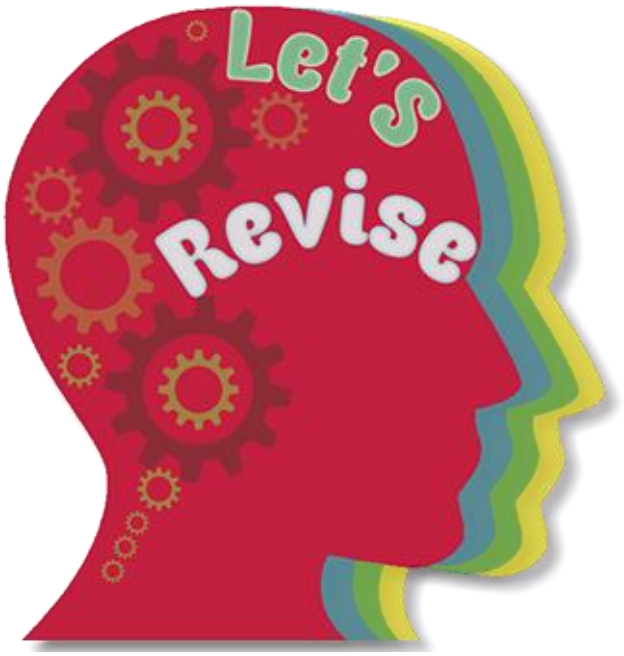
REVISION LIST

Year 11 PPEs

January 2019



Subject List

Science (Biology, Chemistry, Physics)

Art

Business

Child Development

Computer Science

Design & Technology (Core, Textiles, Resistant Materials, Graphics)

Drama

Economics

Food Preparation & Nutrition

French, German, Spanish (Languages)

Geography

Health & Social Care

History

Music

Physical Education

Y11 PPE Revision list – Biology 2018-19

Y11 PPE Revision list

COMBINED

B1 Cell – Level Systems

Cell structures

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B1.1.1 Plant and animal cells	I can state the organelles (structures) present in a plant and animal cell.	☐	I can compare the organelles present in plant and animal cells.	☐	I can discuss the reasons for the presence or absence of organelles in different plant and animal cells.	☐
	I can state the function of each of the main organelles present in a plant and animal cell.	☐	I can explain the function of the organelles, relating the structure and molecules present to the function of the organelles.	☐	I can explain the roles of the molecules or structures within the organelles, such as the receptors in the cell membrane.	☐
	I can label the organelles in representational models of plant and animal cells.	☐	I can explain how a model cell is similar to, and different from, a real cell.	☐	I can discuss the benefits and drawbacks of using a representational model to help in explaining the structures and functions of cell organelles.	☐
B1.1.2 Bacterial cells	I can name some examples of prokaryotes.	☐	I can compare prokaryotic and eukaryotic cells.	☐	I can discuss the reasons for the presence or absence of organelles in different prokaryotic cells.	☐
	I can state the main organelles present in a prokaryotic cell.	☐	I can explain the function of the organelles, relating the structure to the function of the organelles.	☐	I can discuss how the organelles of the prokaryote can carry out all of the functions of the eukaryotic cell.	☐
	I can use a method, with some help to obtain results, working safely.	☐	I can use a method independently to obtain results, noting some major hazards.	☐	I can use a method independently to obtain results, justifying the steps to minimise risks.	☐
B1.1.3 Light microscopy	I can identify the components of the light microscope.	☐	I can explain the role of each part of the microscope.	☐	I can discuss why different lenses on the microscope are needed.	☐
	I can describe how to use a microscope to observe cells.	☐	I can explain why stains are used to highlight cell features.	☐	I can discuss why different stains might be required when viewing different cells or tissues.	☐
	I can use a microscope to observe and draw a cell.	☐	I can draw an accurate representation of a cell and calculate the magnification used to make the drawing.	☐	I can calculate specimen size, image size and magnification by substituting values into an equation, rearranging when necessary.	☐
B1.1.4 Electron microscopy	I can describe simply how a transmission electron microscope (TEM) works.	☐	I can explain how electron microscopy has increased understanding of subcellular structures.	☐	I can discuss how useful the electron microscope has been in medicine and biology.	☐
	I can state an advantage of using an electron microscope.	☐	I can describe the advantages of using the electron microscope compared with the light microscope.	☐	I can evaluate the relative advantages and disadvantages of using an electron microscope compared with a light microscope.	☐
	I can state the resolution achieved by an electron microscope in SI units using the correct order of magnitude.	☐	I can compare the increase in resolution, in standard form, of an electron microscope with that of a light microscope.	☐	I can calculate how many times greater the resolution of an electron microscope is compared with a light microscope.	☐

What happens in cells?

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B1.2.1 DNA	I can describe the structure of DNA.	☐	I can describe the structure of the nucleotide as the building block of DNA.	☐	I can explain what is meant by complementary base pairing.	☐
	I can state the role of DNA.	☐	I can describe the role of a gene.	☐	I can explain the relationship between DNA, genes, and chromosomes.	☐
	I can use the correct apparatus to follow a method with help.	☐	I can use a method to carry out an experiment appropriately and independently, having due regard for the correct manipulation of apparatus.	☐	I can use a method to carry out an experiment appropriately and independently, with due regard to the correct manipulation of apparatus and the accuracy of measurements.	☐
B1.2.2 Bacterial cells (H)			I can compare the difference in structure between mRNA and DNA.	☐	I can distinguish between the roles of mRNA and DNA in the process of protein synthesis.	☐
			I can describe the process of protein synthesis; to include transcription and translation.	☐	I can explain how the base sequence in the DNA molecule determines the amino acid sequence in the protein.	☐
			I can summarise and evaluate with accuracy and clear understanding.	☐	I can summarise and critically evaluate with detailed and perceptive understanding.	☐
B1.2.3 Enzymes	I can state what an enzyme is.	☐	I can describe the structure of an enzyme.	☐	I can explain what is meant by enzyme specificity.	☐
	I can describe simply how an enzyme works.	☐	I can explain how an enzyme works.	☐	I can explain in detail how an enzyme interacts with its substrate to catalyse a reaction.	☐
	I can describe how an enzyme works by communicating simply and with some clarity for the audience.	☐	I can illustrate how an enzyme works by communicating effectively, sustaining the audience's interest.	☐	I can interpret how an enzyme works by communicating, with impact and influence.	☐
B1.2.4 Enzyme reactions	I can state the factors that affect enzyme-controlled reactions.	☐	I can describe the effect of a factor on the rate of an enzyme-controlled reaction.	☐	I can explain how different factors affect the rate of an enzyme-controlled reaction.	☐
	I can state what is meant by denaturation.	☐	I can describe what happens when an enzyme is denatured.	☐	I can explain how denaturation affects the rate of an enzyme-controlled reaction.	☐
	I can record observations from an experimental procedure, using a range of apparatus.	☐	I can record measurements from an experimental procedure, and plot a simple graph having been given the axes.	☐	I can record accurate measurements from an experimental procedure, plotting an accurate rate graph.	☐

Respiration

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B1.3.1 Carbohydrates, proteins, and lipids	I can describe the components of carbohydrates, proteins, and lipids.	☐	I can explain how carbohydrates, proteins, and lipids are synthesised and broken down.	☐	I can distinguish between monomers and polymers in biological molecules.	☐
	I can state what is meant by metabolic rate.	☐	I can describe the relationship between metabolic rate, activity levels, and food intake.	☐	I can explain that metabolic reactions can be divided into different groups.	☐
	I can use scientific vocabulary, terminology, and definitions, with limited accuracy of spelling, punctuation, and grammar.	☐	I can use scientific vocabulary, terminology, and definitions accurately with occasional errors in spelling, punctuation, and grammar.	☐	I can use scientific vocabulary, terminology, and definitions accurately and error-free in spelling, punctuation, and grammar.	☐
B1.3.2 Aerobic respiration	I can state the word equation for respiration.	☐	I can state the chemical equation for respiration.	☐	I can discuss the use by the body of the energy transferred in respiration.	☐
	I can state that respiration transfers energy.	☐	I can describe the process of aerobic respiration as an exothermic reaction.	☐	I can explain how ATP is produced during aerobic respiration.	☐
	I can plot a graph of data from experiments.	☐	I can plot an appropriate line graph of two variables from experimental data.	☐	I can plot an appropriate accurate line graph of two variables from experimental data, and interpret the data to draw conclusions.	☐
B1.3.3 Anaerobic respiration	I can state the word equation for anaerobic respiration.	☐	I can state a chemical equation for anaerobic respiration.	☐	I can compare the processes of aerobic and anaerobic respiration in terms of energy yield.	☐
	I can state that there are different types of anaerobic respiration in different organisms.	☐	I can describe the different processes of anaerobic respiration and where they occur.	☐	I can explain the consequences of anaerobic respiration in muscles in terms of oxygen debt.	☐
	I can use the correct apparatus to follow a method with help.	☐	I can use a method to carry out an experiment appropriately and independently, having due regard to the correct manipulation of apparatus.	☐	I can use a method to carry out an experiment appropriately and independently, having due regard to the correct manipulation of apparatus and the accuracy of measurements.	☐

Photosynthesis

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B1.4.1 Photosynthesis	I can state the word equation for photosynthesis.	☐	I can state the chemical equation for photosynthesis.	☐	I can discuss the fate of the products of photosynthesis.	☐
	I can state that sunlight energy is required for the process of photosynthesis.	☐	I can describe the process of photosynthesis as an endothermic reaction.	☐	I can explain that photosynthesis is a two stage process, and where those stages occur.	☐
	I can state basic facts (about photosynthesis), communicating simply and with some clarity.	☐	I can illustrate the process of photosynthesis using labelled diagrams that communicate effectively, making coherent statements.	☐	I can annotate diagrams to explain the process of photosynthesis in detail, communicating coherently and with impact.	☐
B1.4.2 Photosynthesis experiments	I can describe how to test a leaf for the presence of starch.	☐	I can explain how to use the starch test to investigate the factors that affect whether or not photosynthesis occurs.	☐	I can justify the use of each of the steps in the test for starch.	☐
	I can use the correct apparatus to follow a method with help, having due regard for some health and safety considerations.	☐	I can follow a method to carry out an experiment appropriately and independently, having due regard for most health and safety considerations.	☐	I can follow a method to carry out an experiment appropriately and independently, having due regard for the correct manipulation of apparatus and all health and safety considerations.	☐
	I can state a simple conclusion from a scientific observation.	☐	I can interpret experimental observations, drawing a valid conclusion.	☐	I can interpret fully all experimental observations, to provide a detailed conclusion.	☐
B1.4.3 Factors affecting photosynthesis	I can state the factors affecting the rate of photosynthesis.	☐	I can describe the effect of light intensity, carbon dioxide concentration, and temperature on the rate of photosynthesis.	☐	I can explain the effect of light intensity, carbon dioxide concentration, and temperature on the rate of photosynthesis.	☐
	I can record data from an experiment in the table provided.	☐	I can calculate a class average (mean) from data collected in an experiment.	☐	I can calculate the mean rate of photosynthesis from data collected in an experiment, and plot a rate graph as a line graph.	☐
	I can state any difficulties encountered carrying out this method.	☐	I can suggest how any difficulties have affected the repeatability of the results.	☐	I can evaluate the method, discussing the impact upon the validity of the results, and suggest improvements.	☐
B1.4.4 Interaction of limiting factors (H)			I can explain the concept of a limiting factor.	☐	I can explain how factors interact to limit the rate of photosynthesis.	☐
			I can calculate relative light intensity using the inverse square law.	☐	I can explain the relationship between light intensity and distance from a lamp.	☐
			I can describe how light intensity, carbon dioxide concentration, and temperature can be controlled.	☐	I can discuss how controlling the factors that affect the rate of photosynthesis can affect the yield of a plant crop.	☐

B2 – Scaling up

Supplying the cell

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B2.1.1 Diffusion	I can state some examples of diffusion.	☐	I can describe the process of diffusion.	☐	I can explain fully at a molecular level the process of diffusion.	☐
	I can state factors that affect the rate of diffusion.	☐	I can describe the effect of factors on the rate of diffusion.	☐	I can explain the reasons for the effects of factors on the rate of diffusion.	☐
	I can describe by communicating simply, producing text with basic structure and familiar vocabulary.	☐	I can describe by communicating effectively, producing coherent text, which is well structured, and use some appropriate scientific vocabulary.	☐	I can describe by communicating with impact, producing effectively-structured texts, using a full range of precise scientific vocabulary.	☐
B2.1.2 Osmosis	I can state that osmosis is the movement of water molecules into or out of cells.	☐	I can describe the process of osmosis.	☐	I can explain the effect of osmosis on potato cells.	☐
	I can state that osmosis is a type of diffusion.	☐	I can explain why osmosis occurs.	☐	I can explain, in terms of water potential, why osmosis occurs.	☐
B2.1.3 Active transport	I can state some examples of active transport.	☐	I can describe examples of active transport in plants and animals.	☐	I can explain the importance of active transport in plants and animals.	☐
	I can state the differences between active transport and diffusion.	☐	I can describe how molecules move by active transport.	☐	I can explain how carrier proteins function in the process of active transport.	☐
	I can record measurements from an experimental method, and calculate a change in mass.	☐	I can record measurements from an experimental method, and calculate a percentage change in mass.	☐	I can record measurements from an experimental method, calculate a percentage change in mass, and plot the data to determine the concentration that is equal to the cell.	☐

B2.1.4 Mitosis	I can state the stages of the cell cycle.	☐	I can describe the key features of each stage of the cell cycle.	☐	I can explain the process of DNA replication in the cell cycle.	☐
	I can state the purpose of mitosis.	☐	I can describe the process of mitosis.	☐	I can explain the process of mitosis in terms of the movement of chromosomes.	☐
	I can use a model to illustrate the major steps in the cell cycle.	☐	I can use a representational model to describe the key events during the cell cycle.	☐	I can use a representational model to develop scientific explanations of all of the events during the cell cycle.	☐
B2.1.5 Cell differentiation	I can state what is meant by cell differentiation.	☐	I can explain why cells become differentiated.	☐	I can explain the need for cellular differentiation in multicellular organisms.	☐
	I can state some examples of specialised cells.	☐	I can describe the adaptations of a range of specialised cells.	☐	I can explain the link between the adaptation of each specialised cell and its function.	☐
	I can use text to be able to describe features with some accuracy.	☐	I can summarise text, with accuracy, to show clear understanding of cell features.	☐	I can summarise text showing detailed and perceptive understanding of cell features and functions.	☐
B2.1.6 Stem cells	I can state where stem cells are found.	☐	I can describe the difference between a stem cell and a differentiated cell.	☐	I can explain the difference between embryonic and adult stem cells.	☐
	I can state some uses of stem cells.	☐	I can describe the function of stem cells.	☐	I can evaluate the advantages and disadvantages of using stem cells in medicine.	☐
	I can use general references to scientific texts to support my comments and opinions.	☐	I can use appropriate references to scientific texts to support their understanding and opinions.	☐	I can justify my understanding and opinions with illuminating use of references to scientific texts.	☐

The challenges of size

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B2.2.1 Exchange and transport	I can state some examples of exchange surfaces and transport systems.	☐	I can describe the features of an efficient exchange surface.	☐	I can explain why multicellular organisms require adapted exchange surfaces.	☐
	I can calculate the surface area or volume of an object.	☐	I can calculate the surface area: volume ratio.	☐	I can compare the relationship between the surface area: volume ratio and the size of an organism/cell.	☐
	I can describe simple observations made during an experiment.	☐	I can interpret observations and data made during an experiment.	☐	I can interpret observations and data obtained during an experiment, identifying patterns and drawing conclusions.	☐
B2.2.2 Circulatory system	I can state the function of the circulatory system.	☐	I can describe the structure of the double circulatory system.	☐	I can explain the need for a double circulatory system in mammals.	☐
	I can the different types of blood vessels found in a circulatory system.	☐	I can describe the structure of the blood vessels.	☐	I can explain the link between the structure and function of the different types of blood vessels.	☐
	I can use familiar vocabulary to some effect to describe the circulatory system.	☐	I can use vocabulary appropriate to purpose and effect to describe the structure of the circulatory system.	☐	I can use a wide range of well-selected and precise vocabulary to enhance impact when explaining the functioning of the circulatory system.	☐
B2.2.3 Heart and blood	I can identify the components of the blood.	☐	I can describe the functions of the main components of the blood.	☐	I can explain the adaptations of the red blood cell that enable it to carry out its function.	☐
	I can identify the main structures in the heart.	☐	I can describe the flow of blood through the heart.	☐	I can explain how the thickness of the chambers of the heart are related to their function.	☐
	I can state the names of the major parts of the heart and blood.	☐	I can use the correct names of the parts of the heart and blood when describing their function.	☐	I can use an appropriate range of scientific vocabulary and terminology when explaining the functions of the blood and heart.	☐

B2.2.4 Plant transport systems	I can state the function of xylem.	☐	I can describe the function and distribution of xylem tissue.	☐	I can explain how the structure and distribution of xylem tissue is related to its function.	☐
	I can state the function of phloem.	☐	I can describe the function and distribution of phloem tissue.	☐	I can explain how the structure and distribution of phloem tissue is related to its function.	☐
	I can label diagrams using simple sentence structure and familiar vocabulary.	☐	I can annotate diagrams using varied sentence types and appropriate scientific vocabulary.	☐	I can annotate diagrams using a wide range of sentence types, including precise and appropriate scientific vocabulary.	☐
B2.2.5 Transpiration stream	I can state what is meant by transpiration.	☐	I can describe the transpiration stream.	☐	I can explain the mechanisms by which water is moved through the plant.	☐
	I can state the location of most stomata in a plant.	☐	I can describe the structure of a stoma.	☐	I can explain how stomata control water loss from leaves.	☐
	I can describe the observations made during each experiment.	☐	I can explain the observations made during each experiment.	☐	I can relate the findings of both experiments to one another, to explain how water is lost from the plant.	☐
B2.2.6 Factors affecting transpiration	I can state the factors that affect the rate of transpiration.	☐	I can describe the relationship between a given factor and the rate of transpiration.	☐	I can explain how environmental factors affect the rate of transpiration.	☐
	I can state what a potometer measures.	☐	I can describe how to use a potometer.	☐	I can explain how to calculate the rate of transpiration using a potometer.	☐
	I can state a limitation found with the method.	☐	I can discuss a range of limitations with this method, which might affect the results.	☐	I can discuss a range of limitations with this method, which might affect the results, suggesting a series of improvements.	☐

B3 – Organ Level Systems

The nervous system

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B3.1.1 Nervous system	I can state the function of the nervous system.	☐	I can describe the pathway taken by an impulse in a nervous reaction.	☐	I can explain how the nervous system produces a coordinated response.	☐
	I can state the difference between a nerve and a neurone.	☐	I can describe the different types of neurone in the nervous system.	☐	I can explain the difference in function of sensory and motor neurones.	☐
	I can state that the reaction time measured is controlled by the nervous system.	☐	I can identify reasons for reaction times measured, by describing the pathway taken by the impulse.	☐	I can explain the reasons for different reaction times between dominant and non-dominant hands.	☐
B3.1.2 Reflexes	I can state what is meant by a reflex action.	☐	I can describe the pathway of the impulse in the reflex arc during a reflex action.	☐	I can explain how a specific example of a reflex action occurs.	☐
	I can list examples of reflex actions.	☐	I can describe the difference between a reflex action and a voluntary action.	☐	I can explain why a reflex action is faster than a voluntary action.	☐
	I can plan a simple experiment to make a basic observation of the iris reflex.	☐	I can plan a series of simple experiments to make observations of the iris reflex. .	☐	I can plan a systematic series of experiments to fully investigate the iris reflex.	☐

The endocrine system

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B3.2.1 Hormones	I can name examples of endocrine glands and the hormones they release.	☐	I can describe how a hormone reaches its target organ.	☐	I can explain how a hormone acts as a chemical messenger.	☐
	I can state the function of a hormone.	☐	I can describe the specific roles of some hormones in the body.	☐	I can explain how named hormones bring about homeostatic regulation in the body.	☐
	I can use simple sentence types and familiar vocabulary, limited to scientific names, when producing texts.	☐	I can use a variety of sentence types and vocabulary appropriate to purpose when describing the actions of hormones.	☐	I can use a wide range of well-selected sentence types and precise vocabulary when explaining the action of hormones.	☐
B3.2.2 Negative feedback (H)			I can describe the role of thyroxine and adrenaline in the body.	☐	I can explain how the roles of thyroxine and adrenaline are brought about by a number of responses in the body.	☐
			I can describe how negative feedback occurs.	☐	I can explain the purpose of negative feedback.	☐
			I can use a model to describe how negative feedback occurs.	☐	I can use a model to explain how negative feedback brings about control.	☐
B3.2.3 The menstrual cycle	I can state the hormones involved in the menstrual cycle.	☐	I can describe how the levels of the hormones change during the menstrual cycle.	☐	I can explain how some hormones control the level of production of other hormones during the menstrual cycle. (H)	☐
	I can describe the main stages of the menstrual cycle.	☐	I can describe how hormones cause the changes that occur at the different stages of the menstrual cycle.	☐	I can explain how hormones interact to control the menstrual cycle. (H)	☐
	I can state simple factual statements based on data and observations from texts.	☐	I can use data and observations from texts to describe processes in detail.	☐	I can interpret data and observations from texts to explain how changes in the menstrual cycle are related to patterns in the hormone levels.	☐

B3.2.4 Controlling reproduction	I can state some examples of contraception.	☐	I can describe how the different methods of contraception work.	☐	I can evaluate different methods of contraception.	☐
	I can name the different types of hormone-based contraception.	☐	I can explain how hormones are used in contraception.	☐	I can evaluate hormonal contraception methods compared with non-hormonal contraception.	☐
	I can state that applications of science have helped humans control their reproduction.	☐	I can discuss how knowledge of reproduction allowed scientists to develop applications to control reproduction.	☐	I can explain the need for scientists to evaluate reproductive applications of science, in order to inform the public.	☐
B3.2.5 Using hormones to treat infertility (H)			I can describe some causes of infertility.	☐	I can discuss issues surrounding fertility treatment.	☐
			I can describe the process of in vitro fertilisation (IVF).	☐	I can explain how hormones can be used to treat infertility.	☐
			I can use evidence to support or reject the use of IVF.	☐	I can justify decisions about the suitability of IVF based on an evaluation of the evidence and arguments about the technique.	☐

Maintaining internal environments

Lesson	Aiming for Grade 4		Aiming for Grade 6		Aiming for Grade 8	
B3.3.1 Controlling blood sugar	I can name a hormone involved in blood sugar control.	☐	I can explain the role of insulin in maintaining blood glucose levels.	☐	I can explain the role of glucagon and insulin in maintaining blood glucose levels. (H)	☐
	I can state why blood sugar levels change throughout the day.	☐	I can describe the main differences between type 1 and type 2 diabetes.	☐	I can explain the differences between the treatments for type 1 and type 2 diabetes.	☐
	I can state basic observations about blood sugar levels obtained in an experiment.	☐	I can interpret data, obtained in an experiment, to describe the changes in blood glucose levels.	☐	I can Interpret data, obtained in an experiment, to explain the changes in blood glucose levels and compare with other data.	☐

Maintaining internal environments

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B3.3.1 Controlling body temperature	I can state some of the changes that occur in the skin at high or low temperatures.	☐	I can describe the function of the skin in controlling body temperature.	☐	I can explain in detail the body's responses to temperature change. (H)	☐
	I can state what is meant by homeostasis.	☐	I can describe how overheating or cooling can affect the body. (H)	☐	I can explain the importance of maintaining a constant internal environment.	☐
	I can make and record measurements from an experiment.	☐	I can make and record accurate measurements in a clear table.	☐	I can make and record accurate, repeated measurements systematically in a well-organised table with clear headings and units.	☐
B3.3.2 Controlling blood sugar	I can name a hormone involved in blood sugar control.	☐	I can explain the role of insulin in maintaining blood glucose levels.	☐	I can explain the role of glucagon and insulin in maintaining blood glucose levels. (H)	☐
	I can state why blood sugar levels change throughout the day.	☐	I can describe the main differences between type 1 and type 2 diabetes.	☐	I can explain the differences between the treatments for type 1 and type 2 diabetes.	☐
	I can state basic observations about blood sugar levels obtained in an experiment.	☐	I can interpret data, obtained in an experiment, to describe the changes in blood glucose levels.	☐	I can Interpret data, obtained in an experiment, to explain the changes in blood glucose levels and compare with other data.	☐
B3.3.4 Inside the kidney	I can identify the structures present in the kidney.	☐	I can describe the function of the different regions of a nephron.	☐	I can explain ultrafiltration and selective reabsorption in the nephron.	☐
	I can state that the concentration of urine can change.	☐	I can describe how the kidney can produce varying amounts of urine depending upon the body's level of hydration. (H)	☐	I can explain how ADH determines the amount of water that is reabsorbed. (H)	☐
	I can use some scientific vocabulary when discussing the structure or function of the kidney.	☐	I can use appropriate scientific vocabulary when describing the function of the nephron.	☐	I can use a full range of scientific vocabulary and terminology to explain the functioning of the nephron.	☐

For this section combined need to learn the following:

- Be able to explain the importance of maintain a constant internal environment in response to internal and external change
- All of the controlling blood sugar section, to include a comparison of type I and type II diabetes
- Be able to describe the gross structure of the kidney and the structure of the kidney tubule.

B4 – Community level systems

Ecosystems

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B4.1.1 Ecosystems	I can state the names of the different levels of organisation in an ecosystem.	☐	I can describe the levels of organisation within an ecosystem.	☐	I can explain how the different levels of organisation are related.	☐
	I can describe the differences between a producer and a consumer.	☐	I can describe how organisms are organised into food chains and food webs.	☐	I can explain how organisms can be categorised into trophic levels.	☐
	I can use some scientific vocabulary and terminology.	☐	I can use scientific vocabulary, terminology, and definitions.	☐	I can use a full range of scientific vocabulary, terminology, and definitions appropriately and fluently.	☐
B4.1.2 Abiotic and biotic factors	I can state the difference between a biotic and an abiotic factor.	☐	I can describe how a named biotic or abiotic factor might affect a species.	☐	I can explain how biotic and abiotic factors can affect communities.	☐
	I can use a sampling technique to record organisms in their environment.	☐	I can explain that sampling techniques produce results that are representative of the environment as a whole.	☐	I can justify the number and frequency of samples collected to produce unbiased and representative data.	☐
	I can plot data from an experiment onto a graph with given axes.	☐	I can plot data from an experiment in an appropriate graph.	☐	I can plot data from an experiment in an appropriate graph with suitable and correctly labelled axes.	☐
B4.1.3 Competition and interdependence	I can state the factors plants and animals need to survive.	☐	I can describe how species compete with each other for a factor.	☐	I can explain how the availability of a factor affects the population of a species.	☐
	I can state different types of interdependent relationships.	☐	I can describe the difference between mutualism and parasitism.	☐	I can explain how predator and prey populations fluctuate in a predation relationship.	☐
	I can use some scientific vocabulary and terminology.	☐	I can use scientific vocabulary, terminology, and definitions.	☐	I can use a full range of scientific vocabulary, terminology, and definitions appropriately and fluently.	☐
B4.1.6 Nutrient cycling	I can describe what nutrient cycling means.	☐	I can describe how nitrogen and water are cycled through the ecosystem.	☐	I can explain the processes involved in achieving the steps in the cycling of nitrogen and water through an	☐
	I can state that carbon, nitrogen, and water are essential for living organisms.	☐	I can describe how living organisms make use of carbon, nitrogen, and water.	☐	I can explain the role of microorganisms in the recycling of materials for living organisms.	☐
	I can describe an activity that illustrates a process in the nutrient cycle.	☐	I can suggest activities or experiments that would provide observations that could be used to show a process in a nutrient cycle.	☐	I can suggest activities or experiments that would provide observations to explain processes in a nutrient cycle.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B4.1.7 The carbon cycle	I can state that carbon is cycled between the biotic and abiotic world.	☐	I can describe how carbon is added to, or removed from, the atmosphere.	☐	I can explain the processes that bring about the steps in the carbon cycle.	☐
	I can state that carbon dioxide levels in the atmosphere are increasing.	☐	I can describe the ways in which carbon dioxide is being added to the atmosphere in excess.	☐	I can explain fully why atmospheric carbon dioxide levels are increasing, resulting in a cycle that is no longer in balance.	☐
	I can identify connections between statements that help develop an understanding of some stages of the carbon cycle, using some key vocabulary.	☐	I can identify connections between statements, to describe all the stages in the carbon cycle, using a range of appropriate terminology.	☐	I can use a full range of appropriate scientific vocabulary and terminology when explaining the links in the carbon cycle.	☐
B4.1.8 Decomposers	I can state some examples of decomposers and detritivores.	☐	I can describe what is meant by decomposition.	☐	I can explain how environmental factors affect the rate of decomposition.	☐
	I can describe a simple plan, which lacks detail, to test the effect of a factor on decomposition.	☐	I can describe a plan that will test a hypothesis of the effect of a factor on the rate of decay.	☐	I can suggest a detailed plan, which will test a hypothesis of the effect of a number of factors on the rate of	☐
	I can state from my observations that a factor has affected decomposition.	☐	I can use my observations to describe the effect of my factor on the rate of decay.	☐	I can interpret my observations to explain the effect of a series of factors on the rate of decomposition.	☐

B5 – Genes, Inheritance and Selection

Inheritance

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B5.1.1 Inheritance	I can state what is meant by variation.	☐	I can describe the two causes of variation, genetic and environmental, and give examples.	☐	I can explain the differences between genetic and environmental variation.	☐
	I can name some examples of continuous or discontinuous variation.	☐	I can describe the differences between discontinuous and continuous variation.	☐	I can explain distinguish between the causes of discontinuous and continuous variation.	☐
	I can record observations in a basic table.	☐	I can record data from experiments in a clear table with full headings, and plot a simple graph.	☐	I can record data from experiments in a clear table with full headings, and plot appropriate graphs to represent the data.	☐
B5.1.2 Sexual and asexual reproduction	I can state that there are two types of reproduction.	☐	I can describe the differences between asexual and sexual reproduction.	☐	I can explain some of the advantages and disadvantages of asexual and sexual reproduction.	☐
	I can state what is meant by a clone.	☐	I can describe the process by which some organisms are able to produce clones.	☐	I can explain why clones lack genetic variation.	☐
	I can state some applications of a scientific knowledge of reproduction.	☐	I can describe the application of science to reproductive technologies.	☐	I can explain how an application of science to reproductive technologies has brought about new or improved varieties.	☐
B5.1.3 Meiosis	I can state that gametes are produced by meiosis.	☐	I can explain the process of meiosis.	☐	I can explain the significance of meiosis in genetic variation.	☐
	I can state that the chromosome number halves when an organism makes gametes.	☐	I can describe the difference between haploid and diploid cells.	☐	I can explain the role of meiosis in maintaining he chromosome number.	☐
	I can use some scientific vocabulary and to communicate simply and clearly.	☐	I can use scientific vocabulary and terminology to communicate effectively, sustaining interest.	☐	I can use scientific vocabulary and terminology to communicate with impact.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B5.1.4 Dominant and recessive alleles	I can state some examples of characteristics controlled by dominant alleles.	☐	I can describe the difference between homozygous and heterozygous.	☐	I can explain how the combination of alleles in the genotype can be expressed in the phenotype.	☐
	I can state that individuals have two alleles for a characteristic.	☐	I can describe the difference between homozygous and heterozygous.	☐	I can explain how sexual reproduction leads to new combinations of alleles in the genotype.	☐
	I can use some scientific vocabulary to communicate simply and clearly.	☐	I can scientific vocabulary and terminology to communicate effectively, sustaining interest.	☐	I can use scientific vocabulary and terminology to communicate with impact.	☐
B5.1.5 Genetic crosses (1)	I can state that alleles are passed from one generation to the next during reproduction.	☐	I can describe the steps in a genetic cross between two homozygous individuals.	☐	I can explain how to use a Punnet square to show the results of fertilisation.	☐
	I can state that it is possible to predict the outcome of a genetic cross.	☐	I can use any one of percentages, fractions, or ratios to represent the outcome of a genetic cross.	☐	I can compare and evaluate the use of percentages, fractions, and ratios to represent the outcome of a genetic cross.	☐
	I can complete models, such as Punnet squares, given the alleles, to show the outcome of a genetic cross.	☐	I can complete models, such as Punnet squares, to predict the outcome of a genetic cross.	☐	I can draw, and confidently, use models, such as Punnet squares, to predict the outcome of a genetic cross.	☐
B5.1.6 Genetic crosses (2)	I can state that a heterozygous genetic cross can result in offspring of a different phenotype to the parents.	☐	I can describe the steps in a genetic cross between two heterozygous individuals.	☐	I can use percentages, fractions, and ratios to represent the outcome of a heterozygous genetic cross.	☐
	I can state the genotype of a male and female organism.	☐	I can use a genetic cross to show how gender is inherited.	☐	I can compare and evaluate the use of percentages, fractions, and ratios to represent the probability of having male	☐
	I can complete model, such as Punnet squares, given the alleles, to show the outcome of a heterozygous genetic cross.	☐	I can complete models, such as Punnet squares, to predict the outcome of a heterozygous genetic cross.	☐	I can draw, and confidently, use models, such as Punnet squares, to predict the outcome of a heterozygous genetic cross.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B5.1.7 Mutations	I can state what is meant by a mutation.	☐	I can describe how a mutation can influence phenotype.	☐	I can explain how a mutation alters the way in which the gene functions in the cell.	☐
	I can state some examples of harmful, beneficial, and neutral mutations.	☐	I can describe the consequences of harmful or beneficial mutations.	☐	I can explain the causes of mutations.	☐
	I can use some key facts to present a basic description of a genetic disorder.	☐	I can use a range of factual information to present an explanation of the causes and effects of a genetic disorder.	☐	I can use a wide range of relevant factual information, including data, to present a reasoned explanation of the causes, effects, and inheritance of a genetic disorder.	☐

Natural selection and evolution

	Aiming for 4		Aiming for 6		Aiming for 8	
B5.2.1 Inheritance	I can state that evolution is the gradual change in the characteristics of a population over time.	☐	I can describe what is meant by natural selection.	☐	I can explain how evolution occurs through the process of natural selection.	☐
	I can list some examples of evolution.	☐	I can describe some examples of evolution.	☐	I can explain the role of mutations in bringing about evolution.	☐
	I can use observations to present a simple description of the evolution of a characteristic.	☐	I can use some scientific facts to present a simple explanation for the evolution of a characteristic.	☐	I can use a range of scientific facts to present a reasoned explanation for the evolution of a characteristic.	☐
B5.2.2 Evidence for evolution	I can state what a fossil is.	☐	I can describe how a fossil forms.	☐	I can explain how the fossil record provides evidence for evolution.	☐
	I can name other types of evidence for evolution.	☐	I can describe other examples of evidence for evolution.	☐	I can explain how the other types of evidence provide evidence for evolution.	☐
	I can recognise links between pieces of fossil evidence.	☐	I can use fossil evidence to make decisions about the evolution of a characteristic in a species.	☐	I can evaluate the quality of fossil evidence when explaining the evolution of a characteristic in a species.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B5.2.4 Classification systems	I can state what is meant by classification.	☐	I can describe the artificial system of classification.	☐	I can explain how scientific advances have led to the development of the natural classification system.	☐
	I can record some observations and form basic groups of organisms.	☐	I can record observable differences between species and use this evidence to group species.	☐	I can evaluate recorded observations and make decisions to group organisms based on that evaluated evidence.	☐
	I can state that classification systems use a variety of evidence.	☐	I can describe new technologies that are used in classification.	☐	I can discuss how new technologies have influenced the development of scientific classification over time.	☐

B6 – Global challenges

Monitoring and maintaining the environment

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B6.1.1 Sampling techniques (1)	I can describe what is meant by a sample.	☐	I can describe some techniques for sampling.	☐	I can justify the selection of a particular sampling technique for a given organism.	☐
	I can state that there are two types of identification keys that are used to identify organisms.	☐	I can use an identification key to identify organisms.	☐	I can explain how to use an identification key.	☐
	I can use quadrats to sample the abundance of organisms.	☐	I can use transect lines and quadrats to investigate the distribution or abundance of organisms.	☐	I can justify the use of transect lines and quadrats to investigate the distribution or abundance of organisms.	☐
B6.1.2 Sampling techniques (2)	I can describe how to sample plants in a habitat.	☐	I can explain the difference between random and non-random sampling techniques.	☐	I can explain how to calculate a plant population for an area using the scaling-up method.	☐
	I can describe how to sample motile animals in a habitat.	☐	I can explain why the same method of sampling must be used each time when carrying out capture-recapture technique.	☐	I can estimate the size of an animal population using data from the capture-recapture technique.	☐
	I can state what is meant by bias in sampling techniques.	☐	I can describe methods of avoiding bias in sampling technique when collecting data to estimate population size.	☐	I can explain why we are often only able to calculate an estimate of an animal population in a habitat.	☐
B6.1.3 Loss of biodiversity	I can state what biodiversity is.	☐	I can describe some processes that result in a loss of biodiversity.	☐	I can explain how human activity results in a loss of biodiversity.	☐
	I can state that science allows us to understand how we can affect our environment.	☐	I can describe how developments in science have allowed us to understand that we are reducing biodiversity.	☐	I can explain how our developing scientific knowledge has increased our understanding of ways to modify our management of the environment.	☐
	I can state that a loss of biodiversity has negative implications.	☐	I can describe some of the social, economic, and environmental implications of the loss of biodiversity.	☐	I can evaluate the social, economic, and environmental implications associated with a loss of biodiversity.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B6.1.4 Increasing biodiversity	I can state what is meant by conservation.	☐	I can describe the importance of conservation for endangered species.	☐	I can explain how conservation can be used to increase biodiversity.	☐
	I can list at least two methods of conservation.	☐	I can describe a method of conservation that will maintain biodiversity.	☐	I can explain how captive breeding or seed banks can lead to increased biodiversity.	☐
	I can state one reason for conserving a species.	☐	I can describe the ethical issues that might arise from some conservation methods to increase biodiversity.	☐	I can discuss the ethical responsibility to increase species and biodiversity.	☐
B6.1.5 Maintaining biodiversity	I can name some global agreements used to maintain biodiversity.	☐	I can describe how global agreements function to maintain biodiversity.	☐	I can explain why local and global agreements are needed to maintain biodiversity.	☐
	I can state what is meant by ecotourism.	☐	I can describe how ecotourism is different from ordinary tourism.	☐	I can explain how ecotourism helps to maintain biodiversity.	☐
	I can state that there are advantages and disadvantages to methods used to maintain biodiversity.	☐	I can discuss some of the social, economic, and environmental benefits or challenges of maintaining biodiversity.	☐	I can evaluate the social, economic, and environmental benefits and challenges of maintaining biodiversity.	☐

Feeding the human race

B6.2.3 Selective breeding	I can state what is meant by selective breeding.	☐	I can describe how organisms are selectively bred.	☐	I can explain how selective breeding increases yields.	☐
	I can state some advantages of selectively bred organisms.	☐	I ca describe the advantages and disadvantages of selective breeding.	☐	I can evaluate the advantages and disadvantages of selective breeding.	☐
	I can state that an understanding of science has enhanced the process of selective breeding.	☐	I can describe how the understanding of science has given us the power to plan a selective breeding programme.	☐	I can discuss how the limitations of the science of selective breeding have driven scientists to seek other methods to increase yields.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B6.2.4 Genetic engineering	I can state what is meant by genetic engineering.	☐	I can describe simply how an organism is genetically engineered.	☐	I can evaluate the benefits and risks of using genetic engineering in agriculture.	☐
	I can state that an understanding of science has led to genetic engineering.	☐	I can describe how the understanding of science has allowed us to develop the process of genetic engineering.	☐	I can discuss the scientific achievement and limitations of the process of genetic engineering.	☐
	I can state an ethical objection to genetic engineering.	☐	I can discuss a range of ethical concerns arising from genetic engineering.	☐	I can evaluate the ethical issues raised by governments, scientists, and the wider public about genetic engineering.	☐
B6.2.5 Producing a genetically engineered organism			I can describe how to genetically engineer an organism.	☐	I can explain how bacteria are genetically engineered to produce hormones.	☐
			I can describe the role of the various enzymes used in the process of genetic engineering.	☐	I can explain how antibiotic-resistance markers are used to select bacteria that contain foreign genes.	☐
			I can describe some technological processes involved in genetic engineering.	☐	I can explain in detail the technological applications of science in genetic engineering.	☐
B6.2.6 Use of biotechnology in farming	I can state what is meant by biotechnology.	☐	I can describe some examples of biotechnology.	☐	I can explain how biotechnology provides possible solutions to the demands of the growing human population.	☐
	I can state that the global use of GM crops is increasing.	☐	I can compare the use of GM crops between industrial and developing countries.	☐	I can explain how the use of GM crops contributes to food security in different economically developed countries.	☐
	I can use a piece of evidence to support a viewpoint on the use of GM crops.	☐	I can use evidence to make a decision about the use of GM crops.	☐	I can evaluate the evidence and arguments when making a decision about the use of GM crops.	☐

Y11 PPE Revision list – Biology 2018-19

TRIPLES

B1 Cell – Level Systems

Cell structures

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B1.1.1 Plant and animal cells	I can state the organelles (structures) present in a plant and animal cell.	☐	I can compare the organelles present in plant and animal cells.	☐	I can discuss the reasons for the presence or absence of organelles in different plant and animal cells.	☐
	I can state the function of each of the main organelles present in a plant and animal cell.	☐	I can explain the function of the organelles, relating the structure and molecules present to the function of the organelles.	☐	I can explain the roles of the molecules or structures within the organelles, such as the receptors in the cell membrane.	☐
	I can label the organelles in representational models of plant and animal cells.	☐	I can explain how a model cell is similar to, and different from, a real cell.	☐	I can discuss the benefits and drawbacks of using a representational model to help in explaining the structures and functions of cell organelles.	☐
B1.1.2 Bacterial cells	I can name some examples of prokaryotes.	☐	I can compare prokaryotic and eukaryotic cells.	☐	I can discuss the reasons for the presence or absence of organelles in different prokaryotic cells.	☐
	I can state the main organelles present in a prokaryotic cell.	☐	I can explain the function of the organelles, relating the structure to the function of the organelles.	☐	I can discuss how the organelles of the prokaryote can carry out all of the functions of the eukaryotic cell.	☐
	I can use a method, with some help to obtain results, working safely.	☐	I can use a method independently to obtain results, noting some major hazards.	☐	I can use a method independently to obtain results, justifying the steps to minimise risks.	☐
B1.1.3 Light microscopy	I can identify the components of the light microscope.	☐	I can explain the role of each part of the microscope.	☐	I can discuss why different lenses on the microscope are needed.	☐
	I can describe how to use a microscope to observe cells.	☐	I can explain why stains are used to highlight cell features.	☐	I can discuss why different stains might be required when viewing different cells or tissues.	☐
	I can use a microscope to observe and draw a cell.	☐	I can draw an accurate representation of a cell and calculate the magnification used to make the drawing.	☐	I can calculate specimen size, image size and magnification by substituting values into an equation, rearranging when necessary.	☐
B1.1.4 Electron microscopy	I can describe simply how a transmission electron microscope (TEM) works.	☐	I can explain how electron microscopy has increased understanding of subcellular structures.	☐	I can discuss how useful the electron microscope has been in medicine and biology.	☐
	I can state an advantage of using an electron microscope.	☐	I can describe the advantages of using the electron microscope compared with the light microscope.	☐	I can evaluate the relative advantages and disadvantages of using an electron microscope compared with a light microscope.	☐
	I can state the resolution achieved by an electron microscope in SI units using the correct order of magnitude.	☐	I can compare the increase in resolution, in standard form, of an electron microscope with that of a light microscope.	☐	I can calculate how many times greater the resolution of an electron microscope is compared with a light microscope.	☐

What happens in cells?

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B1.2.1 DNA	I can describe the structure of DNA.	☐	I can describe the structure of the nucleotide as the building block of DNA.	☐	I can explain what is meant by complementary base pairing.	☐
	I can state the role of DNA.	☐	I can describe the role of a gene.	☐	I can explain the relationship between DNA, genes, and chromosomes.	☐
	I can use the correct apparatus to follow a method with help.	☐	I can use a method to carry out an experiment appropriately and independently, having due regard for the correct manipulation of apparatus.	☐	I can use a method to carry out an experiment appropriately and independently, with due regard to the correct manipulation of apparatus and the accuracy of measurements.	☐
B1.2.2 Bacterial cells (H)			I can compare the difference in structure between mRNA and DNA.	☐	I can distinguish between the roles of mRNA and DNA in the process of protein synthesis.	☐
			I can describe the process of protein synthesis; to include transcription and translation.	☐	I can explain how the base sequence in the DNA molecule determines the amino acid sequence in the protein.	☐
			I can summarise and evaluate with accuracy and clear understanding.	☐	I can summarise and critically evaluate with detailed and perceptive understanding.	☐
B1.2.3 Enzymes	I can state what an enzyme is.	☐	I can describe the structure of an enzyme.	☐	I can explain what is meant by enzyme specificity.	☐
	I can describe simply how an enzyme works.	☐	I can explain how an enzyme works.	☐	I can explain in detail how an enzyme interacts with its substrate to catalyse a reaction.	☐
	I can describe how an enzyme works by communicating simply and with some clarity for the audience.	☐	I can illustrate how an enzyme works by communicating effectively, sustaining the audience's interest.	☐	I can interpret how an enzyme works by communicating, with impact and influence.	☐
B1.2.4 Enzyme reactions	I can state the factors that affect enzyme-controlled reactions.	☐	I can describe the effect of a factor on the rate of an enzyme-controlled reaction.	☐	I can explain how different factors affect the rate of an enzyme-controlled reaction.	☐
	I can state what is meant by denaturation.	☐	I can describe what happens when an enzyme is denatured.	☐	I can explain how denaturation affects the rate of an enzyme-controlled reaction.	☐
	I can record observations from an experimental procedure, using a range of apparatus.	☐	I can record measurements from an experimental procedure, and plot a simple graph having been given the axes.	☐	I can record accurate measurements from an experimental procedure, plotting an accurate rate graph.	☐

Respiration

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B1.3.1 Carbohydrates, proteins, and lipids	I can describe the components of carbohydrates, proteins, and lipids.	☐	I can explain how carbohydrates, proteins, and lipids are synthesised and broken down.	☐	I can distinguish between monomers and polymers in biological molecules.	☐
	I can state what is meant by metabolic rate.	☐	I can describe the relationship between metabolic rate, activity levels, and food intake.	☐	I can explain that metabolic reactions can be divided into different groups.	☐
	I can use scientific vocabulary, terminology, and definitions, with limited accuracy of spelling, punctuation, and grammar.	☐	I can use scientific vocabulary, terminology, and definitions accurately with occasional errors in spelling, punctuation, and grammar.	☐	I can use scientific vocabulary, terminology, and definitions accurately and error-free in spelling, punctuation, and grammar.	☐
B1.3.2 Aerobic respiration	I can state the word equation for respiration.	☐	I can state the chemical equation for respiration.	☐	I can discuss the use by the body of the energy transferred in respiration.	☐
	I can state that respiration transfers energy.	☐	I can describe the process of aerobic respiration as an exothermic reaction.	☐	I can explain how ATP is produced during aerobic respiration.	☐
	I can plot a graph of data from experiments.	☐	I can plot an appropriate line graph of two variables from experimental data.	☐	I can plot an appropriate accurate line graph of two variables from experimental data, and interpret the data to draw conclusions.	☐
B1.3.3 Anaerobic respiration	I can state the word equation for anaerobic respiration.	☐	I can state a chemical equation for anaerobic respiration.	☐	I can compare the processes of aerobic and anaerobic respiration in terms of energy yield.	☐
	I can state that there are different types of anaerobic respiration in different organisms.	☐	I can describe the different processes of anaerobic respiration and where they occur.	☐	I can explain the consequences of anaerobic respiration in muscles in terms of oxygen debt.	☐
	I can use the correct apparatus to follow a method with help.	☐	I can use a method to carry out an experiment appropriately and independently, having due regard to the correct manipulation of apparatus.	☐	I can use a method to carry out an experiment appropriately and independently, having due regard to the correct manipulation of apparatus and the accuracy of measurements.	☐

Photosynthesis

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B1.4.1 Photosynthesis	I can state the word equation for photosynthesis.	☐	I can state the chemical equation for photosynthesis.	☐	I can discuss the fate of the products of photosynthesis.	☐
	I can state that sunlight energy is required for the process of photosynthesis.	☐	I can describe the process of photosynthesis as an endothermic reaction.	☐	I can explain that photosynthesis is a two stage process, and where those stages occur.	☐
	I can state basic facts (about photosynthesis), communicating simply and with some clarity.	☐	I can illustrate the process of photosynthesis using labelled diagrams that communicate effectively, making coherent statements.	☐	I can annotate diagrams to explain the process of photosynthesis in detail, communicating coherently and with impact.	☐
B1.4.2 Photosynthesis experiments	I can describe how to test a leaf for the presence of starch.	☐	I can explain how to use the starch test to investigate the factors that affect whether or not photosynthesis occurs.	☐	I can justify the use of each of the steps in the test for starch.	☐
	I can use the correct apparatus to follow a method with help, having due regard for some health and safety considerations.	☐	I can follow a method to carry out an experiment appropriately and independently, having due regard for most health and safety considerations.	☐	I can follow a method to carry out an experiment appropriately and independently, having due regard for the correct manipulation of apparatus and all health and safety considerations.	☐
	I can state a simple conclusion from a scientific observation.	☐	I can interpret experimental observations, drawing a valid conclusion.	☐	I can interpret fully all experimental observations, to provide a detailed conclusion.	☐
B1.4.3 Factors affecting photosynthesis	I can state the factors affecting the rate of photosynthesis.	☐	I can describe the effect of light intensity, carbon dioxide concentration, and temperature on the rate of photosynthesis.	☐	I can explain the effect of light intensity, carbon dioxide concentration, and temperature on the rate of photosynthesis.	☐
	I can record data from an experiment in the table provided.	☐	I can calculate a class average (mean) from data collected in an experiment.	☐	I can calculate the mean rate of photosynthesis from data collected in an experiment, and plot a rate graph as a line graph.	☐
	I can state any difficulties encountered carrying out this method.	☐	I can suggest how any difficulties have affected the repeatability of the results.	☐	I can evaluate the method, discussing the impact upon the validity of the results, and suggest improvements.	☐
B1.4.4 Interaction of limiting factors (H)			I can explain the concept of a limiting factor.	☐	I can explain how factors interact to limit the rate of photosynthesis.	☐
			I can calculate relative light intensity using the inverse square law.	☐	I can explain the relationship between light intensity and distance from a lamp.	☐
			I can describe how light intensity, carbon dioxide concentration, and temperature can be controlled.	☐	I can discuss how controlling the factors that affect the rate of photosynthesis can affect the yield of a plant crop.	☐

B2 – Scaling up

Supplying the cell

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B2.1.1 Diffusion	I can state some examples of diffusion.	☐	I can describe the process of diffusion.	☐	I can explain fully at a molecular level the process of diffusion.	☐
	I can state factors that affect the rate of diffusion.	☐	I can describe the effect of factors on the rate of diffusion.	☐	I can explain the reasons for the effects of factors on the rate of diffusion.	☐
	I can describe by communicating simply, producing text with basic structure and familiar vocabulary.	☐	I can describe by communicating effectively, producing coherent text, which is well structured, and use some appropriate scientific vocabulary.	☐	I can describe by communicating with impact, producing effectively-structured texts, using a full range of precise scientific vocabulary.	☐
B2.1.2 Osmosis	I can state that osmosis is the movement of water molecules into or out of cells.	☐	I can describe the process of osmosis.	☐	I can explain the effect of osmosis on potato cells.	☐
	I can state that osmosis is a type of diffusion.	☐	I can explain why osmosis occurs.	☐	I can explain, in terms of water potential, why osmosis occurs.	☐
B2.1.3 Active transport	I can state some examples of active transport.	☐	I can describe examples of active transport in plants and animals.	☐	I can explain the importance of active transport in plants and animals.	☐
	I can state the differences between active transport and diffusion.	☐	I can describe how molecules move by active transport.	☐	I can explain how carrier proteins function in the process of active transport.	☐
	I can record measurements from an experimental method, and calculate a change in mass.	☐	I can record measurements from an experimental method, and calculate a percentage change in mass.	☐	I can record measurements from an experimental method, calculate a percentage change in mass, and plot the data to determine the concentration that is equal to the cell.	☐

B2.1.4 Mitosis	I can state the stages of the cell cycle.	☐	I can describe the key features of each stage of the cell cycle.	☐	I can explain the process of DNA replication in the cell cycle.	☐
	I can state the purpose of mitosis.	☐	I can describe the process of mitosis.	☐	I can explain the process of mitosis in terms of the movement of chromosomes.	☐
	I can use a model to illustrate the major steps in the cell cycle.	☐	I can use a representational model to describe the key events during the cell cycle.	☐	I can use a representational model to develop scientific explanations of all of the events during the cell cycle.	☐
B2.1.5 Cell differentiation	I can state what is meant by cell differentiation.	☐	I can explain why cells become differentiated.	☐	I can explain the need for cellular differentiation in multicellular organisms.	☐
	I can state some examples of specialised cells.	☐	I can describe the adaptations of a range of specialised cells.	☐	I can explain the link between the adaptation of each specialised cell and its function.	☐
	I can use text to be able to describe features with some accuracy.	☐	I can summarise text, with accuracy, to show clear understanding of cell features.	☐	I can summarise text showing detailed and perceptive understanding of cell features and functions.	☐
B2.1.6 Stem cells	I can state where stem cells are found.	☐	I can describe the difference between a stem cell and a differentiated cell.	☐	I can explain the difference between embryonic and adult stem cells.	☐
	I can state some uses of stem cells.	☐	I can describe the function of stem cells.	☐	I can evaluate the advantages and disadvantages of using stem cells in medicine.	☐
	I can use general references to scientific texts to support my comments and opinions.	☐	I can use appropriate references to scientific texts to support their understanding and opinions.	☐	I can justify my understanding and opinions with illuminating use of references to scientific texts.	☐

The challenges of size

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B2.2.1 Exchange and transport	I can state some examples of exchange surfaces and transport systems.	☐	I can describe the features of an efficient exchange surface.	☐	I can explain why multicellular organisms require adapted exchange surfaces.	☐
	I can calculate the surface area or volume of an object.	☐	I can calculate the surface area: volume ratio.	☐	I can compare the relationship between the surface area: volume ratio and the size of an organism/cell.	☐
	I can describe simple observations made during an experiment.	☐	I can interpret observations and data made during an experiment.	☐	I can interpret observations and data obtained during an experiment, identifying patterns and drawing conclusions.	☐
B2.2.2 Circulatory system	I can state the function of the circulatory system.	☐	I can describe the structure of the double circulatory system.	☐	I can explain the need for a double circulatory system in mammals.	☐
	I can the different types of blood vessels found in a circulatory system.	☐	I can describe the structure of the blood vessels.	☐	I can explain the link between the structure and function of the different types of blood vessels.	☐
	I can use familiar vocabulary to some effect to describe the circulatory system.	☐	I can use vocabulary appropriate to purpose and effect to describe the structure of the circulatory system.	☐	I can use a wide range of well-selected and precise vocabulary to enhance impact when explaining the functioning of the circulatory system.	☐
B2.2.3 Heart and blood	I can identify the components of the blood.	☐	I can describe the functions of the main components of the blood.	☐	I can explain the adaptations of the red blood cell that enable it to carry out its function.	☐
	I can identify the main structures in the heart.	☐	I can describe the flow of blood through the heart.	☐	I can explain how the thickness of the chambers of the heart are related to their function.	☐
	I can state the names of the major parts of the heart and blood.	☐	I can use the correct names of the parts of the heart and blood when describing their function.	☐	I can use an appropriate range of scientific vocabulary and terminology when explaining the functions of the blood and heart.	☐

B2.2.4 Plant transport systems	I can state the function of xylem.	☐	I can describe the function and distribution of xylem tissue.	☐	I can explain how the structure and distribution of xylem tissue is related to its function.	☐
	I can state the function of phloem.	☐	I can describe the function and distribution of phloem tissue.	☐	I can explain how the structure and distribution of phloem tissue is related to its function.	☐
	I can label diagrams using simple sentence structure and familiar vocabulary.	☐	I can annotate diagrams using varied sentence types and appropriate scientific vocabulary.	☐	I can annotate diagrams using a wide range of sentence types, including precise and appropriate scientific vocabulary.	☐
B2.2.5 Transpiration stream	I can state what is meant by transpiration.	☐	I can describe the transpiration stream.	☐	I can explain the mechanisms by which water is moved through the plant.	☐
	I can state the location of most stomata in a plant.	☐	I can describe the structure of a stoma.	☐	I can explain how stomata control water loss from leaves.	☐
	I can describe the observations made during each experiment.	☐	I can explain the observations made during each experiment.	☐	I can relate the findings of both experiments to one another, to explain how water is lost from the plant.	☐
B2.2.6 Factors affecting transpiration	I can state the factors that affect the rate of transpiration.	☐	I can describe the relationship between a given factor and the rate of transpiration.	☐	I can explain how environmental factors affect the rate of transpiration.	☐
	I can state what a potometer measures.	☐	I can describe how to use a potometer.	☐	I can explain how to calculate the rate of transpiration using a potometer.	☐
	I can state a limitation found with the method.	☐	I can discuss a range of limitations with this method, which might affect the results.	☐	I can discuss a range of limitations with this method, which might affect the results, suggesting a series of improvements.	☐

B3 – Organ Level Systems

The nervous system

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B3.1.1 Nervous system	I can state the function of the nervous system.	☐	I can describe the pathway taken by an impulse in a nervous reaction.	☐	I can explain how the nervous system produces a coordinated response.	☐
	I can state the difference between a nerve and a neurone.	☐	I can describe the different types of neurone in the nervous system.	☐	I can explain the difference in function of sensory and motor neurones.	☐
	I can state that the reaction time measured is controlled by the nervous system.	☐	I can identify reasons for reaction times measured, by describing the pathway taken by the impulse.	☐	I can explain the reasons for different reaction times between dominant and non-dominant hands.	☐
B3.1.2 Reflexes	I can state what is meant by a reflex action.	☐	I can describe the pathway of the impulse in the reflex arc during a reflex action.	☐	I can explain how a specific example of a reflex action occurs.	☐
	I can list examples of reflex actions.	☐	I can describe the difference between a reflex action and a voluntary action.	☐	I can explain why a reflex action is faster than a voluntary action.	☐
	I can plan a simple experiment to make a basic observation of the iris reflex.	☐	I can plan a series of simple experiments to make observations of the iris reflex. .	☐	I can plan a systematic series of experiments to fully investigate the iris reflex.	☐

Triple content

B3.1.3 The eye	I can identify the main structures of the eye. .	☐	I can describe the function of each of the main structures in the eye.	☐	I can explain how the eye focuses light on the retina.	☐
	I can name some defects of vision.	☐	I can describe some defects of vision.	☐	I can explain how common defects of vision can be corrected.	☐
	I can use a model to observe how light travels through the eye.	☐	I can use a model to describe how the structures of the eye focus light on the retina.	☐	I can use a model to explain how changes in the lens shape would result in accommodation of light rays.	☐

B3.1.4 The brain	I can name the main structures in the brain.	☐	I can describe the location of the main structures of the brain.	☐	I can describe the function of the main structures in the brain.	☐
			I can describe some of the different techniques used to investigate brain function. (H)	☐	I can explain why it is difficult to investigate brain function. (H)	☐
			I can describe a range of practical and ethical concerns in scientific research. (H)	☐	I can justify decisions about the ethics of scientific research methods. (H)	☐
B3.1.5 Nervous system damage (H)			I can describe examples of damage to nervous tissue.	☐	I can explain how damage to nervous has an effect on the functioning of the body.	☐
			I can describe some methods used to treat damage to the nervous system.	☐	I can explain the difficulties in treating the nervous system.	☐
			I can describe some of the personal implications to the patient of treatments for damage to the nervous system.	☐	I can evaluate the personal implications to the patient of treatments for damage to the nervous system.	☐

The endocrine system

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B3.2.1 Hormones	I can name examples of endocrine glands and the hormones they release.	☐	I can describe how a hormone reaches its target organ.	☐	I can explain how a hormone acts as a chemical messenger.	☐
	I can state the function of a hormone.	☐	I can describe the specific roles of some hormones in the body.	☐	I can explain how named hormones bring about homeostatic regulation in the body.	☐
	I can use simple sentence types and familiar vocabulary, limited to scientific names, when producing texts.	☐	I can use a variety of sentence types and vocabulary appropriate to purpose when describing the actions of hormones.	☐	I can use a wide range of well-selected sentence types and precise vocabulary when explaining the action of hormones.	☐
B3.2.2 Negative feedback (H)			I can describe the role of thyroxine and adrenaline in the body.	☐	I can explain how the roles of thyroxine and adrenaline are brought about by a number of responses in the body.	☐
			I can describe how negative feedback occurs.	☐	I can explain the purpose of negative feedback.	☐
			I can use a model to describe how negative feedback occurs.	☐	I can use a model to explain how negative feedback brings about control.	☐
B3.2.3 The menstrual cycle	I can state the hormones involved in the menstrual cycle.	☐	I can describe how the levels of the hormones change during the menstrual cycle.	☐	I can explain how some hormones control the level of production of other hormones during the menstrual cycle. (H)	☐
	I can describe the main stages of the menstrual cycle.	☐	I can describe how hormones cause the changes that occur at the different stages of the menstrual cycle.	☐	I can explain how hormones interact to control the menstrual cycle. (H)	☐
	I can state simple factual statements based on data and observations from texts.	☐	I can use data and observations from texts to describe processes in detail.	☐	I can interpret data and observations from texts to explain how changes in the menstrual cycle are related to patterns in the hormone levels.	☐

B3.2.4 Controlling reproduction	I can state some examples of contraception.	☐	I can describe how the different methods of contraception work.	☐	I can evaluate different methods of contraception.	☐
	I can name the different types of hormone-based contraception.	☐	I can explain how hormones are used in contraception.	☐	I can evaluate hormonal contraception methods compared with non-hormonal contraception.	☐
	I can state that applications of science have helped humans control their reproduction.	☐	I can discuss how knowledge of reproduction allowed scientists to develop applications to control reproduction.	☐	I can explain the need for scientists to evaluate reproductive applications of science, in order to inform the public.	☐
B3.2.5 Using hormones to treat infertility (H)			I can describe some causes of infertility.	☐	I can discuss issues surrounding fertility treatment.	☐
			I can describe the process of in vitro fertilisation (IVF).	☐	I can explain how hormones can be used to treat infertility.	☐
			I can use evidence to support or reject the use of IVF.	☐	I can justify decisions about the suitability of IVF based on an evaluation of the evidence and arguments about the technique.	☐

Triple content

B3.2.6 Plant hormones	I can name the process by which plants respond to light.	☐	I can describe the process of phototropism.	☐	I can explain the role of auxins on phototropism.	☐
	I can name the process by which plants respond to gravity.	☐	I can describe the process of gravitropism.	☐	I can explain the role of auxins in gravitropism.	☐
	I can use scientific facts to develop a method, given a hypothesis.	☐	I can use scientific theories to develop a hypothesis.	☐	I can use scientific theories to develop a hypothesis that clearly links a dependent and independent variable.	☐

B3.2.7 Uses of plant hormones	I can give an example of a plant hormone.	☐	I can describe some of the effects of plant hormones on the plant.	☐	I can explain how plant hormones have their effects on plants.	☐
	I can state one advantage of the use of plant hormones.	☐	I can describe commercial uses of plant hormones. (H)	☐	I can explain the commercial advantages of using plant hormones. (H)	☐
			I can describe some impacts on society of the use of plant hormones. (H)	☐	I can evaluate the economic and other benefits to society of the commercial use of plant hormones. (H)	☐

Maintaining internal environments

Lesson	Aiming for Grade 4		Aiming for Grade 6		Aiming for Grade 8	
B3.3.1 Controlling blood sugar	I can name a hormone involved in blood sugar control.	☐	I can explain the role of insulin in maintaining blood glucose levels.	☐	I can explain the role of glucagon and insulin in maintaining blood glucose levels. (H)	☐
	I can state why blood sugar levels change throughout the day.	☐	I can describe the main differences between type 1 and type 2 diabetes.	☐	I can explain the differences between the treatments for type 1 and type 2 diabetes.	☐
	I can state basic observations about blood sugar levels obtained in an experiment.	☐	I can interpret data, obtained in an experiment, to describe the changes in blood glucose levels.	☐	I can Interpret data, obtained in an experiment, to explain the changes in blood glucose levels and compare with other data.	☐

Maintaining internal environments

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B3.3.1 Controlling body temperature	I can state some of the changes that occur in the skin at high or low temperatures.	☐	I can describe the function of the skin in controlling body temperature.	☐	I can explain in detail the body's responses to temperature change. (H)	☐
	I can state what is meant by homeostasis.	☐	I can describe how overheating or cooling can affect the body. (H)	☐	I can explain the importance of maintaining a constant internal environment.	☐
	I can make and record measurements from an experiment.	☐	I can make and record accurate measurements in a clear table.	☐	I can make and record accurate, repeated measurements systematically in a well-organised table with clear headings and units.	☐
B3.3.2 Controlling blood sugar	I can name a hormone involved in blood sugar control.	☐	I can explain the role of insulin in maintaining blood glucose levels.	☐	I can explain the role of glucagon and insulin in maintaining blood glucose levels. (H)	☐
	I can state why blood sugar levels change throughout the day.	☐	I can describe the main differences between type 1 and type 2 diabetes.	☐	I can explain the differences between the treatments for type 1 and type 2 diabetes.	☐
	I can state basic observations about blood sugar levels obtained in an experiment.	☐	I can interpret data, obtained in an experiment, to describe the changes in blood glucose levels.	☐	I can Interpret data, obtained in an experiment, to explain the changes in blood glucose levels and compare with other data.	☐
B3.3.4 Inside the kidney	I can identify the structures present in the kidney.	☐	I can describe the function of the different regions of a nephron.	☐	I can explain ultrafiltration and selective reabsorption in the nephron.	☐
	I can state that the concentration of urine can change.	☐	I can describe how the kidney can produce varying amounts of urine depending upon the body's level of hydration. (H)	☐	I can explain how ADH determines the amount of water that is reabsorbed. (H)	☐
	I can use some scientific vocabulary when discussing the structure or function of the kidney.	☐	I can use appropriate scientific vocabulary when describing the function of the nephron.	☐	I can use a full range of scientific vocabulary and terminology to explain the functioning of the nephron.	☐

Triples need to learn all of the statements in the grid.

B4 – Community level systems

Ecosystems

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B4.1.1 Ecosystems	I can state the names of the different levels of organisation in an ecosystem.	☐	I can describe the levels of organisation within an ecosystem.	☐	I can explain how the different levels of organisation are related.	☐
	I can describe the differences between a producer and a consumer.	☐	I can describe how organisms are organised into food chains and food webs.	☐	I can explain how organisms can be categorised into trophic levels.	☐
	I can use some scientific vocabulary and terminology.	☐	I can use scientific vocabulary, terminology, and definitions.	☐	I can use a full range of scientific vocabulary, terminology, and definitions appropriately and fluently.	☐
B4.1.2 Abiotic and biotic factors	I can state the difference between a biotic and an abiotic factor.	☐	I can describe how a named biotic or abiotic factor might affect a species.	☐	I can explain how biotic and abiotic factors can affect communities.	☐
	I can use a sampling technique to record organisms in their environment.	☐	I can explain that sampling techniques produce results that are representative of the environment as a whole.	☐	I can justify the number and frequency of samples collected to produce unbiased and representative data.	☐
	I can plot data from an experiment onto a graph with given axes.	☐	I can plot data from an experiment in an appropriate graph.	☐	I can plot data from an experiment in an appropriate graph with suitable and correctly labelled axes.	☐
B4.1.3 Competition and interdependence	I can state the factors plants and animals need to survive.	☐	I can describe how species compete with each other for a factor.	☐	I can explain how the availability of a factor affects the population of a species.	☐
	I can state different types of interdependent relationships.	☐	I can describe the difference between mutualism and parasitism.	☐	I can explain how predator and prey populations fluctuate in a predation relationship.	☐
	I can use some scientific vocabulary and terminology.	☐	I can use scientific vocabulary, terminology, and definitions.	☐	I can use a full range of scientific vocabulary, terminology, and definitions appropriately and fluently.	☐
B4.1.6 Nutrient cycling	I can describe what nutrient cycling means.	☐	I can describe how nitrogen and water are cycled through the ecosystem.	☐	I can explain the processes involved in achieving the steps in the cycling of nitrogen and water through an	☐
	I can state that carbon, nitrogen, and water are essential for living organisms.	☐	I can describe how living organisms make use of carbon, nitrogen, and water.	☐	I can explain the role of microorganisms in the recycling of materials for living organisms.	☐
	I can describe an activity that illustrates a process in the nutrient cycle.	☐	I can suggest activities or experiments that would provide observations that could be used to show a process in a nutrient cycle.	☐	I can suggest activities or experiments that would provide observations to explain processes in a nutrient cycle.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B4.1.7 The carbon cycle	I can state that carbon is cycled between the biotic and abiotic world.	☐	I can describe how carbon is added to, or removed from, the atmosphere.	☐	I can explain the processes that bring about the steps in the carbon cycle.	☐
	I can state that carbon dioxide levels in the atmosphere are increasing.	☐	I can describe the ways in which carbon dioxide is being added to the atmosphere in excess.	☐	I can explain fully why atmospheric carbon dioxide levels are increasing, resulting in a cycle that is no longer in balance.	☐
	I can identify connections between statements that help develop an understanding of some stages of the carbon cycle, using some key vocabulary.	☐	I can identify connections between statements, to describe all the stages in the carbon cycle, using a range of appropriate terminology.	☐	I can use a full range of appropriate scientific vocabulary and terminology when explaining the links in the carbon cycle.	☐
B4.1.8 Decomposers	I can state some examples of decomposers and detritivores.	☐	I can describe what is meant by decomposition.	☐	I can explain how environmental factors affect the rate of decomposition.	☐
	I can describe a simple plan, which lacks detail, to test the effect of a factor on decomposition.	☐	I can describe a plan that will test a hypothesis of the effect of a factor on the rate of decay.	☐	I can suggest a detailed plan, which will test a hypothesis of the effect of a number of factors on the rate of	☐
	I can state from my observations that a factor has affected decomposition.	☐	I can use my observations to describe the effect of my factor on the rate of decay.	☐	I can interpret my observations to explain the effect of a series of factors on the rate of decomposition.	☐

Triple content

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B4.1.4 Pyramids of biomass	I can state what a pyramid of biomass shows.	☐	I can explain what pyramids of biomass show.	☐	I can explain the advantage of plotting a pyramid of biomass.	☐
	I can state what is meant by the term biomass.	☐	I can describe how biomass data is collected.	☐	I can suggest advantages and disadvantages of collecting biomass data.	☐
	I can use data to sketch a pyramid of biomass.	☐	I can calculate biomass data and sketch a pyramid of biomass to represent the data.	☐	I can calculate biomass data and accurately plot a pyramid of biomass to represent the data.	☐
B4.1.5 Efficiency of biomass transfer	I can state that biomass is lost between trophic levels.	☐	I can describe how biomass is lost between trophic levels.	☐	I can explain why the loss of biomass limits the number of trophic levels.	☐
	I can calculate the biomass loss at each link in a food chain.	☐	I can calculate the efficiency of biomass transfer.	☐	I can compare the efficiency of biomass transfer for different organisms.	☐
	I can compare biomass losses at each link in the food chain.	☐	I can interpret data on the efficiency of biomass transfer.	☐	I can interpret data on the efficiency of biomass transfer between different links in the food chains or between different	☐

B5 – Genes, Inheritance and Selection

Inheritance

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B5.1.1 Inheritance	I can state what is meant by variation.	☐	I can describe the two causes of variation, genetic and environmental, and give examples.	☐	I can explain the differences between genetic and environmental variation.	☐
	I can name some examples of continuous or discontinuous variation.	☐	I can describe the differences between discontinuous and continuous variation.	☐	I can explain distinguish between the causes of discontinuous and continuous variation.	☐
	I can record observations in a basic table.	☐	I can record data from experiments in a clear table with full headings, and plot a simple graph.	☐	I can record data from experiments in a clear table with full headings, and plot appropriate graphs to represent the data.	☐
B5.1.2 Sexual and asexual reproduction	I can state that there are two types of reproduction.	☐	I can describe the differences between asexual and sexual reproduction.	☐	I can explain some of the advantages and disadvantages of asexual and sexual reproduction.	☐
	I can state what is meant by a clone.	☐	I can describe the process by which some organisms are able to produce clones.	☐	I can explain why clones lack genetic variation.	☐
	I can state some applications of a scientific knowledge of reproduction.	☐	I can describe the application of science to reproductive technologies.	☐	I can explain how an application of science to reproductive technologies has brought about new or improved varieties.	☐
B5.1.3 Meiosis	I can state that gametes are produced by meiosis.	☐	I can explain the process of meiosis.	☐	I can explain the significance of meiosis in genetic variation.	☐
	I can state that the chromosome number halves when an organism makes gametes.	☐	I can describe the difference between haploid and diploid cells.	☐	I can explain the role of meiosis in maintaining he chromosome number.	☐
	I can use some scientific vocabulary and to communicate simply and clearly.	☐	I can use scientific vocabulary and terminology to communicate effectively, sustaining interest.	☐	I can use scientific vocabulary and terminology to communicate with impact.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B5.1.4 Dominant and recessive alleles	I can state some examples of characteristics controlled by dominant alleles.	☐	I can describe the difference between homozygous and heterozygous.	☐	I can explain how the combination of alleles in the genotype can be expressed in the phenotype.	☐
	I can state that individuals have two alleles for a characteristic.	☐	I can describe the difference between homozygous and heterozygous.	☐	I can explain how sexual reproduction leads to new combinations of alleles in the genotype.	☐
	I can use some scientific vocabulary to communicate simply and clearly.	☐	I can scientific vocabulary and terminology to communicate effectively, sustaining interest.	☐	I can use scientific vocabulary and terminology to communicate with impact.	☐
B5.1.5 Genetic crosses (1)	I can state that alleles are passed from one generation to the next during reproduction.	☐	I can describe the steps in a genetic cross between two homozygous individuals.	☐	I can explain how to use a Punnet square to show the results of fertilisation.	☐
	I can state that it is possible to predict the outcome of a genetic cross.	☐	I can use any one of percentages, fractions, or ratios to represent the outcome of a genetic cross.	☐	I can compare and evaluate the use of percentages, fractions, and ratios to represent the outcome of a genetic cross.	☐
	I can complete models, such as Punnet squares, given the alleles, to show the outcome of a genetic cross.	☐	I can complete models, such as Punnet squares, to predict the outcome of a genetic cross.	☐	I can draw, and confidently, use models, such as Punnet squares, to predict the outcome of a genetic cross.	☐
B5.1.6 Genetic crosses (2)	I can state that a heterozygous genetic cross can result in offspring of a different phenotype to the parents.	☐	I can describe the steps in a genetic cross between two heterozygous individuals.	☐	I can use percentages, fractions, and ratios to represent the outcome of a heterozygous genetic cross.	☐
	I can state the genotype of a male and female organism.	☐	I can use a genetic cross to show how gender is inherited.	☐	I can compare and evaluate the use of percentages, fractions, and ratios to represent the probability of having male	☐
	I can complete model, such as Punnet squares, given the alleles, to show the outcome of a heterozygous genetic cross.	☐	I can complete models, such as Punnet squares, to predict the outcome of a heterozygous genetic cross.	☐	I can draw, and confidently, use models, such as Punnet squares, to predict the outcome of a heterozygous genetic cross.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B5.1.7 Mutations	I can state what is meant by a mutation.	☐	I can describe how a mutation can influence phenotype.	☐	I can explain how a mutation alters the way in which the gene functions in the cell.	☐
	I can state some examples of harmful, beneficial, and neutral mutations.	☐	I can describe the consequences of harmful or beneficial mutations.	☐	I can explain the causes of mutations.	☐
	I can use some key facts to present a basic description of a genetic disorder.	☐	I can use a range of factual information to present an explanation of the causes and effects of a genetic disorder.	☐	I can use a wide range of relevant factual information, including data, to present a reasoned explanation of the causes, effects, and inheritance of a genetic disorder.	☐

Triple content

B5.1.8 The history of genetics	I can name the key scientist who developed our understanding of inheritance.	☐	I can describe the conclusions Mendel drew from his experiments.	☐	I can discuss the importance of Mendel's work on genetics.	☐
	I can state that Mendel's work led to further discoveries.	☐	I can describe how our understanding of genetics has changed over time.	☐	I can explain how scientific ideas are built upon prior work of other scientists.	☐
	I can state that scientists publish their results and ideas for other scientists to read.	☐	I can describe how scientists publish their results and how they are checked.	☐	I can explain the importance of peer review of results and of communicating those results.	☐

Natural selection and evolution

	Aiming for 4		Aiming for 6		Aiming for 8	
B5.2.1 Inheritance	I can state that evolution is the gradual change in the characteristics of a population over time.	☐	I can describe what is meant by natural selection.	☐	I can explain how evolution occurs through the process of natural selection.	☐
	I can list some examples of evolution.	☐	I can describe some examples of evolution.	☐	I can explain the role of mutations in bringing about evolution.	☐
	I can use observations to present a simple description of the evolution of a characteristic.	☐	I can use some scientific facts to present a simple explanation for the evolution of a characteristic.	☐	I can use a range of scientific facts to present a reasoned explanation for the evolution of a characteristic.	☐
B5.2.2 Evidence for evolution	I can state what a fossil is.	☐	I can describe how a fossil forms.	☐	I can explain how the fossil record provides evidence for evolution.	☐
	I can name other types of evidence for evolution.	☐	I can describe other examples of evidence for evolution.	☐	I can explain how the other types of evidence provide evidence for evolution.	☐
	I can recognise links between pieces of fossil evidence.	☐	I can use fossil evidence to make decisions about the evolution of a characteristic in a species.	☐	I can evaluate the quality of fossil evidence when explaining the evolution of a characteristic in a species.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B5.2.4 Classification systems	I can state what is meant by classification.	☐	I can describe the artificial system of classification.	☐	I can explain how scientific advances have led to the development of the natural classification system.	☐
	I can record some observations and form basic groups of organisms.	☐	I can record observable differences between species and use this evidence to group species.	☐	I can evaluate recorded observations and make decisions to group organisms based on that evaluated evidence.	☐
	I can state that classification systems use a variety of evidence.	☐	I can describe new technologies that are used in classification.	☐	I can discuss how new technologies have influenced the development of scientific classification over time.	☐

Triple content

B5.2.3 The theory of evolution	I can name the key scientists involved in developing the theory of evolution.	☐	I can describe how these scientists formed their theory of evolution.	☐	I can explain how the evidence that the scientists collected allowed them to develop their theory.	☐
	I can state one reason why many people rejected the theory of evolution.	☐	I can describe the reaction of other scientists and the public to the theory of evolution when it was published.	☐	I can explain how the theory of evolution has more accepted and has had an impact on modern biology.	☐
	I can state that the theory of evolution was published for others to read.	☐	I can describe the importance of peer review for the acceptance of Darwin and Wallace's work.	☐	I can explain the importance of the recognition of the work of Darwin and Wallace by scientists to the public acceptance of the ideas..	☐

B6 – Global challenges

Monitoring and maintaining the environment

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B6.1.1 Sampling techniques (1)	I can describe what is meant by a sample.	☐	I can describe some techniques for sampling.	☐	I can justify the selection of a particular sampling technique for a given organism.	☐
	I can state that there are two types of identification keys that are used to identify organisms.	☐	I can use an identification key to identify organisms.	☐	I can explain how to use an identification key.	☐
	I can use quadrats to sample the abundance of organisms.	☐	I can use transect lines and quadrats to investigate the distribution or abundance of organisms.	☐	I can justify the use of transect lines and quadrats to investigate the distribution or abundance of organisms.	☐
B6.1.2 Sampling techniques (2)	I can describe how to sample plants in a habitat.	☐	I can explain the difference between random and non-random sampling techniques.	☐	I can explain how to calculate a plant population for an area using the scaling-up method.	☐
	I can describe how to sample motile animals in a habitat.	☐	I can explain why the same method of sampling must be used each time when carrying out capture-recapture technique.	☐	I can estimate the size of an animal population using data from the capture-recapture technique.	☐
	I can state what is meant by bias in sampling techniques.	☐	I can describe methods of avoiding bias in sampling technique when collecting data to estimate population size.	☐	I can explain why we are often only able to calculate an estimate of an animal population in a habitat.	☐
B6.1.3 Loss of biodiversity	I can state what biodiversity is.	☐	I can describe some processes that result in a loss of biodiversity.	☐	I can explain how human activity results in a loss of biodiversity.	☐
	I can state that science allows us to understand how we can affect our environment.	☐	I can describe how developments in science have allowed us to understand that we are reducing biodiversity.	☐	I can explain how our developing scientific knowledge has increased our understanding of ways to modify our management of the environment.	☐
	I can state that a loss of biodiversity has negative implications.	☐	I can describe some of the social, economic, and environmental implications of the loss of biodiversity.	☐	I can evaluate the social, economic, and environmental implications associated with a loss of biodiversity.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B6.1.4 Increasing biodiversity	I can state what is meant by conservation.	☐	I can describe the importance of conservation for endangered species.	☐	I can explain how conservation can be used to increase biodiversity.	☐
	I can list at least two methods of conservation.	☐	I can describe a method of conservation that will maintain biodiversity.	☐	I can explain how captive breeding or seed banks can lead to increased biodiversity.	☐
	I can state one reason for conserving a species.	☐	I can describe the ethical issues that might arise from some conservation methods to increase biodiversity.	☐	I can discuss the ethical responsibility to increase species and biodiversity.	☐
B6.1.5 Maintaining biodiversity	I can name some global agreements used to maintain biodiversity.	☐	I can describe how global agreements function to maintain biodiversity.	☐	I can explain why local and global agreements are needed to maintain biodiversity.	☐
	I can state what is meant by ecotourism.	☐	I can describe how ecotourism is different from ordinary tourism.	☐	I can explain how ecotourism helps to maintain biodiversity.	☐
	I can state that there are advantages and disadvantages to methods used to maintain biodiversity.	☐	I can discuss some of the social, economic, and environmental benefits or challenges of maintaining biodiversity.	☐	I can evaluate the social, economic, and environmental benefits and challenges of maintaining biodiversity.	☐

Triple content

B6.1.6 Monitoring biodiversity		I can describe what an indicator species is.	☐	I can explain how scientists use the distribution of organisms to monitor air and water pollution.	☐
		I can compare indicator species distributions with physical data of environmental pollution.	☐	I can evaluate indicator species as a measure of environmental pollution.	☐
		I can describe the risks to wildlife to environmental pollution.	☐	I can evaluate the risks posed to wildlife and society from environmental pollution.	☐

Feeding the human race

B6.2.3 Selective breeding	I can state what is meant by selective breeding.	☐	I can describe how organisms are selectively bred.	☐	I can explain how selective breeding increases yields.	☐
	I can state some advantages of selectively bred organisms.	☐	I ca describe the advantages and disadvantages of selective breeding.	☐	I can evaluate the advantages and disadvantages of selective breeding.	☐
	I can state that an understanding of science has enhanced the process of selective breeding.	☐	I can describe how the understanding of science has given us the power to plan a selective breeding programme.	☐	I can discuss how the limitations of the science of selective breeding have driven scientists to seek other methods to increase yields.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B6.2.4 Genetic engineering	I can state what is meant by genetic engineering.	☐	I can describe simply how an organism is genetically engineered.	☐	I can evaluate the benefits and risks of using genetic engineering in agriculture.	☐
	I can state that an understanding of science has led to genetic engineering.	☐	I can describe how the understanding of science has allowed us to develop the process of genetic engineering.	☐	I can discuss the scientific achievement and limitations of the process of genetic engineering.	☐
	I can state an ethical objection to genetic engineering.	☐	I can discuss a range of ethical concerns arising from genetic engineering.	☐	I can evaluate the ethical issues raised by governments, scientists, and the wider public about genetic engineering.	☐
B6.2.5 Producing a genetically engineered organism			I can describe how to genetically engineer an organism.	☐	I can explain how bacteria are genetically engineered to produce hormones.	☐
			I can describe the role of the various enzymes used in the process of genetic engineering.	☐	I can explain how antibiotic-resistance markers are used to select bacteria that contain foreign genes.	☐
			I can describe some technological processes involved in genetic engineering.	☐	I can explain in detail the technological applications of science in genetic engineering.	☐
B6.2.6 Use of biotechnology in farming	I can state what is meant by biotechnology.	☐	I can describe some examples of biotechnology.	☐	I can explain how biotechnology provides possible solutions to the demands of the growing human population.	☐
	I can state that the global use of GM crops is increasing.	☐	I can compare the use of GM crops between industrial and developing countries.	☐	I can explain how the use of GM crops contributes to food security in different economically developed countries.	☐
	I can use a piece of evidence to support a viewpoint on the use of GM crops.	☐	I can use evidence to make a decision about the use of GM crops.	☐	I can evaluate the evidence and arguments when making a decision about the use of GM crops.	☐

Triple content

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
B6.2.1 Food security	I can state what is meant by food security.	☐	I can describe biological factors that affect the levels of food security.	☐	I can explain why food security is important for the human population.	☐
	I can list techniques used for increasing food security.	☐	I can describe techniques for increasing food production.	☐	I can evaluate the effectiveness of the different methods for increasing food production.	☐
	I can state some arguments for and against methods to give greater food security.	☐	I can compare arguments and evidence for and against methods used to give greater food security.	☐	I can evaluate the arguments and evidence used to make decisions about the use of methods to give greater food security.	☐
B6.2.2 Feeding the world	I can state what is meant by sustainable food production.	☐	I can describe how fertilisers, pesticides, and biological control improve food production.	☐	I can evaluate the advantages and disadvantages and disadvantages of the use of fertilisers, pesticides, and biological control in improving food	☐
	I can name two modern methods for increasing food production.	☐	I can describe how modern methods, such as fish farming and hydroponics, can be used to produce food.	☐	I can explain how modern methods of farming, such as hydroponics and fish farming, provide a sustainable food	☐
	I can state that our understanding of science has led to the development of new farming techniques.	☐	I can describe how newly developed farming techniques have led to an improved quality of life.	☐	I can discuss how scientific developments in farming have led to an improved quality of life, whilst limitations	☐

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C1 Particles

The particle model

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C1.1.1 Introducing particles	I can draw diagrams to show the arrangements of particles in the three states of matter.	☐	I can describe the movement and arrangement of particles in the three states of matter, and give examples of three	☐	I can compare the movement and arrangement of particles in the three states of matter.	☐
	I can describe typical physical properties of a substance in a given state.	☐	I can compare the physical properties of a substance in its three states.	☐	I can use the particle model to explain the differences in physical properties of a substance in its three states.	☐
	I can state whether a given particle model is in two or three dimensions.	☐	I can compare the features of 2D and 3D models to represent particles.	☐	I can evaluate the advantages and disadvantages of given 2D and 3D models to represent particles.	☐
C1.1.2 Chemical and physical changes	I can make observations, and give examples of physical and chemical changes.	☐	I can state whether an observed change is physical or chemical.	☐	I can justify classifying a given observed change as physical or chemical.	☐
	I can state the definition of a physical change and a chemical changes.	☐	I can compare the features of physical and chemical changes.	☐	I can explain the differences between physical and chemical changes using the particle model.	☐
	I can compare reactants and products in a chemical reaction using particle diagrams or physical models.	☐	I can deduce whether a given change is physical or chemical by interpreting particle diagrams of reactants and products.	☐	I can draw particle diagrams of reactants and products to model a chemical reaction.	☐
C1.1.3 Limitations of the particle model	I can name the type of force that acts between particles.	☐	I can describe how the strength of the forces between particles changes with distance.	☐	I can explain why the strength of the forces between particles affects the properties of a substance.	☐
	I can compare the relative distances between particles in the three states of matter.	☐	I can state typical distances between particles in the gas state.	☐	I can calculate the ratio distance to diameter, the distance between particles in a gas state, and the sizes of objects in scale models.	☐
	I can describe one way in which the particle model is unlike the situation it represents.	☐	I can describe three limitations of the particle model.	☐	I can use mathematical ideas to explain some limitations of the particle model.	☐

Atomic structure

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C1.2.1 Atomic structure	I can list the subatomic particles in an atom.	☐	I can describe the subatomic particles in an atom.	☐	I can explain evidence for the structure of the atom.	☐
	I can qualitatively describe: the relative sizes of an atom, chemical bonds, and simple molecules.	☐	I can use standard form to describe the sizes of atoms, chemical bonds, and molecules.	☐	I can explain why a relative scale is used to compare subatomic particles.	☐
	I can state the size of a typical atom.	☐	I can use data to calculate the sizes, masses, and charges of subatomic particles.	☐	I can use data to calculate the relative sizes, masses, and charges of subatomic particles.	☐
C1.2.2 Isotopes	I can state definitions of the terms ion, atomic number, mass number, and isotope.	☐	I can use an example to describe the similarities and differences between isotopes in terms of subatomic particles.	☐	I can explain why isotopes of the same element may have different physical properties but identical chemical properties.	☐
	I can describe how an atom becomes an ion.	☐	I can use standard notation to represent an ion.	☐	I can use and interpret standard notation to represent atoms, ions, and isotopes.	☐
	I can state the number of protons, neutrons, and electrons from given values of atomic number and mass number.	☐	I can state the numbers of protons, neutrons, and electrons in an atom when a Periodic Table is supplied.	☐	I can state the number of protons, neutrons, and electrons for an ion when a Periodic Table is supplied.	☐
C1.2.3 Developing the atomic model	I can recall the main features of the plum-pudding model and the Bohr model.	☐	I can describe the development of the atomic model.	☐	I can explain why the atomic model has changed over time.	☐
	I can state the contribution Dalton, Thomson, Rutherford, Bohr, Geiger, and Marsden made to the atomic model.	☐	I can explain the contribution of Dalton, Thomson, Rutherford, Bohr, Geiger, and Marsden to the development of the atomic model.	☐	I can justify amendments to the model of the atom.	☐
	I can state what an atom is.	☐				

C2 Elements, compounds and mixtures

Purity and separating mixtures

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C2.1.1 Relative formula mass	I can state definitions of relative atomic mass, relative molecular mass, and relative formula mass.	☐	I can use data from the Periodic Table to compare the relative atomic masses of different elements.	☐	I can explain why relative formula mass is a useful measurement.	☐
	I can use the Periodic Table to find the chemical symbol for an element.	☐	I can interpret simple formulae to list the number of each type of atom present.	☐	I can interpret diagrams of molecular compounds to write chemical formulae.	☐
	I can use the Periodic Table to give the relative atomic mass of an element.	☐	I can calculate the relative formula mass or relative molecular mass of a simple substance when the relative atomic mass and formula are given.	☐	I can calculate the relative formula mass or relative molecular mass of substances from diagrams or formulae (including those with brackets).	☐
C2.1.2 Empirical formula	I can state a definition of empirical formula.	☐	I can use an example to explain how a molecular formula and an empirical formula can be the same.	☐	I can explain why ionic compounds are always referred to by their empirical formulae.	☐
	I can calculate the empirical formula for a simple covalent compound when the molecular formula is given.	☐	I can calculate the empirical formula for a compound from a diagram.	☐	I can calculate an empirical formula from a molecular formula that contains brackets.	☐
	I can use a balanced symbol equation to calculate the relative formula mass or relative molecular mass when the relative atomic masses are given.	☐	I can explain when the term relative molecular mass can be used.	☐	I can explain how the sum of the M_r values of the reactants must equal the sum of the M_r values of the products in a balanced symbol equation.	☐
C2.1.3 Pure and impure substances	I can state definitions of the terms pure and mixture.	☐	I can explain the different meanings of pure in everyday and scientific language.	☐	I can explain why a mixture is often more useful than a pure substance.	☐
	I can give an example of a pure substance and a mixture.	☐	I can identify a substance as either pure or a mixture.	☐	I can explain the effect on melting point of adding different substances to a pure substance.	☐
	I can safely determine the melting point of a substance.	☐	I can identify a substance from melting point data.	☐	I can evaluate the purity of a sample from its melting point data.	☐
C2.1.4 Filtration and crystallisation	I can safely separate a mixture to collect an insoluble substance from a liquid or solution.	☐	I can describe the process of filtering.	☐	I can explain how filtration separates an insoluble solid from a liquid or solution.	☐
	I can safely separate a solution to collect the solute.	☐	I can describe the process of crystallisation.	☐	I can explain how crystallisation separates the components of a solution.	☐
	I can identify the solute, solvent, residue, and filtrate in named solutions or suspensions that have been separated.	☐	I can suggest and describe a suitable technique to separate a named solution or suspension.	☐	I can evaluate different techniques for folding filter paper.	☐
C2.1.5 Distillation	I can list and recognise the key equipment used in a simple distillation.	☐	I can describe the process of simple distillation.	☐	I can explain how simple distillation separates a solution.	☐
	I can safely use distillation to separate two miscible liquids.	☐	I can describe the process of fractional distillation.	☐	I can explain how fractional distillation separates a mixture of liquids.	☐
	I can state the types of mixtures that can be separated by distillation.	☐	I can suggest and describe a suitable technique to separate a named solution.	☐	I can predict and justify the value shown on a thermometer in a distillation, given the mixture and relevant data.	☐
C2.1.6 Chromatography	I can state definitions for the stationary and mobile phases in chromatography.	☐	I can describe how to complete paper chromatography.	☐	I can explain how separation occurs in a chromatography experiment.	☐
	I can safely complete a paper chromatogram.	☐	I can describe how to complete thin-layer chromatography.	☐	I can explain how chromatograms for the same substances can be different when phases are changed.	☐
	I can recall the formula for the R_f value.	☐	I can calculate R_f values given a chromatogram.	☐	I can interpret a chromatogram.	☐
C2.1.7 Purification and checking purity	I can describe one purification technique to separate a simple mixture.	☐	I can suggest a multistep separation technique for a mixture.	☐	I can explain how a multistep method can be used to separate a given mixture.	☐
	I can describe the processes of paper, thin-layer, and gas chromatography.	☐	I can explain the processes of paper, thin-layer, and gas chromatography.	☐	I can evaluate the different types of chromatography.	☐
	I can use a chromatogram to classify a substance as pure or a mixture.	☐	I can explain how a chromatogram can be used to identify a pure substance or a mixure.	☐	I can justify the use of different purification techniques in different circumstances.	☐

Bonding

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C2.2.1 Metals and non-metals	I can list the physical properties of metals and non-metals.	☐	I can describe the differences between the chemical properties of metals and non-metals.	☐	I can predict the physical and chemical properties of an element based on its position in the Periodic Table.	☐
	I can state where metals and non-metals are found in the Periodic Table.	☐	I can describe an experiment to determine whether an element is a metal or a non-metal.	☐	I can evaluate an experiment designed to classify an element as a metal or a non-metal.	☐
	I can use the Periodic Table to classify an element as a metal or a non-metal.	☐	I can identify patterns in the Periodic Table for the physical properties of elements.	☐	I can identify and justify anomalous elements in the Periodic Table.	☐
C2.2.2 Electronic structures	I can state definitions of a group and a period in the Periodic Table.	☐	I can identify an element given the group and period number, and vice versa.	☐	I can determine the electronic structure of each of the first 20 elements given group number and period number.	☐
	I can state the maximum number of electrons in each of the first three shells.	☐	I can use simplified electronic structure notation to draw the electronic structure of the first 20 elements in the Periodic Table.	☐	I can interpret simplified electronic notation for the first 20 elements to determine group number, period number, and element.	☐
	I can draw the electronic structure of the first 20 elements given the number of electrons.	☐	I can draw the electronic structure of the first 20 elements using the Periodic Table to determine their number of electrons.	☐	I can justify the study of the electronic structures of only the first 20 elements.	☐
C2.2.3 Forming ions	I can state the definition of the term ion.	☐	I can use electron diagrams to explain how ions are formed.	☐	I can explain the charge on a given ion in terms of subatomic particles and electron transfer.	☐
	I can recognise an ion from its symbol.	☐	I can explain whether a given electron diagram represents an atom or an ion.	☐	I can explain how atoms and ions of different elements can have the same electronic structure.	☐
	I can draw or state the electronic structure of an ion given its charge and the electronic structure of the neutral atom.	☐	I can draw the electronic structure of an ion given its charge and the number of electrons in the neutral atom.	☐	I can predict the electronic structure of an ion given its position in the Periodic Table.	☐
C2.2.4 Ionic compounds	I can state that ionic compounds tend to form between a metal and a non-metal.	☐	I can explain the formation of ionic bonds in terms of electron transfer.	☐	I can justify the formation of ionic bonds in terms of the stability of the atoms and ions involved.	☐
	I can draw dot-and-cross diagrams to represent simple binary ionic compounds in which one electron per atom is transferred.	☐	I can draw dot-and-cross diagrams to represent ionic compounds in which more than one electron per atom is transferred.	☐	I can justify how a space-filling model for a given compound arises from its dot-and-cross diagram.	☐
	I can describe the structure and bonding in an ionic compound.	☐	I can explain how a given model represents an ionically bonded compound.	☐	I can evaluate different models to represent ionic compounds.	☐
C2.2.5 Simple molecules	I can state that covalent compounds form between non-metal atoms.	☐	I can describe the formation of covalent bonds in terms of electron sharing.	☐	I can explain how covalent bonds form between non-metal atoms.	☐
	I can recognise covalent bonding and identify substances as covalently bonded.	☐	I can describe structure and bonding in simple molecular substances.	☐	I can evaluate different models to represent covalent compounds.	☐
	I can draw dot-and-cross diagrams of simple covalent substances, limited to the first 20 elements and single bonds.	☐	I can draw displayed formulae or dot-and-cross diagrams of covalent compounds, limited to the first 20 elements with single and/or double bonds.	☐	I can suggest the displayed formula, space-filling, or dot-and-cross diagrams for covalent compounds, including those with multiple bonds.	☐
C2.2.6 Giant covalent structures	I can state that covalent compounds form between non-metal atoms.	☐	I can describe the formation of covalent bonds in terms of electron sharing.	☐	I can use examples to explain how covalent bonds hold together a giant covalent structure.	☐
	I can state examples of substances with giant covalent structures.	☐	I can describe the structure and bonding in giant covalent structures.	☐	I can evaluate different models to represent covalent compounds.	☐
	I can draw a 3D representation of a giant covalent structure.	☐	I can determine the empirical formula of a substance with a giant covalent structure.	☐	I can justify the use of empirical formulae to describe substances that have giant covalent structures.	☐
C2.2.7 Polymer molecules	I can state definitions of the terms monomer and polymer and give examples of each.	☐	I can describe the formation of a polymer.	☐	I can explain how monomers join together to form an addition polymer.	☐
	I can describe the difference between the properties of thermosoftening and thermosetting polymers.	☐	I can describe an experiment to classify a polymer as thermosoftening or thermosetting.	☐	I can explain how the structures of thermosoftening and thermosetting polymers affect their properties.	☐
	I can identify a monomer and polymer in a model.	☐	I can explain a model to represent a polymer.	☐	I can evaluate different models to represent polymers.	☐
C2.2.8 Structure of metals	I can list examples of substances with metallic bonds.	☐	I can describe the formation of metallic bonds.	☐	I can explain how monomers join together to form an addition polymer.	☐
	I can describe the lattice structure of a metallic crystal.	☐	I can use a model to explain the lattice structure of a metallic crystal.	☐	I can explain how the structures of thermosoftening and thermosetting polymers affect their properties.	☐
	I can recognise a model of a metallic lattice.	☐	I can compare metallic bonds with covalent and ionic bonds.	☐	I can evaluate different models to represent polymers.	☐
C2.2.9 Developing the Periodic Table	I can describe how the elements are listed in the Periodic Table.	☐	I can explain how Mendeleev organised the elements in the Periodic Table.	☐	I can explain why the modern Periodic Table is not the same as Mendeleev's Periodic Table.	☐
	I can use the Periodic Table to determine the symbol, atomic number, and relative atomic mass of an element.	☐	I can explain why Mendeleev's Periodic Table was not adopted straight away.	☐	I can evaluate the Periodic Table as a method of displaying information about the elements.	☐

C2.2.10 Atomic structure and the Periodic Table	I can state the number of electrons in the outer electron shells for the elements in Groups 1 and 8.	☐	I can use the Periodic Table to suggest the electronic structure for the first 20 elements.	☐	I can use the Periodic Table to suggest the number of outer-shell electrons and the number of electron shells for an element.	☐
	I can describe the trend in the reactions of the Group 1 elements with water.	☐	I can predict and explain the trend in reactivity of elements in Groups 2 and 6.	☐	I can explain, in terms of electronic structure, why noble gases are described as inert.	☐
	I can describe observations from displacement reactions.	☐	I can use the Periodic Table to make predictions about the chemical reactions of elements with oxygen.	☐	I can evaluate the versatility of the Periodic Table as new elements are discovered.	☐

Properties of materials

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C2.3.1 Carbon	I can describe the structure and bonding in graphite and diamond.	☐	I can explain how carbon can form different families of compounds.	☐	I can explain the uses of graphite and diamond in terms of their properties.	☐
	I can list the properties of graphite and diamond.	☐	I can explain the properties of graphite and diamond in terms of structure and bonding.	☐	I can predict the properties of carbon allotropes, given information about their structure and bonding.	☐
	I can name examples of carbon allotropes.	☐	I can explain the term allotrope using carbon to illustrate.	☐	I can predict the properties or structure of Group 4 elements.	☐
C2.3.2 Changing state	I can describe changes of state in terms of bonds and forces of attraction.	☐	I can explain changes of state in terms of bonds and interactions between particles.	☐	I can use an example to explain sublimation.	☐
	I can state what is meant by melting point and boiling point.	☐	I can use melting and boiling point data to determine the state of a substance at a given temperature.	☐	I can use melting and boiling point data to suggest the type of substance and/ or type of bonds present in a sample.	☐
	I can explain why the boiling point of a substance is always higher than its melting point.	☐	I can use melting and boiling point data to interpret the relative strengths of forces of attraction.	☐	I can explain how to use melting and boiling point data to interpret the relative strengths of forces of attraction.	☐
C2.3.3 Bulk properties of materials	I can state a definition of the term bulk properties.	☐	I can explain that individual atoms do not exhibit the bulk properties of a material.	☐	I can justify the choice of a material for a function based on its bulk properties.	☐
	I can list the main bulk properties of ionic compounds, simple molecules, giant covalent structures, polymers and metals.	☐	I can explain how structure and bonding cause the bulk properties of a material.	☐	I can predict the bulk properties of a material given information about its structure and bonding.	☐
	I can recognise models of ionic compounds, simple molecules, giant covalent structures, polymers and metals.	☐	I can use models of ionic compounds, simple molecules, giant covalent structures, polymers and metals to explain bulk properties.	☐	I can evaluate models of ionic compounds, simple molecules, giant covalent structures, polymers and metals used to explain bulk properties.	☐

C2.3.4 Nanoparticles	I can state the relative size of nanoparticles and use this to classify substances.	☐	I can describe how the properties of nanoparticles relate to their uses.	☐	I can use standard form where appropriate, to describe the size of nanoparticles.	☐
	I can calculate the surface area of a cube given the formula.	☐	I can describe and explain how the surface-area-to-volume ratio affects properties.	☐	I can calculate the surface-area-to-volume ratio of a cube.	☐
	I can list some examples of the use of nanotechnology.	☐	I can list the advantages and disadvantages of nanotechnology.	☐	I can evaluate the use of nanotechnology.	☐

C3 Chemical Reactions

Introducing chemical reactions

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C3.1.1 Formulae of elements and molecules	I can name the elements in a familiar simple covalent substance, given the formula.	☐	I can state the number of atoms of each element in an unfamiliar simple covalent substance, given the formula.	☐	I can explain why metal elements are described using empirical formula and noble gases using just the element symbol.	☐
	I can use the Periodic Table to find symbols for elements.	☐	I can write the molecular formula of a compound that exists as simple covalent molecules, given the name or the number of atoms of each element present.	☐	I can write the molecular formula for a simple covalent compound, given the structural formula.	☐
C3.1.2 Formulae of ionic compounds	I can state the charges on ions in Groups 1, 2, 6 (IUPAC 16), and 7 (IUPAC 17).	☐	I can determine the number and type of elements in unfamiliar ionic substances, given the formulae.	☐	I can explain how a compound can contain both covalent and ionic bonds.	☐
	I can state the ions in familiar ionic substances, given the formulae.	☐	I can write the formula of ionic compounds containing one metal and one non-metal, given the name.	☐	I can write the formulae of ionic compounds that include compound ions.	☐
	I can state that transition metals can make more than one type of ion.	☐	I can write the formula of a named ion, including using the Roman numeral convention.	☐	I can name ionic compounds that contain transition metals using the Roman numeral convention.	☐
C3.1.3 Conservation of mass	I can state the law of conservation of mass.	☐	I can use the particle model to explain the law of conservation of mass.	☐	I can explain why, in some chemical reactions performed in the laboratory, there appears to be a change in total mass.	☐
	I can predict the total mass of the products or reactants in a closed chemical system, given the total mass of the reactants or products.	☐	I can predict the total mass of the products or reactants in a non-enclosed chemical system, given the total mass of the reactants or products.	☐	I can calculate the mass of one substance from a balanced symbol equation, given the masses of the other substances.	☐
C3.1.4 Chemical equations	I can write a word equation, given a statement naming the reactants and products.	☐	I can explain why a symbol equation must be balanced.	☐	I can write a balanced symbol equation, given a statement describing a familiar chemical reaction.	☐
	I can identify the reactants and products in a word or symbol equation.	☐	I can balance symbol equations with formulae that do not contain brackets.	☐	I can balance symbol equations with formulae that include brackets.	☐
	I can recognise state symbols for solids, liquids, and gases.	☐	I can add state symbols to balanced symbol equations and explain what they mean.	☐	I can evaluate the use of the terms equations, balanced symbol equations, and state symbols to describe a chemical system.	☐
C3.1.5 Half equations and ionic equations (H)			I can determine the ions in a compound, including those containing compound ions.	☐	I can write an ionic equation or half equations, given a description of a chemical reaction.	☐
			I can balance an ionic equation or half equation and explain what the equation shows.	☐	I can explain what spectator ions are, and determine them in a given example.	☐
			I can explain why precipitation reactions can be described by ionic equations.	☐		
C3.1.6 The mole (H)			I can calculate the number of particles in a sample of a substance, given the amount in moles.	☐	I can explain the relationship between the mole and the Avogadro constant.	☐
			I can state the formula that links the amount in moles, mass, and molar mass.	☐	I can calculate the mass or amount in moles of a given sample of a substance.	☐
			I can use the Periodic Table to determine the molar mass of monatomic and polyatomic elements and compounds.	☐	I can use standard form in calculations involving amounts of substance.	☐
C3.1.7 Mole calculations (H)			I can define a limiting reactant.	☐	I can explain the effect of a limiting amount of a reactant.	☐
			I can identify a limiting reactant, given the mole values for a reaction.	☐	I can use mass data to determine the stoichiometry and generate a balanced symbol equation for a reaction.	☐
			I can calculate the number of moles of a substance used or produced in a chemical reaction, given the amounts of all of the other substances.	☐	I can calculate the mass of a substance used or produced in a chemical reaction, given the mass of the limiting reactant.	☐

Energetics

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C3.2.1 Exothermic and endothermic reactions	I can state definitions of the terms exothermic and endothermic.	☐	I can describe the observations that indicate whether a reaction is exothermic or endothermic.	☐	I can draw a line graph to calculate the maximum temperature change during a reaction, determine when the reaction stopped, and predict the temperature at different times during the reaction.	☐
	I can identify a reaction as exothermic or endothermic when the temperature change is given.	☐	I can describe an experiment to determine if a reaction is exothermic or endothermic.	☐	I can evaluate an experiment to classify a reaction as exothermic or endothermic.	☐
	I can state an example of an exothermic and an endothermic reaction.	☐	I can explain the use of endothermic and exothermic reactions for a stated function.	☐	I can compare endothermic and exothermic reactions.	☐
C3.2.2 Reaction profiles	I can state a definition of activation energy.	☐	I can describe activation energy using a reaction profile.	☐	I can explain, in terms of bonds, the need for activation energy.	☐
	I can identify a reaction as exothermic or endothermic from the reaction profile.	☐	I can sketch a general reaction profile for an exothermic and an endothermic reaction.	☐	I can sketch a specific reaction profile for a given reaction.	☐
	I can identify bond breaking as endothermic and bond making as exothermic.	☐	I can explain why bond breaking is endothermic and bond making is exothermic.	☐	I can use the particle model to model a chemical reaction in terms of bond breaking and bond making.	☐
C3.2.3 Calculating energy changes (H)			I can define the term bond energy.	☐	I can compare bond energies for different bonds, and suggest reasons for differences.	☐
			I can calculate the number and type of bonds in a molecule, given the displayed formula.	☐	I can draw displayed formulae of familiar covalent molecules.	☐
			I can use bond energy data to calculate the energy change in a given reaction.	☐	I can explain why the calculated energy change may not be the same as the actual value.	☐

Types of chemical reaction

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C3.3.1 Redox reactions	I can state definitions of reduction, oxidation, and redox.	☐	I can explain reduction, oxidation, and redox in terms of electrons.	☐	I can write balanced half equations to illustrate reduction and oxidation.	☐
	I can state an example of a redox reaction.	☐	I can balance half equations.	☐	I can explain why oxidation or reduction does not happen in isolation.	☐
	I can describe an oxidising agent and a reducing agent.	☐	I can identify substances as oxidising agents or reducing agents, given the balanced symbol equation.	☐	I can construct balanced symbol equations by combining half equations and adding spectator ions.	☐
C3.3.2 The pH scale	I can state definitions of an acid and an alkali and give examples.	☐	I can explain the terms acid and alkali in terms of ions.	☐	I can use ionic equations to explain how acids produce hydrogen ions and alkalis produce hydroxide ions in solution.	☐
	I can identify a solution as acidic or alkaline given its pH.	☐	I can describe a method to use universal indicator or a pH probe to determine the pH of a solution.	☐	I can evaluate the use of indicators or pH probes and dataloggers to determine the pH of a solution.	☐
	I can safely use an indicator to classify a substance as an acid or an alkali.	☐	I can explain the pH scale in terms of acidity and alkalinity.	☐	I can explain the difference between an alkali and a base.	☐
C3.3.3 Neutralisation	I can state a definition of neutralisation.	☐	I can describe neutralisation in terms of reactants, products, and reacting ions.	☐	I can write an ionic equation for the neutralisation of an alkali by an acid.	☐
	I can describe some uses of neutralisation.	☐	I can write a balanced symbol equation to describe a neutralisation reaction.	☐	I can write balanced symbol equations with state symbols for unfamiliar neutralisation reactions.	☐
	I can predict the name of a salt made from a named alkali and common strong acids.	☐	I can state the formula of the salt made from a given alkali and strong acid.	☐	I can use the particle model to explain how the products of neutralisation form.	☐

C3.3.4 Reactions of acids	I can predict the names of the products of a reaction between a metal or a metal carbonate and an acid.	☐	I can predict the observations that might be made during a reaction between a metal or a metal carbonate and an acid.	☐	I can explain why the reaction between a metal or a metal carbonate and an acid is classified as a neutralisation reaction.	☐
	I can write a word equation to model a reaction between a metal or a metal carbonate and an acid.	☐	I can write a balanced symbol equation to model a reaction between a metal or a metal carbonate and an acid.	☐	I can write a balanced symbol equation, including state symbols, to model a reaction between a metal or a metal carbonate and an acid.	☐
	I can describe how to test and identify a gas made when a metal or a metal carbonate reacts with an acid.	☐	I can describe how to make and collect a dry sample of a named salt from a reaction between a metal or a metal carbonate and an acid.	☐	I can explain how the reactions of metals and metal carbonates with acids can be used to determine the reactivity of the metal.	☐
C3.3.5 Hydrogen ions and pH (H)			I can describe what is meant by a strong acid and a weak acid.	☐	I can explain the difference between a strong acid and a weak acid.	☐
			I can describe how an acid can be dilute or concentrated.	☐	I can explain the difference between a concentrated acid or alkali and a dilute acid or alkali.	☐
			I can collect data to plot a pH curve.	☐	I can interpret pH curves to determine the titre and the strength of reactants.	☐

Electrolysis

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C3.4.1 Electrolysis of molten salts	I can explain why solid compounds of a metal with a non-metal do not conduct electricity.	☐	I can describe the components of an electrolysis circuit, and how to mobilise the ions in the electrolyte.	☐	I can explain why electrolysis provides evidence for the existence of ions.	☐
	I can state that electrolysis breaks ionic compounds down into their component elements.	☐	I can describe the process of electrolysis.	☐	I can explain the process of electrolysis in detail.	☐
	I can predict the products of electrolysis.	☐	I can predict the products at the anode and the cathode during the electrolysis of molten ionic compounds.	☐	I can write half equations for the reactions that occur at the anode and the cathode, and explain in terms of electron transfer why these are redox reactions.	☐
C3.4.2 Electrolysis of solutions	I can state that inert electrodes are made from unreactive metals or graphite.	☐	I can explain why inert electrodes are used for the electrolysis of water (and aqueous solutions) and state the products of this reaction.	☐	I can use half equations to explain the formation of the products at each electrode during the electrolysis of water.	☐
	I can name some products of the electrolysis of solutions.	☐	I can predict and describe the products at each electrode during the electrolysis of a solution.	☐	I can predict and explain the products at each electrode during the electrolysis of a solution.	☐
	I can set up an electrolysis circuit and collect/observe some products formed by the electrolysis of a solution.	☐	I can identify products formed by the electrolysis of a solution.	☐	I can collect and identify the products at each electrode during the electrolysis of a solution.	☐
C3.4.3 Electroplating	I can state that electrolysis can be used to electroplate metals.	☐	I can describe the process of electroplating.	☐	I can write half equations to show what happens at the anode and the cathode during electroplating.	☐
	I can describe some components of an electroplating circuit.	☐	I can suggest suitable substances for the anode, cathode, and electrolyte when electroplating.	☐	I can explain in detail the components of an electroplating circuit.	☐

	I can explain that copper can be purified by electrolysis.	☐	I can explain how electrolysis is used to purify copper.	☐	I can write half equations to explain what happens at the anode and the cathode during the purification of copper using electrolysis.	☐

C4 Predicting and identifying reactions and products

C4.1 Predicting chemical reactions

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C4.1.1 Group 1 – the alkali metals	I can describe some physical properties of the Group 1 elements.	☐	I can interpret data to describe trends in the physical properties of the Group 1 elements.	☐	I can predict the physical properties of a Group 1 element, given data about other members of the group.	☐
	I can record the observations noted when Group 1 elements react with water.	☐	I can explain the observations noted when Group 1 elements react with water.	☐	I can explain in detail the observations noted when Group 1 elements react with water.	☐
	I can state that Group 1 metals react vigorously with water, and name the products formed.	☐	I can write balanced equations for the reactions of the Group 1 elements with water.	☐	I can use knowledge of electronic structures to explain in detail the trend in reactivity of the Group 1 elements.	☐
C4.1.2 Group 7 – the halogens	I can describe some physical properties of the Group 7 (IUPAC Group 17) elements.	☐	I can interpret data to describe trends in the physical properties of the Group 7 (IUPAC Group 17) elements.	☐	I can predict the physical properties of a Group 7 (IUPAC Group 17) element, given data about other members of the	☐
	I can name the salt formed when a Group 7 (IUPAC Group 17) element reacts with a metal, and write the word equation for the reaction.	☐	I can write balanced chemical equations for the reactions of Group 7 (IUPAC Group 17) elements with metals, given the formula of the salt formed.	☐	Write balanced chemical equations for the reactions of Group 7 (IUPAC Group 17) elements with metals.	☐
	I can state that Group 7 (IUPAC Group 17) elements react vigorously with metals.	☐	I can describe the trend in reactivity of the Group 7 (IUPAC Group 17) elements.	☐	I can use knowledge of electronic structures to explain in detail the trend in reactivity of the Group 7 (IUPAC Group 17) elements.	☐
C4.1.3 Halogen displacement reactions	I can state that a more reactive halogen can displace a less reactive halogen from its compounds.	☐	I can use the order of reactivity of the halogens to explain the outcome of a displacement reaction.	☐	I can predict possible reactions from the order of reactivity of the halogens, or their positions in the Periodic Table.	☐
	I can record the observations noted when halogens react with halide ions in solution.	☐	I can use observations from halogen displacement reactions to identify the more reactive halogen in the reaction.	☐	I ca use observations from halogen displacement reactions to deduce the order of reactivity of the halogens.	☐
	I can state the products when a halogen reacts with a halide ion.	☐	I can write balanced equations for halogen displacement reactions.	☐	I can write half equations for each reactant in a halogen displacement reaction, and use them to identify which species have been oxidised and which have been reduced.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C4.1.4 Group 0 – the noble gases	I can describe some physical properties od the noble gases.	☐	I can interpret data to describe trends in the physical properties of the noble gases.	☐	I can predict the physical properties of a noble gas element, given data about other members of the group.	☐
	I can state that noble gases are unreactive.	☐	I can relate the lack of reactivity of the noble gasses to their outer shell.	☐	I can use knowledge of electronic structures to explain in detail the lack of reactivity of the noble gases.	☐
	I can explain that noble gases exist as separate atoms.	☐	I can use nomenclature nature of the noble gases to explain their low boiling points and densities.	☐	I can use the relative strengths of the forces between atoms to explain the trend in boiling point of the noble gases.	☐
C4.1.5 The transition metals	I can describe some physical properties of transition metals.	☐	I can compare the physical properties of transition metals with those of Group 1 metals.	☐	I can explain in detail how the uses of transition metals depend on their physical properties.	☐
	I can describe some simple reactions of transition metals.	☐	I can describe how to distinguish transition compounds from each other and from Group 1 compounds.	☐	I can explain the use of transition metals as catalysts.	☐
	I can state that transition metals can form more than one kind of ion.	☐	I can deduce the charge on a transition metal ion, given the names of compounds that include it.	☐	I can deduce the charge on a transition metal ion, given the formulae of its compounds.	☐
C4.1.6 The reactivity of elements	I can record observations noted when metals react with water and dilute acids.	☐	I can use observations from metal reactions to place them in an order of reactivity.	☐	I can explain why some metals are more reactive than others.	☐
	I can describe the products of a metal displacement reaction.	☐	I can write balanced equations for metal displacement reactions.	☐	I can write half equations for metal displacement reactions and distinguish those that model oxidation and those that model reduction.	☐
		☐	I can use the order of reactivity of metals to predict reactions.	☐	I can use the order of reactivity of metals to predict reactions, and justify these predictions.	☐

C4.2 Identifying the products of chemical

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C4.2.1 Detecting gases	I can recognise that limewater turns cloudy when carbon dioxide is bubbled through it.	☐	I can describe in detail how to use limewater to test for carbon dioxide.	☐	I can write balanced chemical equations to explain the reactions that occur when carbon dioxide is bubbled through lime.	☐
	I can describe the results of positive tests for hydrogen and oxygen.	☐	I can describe in detail how to test for chlorine, hydrogen, and oxygen.	☐	I can write equations for the reactions that occur in the tests for hydrogen and oxygen.	☐
	I can recognise that substances need to be smelt safely.	☐	I can smell substances safely in the laboratory.	☐	I can explain why it is important to smell substances safely.	☐
C4.2.2 Detecting cations	I can describe some steps in performing a flame test to identify metal ions.	☐	I can describe in detail how to perform a flame test to identify metal ions.	☐	I can explain why each step in the flame test is necessary to obtain a valid result.	☐
	I can record observations when metal ions are heated.	☐	I can interpret flame test results to identify the metal ions present in a substances.	☐	I can explain why different metal ions produce different colours when heated.	☐
	I can recognise that sodium hydroxide can be used to identify aqueous metal ions.	☐	I can explain how to use sodium hydroxide to identify aqueous metal ions.	☐	I can explain in detail, including equations, how aqueous cations can be identified with sodium hydroxide solution.	☐
C4.2.3 Detecting anions	I can describe some steps and expected results for sulfate and carbonate anion tests.	☐	I can describe in detail how to test for sulfate and carbonate anions.	☐	I can describe in detail how to identify sulfate and carbonate anions, and write equations for all reactions that occur.	☐
	I can state that aqueous halide ions form a precipitate with silver nitrate solution and that this can be used to identify them.	☐	I can explain how silver nitrate solution can be used to test for halide ions.	☐	I can explain in detail how silver nitrate solution can be used to identify halide ions, and write equations for reactions that occur.	☐
	I can record observations when carrying out tests for anions.	☐	I can explain observations noted when testing for anions.	☐	I can explain in detail observations noted when testing for anions, and write equations for all reactions that occur.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C4.2.4 Instrumental methods of analysis	I can state that scientific instruments can be used to identify substances and recall one use of instrumental analysis.	☐	I can describe some advantages of instrumental analysis.	☐	I can justify the use of particular instruments to analyse given substances or mixtures of substances.	☐
	I can list some methods of instrumental analysis.	☐	I can describe some details of the different methods of instrumental analysis available.	☐	I can explain why different instrumental techniques are used together.	☐
	I can recognise that the spectrum produced by an instrument is unique for a particular substance.	☐	I can interpret simple spectra to suggest the relative formula mass of a substance or the bonds present.	☐	I can use data and spectra to suggest functional groups in a sample.	☐

C5 Monitoring and Controlling Chemical Reactions

C5.1 Monitoring chemical reactions

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C5.1.1 Theoretical yield	I can calculate the relative formula mass of elements and compounds that exist as diatomic molecules (e.g., hydrogen, H_2, hydrogen chloride, HCl, and oxygen, O_2).	☐	I can calculate the relative formula mass of molecules and compounds containing simple ions (e.g., magnesium chloride, $MgCl_2$).	☐	I can calculate the relative formula mass of compounds containing ions made up of atoms of more than one element (e.g., magnesium hydroxide, $Mg(OH)_2$).	☐
	I can state that the mass of a product obtained in a chemical reaction is the yield.	☐	I can define the term theoretical yield.	☐	I can justify the use of the law of conservation of mass and the identity of the limiting reactant in theoretical yield calculations.	☐
			I can calculate the theoretical yield of a product from a given mass of reactant, given the equation for the reaction.	☐	I can calculate the theoretical yield of a product from a given mass of reactant in a given reaction.	☐
C5.1.2 Percentage yield and atom economy	I can state that the actual yield of a reaction may be less than the theoretical yield.	☐	I can suggest some reasons why the percentage yield of a reaction may be less than 100%.	☐	I can suggest why percentage yield may be less than 100%for given reactions.	☐
	I can calculate the percentage yield of a reaction, given the equation for the process, the actual yield, and the theoretical yield.	☐	I can calculate the percentage yield of a product, given the theoretical yield and the actual yield.	☐	I can calculate the percentage yield of a product, given the mass of the reactants and the actual yield.	☐
	I can calculate the atom economy of a reaction, given the equation for the process, the relative masses of all the products, and the relative mass of the desired product.	☐	I can define the term atom economy and calculate the atom economy of a reaction, given the balanced chemical equation.	☐	I can evaluate different processes used to make the same substance, in order to compare their atom economies.	☐

Lesson	Aiming for 4	Aiming for 6		Aiming for 8	
C5.1.3 Choosing a reaction pathway		I can list some of the factors that chemists consider when choosing a reaction pathway.	☐	I can perform practicals to make a substance in two different ways. I can use this example to explain in detail the factors that chemist consider when choosing a reaction pathway.	☐
		I can explain why reaction pathways with high atom economies are desirable.	☐	I can demonstrate by calculation how selling a by-product can be used to improve the atom economy of a reaction.	☐
		I can define the term by-product and explain how selling a by-product can improve the atom economy of a reaction.	☐		
C5.1.4 Concentration of solution		I can state that 1ml = 1cm³ and convert volumes given in cm³ to dm³ by calculation.	☐	I can explain why it is useful to convert cm³ to dm³ in calculations.	☐
		I can calculate concentrations in g/dm³.	☐	I can convert concentrations in g/dm³ to mol/dm³ and vice versa by calculations.	☐
		I can calculate concentrations in mol/dm³.	☐	I can rearrange the concentration equation to calculate the volume of solution or the amount of solute in mol.	☐

Lesson	Aiming for 4	Aiming for 6		Aiming for 8	
C5.1.5 Titrations		I can name the apparatus used in an acid-alkali titration.	☐	I can explain in detail how to carry out an acid-alkali titration with accuracy and precision.	☐
		I can perform an acid-alkali titration and obtain a titre value.	☐	I can perform an acid-alkali titration to obtain concordant titre values.	☐
		I can record initial and final burette readings to 2 decimal places and select suitable titres to calculate the mean titre.	☐	I can justify the use of a volumetric pipette and a burette in titrations.	☐
C5.1.6 Titration calculations		I can calculate the number of moles of substance in a standard solution used in a titration, given its volume and concentration.	☐	I can use titration results to calculate the number of moles of substance in a standard solution used in a titration.	☐
		I can calculate the number of moles of a substance of unknown concentration in a titration, given the equation or ratio of reacting moles.	☐	I can write a balanced equation for the reaction in a titration and use this to calculate the number of moles of reactant in a solution of unknown concentration.	☐
		I can calculate the concentration of a solution following a titration, given the number of moles and volume.	☐	I can calculate the concentration of a solution following a titration to the appropriate number if significant figures.	☐
C5.1.7 Gas calculations		I can state that 1 mol of a gas occupies 24dm³ at RTP and use this to calculate the volumes of gases at room temperature and pressure (RTP).	☐	I can rearrange the gas equation to calculate the moles or volume of any gas at RTP.	☐
		I can calculate the volume of gas produced in a reaction, given the appropriate equations and/or a stepped calculation.	☐	I can calculate the volume or mass of a gas produced in a reaction.	☐
		I can perform an experiment to determine the volume of gas produced in a reaction.	☐	I can compare the amount of gas produced by experiment with the calculated theoretical yield and suggest reasons for any discrepancies.	☐

C5.2 Controlling reactions

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C5.2.1 Measuring reaction rates	I can state that reactions with a high rate proceed quickly and produce a large amount of product in a short time, and that those with low rate take longer to produce the same amount of product.	☐	I can define the term rate of reaction.	☐		
	I can explain that the volume of gas produced in a reaction can be used as a measure of reaction rate.	☐	I can explain how to use a gas syringe, measuring cylinder, or top-pan balance to monitor the volume of gas produced in a reaction.	☐		
	I can use a graph to describe how rate of reaction changes with time.	☐	I can calculate rate of reaction from a graph.	☐		
C5.2.2 Temperature and rate	I can state that particles have to collide in order to react.	☐	I can define the term successful collision and explain how the number of successful collisions can be increased.	☐	I can explain collision theory in detail.	☐
	I can state that rate of reaction increases with temperature.	☐	I can use collision theory to explain the effect of temperature on rate of reaction.	☐	I can use collision theory to justify a detailed explanation of the effect of temperature on rate of reaction.	☐
	I can record some reaction times at different temperatures in rate-of-reaction experiments.	☐	I can use experimental data to calculate rate of reaction at different temperatures.	☐	I can interpret a graph of rate of reaction against temperature and explain its shape.	☐
C5.2.3 Concentration, pressure, and rate	I can state that rate of reaction increases as concentration increases.	☐	I can define the term concentration and use collision theory to explain how concentration affects rate of reaction.	☐	I can use detailed collision theory to explain the relationship between concentration and rate of reaction.	☐
	I can state that rate of reaction increases as pressure increases.	☐	I can define the term pressure and use collision theory to explain how pressure affects rate of reaction.	☐	I can explain why the temperature should be kept constant when investigating the effect of concentration or pressure on rate of reaction.	☐
	I can record some reaction times at different concentrations in rate-of-reaction experiments.	☐	I can use experimental data to calculate rate of reaction at different concentrations.	☐	I can interpret a graph of rate of reaction against concentration and explain its shape.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C5.2.4 Surface area and rate	I can state that small pieces of a solid have a larger surface-area-to-volume ratio than larger pieces.	☐	I can explain how to conduct a fair test and obtain valid results when investigating the effect of particle size on rate of reaction.	☐	I can calculate the surface-area-to-volume ratio for different-sized pieces of solid.	☐
	I can state that pieces of solid with a large surface area react more quickly than those with a smaller surface area.	☐	I can use collision theory to explain how surface area affects rate of reaction.	☐	I can use detailed collision theory to justify the relationship between surface area and rate of reaction.	☐
	I can record data in rate-of-reaction experiments for pieces of solid with different surface areas.	☐	I can use experimental data to demonstrate the effect of surface area on rate of reaction.	☐	I can use experimental data to calculate mean rates of reaction for different surface areas.	☐
C5.2.5 Catalysts and rate	I can state that catalysts can be used to speed up chemical reactions.	☐	I can define the term catalyst and describe how catalysts work.	☐	I can explain in detail how catalysts affect rate of reaction.	☐
	I can state that enzymes are biological catalysts.	☐	I can explain how surface area affects the action of a catalyst.	☐	I can explain using collision theory how a catalyst work.	☐
	I can record reaction times for reactions involving catalysts.	☐	I can process experimental data to demonstrate the effect of different catalysts on rate of reaction.	☐	I can use experimental data to calculate the effects of different catalysts on rate of reaction.	☐

C5.3 Equilibria

Name Class Date

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C5.3.1 Reversible reactions	I can state that some reactions are reversible.	☐	I can explain the meaning of ⇋ symbol.	☐	I can write balanced equations for a reversible reaction to model the forward and backward reactions.	☐
	I can state one example of a reversible reaction.	☐	I can describe how some chemical reactions can be reversed by altering the reaction conditions.	☐	I can suggest the conditions needed to reverse a given chemical reaction.	☐
	I can describe the concentrations of reacting substances as constant in a dynamic equilibrium.	☐	I can explain why, in dynamic equilibrium reactions, the rates of the forward and backward reactions are equal.	☐	I can explain in detail the conditions under which dynamic equilibria occur.	☐
C5.3.2 Equilibrium position			I can describe the effect of changing pressure on a given equilibrium system.	☐	I can explain fully the effect of changing pressure on a given equilibrium system.	☐
			I can describe the effect of changing concentration on a given equilibrium system.	☐	I can explain fully the effect of changing concentration on a given equilibrium system.	☐
			I can describe the effect of changing temperature on a given equilibrium system.	☐	I can explain fully the effect of changing temperature on a given equilibrium system.	☐
C5.3.3 Choosing reaction conditions			I can describe the factors that affect the equilibrium yield of reaction.	☐	I can explain why removing the product of a reversible reaction moves the equilibrium position to the right.	☐
			I can explain the optimum pressure for producing a high yield of a particular product in an equilibrium reaction.	☐	I can justify the choice of a compromise pressure for a particular equilibrium reaction.	☐
			I can explain the optimum temperature for producing a high yield of a particular product in an equilibrium reaction.	☐	I can justify the choice of a compromise temperature for a particular equilibrium reaction.	☐

C6 Global Challenges

C6.1 Improving processes and products

C6.1.6 Extracting metals	I can state a definition of the term ore.	☐	I can outline the steps in extracting a metal from its ore.	☐	I can explain, using the position of carbon in the reactivity series, how the industrial process used to extract a metal is chosen.	☐
	I can describe some stages in the extraction of copper.	☐	I can describe how copper is extracted from copper (II) oxide.	☐	I can explain the extraction of copper from different ores using chemical equations, and describe each part of the process as oxidation or reduction.	☐
	I can use laboratory apparatus to heat a sample of copper (II) oxide and charcoal.	☐	I can prepare a sample of copper from copper (II) oxide.	☐	I can prepare a sample of copper from copper (II) oxide and explain why an excess of charcoal is used.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C6.1.7 Extracting iron	I can state that iron is produced from iron ore and coke.	☐	I can name all the raw materials used to make iron.	☐	I can explain why each of the raw materials used in iron production is needed.	☐
	I can state that iron ore is converted into iron at a high temperature in the blast furnace.	☐	I can describe the main processes that occur in the blast furnace in the production of iron ore.	☐	I can explain in detail how iron is extracted from iron ore.	☐
	I can state that the reaction that produces iron is a reduction reaction.	☐	I can write equations for the reactions that occur in the blast furnace in the production of iron ore.	☐	I can distinguish the reactions that occur in the blast furnace as combustion, oxidation, redox, or neutralisation.	☐
C6.1.8 Extracting aluminium	I can state that aluminium is extracted from aluminium oxide by electrolysis.	☐	I can state that the main ore of aluminium is bauxite, and explain why aluminium has to be extracted by electrolysis.	☐	I can explain why aluminium oxide is dissolved in cryolite before electrolysis.	☐
	I can describe some stages in the process of extracting aluminium from its ore.	☐	I can describe how aluminium is extracted from its oxide.	☐	I can explain in detailed each stage of the extraction of aluminium from its ore and write a balanced equation to model the overall reaction.	☐
	I can state that the electrolysis of aluminium oxide produces aluminium and oxygen.	☐	I can name the substances formed at each electrode in the electrolysis of aluminium oxide, and explain why the anode needs replacing frequently.	☐	I can write equations for the processes that occur at each electrode and describe them as oxidation or reduction.	☐
C6.1.9 Biological metal extraction			I can describe the process of bioleaching.	☐	I can explain the process of bioleaching in detail.	☐
			I can describe the process of phytoextraction.	☐	I can explain the process of phytoextraction in detail.	☐
			I can describe some advantages and disadvantages of bioleaching and phytoextraction.	☐	I can compare bioleaching and phytoextraction with alternative methods of metal extraction and evaluate them.	☐

C6.1.15 Choosing materials	I can state why one material would be more suitable than another for a particular purpose.	☐	I can choose the most appropriate material for a particular purpose, given data on a range of properties, and briefly explain this choice.	☐	I can explain in detail the choice of an appropriate for a particular purpose.	☐
	I can explain what a life-cycle assessment (LCA) is.	☐	I can describe the basic principles of carrying out an LCA.	☐	I can describe in detail the process of carrying out an LCA.	☐
	I can describe the stages in the life cycle of a product, given data.	☐	I can interpret data from the LCA of a material or product.	☐	I can evaluate data from an LCA and draw conclusions about the material or product.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C6.1.16 Recycling materials	I can describe some benefits of recycling materials.	☐	I can explain the benefits of recycling materials.	☐	I can interpret data to evaluate the recycling of different materials.	☐
	I can state one factor to consider before deciding whether or not to recycle a material.	☐	I can describe several factors to consider before deciding whether or not to recycle a material.	☐	I can process numeric data to demonstrate the relative benefit of recycling different materials.	☐
	I can describe methods of sorting materials before they are recycled.	☐	I can explain why it is important to sort materials before recycling and describe how some materials are sorted.	☐	I can explain in detail how materials are recycled.	☐

6.2 Organic

C6.2.5 Alkanes from crude oil	I can name some uses of crude oil and state that it is a fossil fuel.	☐	I can explain how crude oil forms and why it is described as non-renewable.	☐	I can explain in detail why crude oil in a finite resource.	☐
	I can state that the fractions in crude oil can be separated by fractional distillation.	☐	I can explain how the properties of alkanes are related to the number of carbon atoms in the molecule.	☐	I can explain in detail the separation of crude oil by fractional distillation.	☐
	I can name some fractions of crude oil.	☐	I can name the fractions of crude oil in order of increasing boiling point.	☐	I can justify the uses of different fractions obtained from crude oil.	☐
C6.2.6 Cracking oil fractions	I can state that during cracking large alkane molecules are broken down into smaller ones.	☐	I can describe the process of cracking and the conditions needed.	☐	I can explain, with balanced chemical equations, the process of cracking.	☐
	I can state that cracking is carried out to convert hydrocarbons with long-chain molecules into more useful ones with shorter-chain molecules.	☐	I can explain why cracking is carried out.	☐	I can explain in detail how cracking helps to satisfy the demand for specific fuels and other substances.	☐
	I can describe some uses of substances obtained from crude oil.	☐				

C6.3 Interpreting and interacting with Earth Systems

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C6.3.1 Forming the atmosphere	I can name the main gases in the atmosphere.	☐	I can describe the composition of the atmosphere.	☐	I can describe in detail the composition of the atmosphere.	☐
	I can state that early atmosphere was mostly carbon dioxide.	☐	I can explain how the Earth's early atmosphere is thought to have formed.	☐	I can interpret evidence about the formation of the early atmosphere.	☐
	I can state that photosynthesis may have caused the percentage of oxygen in the atmosphere to increase over time.	☐	I can explain how an oxygen-rich atmosphere may have developed over time.	☐	I can interpret evidence about changes in the atmosphere over time.	☐
C6.3.2 Pollution and the atmosphere	I can state that carbon monoxide is a pollutant that may harm living things.	☐	I can describe how carbon monoxide is produced and explain the effect it has on the body.	☐	I can explain in detail the health problems caused by increased amounts of carbon monoxide in the atmosphere.	☐
	I can state that particulates are pollutants that may harm living things.	☐	I can describe how particulates are produced and explain the effect they have on the body.	☐	I can explain in detail the health problems caused by increased amounts of particulates in the atmosphere.	☐
	I can state that nitrogen oxide and sulphur dioxide are pollutants that may harm living things.	☐	I can describe how acidic oxides are produced and explain the effect they have on living organisms.	☐	I can explain in detail the health problems caused by increased amounts of acidic oxides in the atmosphere.	☐
C6.3.3 Climate change	I can state that the greenhouse effect keeps the Earth and its atmosphere warm enough for living things to exist.	☐	I can describe the atmospheric greenhouse effect.	☐	I can explain the greenhouse effect in terms of the interaction of radiation with matter within the atmospheric.	☐
	I can state that an increase in greenhouse gases is causing global warming.	☐	I can explain the problems caused by an enhanced greenhouse effect.	☐	I can evaluate evidence for causes of climate change.	☐
	I can describe the importance of reducing emissions of greenhouse gases.	☐	I can explain methods for reducing emissions of greenhouse gases.	☐	I can evaluate the effectiveness of methods for reducing greenhouse gas emissions.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C6.3.4 Water for drinking	I can describe where drinking water comes from.	☐	I can name the substances that are present in riders and waste water.	☐	I can explain the sources of the substances present in rivers and waste water.	☐
	I can state that water has to be treated before it is safe to drink.	☐	I can describe how ground water and waste water are treated in order to make them safe to drink.	☐	I can evaluate the arguments for and against the fluoridation of drinking water.	☐
	I can state that seawater can be made safe to drink using desalination to remove dissolved salts.	☐	I can describe how salt water is treated to make it safe to drink.	☐	I can evaluate the advantages and disadvantages of distilling large volumes of seawater to provide drinking water.	☐

Y11 Combined Science CHEMISTRY PPE Exam Revision list

C1 Particles

The particle model

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C1.1.1 Introducing particles	I can draw diagrams to show the arrangements of particles in the three states of matter.	☐	I can describe the movement and arrangement of particles in the three states of matter, and give examples of three	☐	I can compare the movement and arrangement of particles in the three states of matter.	☐
	I can describe typical physical properties of a substance in a given state.	☐	I can compare the physical properties of a substance in its three states.	☐	I can use the particle model to explain the differences in physical properties of a substance in its three states.	☐
	I can state whether a given particle model is in two or three dimensions.	☐	I can compare the features of 2D and 3D models to represent particles.	☐	I can evaluate the advantages and disadvantages of given 2D and 3D models to represent particles.	☐
C1.1.2 Chemical and physical changes	I can make observations, and give examples of physical and chemical changes.	☐	I can state whether an observed change is physical or chemical.	☐	I can justify classifying a given observed change as physical or chemical.	☐
	I can state the definition of a physical change and a chemical changes.	☐	I can compare the features of physical and chemical changes.	☐	I can explain the differences between physical and chemical changes using the particle model.	☐
	I can compare reactants and products in a chemical reaction using particle diagrams or physical models.	☐	I can deduce whether a given change is physical or chemical by interpreting particle diagrams of reactants and products.	☐	I can draw particle diagrams of reactants and products to model a chemical reaction.	☐
C1.1.3 Limitations of the particle model	I can name the type of force that acts between particles.	☐	I can describe how the strength of the forces between particles changes with distance.	☐	I can explain why the strength of the forces between particles affects the properties of a substance.	☐
	I can compare the relative distances between particles in the three states of matter.	☐	I can state typical distances between particles in the gas state.	☐	I can calculate the ratio distance to diameter, the distance between particles in a gas state, and the sizes of objects in scale models.	☐
	I can describe one way in which the particle model is unlike the situation it represents.	☐	I can describe three limitations of the particle model.	☐	I can use mathematical ideas to explain some limitations of the particle model.	☐

Atomic structure

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C1.2.1 Atomic structure	I can list the subatomic particles in an atom.	☐	I can describe the subatomic particles in an atom.	☐	I can explain evidence for the structure of the atom.	☐
	I can qualitatively describe: the relative sizes of an atom, chemical bonds, and simple molecules.	☐	I can use standard form to describe the sizes of atoms, chemical bonds, and molecules.	☐	I can explain why a relative scale is used to compare subatomic particles.	☐
	I can state the size of a typical atom.	☐	I can use data to calculate the sizes, masses, and charges of subatomic particles.	☐	I can use data to calculate the relative sizes, masses, and charges of subatomic particles.	☐
C1.2.2 Isotopes	I can state definitions of the terms ion, atomic number, mass number, and isotope.	☐	I can use an example to describe the similarities and differences between isotopes in terms of subatomic particles.	☐	I can explain why isotopes of the same element may have different physical properties but identical chemical properties.	☐
	I can describe how an atom becomes an ion.	☐	I can use standard notation to represent an ion.	☐	I can use and interpret standard notation to represent atoms, ions, and isotopes.	☐
	I can state the number of protons, neutrons, and electrons from given values of atomic number and mass number.	☐	I can state the numbers of protons, neutrons, and electrons in an atom when a Periodic Table is supplied.	☐	I can state the number of protons, neutrons, and electrons for an ion when a Periodic Table is supplied.	☐
C1.2.3 Developing the atomic model	I can recall the main features of the plum-pudding model and the Bohr model.	☐	I can describe the development of the atomic model.	☐	I can explain why the atomic model has changed over time.	☐
	I can state the contribution Dalton, Thomson, Rutherford, Bohr, Geiger, and Marsden made to the atomic model.	☐	I can explain the contribution of Dalton, Thomson, Rutherford, Bohr, Geiger, and Marsden to the development of the atomic model.	☐	I can justify amendments to the model of the atom.	☐
	I can state what an atom is.	☐				

C2 Elements, compounds and mixtures

Purity and separating mixtures

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C2.1.1 Relative formula mass	I can state definitions of relative atomic mass, relative molecular mass, and relative formula mass.	☐	I can use data from the Periodic Table to compare the relative atomic masses of different elements.	☐	I can explain why relative formula mass is a useful measurement.	☐
	I can use the Periodic Table to find the chemical symbol for an element.	☐	I can interpret simple formulae to list the number of each type of atom present.	☐	I can interpret diagrams of molecular compounds to write chemical formulae.	☐
	I can use the Periodic Table to give the relative atomic mass of an element.	☐	I can calculate the relative formula mass or relative molecular mass of a simple substance when the relative atomic mass and formula are given.	☐	I can calculate the relative formula mass or relative molecular mass of substances from diagrams or formulae (including those with brackets).	☐
C2.1.2 Empirical formula	I can state a definition of empirical formula.	☐	I can use an example to explain how a molecular formula and an empirical formula can be the same.	☐	I can explain why ionic compounds are always referred to by their empirical formulae.	☐
	I can calculate the empirical formula for a simple covalent compound when the molecular formula is given.	☐	I can calculate the empirical formula for a compound from a diagram.	☐	I can calculate an empirical formula from a molecular formula that contains brackets.	☐
	I can use a balanced symbol equation to calculate the relative formula mass or relative molecular mass when the relative atomic masses are given.	☐	I can explain when the term relative molecular mass can be used.	☐	I can explain how the sum of the M_r values of the reactants must equal the sum of the M_r values of the products in a balanced symbol equation.	☐
C2.1.3 Pure and impure substances	I can state definitions of the terms pure and mixture.	☐	I can explain the different meanings of pure in everyday and scientific language.	☐	I can explain why a mixture is often more useful than a pure substance.	☐
	I can give an example of a pure substance and a mixture.	☐	I can identify a substance as either pure or a mixture.	☐	I can explain the effect on melting point of adding different substances to a pure substance.	☐
	I can safely determine the melting point of a substance.	☐	I can identify a substance from melting point data.	☐	I can evaluate the purity of a sample from its melting point data.	☐
C2.1.4 Filtration and crystallisation	I can safely separate a mixture to collect an insoluble substance from a liquid or solution.	☐	I can describe the process of filtering.	☐	I can explain how filtration separates an insoluble solid from a liquid or solution.	☐
	I can safely separate a solution to collect the solute.	☐	I can describe the process of crystallisation.	☐	I can explain how crystallisation separates the components of a solution.	☐
	I can identify the solute, solvent, residue, and filtrate in named solutions or suspensions that have been separated.	☐	I can suggest and describe a suitable technique to separate a named solution or suspension.	☐	I can evaluate different techniques for folding filter paper.	☐
C2.1.5 Distillation	I can list and recognise the key equipment used in a simple distillation.	☐	I can describe the process of simple distillation.	☐	I can explain how simple distillation separates a solution.	☐
	I can safely use distillation to separate two miscible liquids.	☐	I can describe the process of fractional distillation.	☐	I can explain how fractional distillation separates a mixture of liquids.	☐
	I can state the types of mixtures that can be separated by distillation.	☐	I can suggest and describe a suitable technique to separate a named solution.	☐	I can predict and justify the value shown on a thermometer in a distillation, given the mixture and relevant data.	☐
C2.1.6 Chromatography	I can state definitions for the stationary and mobile phases in chromatography.	☐	I can describe how to complete paper chromatography.	☐	I can explain how separation occurs in a chromatography experiment.	☐
	I can safely complete a paper chromatogram.	☐	I can describe how to complete thin-layer chromatography.	☐	I can explain how chromatograms for the same substances can be different when phases are changed.	☐
	I can recall the formula for the R_f value.	☐	I can calculate R_f values given a chromatogram.	☐	I can interpret a chromatogram.	☐
C2.1.7 Purification and checking purity	I can describe one purification technique to separate a simple mixture.	☐	I can suggest a multistep separation technique for a mixture.	☐	I can explain how a multistep method can be used to separate a given mixture.	☐
	I can describe the processes of paper, thin-layer, and gas chromatography.	☐	I can explain the processes of paper, thin-layer, and gas chromatography.	☐	I can evaluate the different types of chromatography.	☐
	I can use a chromatogram to classify a substance as pure or a mixture.	☐	I can explain how a chromatogram can be used to identify a pure substance or a mixure.	☐	I can justify the use of different purification techniques in different circumstances.	☐

Bonding

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C2.2.1 Metals and non-metals	I can list the physical properties of metals and non-metals.	☐	I can describe the differences between the chemical properties of metals and non-metals.	☐	I can predict the physical and chemical properties of an element based on its position in the Periodic Table.	☐
	I can state where metals and non-metals are found in the Periodic Table.	☐	I can describe an experiment to determine whether an element is a metal or a non-metal.	☐	I can evaluate an experiment designed to classify an element as a metal or a non-metal.	☐
	I can use the Periodic Table to classify an element as a metal or a non-metal.	☐	I can identify patterns in the Periodic Table for the physical properties of elements.	☐	I can identify and justify anomalous elements in the Periodic Table.	☐
C2.2.2 Electronic structures	I can state definitions of a group and a period in the Periodic Table.	☐	I can identify an element given the group and period number, and vice versa.	☐	I can determine the electronic structure of each of the first 20 elements given group number and period number.	☐
	I can state the maximum number of electrons in each of the first three shells.	☐	I can use simplified electronic structure notation to draw the electronic structure of the first 20 elements in the Periodic Table.	☐	I can interpret simplified electronic notation for the first 20 elements to determine group number, period number, and element.	☐
	I can draw the electronic structure of the first 20 elements given the number of electrons.	☐	I can draw the electronic structure of the first 20 elements using the Periodic Table to determine their number of electrons.	☐	I can justify the study of the electronic structures of only the first 20 elements.	☐
C2.2.3 Forming ions	I can state the definition of the term ion.	☐	I can use electron diagrams to explain how ions are formed.	☐	I can explain the charge on a given ion in terms of subatomic particles and electron transfer.	☐
	I can recognise an ion from its symbol.	☐	I can explain whether a given electron diagram represents an atom or an ion.	☐	I can explain how atoms and ions of different elements can have the same electronic structure.	☐
	I can draw or state the electronic structure of an ion given its charge and the electronic structure of the neutral atom.	☐	I can draw the electronic structure of an ion given its charge and the number of electrons in the neutral atom.	☐	I can predict the electronic structure of an ion given its position in the Periodic Table.	☐
C2.2.4 Ionic compounds	I can state that ionic compounds tend to form between a metal and a non-metal.	☐	I can explain the formation of ionic bonds in terms of electron transfer.	☐	I can justify the formation of ionic bonds in terms of the stability of the atoms and ions involved.	☐
	I can draw dot-and-cross diagrams to represent simple binary ionic compounds in which one electron per atom is transferred.	☐	I can draw dot-and-cross diagrams to represent ionic compounds in which more than one electron per atom is transferred.	☐	I can justify how a space-filling model for a given compound arises from its dot-and-cross diagram.	☐
	I can describe the structure and bonding in an ionic compound.	☐	I can explain how a given model represents an ionically bonded compound.	☐	I can evaluate different models to represent ionic compounds.	☐
C2.2.5 Simple molecules	I can state that covalent compounds form between non-metal atoms.	☐	I can describe the formation of covalent bonds in terms of electron sharing.	☐	I can explain how covalent bonds form between non-metal atoms.	☐
	I can recognise covalent bonding and identify substances as covalently bonded.	☐	I can describe structure and bonding in simple molecular substances.	☐	I can evaluate different models to represent covalent compounds.	☐
	I can draw dot-and-cross diagrams of simple covalent substances, limited to the first 20 elements and single bonds.	☐	I can draw displayed formulae or dot-and-cross diagrams of covalent compounds, limited to the first 20 elements with single and/or double bonds.	☐	I can suggest the displayed formula, space-filling, or dot-and-cross diagrams for covalent compounds, including those with multiple bonds.	☐
C2.2.6 Giant covalent structures	I can state that covalent compounds form between non-metal atoms.	☐	I can describe the formation of covalent bonds in terms of electron sharing.	☐	I can use examples to explain how covalent bonds hold together a giant covalent structure.	☐
	I can state examples of substances with giant covalent structures.	☐	I can describe the structure and bonding in giant covalent structures.	☐	I can evaluate different models to represent covalent compounds.	☐
	I can draw a 3D representation of a giant covalent structure.	☐	I can determine the empirical formula of a substance with a giant covalent structure.	☐	I can justify the use of empirical formulae to describe substances that have giant covalent structures.	☐

C2.2.7 Polymer molecules	I can state definitions of the terms monomer and polymer and give examples of each.	☐	I can describe the formation of a polymer.	☐	I can explain how monomers join together to form an addition polymer.	☐
	I can describe the difference between the properties of thermosoftening and thermosetting polymers.	☐	I can describe an experiment to classify a polymer as thermosoftening or thermosetting.	☐	I can explain how the structures of thermosoftening and thermosetting polymers affect their properties.	☐
	I can identify a monomer and polymer in a model.	☐	I can explain a model to represent a polymer.	☐	I can evaluate different models to represent polymers.	☐
C2.2.8 Structure of metals	I can list examples of substances with metallic bonds.	☐	I can describe the formation of metallic bonds.	☐	I can explain how monomers join together to form an addition polymer.	☐
	I can describe the lattice structure of a metallic crystal.	☐	I can use a model to explain the lattice structure of a metallic crystal.	☐	I can explain how the structures of thermosoftening and thermosetting polymers affect their properties.	☐
	I can recognise a model of a metallic lattice.	☐	I can compare metallic bonds with covalent and ionic bonds.	☐	I can evaluate different models to represent polymers.	☐
C2.2.9 Developing the Periodic Table	I can describe how the elements are listed in the Periodic Table.	☐	I can explain how Mendeleev organised the elements in the Periodic Table.	☐	I can explain why the modern Periodic Table is not the same as Mendeleev's Periodic Table.	☐
	I can use the Periodic Table to determine the symbol, atomic number, and relative atomic mass of an element.	☐	I can explain why Mendeleev's Periodic Table was not adopted straight away.	☐	I can evaluate the Periodic Table as a method of displaying information about the elements.	☐

C2.2.10 Atomic structure and the Periodic Table	I can state the number of electrons in the outer electron shells for the elements in Groups 1 and 8.	☐	I can use the Periodic Table to suggest the electronic structure for the first 20 elements.	☐	I can use the Periodic Table to suggest the number of outer-shell electrons and the number of electron shells for an element.	☐
	I can describe the trend in the reactions of the Group 1 elements with water.	☐	I can predict and explain the trend in reactivity of elements in Groups 2 and 6.	☐	I can explain, in terms of electronic structure, why noble gases are described as inert.	☐
	I can describe observations from displacement reactions.	☐	I can use the Periodic Table to make predictions about the chemical reactions of elements with oxygen.	☐	I can evaluate the versatility of the Periodic Table as new elements are discovered.	☐

Properties of materials

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C2.3.1 Carbon	I can describe the structure and bonding in graphite and diamond.	☐	I can explain how carbon can form different families of compounds.	☐	I can explain the uses of graphite and diamond in terms of their properties.	☐
	I can list the properties of graphite and diamond.	☐	I can explain the properties of graphite and diamond in terms of structure and bonding.	☐	I can predict the properties of carbon allotropes, given information about their structure and bonding.	☐
	I can name examples of carbon allotropes.	☐	I can explain the term allotrope using carbon to illustrate.	☐	I can predict the properties or structure of Group 4 elements.	☐
C2.3.2 Changing state	I can describe changes of state in terms of bonds and forces of attraction.	☐	I can explain changes of state in terms of bonds and interactions between particles.	☐	I can use an example to explain sublimation.	☐
	I can state what is meant by melting point and boiling point.	☐	I can use melting and boiling point data to determine the state of a substance at a given temperature.	☐	I can use melting and boiling point data to suggest the type of substance and/ or type of bonds present in a sample.	☐
	I can explain why the boiling point of a substance is always higher than its melting point.	☐	I can use melting and boiling point data to interpret the relative strengths of forces of attraction.	☐	I can explain how to use melting and boiling point data to interpret the relative strengths of forces of attraction.	☐
C2.3.3 Bulk properties of materials	I can state a definition of the term bulk properties.	☐	I can explain that individual atoms do not exhibit the bulk properties of a material.	☐	I can justify the choice of a material for a function based on its bulk properties.	☐
	I can list the main bulk properties of ionic compounds, simple molecules, giant covalent structures, polymers and metals.	☐	I can explain how structure and bonding cause the bulk properties of a material.	☐	I can predict the bulk properties of a material given information about its structure and bonding.	☐
	I can recognise models of ionic compounds, simple molecules, giant covalent structures, polymers and metals.	☐	I can use models of ionic compounds, simple molecules, giant covalent structures, polymers and metals to explain bulk properties.	☐	I can evaluate models of ionic compounds, simple molecules, giant covalent structures, polymers and metals used to explain bulk properties.	☐

C3 Chemical Reactions

Introducing chemical reactions

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C3.1.1 Formulae of elements and molecules	I can name the elements in a familiar simple covalent substance, given the formula.	☐	I can state the number of atoms of each element in an unfamiliar simple covalent substance, given the formula.	☐	I can explain why metal elements are described using empirical formula and noble gases using just the element symbol.	☐
	I can use the Periodic Table to find symbols for elements.	☐	I can write the molecular formula of a compound that exists as simple covalent molecules, given the name or the number of atoms of each element present.	☐	I can write the molecular formula for a simple covalent compound, given the structural formula.	☐
C3.1.2 Formulae of ionic compounds	I can state the charges on ions in Groups 1, 2, 6 (IUPAC 16), and 7 (IUPAC 17).	☐	I can determine the number and type of elements in unfamiliar ionic substances, given the formulae.	☐	I can explain how a compound can contain both covalent and ionic bonds.	☐
	I can state the ions in familiar ionic substances, given the formulae.	☐	I can write the formula of ionic compounds containing one metal and one non-metal, given the name.	☐	I can write the formulae of ionic compounds that include compound ions.	☐
	I can state that transition metals can make more than one type of ion.	☐	I can write the formula of a named ion, including using the Roman numeral convention.	☐	I can name ionic compounds that contain transition metals using the Roman numeral convention.	☐
C3.1.3 Conservation of mass	I can state the law of conservation of mass.	☐	I can use the particle model to explain the law of conservation of mass.	☐	I can explain why, in some chemical reactions performed in the laboratory, there appears to be a change in total mass.	☐
	I can predict the total mass of the products or reactants in a closed chemical system, given the total mass of the reactants or products.	☐	I can predict the total mass of the products or reactants in a non-enclosed chemical system, given the total mass of the reactants or products.	☐	I can calculate the mass of one substance from a balanced symbol equation, given the masses of the other substances.	☐
C3.1.4 Chemical equations	I can write a word equation, given a statement naming the reactants and products.	☐	I can explain why a symbol equation must be balanced.	☐	I can write a balanced symbol equation, given a statement describing a familiar chemical reaction.	☐
	I can identify the reactants and products in a word or symbol equation.	☐	I can balance symbol equations with formulae that do not contain brackets.	☐	I can balance symbol equations with formulae that include brackets.	☐
	I can recognise state symbols for solids, liquids, and gases.	☐	I can add state symbols to balanced symbol equations and explain what they mean.	☐	I can evaluate the use of the terms equations, balanced symbol equations, and state symbols to describe a chemical system.	☐
C3.1.5 Half equations and ionic equations (H)			I can determine the ions in a compound, including those containing compound ions.	☐	I can write an ionic equation or half equations, given a description of a chemical reaction.	☐
			I can balance an ionic equation or half equation and explain what the equation shows.	☐	I can explain what spectator ions are, and determine them in a given example.	☐
			I can explain why precipitation reactions can be described by ionic equations.	☐		
C3.1.6 The mole (H)			I can calculate the number of particles in a sample of a substance, given the amount in moles.	☐	I can explain the relationship between the mole and the Avogadro constant.	☐
			I can state the formula that links the amount in moles, mass, and molar mass.	☐	I can calculate the mass or amount in moles of a given sample of a substance.	☐
			I can use the Periodic Table to determine the molar mass of monatomic and polyatomic elements and compounds.	☐	I can use standard form in calculations involving amounts of substance.	☐
C3.1.7 Mole calculations (H)			I can define a limiting reactant.	☐	I can explain the effect of a limiting amount of a reactant.	☐
			I can identify a limiting reactant, given the mole values for a reaction.	☐	I can use mass data to determine the stoichiometry and generate a balanced symbol equation for a reaction.	☐
			I can calculate the number of moles of a substance used or produced in a chemical reaction, given the amounts of all of the other substances.	☐	I can calculate the mass of a substance used or produced in a chemical reaction, given the mass of the limiting reactant.	☐
C3.1.4 Concentration of solution			I can state that 1ml = 1cm^3 and convert volumes given in cm^3 to dm^3 by calculation.	☐	I can explain why it is useful to convert cm^3 to dm^3 in calculations.	☐
			I can calculate concentrations in g/dm^3.	☐	I can convert concentrations in g/dm^3 to mol/dm^3 and vice versa by calculations.	☐
			I can calculate concentrations in mol/dm^3.	☐	I can rearrange the concentration equation to calculate the volume of solution or the amount of solute in mol.	☐

C3.1.7 Detecting gases	I can recognise that limewater turns cloudy when carbon dioxide is bubbled through it.	☐	I can describe in detail how to use limewater to test for carbon dioxide.	☐	I can write balanced chemical equations to explain the reactions that occur when carbon dioxide is bubbled through lime.	☐
	I can describe the results of positive tests for hydrogen and oxygen.	☐	I can describe in detail how to test for chlorine, hydrogen, and oxygen.	☐	I can write equations for the reactions that occur in the tests for hydrogen and oxygen.	☐
	I can recognise that substances need to be smelt safely.	☐	I can smell substances safely in the laboratory.	☐	I can explain why it is important to smell substances safely.	☐

Energetics

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C3.2.1 Exothermic and endothermic reactions	I can state definitions of the terms exothermic and endothermic.	☐	I can describe the observations that indicate whether a reaction is exothermic or endothermic.	☐	I can draw a line graph to calculate the maximum temperature change during a reaction, determine when the reaction stopped, and predict the temperature at different times during the reaction.	☐
	I can identify a reaction as exothermic or endothermic when the temperature change is given.	☐	I can describe an experiment to determine if a reaction is exothermic or endothermic.	☐	I can evaluate an experiment to classify a reaction as exothermic or endothermic.	☐
	I can state an example of an exothermic and an endothermic reaction.	☐	I can explain the use of endothermic and exothermic reactions for a stated function.	☐	I can compare endothermic and exothermic reactions.	☐
C3.2.2 Reaction profiles	I can state a definition of activation energy.	☐	I can describe activation energy using a reaction profile.	☐	I can explain, in terms of bonds, the need for activation energy.	☐
	I can identify a reaction as exothermic or endothermic from the reaction profile.	☐	I can sketch a general reaction profile for an exothermic and an endothermic reaction.	☐	I can sketch a specific reaction profile for a given reaction.	☐
	I can identify bond breaking as endothermic and bond making as exothermic.	☐	I can explain why bond breaking is endothermic and bond making is exothermic.	☐	I can use the particle model to model a chemical reaction in terms of bond breaking and bond making.	☐
C3.2.3 Calculating energy changes (H)			I can define the term bond energy.	☐	I can compare bond energies for different bonds, and suggest reasons for differences.	☐
			I can calculate the number and type of bonds in a molecule, given the displayed formula.	☐	I can draw displayed formulae of familiar covalent molecules.	☐
			I can use bond energy data to calculate the energy change in a given reaction.	☐	I can explain why the calculated energy change may not be the same as the actual value.	☐

Types of chemical reaction

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C3.3.1 Redox reactions	I can state definitions of reduction, oxidation, and redox.	☐	I can explain reduction, oxidation, and redox in terms of electrons.	☐	I can write balanced half equations to illustrate reduction and oxidation.	☐
	I can state an example of a redox reaction.	☐	I can balance half equations.	☐	I can explain why oxidation or reduction does not happen in isolation.	☐
	I can describe an oxidising agent and a reducing agent.	☐	I can identify substances as oxidising agents or reducing agents, given the balanced symbol equation.	☐	I can construct balanced symbol equations by combining half equations and adding spectator ions.	☐
C3.3.2 The pH scale	I can state definitions of an acid and an alkali and give examples.	☐	I can explain the terms acid and alkali in terms of ions.	☐	I can use ionic equations to explain how acids produce hydrogen ions and alkalis produce hydroxide ions in solution.	☐
	I can identify a solution as acidic or alkaline given its pH.	☐	I can describe a method to use universal indicator or a pH probe to determine the pH of a solution.	☐	I can evaluate the use of indicators or pH probes and dataloggers to determine the pH of a solution.	☐
	I can safely use an indicator to classify a substance as an acid or an alkali.	☐	I can explain the pH scale in terms of acidity and alkalinity.	☐	I can explain the difference between an alkali and a base.	☐
C3.3.3 Neutralisation	I can state a definition of neutralisation.	☐	I can describe neutralisation in terms of reactants, products, and reacting ions.	☐	I can write an ionic equation for the neutralisation of an alkali by an acid.	☐
	I can describe some uses of neutralisation.	☐	I can write a balanced symbol equation to describe a neutralisation reaction.	☐	I can write balanced symbol equations with state symbols for unfamiliar neutralisation reactions.	☐
	I can predict the name of a salt made from a named alkali and common strong acids.	☐	I can state the formula of the salt made from a given alkali and strong acid.	☐	I can use the particle model to explain how the products of neutralisation form.	☐

C3.3.4 Reactions of acids	I can predict the names of the products of a reaction between a metal or a metal carbonate and an acid.	☐	I can predict the observations that might be made during a reaction between a metal or a metal carbonate and an acid.	☐	I can explain why the reaction between a metal or a metal carbonate and an acid is classified as a neutralisation reaction.	☐
	I can write a word equation to model a reaction between a metal or a metal carbonate and an acid.	☐	I can write a balanced symbol equation to model a reaction between a metal or a metal carbonate and an acid.	☐	I can write a balanced symbol equation, including state symbols, to model a reaction between a metal or a metal carbonate and an acid.	☐
	I can describe how to test and identify a gas made when a metal or a metal carbonate reacts with an acid.	☐	I can describe how to make and collect a dry sample of a named salt from a reaction between a metal or a metal carbonate and an acid.	☐	I can explain how the reactions of metals and metal carbonates with acids can be used to determine the reactivity of the metal.	☐
C3.3.5 Hydrogen ions and pH (H)			I can describe what is meant by a strong acid and a weak acid.	☐	I can explain the difference between a strong acid and a weak acid.	☐
			I can describe how an acid can be dilute or concentrated.	☐	I can explain the difference between a concentrated acid or alkali and a dilute acid or alkali.	☐
			I can collect data to plot a pH curve.	☐	I can interpret pH curves to determine the titre and the strength of reactants.	☐

Electrolysis

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C3.4.1 Electrolysis of molten salts	I can explain why solid compounds of a metal with a non-metal do not conduct electricity.	☐	I can describe the components of an electrolysis circuit, and how to mobilise the ions in the electrolyte.	☐	I can explain why electrolysis provides evidence for the existence of ions.	☐
	I can state that electrolysis breaks ionic compounds down into their component elements.	☐	I can describe the process of electrolysis.	☐	I can explain the process of electrolysis in detail.	☐
	I can predict the products of electrolysis.	☐	I can predict the products at the anode and the cathode during the electrolysis of molten ionic compounds.	☐	I can write half equations for the reactions that occur at the anode and the cathode, and explain in terms of electron transfer why these are redox reactions.	☐
C3.4.2 Electrolysis of solutions	I can state that inert electrodes are made from unreactive metals or graphite.	☐	I can explain why inert electrodes are used for the electrolysis of water (and aqueous solutions) and state the products of this reaction.	☐	I can use half equations to explain the formation of the products at each electrode during the electrolysis of water.	☐
	I can name some products of the electrolysis of solutions.	☐	I can predict and describe the products at each electrode during the electrolysis of a solution.	☐	I can predict and explain the products at each electrode during the electrolysis of a solution.	☐
	I can set up an electrolysis circuit and collect/observe some products formed by the electrolysis of a solution.	☐	I can identify products formed by the electrolysis of a solution.	☐	I can collect and identify the products at each electrode during the electrolysis of a solution.	☐
C3.4.3 Electroplating	I can state that electrolysis can be used to electroplate metals.	☐	I can describe the process of electroplating.	☐	I can write half equations to show what happens at the anode and the cathode during electroplating.	☐
	I can describe some components of an electroplating circuit.	☐	I can suggest suitable substances for the anode, cathode, and electrolyte when electroplating.	☐	I can explain in detail the components of an electroplating circuit.	☐

	I can explain that copper can be purified by electrolysis.	☐	I can explain how electrolysis is used to purify copper.	☐	I can write half equations to explain what happens at the anode and the cathode during the purification of copper using electrolysis.	☐

Predicting chemical reactions

Lesson	Aiming for Grade 4		Aiming for Grade 6		Aiming for Grade 8	
C4.1.1 Group 1 – the alkali metals	I can describe some physical properties of the Group 1 elements.	☐	I can interpret data to describe trends in the physical properties of the Group 1 elements.	☐	I can predict the physical properties of a Group 1 element, given data about other members of the group.	☐
	I can record the observations noted when Group 1 elements react with water.	☐	I can explain the observations noted when Group 1 elements react with water.	☐	I can explain in detail the observations noted when Group 1 elements react with water.	☐
	I can state that Group 1 metals react vigorously with water, and name the products formed.	☐	I can write balanced equations for the reactions of the Group 1 elements with water.	☐	I can use knowledge of electronic structures to explain in detail the trend in reactivity of the Group 1 elements.	☐
C4.1.2 Group 7 – the halogens	I can describe some physical properties of the Group 7 (IUPAC Group 17) elements.	☐	I can interpret data to describe trends in the physical properties of the Group 7 (IUPAC Group 17) elements.	☐	I can predict the physical properties of a Group 7 (IUPAC Group 17) element, given data about other members of the group.	☐
	I can name the salt formed when a Group 7 (IUPAC Group 17) element reacts with a metal, and write the word equation for the reaction.	☐	I can write balanced chemical equations for the reactions of Group 7 (IUPAC Group 17) elements with metals, given the formula of the salt formed.	☐	Write balanced chemical equations for the reactions of Group 7 (IUPAC Group 17) elements with metals.	☐
	I can state that Group 7 (IUPAC Group 17) elements react vigorously with metals.	☐	I can describe the trend in reactivity of the Group 7 (IUPAC Group 17) elements.	☐	I can use knowledge of electronic structures to explain in detail the trend in reactivity of the Group 7 (IUPAC Group 17) elements.	☐
C4.1.3 Halogen displacement reactions	I can state that a more reactive halogen can displace a less reactive halogen from its compounds.	☐	I can use the order of reactivity of the halogens to explain the outcome of a displacement reaction.	☐	I can predict possible reactions from the order of reactivity of the halogens, or their positions in the Periodic Table.	☐
	I can record the observations noted when halogens react with halide ions in solution.	☐	I can use observations from halogen displacement reactions to identify the more reactive halogen in the reaction.	☐	I can use observations from halogen displacement reactions to deduce the order of reactivity of the halogens.	☐
	I can state the products when a halogen reacts with a halide ion.	☐	I can write balanced chemical equations for halogen displacement reactions.	☐	I can write half equations for each reactant in a halogen displacement reaction, and use them to identify which species have been oxidised and which have been reduced.	☐ H

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C4.1.4 Group 0 – the noble gases	I can describe some physical properties od the noble gases.	☐	I can interpret data to describe trends in the physical properties of the noble gases.	☐	I can predict the physical properties of a noble gas element, given data about other members of the group.	☐
	I can state that noble gases are unreactive.	☐	I can relate the lack of reactivity of the noble gasses to their outer shell.	☐	I can use knowledge of electronic structures to explain in detail the lack of reactivity of the noble gases.	☐
	I can explain that noble gases exist as separate atoms.	☐	I can use nomenclature nature of the noble gases to explain their low boiling points and densities.	☐	I can use the relative strengths of the forces between atoms to explain the trend in boiling point of the noble gases.	☐

C4.1.6 The reactivity of elements	I can record observations noted when metals react with water and dilute acids.	☐	I can use observations from metal reactions to place them in an order of reactivity.	☐	I can explain why some metals are more reactive than others.	☐
	I can describe the products of a metal displacement reaction.	☐	I can write balanced equations for metal displacement reactions.	☐	I can write half equations for metal displacement reactions and distinguish those that model oxidation and those that model reduction.	☐
		☐	I can use the order of reactivity of metals to predict reactions.	☐	I can use the order of reactivity of metals to predict reactions, and justify these predictions.	☐

C5 Monitoring and controlling chemical reactions

C5.2 Controlling reactions

Lesson	Aiming for Grade 4		Aiming for Grade 6		Aiming for Grade 8	
C5.1.1 Rate of reaction	I can state that reactions with a high rate proceed quickly and produce a large amount of product in a short time, and that those with low rate take longer to produce the same amount of product.	☐	I can define the term rate of reaction.	☐	I can explain how equations can be used to calculate rate of reaction.	☐
	I can explain that the volume of gas produced in a reaction can be used as a measure of reaction rate.	☐	I can explain how to use a gas syringe, measuring cylinder, or top-pan balance to monitor the volume of gas produced in a reaction.	☐	I can explain how the volume of gas produced in a reaction can be used to calculate rate of reaction.	☐
	I can use a graph to describe how rate of reaction changes with time.	☐	I can calculate rate of reaction from a graph.	☐	I can plot appropriate graphs from experimental data and use them to calculate rate of reaction.	☐
C5.1.2 Temperature and reaction rate	I can state that particles have to collide in order to react.	☐	I can define the term successful collision and explain how the number of successful collisions can be increased.	☐	I can explain collision theory in detail.	☐
	I can state that rate of reaction increases with temperature.	☐	I can use collision theory to explain the effect of temperature on rate of reaction.	☐	I can use collision theory to justify a detailed explanation of the effect of temperature on rate of reaction.	☐
	I can record some reaction times at different temperatures in rate-of-reaction experiments.	☐	I can use experimental data to calculate rate of reaction at different temperatures.	☐	I can interpret a graph of rate of reaction against temperature and explain its shape.	☐
C5.1.3 Concentration, pressure, and rate	I can state that rate of reaction increases as concentration increases.	☐	I can define the term concentration and use collision theory to explain how concentration affects rate of reaction.	☐	I can use detailed collision theory to explain the relationship between concentration and rate of reaction.	☐
	I can state that rate of reaction increases as pressure increases.	☐	I can define the term pressure and use collision theory to explain how pressure affects rate of reaction.	☐	I can explain why the temperature should be kept constant when investigating the effect of concentration or pressure on rate	☐
	I can record some reaction times at different concentrations in rate-of-reaction experiments.	☐	I can use experimental data to calculate rate of reaction at different concentrations.	☐	I can interpret a graph of rate of reaction against concentration and explain its shape.	☐

Lesson	Aiming for Grade 4		Aiming for Grade 6		Aiming for Grade 8	
C5.1.1 Rate of reaction	I can state that reactions with a high rate proceed quickly and produce a large amount of product in a short time, and that those with low rate take longer to produce the same amount of product.	☐	I can define the term rate of reaction.	☐	I can explain how equations can be used to calculate rate of reaction.	☐
	I can explain that the volume of gas produced in a reaction can be used as a measure of reaction rate.	☐	I can explain how to use a gas syringe, measuring cylinder, or top-pan balance to monitor the volume of gas produced in a reaction.	☐	I can explain how the volume of gas produced in a reaction can be used to calculate rate of reaction.	☐
	I can use a graph to describe how rate of reaction changes with time.	☐	I can calculate rate of reaction from a graph.	☐	I can plot appropriate graphs from experimental data and use them to calculate rate of reaction.	☐
C5.1.2 Temperature and reaction rate	I can state that particles have to collide in order to react.	☐	I can define the term successful collision and explain how the number of successful collisions can be increased.	☐	I can explain collision theory in detail.	☐
	I can state that rate of reaction increases with temperature.	☐	I can use collision theory to explain the effect of temperature on rate of reaction.	☐	I can use collision theory to justify a detailed explanation of the effect of temperature on rate of reaction.	☐
	I can record some reaction times at different temperatures in rate-of-reaction experiments.	☐	I can use experimental data to calculate rate of reaction at different temperatures.	☐	I can interpret a graph of rate of reaction against temperature and explain its shape.	☐
C5.1.3 Concentration, pressure, and rate	I can state that rate of reaction increases as concentration increases.	☐	I can define the term concentration and use collision theory to explain how concentration affects rate of reaction.	☐	I can use detailed collision theory to explain the relationship between concentration and rate of reaction.	☐
	I can state that rate of reaction increases as pressure increases.	☐	I can define the term pressure and use collision theory to explain how pressure affects rate of reaction.	☐	I can explain why the temperature should be kept constant when investigating the effect of concentration or pressure on rate	☐
	I can record some reaction times at different concentrations in rate-of-reaction experiments.	☐	I can use experimental data to calculate rate of reaction at different concentrations.	☐	I can interpret a graph of rate of reaction against concentration and explain its shape.	☐

Lesson	Aiming for Grade 4		Aiming for Grade 6		Aiming for Grade 8	
C5.1.4 Particle size and reaction rate	I can state that small pieces of a solid have a larger surface-area-to-volume ratio than larger pieces.	☐	I can explain how to conduct a fair test and obtain valid results when investigating the effect of particle size on rate of reaction.	☐	I can calculate the surface-area-to-volume ratio for different-sized pieces of solid.	☐
	I can state that pieces of solid with a large surface area react more quickly than those with a smaller surface area.	☐	I can use collision theory to explain how surface area affects rate of reaction.	☐	I can use detailed collision theory to justify the relationship between surface area and rate of reaction.	☐
	I can record data in rate-of-reaction experiments for pieces of solid with different surface areas.	☐	I can use experimental data to demonstrate the effect of surface area on rate of reaction.	☐	I can use experimental data to calculate mean rates of reaction for different surface areas.	☐
C5.1.5 Catalysts and reaction rate	I can state that catalysts can be used to speed up chemical reactions.	☐	I can define the term catalyst and describe how catalysts work.	☐	I can explain in detail how catalysts affect rate of reaction.	☐
	I can state that enzymes are biological catalysts.	☐	I can explain how surface area affects the action of a catalyst.	☐	I can explain using collision theory how a catalyst works.	☐
	I can record reaction times for reactions involving catalysts.	☐	I can process experimental data to demonstrate the effect of different catalysts on rate of reaction.	☐	I can use experimental data to calculate the effects of different catalysts on rate of reaction.	☐

C5.2 Controlling reactions Equilibria

Lesson	Aiming for Grade 4		Aiming for Grade 6		Aiming for Grade 8	
C5.2.1 Reversible reactions	I can state that some reactions are reversible.	☐	I can explain the meaning of the ⇌ symbol.	☐	I can write balanced equations for a reversible reaction to model the forward and backward reactions.	☐
	I can state one example of a reversible reaction.	☐	I can describe how some chemical reactions can be reversed by altering the reaction conditions.	☐	I can suggest the conditions needed to reverse a given chemical reaction.	☐
	I can describe the concentrations of reacting substances as constant in a dynamic equilibrium.	☐	I can explain why, in dynamic equilibrium reactions, the rates of the forward and backward reactions are equal.	☐	I can explain in detail the conditions under which dynamic equilibria occur.	☐
(H) C5.2.2 Equilibrium position			I can describe the effect of changing pressure on a given equilibrium system.	☐	I can explain fully the effect of changing pressure on a given equilibrium system.	☐
			I can describe the effect of changing concentration on a given equilibrium system.	☐	I can explain fully the effect of changing concentration on a given equilibrium system.	☐
			I can describe the effect of changing temperature on a given equilibrium system.	☐	I can explain fully the effect of changing temperature on a given equilibrium system.	☐
(H) C5.2.3 Choosing reaction conditions			I can describe the factors that affect the equilibrium yield of reaction.	☐	I can explain why removing the product of a reversible reaction moves the equilibrium position to the right.	☐
			I can explain the optimum pressure for producing a high yield of a particular product in an equilibrium reaction.	☐	I can justify the choice of a compromise pressure for a particular equilibrium reaction.	☐
			I can explain the optimum temperature for producing a high yield of a particular product in an equilibrium reaction.	☐	I can justify the choice of a compromise temperature for a particular equilibrium reaction.	☐

C6 Global Challenges

C6.1 Improving processes and products

C6.1.6 Extracting metals	I can state a definition of the term ore.	☐	I can outline the steps in extracting a metal from its ore.	☐	I can explain, using the position of carbon in the reactivity series, how the industrial process used to extract a metal is chosen.	☐
	I can describe some stages in the extraction of copper.	☐	I can describe how copper is extracted from copper (II) oxide.	☐	I can explain the extraction of copper from different ores using chemical equations, and describe each part of the process as oxidation or reduction.	☐
	I can use laboratory apparatus to heat a sample of copper (II) oxide and charcoal.	☐	I can prepare a sample of copper from copper (II) oxide.	☐	I can prepare a sample of copper from copper (II) oxide and explain why an excess of charcoal is used.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C6.1.7 Extracting iron	I can state that iron is produced from iron ore and coke.	☐	I can name all the raw materials used to make iron.	☐	I can explain why each of the raw materials used in iron production is needed.	☐
	I can state that iron ore is converted into iron at a high temperature in the blast furnace.	☐	I can describe the main processes that occur in the blast furnace in the production of iron ore.	☐	I can explain in detail how iron is extracted from iron ore.	☐
	I can state that the reaction that produces iron is a reduction reaction.	☐	I can write equations for the reactions that occur in the blast furnace in the production of iron ore.	☐	I can distinguish the reactions that occur in the blast furnace as combustion, oxidation, redox, or neutralisation.	☐
C6.1.8 Extracting aluminium	I can state that aluminium is extracted from aluminium oxide by electrolysis.	☐	I can state that the main ore of aluminium is bauxite, and explain why aluminium has to be extracted by electrolysis.	☐	I can explain why aluminium oxide is dissolved in cryolite before electrolysis.	☐
	I can describe some stages in the process of extracting aluminium from its ore.	☐	I can describe how aluminium is extracted from its oxide.	☐	I can explain in detailed each stage of the extraction of aluminium from its ore and write a balanced equation to model the overall reaction.	☐
	I can state that the electrolysis of aluminium oxide produces aluminium and oxygen.	☐	I can name the substances formed at each electrode in the electrolysis of aluminium oxide, and explain why the anode needs replacing frequently.	☐	I can write equations for the processes that occur at each electrode and describe them as oxidation or reduction.	☐
C6.1.9 Biological metal extraction			I can describe the process of bioleaching.	☐	I can explain the process of bioleaching in detail.	☐
			I can describe the process of phytoextraction.	☐	I can explain the process of phytoextraction in detail.	☐
			I can describe some advantages and disadvantages of bioleaching and phytoextraction.	☐	I can compare bioleaching and phytoextraction with alternative methods of metal extraction and evaluate them.	☐

C6.1.15 Choosing materials	I can state why one material would be more suitable than another for a particular purpose.	☐	I can choose the most appropriate material for a particular purpose, given data on a range of properties, and briefly explain this choice.	☐	I can explain in detail the choice of an appropriate for a particular purpose.	☐
	I can explain what a life-cycle assessment (LCA) is.	☐	I can describe the basic principles of carrying out an LCA.	☐	I can describe in detail the process of carrying out an LCA.	☐
	I can describe the stages in the life cycle of a product, given data.	☐	I can interpret data from the LCA of a material or product.	☐	I can evaluate data from an LCA and draw conclusions about the material or product.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C6.1.16 Recycling materials	I can describe some benefits of recycling materials.	☐	I can explain the benefits of recycling materials.	☐	I can interpret data to evaluate the recycling of different materials.	☐
	I can state one factor to consider before deciding whether or not to recycle a material.	☐	I can describe several factors to consider before deciding whether or not to recycle a material.	☐	I can process numeric data to demonstrate the relative benefit of recycling different materials.	☐
	I can describe methods of sorting materials before they are recycled.	☐	I can explain why it is important to sort materials before recycling and describe how some materials are sorted.	☐	I can explain in detail how materials are recycled.	☐

6.2 Organic

C6.2.5 Alkanes from crude oil	I can name some uses of crude oil and state that it is a fossil fuel.	☐	I can explain how crude oil forms and why it is described as non-renewable.	☐	I can explain in detail why crude oil in a finite resource.	☐
	I can state that the fractions in crude oil can be separated by fractional distillation.	☐	I can explain how the properties of alkanes are related to the number of carbon atoms in the molecule.	☐	I can explain in detail the separation of crude oil by fractional distillation.	☐
	I can name some fractions of crude oil.	☐	I can name the fractions of crude oil in order of increasing boiling point.	☐	I can justify the uses of different fractions obtained from crude oil.	☐
C6.2.6 Cracking oil fractions	I can state that during cracking large alkane molecules are broken down into smaller ones.	☐	I can describe the process of cracking and the conditions needed.	☐	I can explain, with balanced chemical equations, the process of cracking.	☐
	I can state that cracking is carried out to convert hydrocarbons with long-chain molecules into more useful ones with shorter-chain molecules.	☐	I can explain why cracking is carried out.	☐	I can explain in detail how cracking helps to satisfy the demand for specific fuels and other substances.	☐
	I can describe some uses of substances obtained from crude oil.	☐				

C6.3 Interpreting and interacting with Earth Systems

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C6.3.1 Forming the atmosphere	I can name the main gases in the atmosphere.	☐	I can describe the composition of the atmosphere.	☐	I can describe in detail the composition of the atmosphere.	☐
	I can state that early atmosphere was mostly carbon dioxide.	☐	I can explain how the Earth's early atmosphere is thought to have formed.	☐	I can interpret evidence about the formation of the early atmosphere.	☐
	I can state that photosynthesis may have caused the percentage of oxygen in the atmosphere to increase over time.	☐	I can explain how an oxygen-rich atmosphere may have developed over time.	☐	I can interpret evidence about changes in the atmosphere over time.	☐
C6.3.2 Pollution and the atmosphere	I can state that carbon monoxide is a pollutant that may harm living things.	☐	I can describe how carbon monoxide is produced and explain the effect it has on the body.	☐	I can explain in detail the health problems caused by increased amounts of carbon monoxide in the atmosphere.	☐
	I can state that particulates are pollutants that may harm living things.	☐	I can describe how particulates are produced and explain the effect they have on the body.	☐	I can explain in detail the health problems caused by increased amounts of particulates in the atmosphere.	☐
	I can state that nitrogen oxide and sulphur dioxide are pollutants that may harm living things.	☐	I can describe how acidic oxides are produced and explain the effect they have on living organisms.	☐	I can explain in detail the health problems caused by increased amounts of acidic oxides in the atmosphere.	☐
C6.3.3 Climate change	I can state that the greenhouse effect keeps the Earth and its atmosphere warm enough for living things to exist.	☐	I can describe the atmospheric greenhouse effect.	☐	I can explain the greenhouse effect in terms of the interaction of radiation with matter within the atmospheric.	☐
	I can state that an increase in greenhouse gases is causing global warming.	☐	I can explain the problems caused by an enhanced greenhouse effect.	☐	I can evaluate evidence for causes of climate change.	☐
	I can describe the importance of reducing emissions of greenhouse gases.	☐	I can explain methods for reducing emissions of greenhouse gases.	☐	I can evaluate the effectiveness of methods for reducing greenhouse gas emissions.	☐

Lesson	Aiming for 4		Aiming for 6		Aiming for 8	
C6.3.4 Water for drinking	I can describe where drinking water comes from.	☐	I can name the substances that are present in riders and waste water.	☐	I can explain the sources of the substances present in rivers and waste water.	☐
	I can state that water has to be treated before it is safe to drink.	☐	I can describe how ground water and waste water are treated in order to make them safe to drink.	☐	I can evaluate the arguments for and against the fluoridation of drinking water.	☐
	I can state that seawater can be made safe to drink using desalination to remove dissolved salts.	☐	I can describe how salt water is treated to make it safe to drink.	☐	I can evaluate the advantages and disadvantages of distilling large volumes of seawater to provide drinking water.	☐

Year 11 Physics Revision List

Please remember that memorising and applying formulae in physics is extremely important.

All objectives highlighted in yellow contain a formula you must memorise in order to use it in your exam.

All objectives highlighted in pink contain a formula you are given in the exam but you must know how to use.

P1 Matter

Lesson 1

◙ describe how and why the atomic model has changed over time – to include Rutherford (alongside Geiger and Marsden) and Bohr models

◙ describe the atom as a positively charged nucleus surrounded by negatively charged electrons, with the nuclear radius much smaller than that of the atom and with almost all of the mass in the nucleus

◙ recall the typical size (order of magnitude) of atoms and small molecules – typically 1 x 10^{-10}m)

Lesson 2

◙ define density

◙ recall and apply: density (kg/m^3) = mass (kg) / volume (m^3)

Lesson 3

◙ explain the differences in density between the different states of matter in terms of the arrangements of the atoms and molecules

◙ apply the relationship between density, mass and volume to changes where mass is conserved

Lesson 4

◙ describe how mass is conserved when substances melt, freeze, evaporate, condense and sublimate

◙ describe that these physical changes differ from chemical changes because the material recovers its original properties if the change is reversed

Lesson 5

◙ describe how heating a system will change the energy stored within the system and raise its temperature or produce changes of state

◙ define the term specific heat capacity

◙ apply the relationship between change in internal energy of a material and its mass, specific heat capacity and temperature change to calculate the energy change involved

◙ apply: change in thermal energy (J) = mass (kg) x specific heat capacity (J/kg°C) x

change in temperature (°C)

Lesson 6

◙ define the term specific heat capacity and distinguish between it and the term specific latent heat

◙ apply the relationship between change in internal energy of a material and its mass, specific heat capacity and temperature change to calculate the energy change involved

◙ apply the relationship between specific latent heat and mass to calculate the energy change involved in a change of state

◙ apply: thermal energy for a change in state (J) = mass (kg) x specific latent heat (J/kg)

Lesson 7

◙ explain how the motion of the molecules in a gas is related both to its temperature and its pressure – application to closed systems only

◙ explain the relationship between the temperature of a gas and its pressure at constant volume

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Lesson 8

◙ recall that gases can be compressed or expanded by pressure changes and that the pressure produces a net force at right angles to any surface

◙ explain how increasing the volume in which a gas is contained, at constant temperature can lead to a decrease in pressure

◙ explain how doing work on a gas can increase its temperature e.g. a bicycle pump

◙ apply: for gases: pressure (Pa) x volume (m^3) = constant (for a given mass of gas and at a constant temperature)

Lesson 9

◙ describe a simple model of the Earth's atmosphere and of atmospheric pressure – an assumption of uniform density; knowledge of layers is not expected

◙ explain why atmospheric pressure varies with height above the surface of the planet

Lesson 10

◙ describe the factors which influence floating and sinking

◙ explain why pressure in a liquid varies with depth and density and how this leads to an upwards force on a partially submerged object

◙ calculate the difference in pressure at different depths in a liquid (to include knowledge that g is the strength of the gravitational field and has a value of 10 N/kg near the Earth's surface

◙ apply: pressure due to a column of liquid (Pa) = height of column (m) x density of liquid (kg/m^3) x g (N/kg)

P2 Forces (Part One)

Lesson 1

◙ recall and apply: distance travelled (m) = speed (m/s) x time (s)
◙ describe how to measure distance and time in a range of scenarios
◙ describe how to measure distance and time and use these to calculate speed
◙ calculate average speed for non-uniform motion
◙ make calculations using ratios and proportional reasoning to convert units and to compute rates
◙ explain the vector- scalar distinction as it applies to displacement and distance, velocity and speed
◙ explain why an object moving in a circle with a constant speed has a changing velocity (qualitative only)

Lesson 2

◙ relate changes and differences in motion to appropriate distance-time, and velocity-time graphs, and interpret lines, slopes and enclosed areas in such graphs
◙ explain the vector-scalar distinction as it applies to displacement and distance, velocity and speed

Lesson 3

◙ recall and apply: acceleration (m/s^2) = change in speed (m/s) / time (s)
◙ relate changes and differences in motion to appropriate distance-time, and velocity-time graphs, and interpret lines, slopes and enclosed areas in such graphs
◙ explain the vector- scalar distinction as it applies to displacement and distance, velocity and speed

Lesson 4-5

◙ calculate average speed for non-uniform motion
◙ apply: (final velocity (m/s))^2 - (initial velocity (m/s))^2 = 2 x acceleration (m/s^2) x distance (m)
◙ apply formulae relating distance, time and speed, for uniform motion, and for motion with uniform acceleration

Lesson 6-7

◙ apply Newton's First Law to explain the motion of an object moving with uniform velocity and also an object where the speed and/or direction change
◙ describe examples of the forces acting on an isolated solid object or system
◙ describe, using free body diagrams, examples where two or more forces lead to a resultant force on an object (qualitative only)
◙ describe, using free body diagrams, examples of the special case where forces balance to produce a resultant force of zero

Lesson 8

◙ recall and apply Newton's Third Law
◙ recall examples of ways in which objects interact
◙ describe how such examples involve interactions between pairs of objects which produce a force on each object
◙ represent such forces as vectors

Lesson 9

◙ describe examples of the forces acting on an isolated solid object or system
◙ describe, using free body diagrams, examples where two or more forces lead to a resultant force on an object (qualitative only)
◙ use vector diagrams to illustrate resolution of forces, a net force, and equilibrium situations.

◙ describe, using free body diagrams, examples of the special case where forces balance to produce a resultant force of zero

Lesson 10

◙ define momentum and describe examples of momentum in collisions

◙ recall and apply: momentum (kgm/s) = mass (kg) x velocity (m/s)

P2 Forces (Part Two)

Lesson 1-2

◙ recall and apply: force (N) = mass (kg) × acceleration (m/s^2)

◙ apply Newton's Second Law in calculations relating forces, masses and accelerations.

◙ explain that inertia is a measure of how difficult it is to change the velocity of an object and that the mass is defined as the ratio of force over acceleration.

◙ apply formulae relating force, mass, velocity and acceleration to explain how the changes involved are inter-related.

Lesson 3

◙ recall and apply: work done (J) = force (N) × distance (m) (along the line of action of the force)

◙ use the relationship between work done, force, and distance moved along the line of action of the force and describe the energy transfer involved

◙ calculate relevant values of stored energy and energy transfers; convert between newton-metres and joules

Lesson 4

◙ recall and apply: gravity force (N) = mass (kg) x gravitational field strength, g (N/kg)

◙ recall and apply: (in a gravity field) potential energy (J) = mass (kg) x height (m) x gravitational field strength, g (N/kg)

◙ describe that all matter has a gravitational field that causes attraction, and the field strength is much greater for massive objects

◙ recall the acceleration in free fall (=$10m/s^2$)

◙ define weight, describe how it is measured and describe the relationship between the weight of an object and the gravitational field strength (g) (and) has a value of 10N/kg at the Earth's surface

Lesson 5

◙ recall and apply: kinetic energy (J) = 0.5 x mass (kg) x $(\text{speed (m/s)})^2$

◙ calculate relevant values of stored energy and energy transfers; convert between newton-metres and joules

Lesson 6

◙ recall and apply: power (W) = work done (J) / time (s)

◙ explain, with reference to examples, the definition of power as the rate at which energy is transferred

Lesson 7-8

◙ explain that to stretch, bend or compress an object, more than one force has to be applied

◙ describe the difference between linear and non-linear relationships between force and extension

Lesson 9

◙ describe the relationship between force and extension for a spring and other simple systems

◙ describe the difference between elastic and plastic deformation (distortions) caused by stretching forces

◙ recall and apply: force exerted by a spring (N) = extension (m) x spring constant (N/m)

◙ calculate a spring constant in linear cases

Lesson 10

◙ apply: energy transferred in stretching (J) = 0.5 x spring constant (N/m) x $(\text{extension (m)})^2$

◙ calculate the work done in stretching

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P2 Forces (Part Three)

Lesson 1

◙ apply formulae relating force, mass, velocity and acceleration to explain how the changes involved
are inter-related
◙ apply formulae relating force, mass and relevant physical constants, including gravitational field strength (g), to explore how changes in these are inter-related

Lesson 2

◙ describe examples in which forces cause rotation
◙ define and calculate the moment of the force in such examples
◙ recall and apply: moment of a force (Nm) = force (N) × distance (m) (normal to direction of the force)

Lesson 3

◙ explain how levers and gears transmit the rotational effects of forces.

Lesson 4

◙ recall that the pressure in fluids (gases and liquids) causes a net force at right angles to any surface
◙ use the relationship between the force, the pressure and the area in contact
◙ recall and apply: pressure (Pa) = force normal to a surface (N) / area of that surface (m^2)

P3 Electricity

Lesson 1

◙ Describe that charge is a property of all matter and there are +ve and –ve charges. The effects of charges are not normally seen on bodies that are neutral as their effects cancel out.
◙ Describe the production of static electricity, and sparking, by rubbing surfaces, and evidence that charged objects exert forces of attraction and repulsion on one another when not in contact.
◙ Explain how transfer of electrons between objects can explain the phenomena of statics.
◙ Explain the concept of an electric field and how it helps to explain the phenomena of statics.

Lesson 2

◙ Recall that current depends on both resistance and p.d, and the units in which these are measured.
◙ Recall and apply the V, I and R relationship and that for some resistors the value of R remains constant but that in others it can change as the current changes.
◙ Apply the equations relating p.d., current, quantity of charge, resistance, power, energy and time, and solve problems for circuits which include resistors in series, using the concept of equivalent resistance.

Lesson 3

◙ Recall that current is the rate of flow of charge (electrons) and the conditions needed for charge to flow
◙ Recall and use the relationship between quantity of charge, current and time.
◙ Recall and apply: charge flow (C) = current (A) x time (s)
◙ Recall and apply: energy transferred (J) = charge (C) x potential difference (V)

Lesson 4

◙ Recall that current depends on both resistance and p.d, and the units in which these are measured.
◙ Recall and apply the V, I and R relationship and that for some resistors the value of R remains constant but that in others it can change as the current changes.
◙ Calculate the currents, p.ds and resistances in d.c. series and parallel circuits.
◙ Apply the equations relating p.d., current, quantity of charge, resistance, power, energy and time, and solve problems for circuits which include resistors in series, using the concept of equivalent resistance.
◙ Recall and apply: potential difference (V) = current (A) x resistance (Ω)

Lesson 5

◙ Describe the differences between series and parallel circuits.
◙ Represent d.c. circuits with the conventions of +ve and –ve terminal, and the symbols that represent common circuit elements.
◙ Explain why, if two resistors are in series the net R is increased, whereas if two resistors are in parallel it is decreased.
◙ Calculate the currents, p.ds and resistances in d.c. series and parallel circuits.
◙ current, quantity of charge, resistance, power, energy and time, and solve problems for circuits which include resistors in series, using the concept of equivalent resistance.

Lesson 6

◙ Describe the differences between series and parallel circuits.
◙ Explain why, if two resistors are in series the net R is increased, whereas if two resistors are in parallel it is decreased.
◙ Calculate the currents, p.ds and resistances in d.c. series and parallel circuits.
◙ Apply the equations relating p.d., current, quantity of charge, resistance, power, energy and time, and solve problems for circuits which include resistors in series, using the concept of equivalent resistance.

Lesson 7

◙ Use graphs to explore whether circuit elements are linear of non-linear
◙ Use graphs and relate the curves produced to the function and properties of circuit elements

Lesson 8

◙ Explain how the power transfer in any circuit device is related to the p.d. across it and the current, and to the energy changes over a given time.
◙ Apply the equations relating p.d., current, quantity of charge, resistance, power, energy and time, and solve problems for circuits which include resistors in series, using the concept of equivalent resistance.
◙ Recall and apply: power (W) = potential difference (V) x current (A) = (current (A))^2 x resistance (Ω)
◙ Recall and apply: energy transferred (J, kWh) = power (W, kW) x time (s, h)

P4 Magnetism (P3 in Combined Science Books)

Lesson 1

◙ Describe the attraction and repulsion between unlike and like magnetic poles
◙ Describe the difference between permanent and induced magnets
◙ Describe the characteristics of the magnetic field of a magnet, showing how strength and direction change from one point to another
◙ Explain how the behaviour of a magnetic (dipping) compass is related to evidence that the core of the Earth must be magnetic

Lesson 2

◙ Describe the difference between permanent and induced magnets
◙ Describe how to show that a current can create a magnetic effect and describe the directions of the magnetic field around a conducting wire
◙ Recall that the strength of the field depends on the current and the distance from the conductor
◙ Explain how solenoid arrangements can enhance the magnetic effect

Lesson 3

◙ Describe how a magnet and a current-carrying conductor exert a force on one another
◙ Show that Fleming's left-hand rule represents the force, conductor and magnetic field orientations
◙ Apply the equation that links force on the conductor to the magnetic flux density, current and length of the conductor
◙ apply: force on a conductor (at right angles to a magnetic field) carrying a current (N) = magnetic flux density (T) x current (A) x length (m)

Lesson 4

◙ Explain how the force exerted from a magnet and a current-carrying conductor is used to cause rotation in electric motors

TRIPLE SCIENCE ONLY

Lesson 5

◙ Recall that a change in the magnetic field around a conductor can give rise to an induced potential difference across its ends, which could drive a current, generating a magnetic field that would oppose the original change

Lesson 6

◙ Explain how this effect is used in an alternator to generate a.c., and in a dynamo to generate d.c.

Lesson 7

◙ Explain how the effect of an alternating current in one circuit, in inducing a current in another, is used in transformers
◙ Explain how the ratio of the potential differences across the two circuits depends on the ratio of the numbers of turns in each one
◙ Apply the equations linking the p.ds and the number of turns in the two coils of a transformer, to the currents that flow in the circuits
◙ Apply: potential difference across primary coil (V)/ potential difference across secondary coil (V) = number of turns in primary coil / number of turns in secondary coil

Lesson 8

◙ Explain the action of the microphone in converting the pressure variations in sound waves into variations in current in electrical circuits, and the reverse effect used in loudspeakers and headphones

P5 Waves in Matter (P4 in Combined Science Books)

Lesson 1

◙ Describe differences between transverse and longitudinal waves
◙ Describe how ripples on water surfaces are used to model transverse waves whilst sound waves in air are longitudinal waves, and how the speed of each may be measured.
◙ Describe evidence that in both cases it is the wave and not the water or air itself that travels.

Lesson 2

◙ Describe how ripples on water surfaces are used to model transverse waves whilst sound waves in air are longitudinal waves, and how the speed of each may be measured.

◙ Describe wave motion in terms of amplitude, wavelength, frequency and period.

◙ Define wavelength and frequency.

◙ Describe and apply the relationship between these and the wave velocity.

◙ Apply formulae relating velocity, frequency and wavelength

◙ Recall and apply: wave speed (m/s) = frequency (Hz) x wavelength (m)

◙ Recall and apply: frequency (Hz) = 1 ÷ period

Lesson 4

◙ Recall that electromagnetic waves are transverse and are transmitted through space where all have the same velocity.

◙ Explain that electromagnetic waves transfer energy from source to absorber.

◙ Describe the main groupings of the electromagnetic spectrum and that these groupings range from long to short wavelengths and from low to high frequencies.

◙ Describe that our eyes can only detect a limited range of the electromagnetic spectrum

◙ Recall that light is an electromagnetic wave

Lesson 5

◙ Give examples of some practical uses of electromagnetic waves in the radio, micro-wave, infra-red, visible, ultraviolet, X-ray and gamma-ray regions.

◙ Recall that radio waves can be produced by, or can themselves induce, oscillations in electrical circuits.

◙ Describe how ultra-violet waves, X-rays and gamma-rays can have hazardous effects, notably on human bodily tissues

Lesson 6

◙ Recall that different substances may absorb, transmit, refract, or reflect electromagnetic waves in ways that vary with wavelength.

◙ Explain how some effects are related to differences in the velocity of electromagnetic waves in different substances.

Lesson 8

◙ Recall that different substances may absorb, transmit, refract, or reflect electromagnetic waves in ways that vary with wavelength.

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Lesson 3

◙ Describe, with examples, processes which convert wave disturbances between sound waves and vibrations in solids. [*knowledge of the parts of the ear*]

◙ Explain why such processes only work over a limited frequency range, and the relevance of this to human

hearing [*why hearing (audition) changes due to ageing*]

◙ Show how changes, in velocity, frequency and wavelength, in transmission of sound waves from one medium to another, are inter-related.

◙ Describe the effects of reflection, transmission, and absorption of waves at material. [*ultrasound and sonar*]

Lesson 6

◙ Use ray diagrams to illustrate reflection, refraction and the similarities between convex and concave lenses.

◙ Construct two-dimensional ray diagrams to illustrate reflection and refraction.

Lesson 7

◙ Use ray diagrams to illustrate reflection, refraction and the similarities between convex and concave lenses. [how they are used to correct vision].

◙ Construct two-dimensional ray diagrams to illustrate reflection and refraction.

Lesson 8

◙ Use ray diagrams to illustrate reflection, refraction and the similarities between convex and concave lenses.

◙ Explain how colour is related to differential absorption, transmission and reflection [specular reflection and scattering].

Lesson 9

◙ Explain, in qualitative terms, how the differences in velocity, absorption and reflection between different types of waves in solids and liquids can be used both for detection and for exploration of structures which are hidden from direct observation, notably our bodies.

P6 Radioactivity (P4 in Combined Science Books)

Lesson 1

◙ Understand that an atom has a nucleus, made of protons and neutrons, that the nucleus of each element has a characteristic positive charge

◙ Recall that atoms of the same elements can differ in nuclear mass by having different numbers of neutrons

◙ Use the conventional representation for nuclei to relate the differences between isotopes

Lesson 2

◙ Recall that some nuclei are unstable and may emit alpha or beta particles or neutrons and electromagnetic radiation such as gamma rays

◙ Relate these emissions to possible changes in the mass or the charge of the nucleus or both

◙ Recall the differences in the penetration properties of alpha, beta and gamma radiation

Lesson 3

◙ Use names and symbols of common nuclei and particles to write balanced equations that represent radioactive decay

◙ Balance equations representing alpha, beta and gamma radiation in terms of the masses, and charges of the atoms involved

Lesson 4

◙ Explain the concept of half-life and how this is related to the random nature of radioactive decay

◙ Calculate the net decline, expressed as a ratio, during radioactive emission after a given (integral) number of half-lives

Lesson 5

◙ Recall that in each atom its electrons are arranged at different distances from the nucleus, that such arrangements may change with absorption or emission of EM radiation and that atoms can become ions by loss of outer electrons

◙ Recall that changes in atoms and nuclei can also generate and absorb radiations over a wide frequency range

Lesson 6

◙ Recall the differences between irradiation and contamination effects and compare the hazards associated with these two.

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Lesson 6

◙ Explain why the hazards associated with radioactive material differ according to the half-life involved

Lesson 7

◙ Recall that some nuclei are unstable and may split, and relate such effects to radiation which might emerge, to transfer of energy to other particles and to the possibility of chain reactions

Lesson 8

◙ Describe the process of nuclear fusion

Lesson 9

◙ Describe the different uses of nuclear radiations for exploration of internal organs, and for control or destruction of unwanted tissue

P7 Energy (P5 in Combined Science Books)

Lesson 1

◙ Describe for situations where there are energy transfers in a system, that there is no net change to the total energy of a closed system (qualitative only). To include conservation of energy

◙ Describe all the changes involved in the way energy is stored when a system changes for common situations (an object projected upwards or up a slope, a moving object hitting an obstacle, an object being accelerated by a constant force, a vehicle slowing down, bringing water to boil in an electric kettle

Lesson 2

◙ Describe the changes in energy involved when a system is changed by heating (in terms of temperature change and specific heat capacity), by work done by forces, and by work done when a current flows

◙ Make calculations of the energy changes associated with changes in a system, recalling or selecting the relevant equations for mechanical, electrical and thermal processes; thereby express in quantitative form and on a common scale the overall redistribution of energy in the system (To include work done by forces, current flow and through heating and the use of kWh to measure energy use in electrical appliances in the home

◙ Calculate the amounts of energy associated with a moving body, a stretched spring and an object raised above ground level

Lesson 3

◙ Describe the changes in energy involved when a system is changed by heating (in terms of temperature change and specific heat capacity), by work done by forces, and by work done when a current flows

◙ Make calculations of the energy changes associated with changes in a system, recalling or selecting the relevant equations for mechanical, electrical and thermal processes; thereby express in quantitative form and on a common scale the overall redistribution of energy in the system (To include work done by forces, current flow and through heating and the use of kWh to measure energy use in electrical appliances in the home

Lesson 4

◙ Describe, with examples, the process by which energy is dissipated, so that it is stored in less useful ways

◙ Describe how, in different domestic devices, energy is transferred from batteries or the a.c. from the mains. To include how energy may be wasted in the transfer to and within motors and heating devices

Lesson 5

◙ Describe how, in different domestic devices, energy is transferred from batteries or the a.c. from the mains. To include how energy may be wasted in the transfer to and within motors and heating devices

◙ Recall and apply: efficiency = useful output energy transfer (J)/input energy transfer (J)

Lesson 6

◙ Describe, with examples, the relationship between the power ratings for domestic electrical appliances and how this is linked to the changes in stored energy when they are in use

◙ Calculate energy efficiency for any energy transfer

Lesson 7-8

◙ Describe ways to increase efficiency

◙ Explain ways of reducing unwanted energy transfer (to include through lubrication and thermal insulation)

◙ Describe how the rate of cooling of a building is affected by the thickness and thermal conductivity of its walls (qualitative only)

Year 11 GCSE ART

The GCSE art exam paper will be released on 3rd January with the exam period running from January 3rd to early May. Students are to choose **one** of the seven starting points set by AQA and develop a book of preparatory work in response. The bookwork will be produced during lesson time and home-learning time, exploring the chosen theme thoroughly and developing ideas through to a final outcome. The final piece will be produced in a 10-hour exam in early May. This will be a very similar experience to the mock exam the students experienced in year 10 when they produced their Collections project. All book work must be submitted when the exam starts.

Whilst there is no specific revision of material for art, it is essential that all students allocate time to their art exam prep work during the PPE fortnight in January. It is expected that all art students will begin work on exam the unit whilst the PPE's are on. This unit is significantly shorter than the coursework units and as a result no time can be lost.

The Art sessions on the students PPE timetables are times set specifically for working on the Exam unit with the support of staff who will check progress and discuss ideas and next steps.

Students will need to collect the exam paper on the 3rd January during break or lunchtime (unless they have a lesson that day).

AQA (9-1) GCSE Business – Year 11 revision list

3.1 The purpose and nature of businesses (year 10)

3.1.1 The purpose and nature of businesses	
Content	**Additional information**
• Purpose of business • Reasons for starting a business • Basic functions and types of business • Business enterprise and entrepreneurship • Dynamic nature of business	• Understand what a business is and the reasons for starting a business • Understand the difference between goods and services, needs and wants • Understand the meaning of factors of production – • Define opportunity cost • Understand primary, secondary and tertiary • Understand the terms enterprise and entrepreneur • Outline the characteristics of an entrepreneur • Outline the objectives of an entrepreneur, • Understand that businesses face a constantly changing business environment

3.1.2 Business ownership	
Content	**Additional information**
• Sole traders • Partnerships • Private limited companies (ltd) • Public limited companies (plc) • Not-for-profit organisations	• Understand the different legal structures that businesses adopt • Analyse the benefits and drawbacks of each legal structure) • Understand the concept of limited liability and which legal structures benefit from this • Evaluate which legal structure would be most appropriate for a variety of business examples, including new start-up businesses and large established businesses.

3.1.3 Setting business aims and objectives	
Content	**Additional information**
• What are business aims and objectives • Purpose of setting objectives • Role of objectives in running a business • Changing objectives • Use of objectives in judging success	• Understand the main aims and objectives for businesses: • Understand the role of objectives in running a business • Understand how and why the objectives set will differ between businesses • Understand how and why the objectives set may change as businesses evolve • Understand the success of a business can be measured in other ways than profit.

3.1.4 Stakeholders	
Content	Additional information
• Main stakeholders of business • Objectives of stakeholders • Impact of business activity on stakeholders • Impact and influence stakeholders have on businesses	• Understand what is meant by a stakeholder and who the main stakeholders of a business are • Understand stakeholders' main objectives • Understand the impact and influence stakeholders have on businesses and their objectives and how businesses may face conflict between stakeholders.

3.1.5 Business location	
Content	Additional information
• Factors influencing the location decision of a business	• understand the factors that influence where a business is located

3.1.6 Business planning	
Content	Additional information
• The purpose of business planning • The main sections within a business plan • Basic financial terms • Basic financial calculations	• Understand the reasons why businesses create plans • Understand the main sections of a business plan • Analyse the benefits and drawbacks of business planning • Understand the difference between variable costs, fixed costs and total costs • Understand the concept of revenue, costs, profit and loss.

3.1.7 Expanding a business	
Content	Additional information
• Methods of expansion • Benefits and drawbacks of expansion • Economies of scale • Diseconomies of scale	• Discuss the advantages and disadvantages of methods of growth • Understand the methods used by businesses when expanding • Understand the benefits of growth and the drawbacks of growth • Understand the meaning of purchasing and technical economies of scale • Understand that with growth businesses increase the risk of diseconomies of scale occurring • Calculate and interpret average unit costs.

3.2 Influences on business (end of year 10 and year 11)

3.2.1. Technology	
Content	**Additional information**
• E-commerce • Digital communication	• understand the impact of the changing use of ICT and how it influences business activity • E-commerce to access wider markets. • Digital communication changing the way businesses communicate with stakeholders.

3.2.2 Ethical and environmental considerations	
Content	**Additional information**
Ethical considerations	• identify and analyse where there may be a possible trade-off between ethics and profit. • Ethical behaviour requires businesses to act in ways that stakeholders consider to be both fair and honest.
Environmental considerations: • Impact on traffic congestion • Recycling • Disposal of waste • Noise and pollution	• demonstrate knowledge and understanding of how business and consumers accept greater environmental responsibility in their decision making and the costs and benefits of businesses behaving this way.
Sustainability • Global warming • Using scarce resources	• identify and analyse where there may be a possible trade-off between sustainability and profit.

3.2.3 The economic climate on businesses	
Content	**Additional information**
Interest rates: • How fluctuating interest rates can affect businesses that rely on overdrafts and loans for finance • How fluctuating interest rates can affect consumer and business spending. Level of employment: Consumer spending:	• understand how businesses might be affected by changes in the rate of interest. • identify how and why businesses might be affected by changes in levels of employment. • discuss how demand for products and services may change as incomes fluctuate.

3.2.4 Globalisation	
Content	**Additional information**
How UK businesses compete internationally, offering: • Better designs • Higher quality products at lower prices.	• understand globalisation and the benefits and drawbacks that it offers UK businesses.
Exchange rates	• impact of exchange rates on the profit and sales of those businesses that import and/or export.

3.2.5 Legislation	
Content	**Additional information**

• Employment law
• Health And Safety law
• Consumer law
	• impact of legislation on businesses,
	• benefits of providing a safe working environment.
	• Employment law including:
	  • National minimum wage/living wage
	  • The Equality Act (2010).
	• Health and safety law including: the Health and Safety at Work Act (1974).
	• Consumer law including trade descriptions.

3.2.6 Competitive environment	
Content	**Additional information**
• Impact on businesses of operating in competitive markets • Uncertainty and risks businesses face	• Understand the meaning of a market and competition • Analyse potential impacts of competition on businesses and identify situations when businesses face minimal or no competition • Understand the risks businesses face and the reasons why all businesses face uncertainty • Understand the reason why entrepreneurs embark on running businesses and the activities businesses can undertake to minimise risks.

3.3 Business operations (year 11)

3.3.1 Production processes	
Content	**Additional information**
Methods of production: • Job • Flow	• Understand job and flow production methods and understand when each is appropriate.
Efficiency in production: • Lean production • Just in time (JIT)	• Understand how production might be made more efficient by the use of lean production techniques.

3.3.2 The role of procurement	
Content	**Additional information**
Managing stock: • Just in time (JIT) • Just in case (JIC)	• evaluate the use of managing of stock using JIT • benefits of reduced costs must be balanced against the cost of more frequent deliveries and lost purchasing economies of scale. • benefits of having spare stock to satisfy demand balanced against the cost of holding buffer stock.
Factors affecting choice of suppliers including: • Price • Quality • Reliability	• analyse the factors that affect the choice of suppliers for a given business.

The effects of procurement and logistics on a business, including: • Efficiency • Lower unit costs The value of effective supply chain management, including: • Working with suppliers to ensure that key processes are running efficiently and cost effectively • Getting goods and services for the best price and value • Cutting any waste and unnecessary costs to create a streamlined process and fast production times.	• understand what procurement and logistics are and their effect on a business. • understand that the benefits of reduced costs must be balanced against the quality of service. • understand what a supply chain is and recognise the benefits of managing an effective supply chain.

3.3.3. The concept of quality	
Content	**Additional information**
Consequences of quality issues	• understanding of customer expectations of quality in terms of production of goods and the provision of services. • Identify how businesses identify quality problems and how businesses measure quality and the consequences of these issues.
Methods of maintaining consistent quality: Total quality management (TQM)	• aware of the methods of maintaining consistent quality and be able to identify the advantages to a business of using TQM.
Costs and benefits of maintaining quality: • Additional sales • Image/reputation • Higher price • Inspection costs • Staff training • Product recalls • The provision of services	• aware of the possible quality issues as businesses grow, particularly if outsourcing and franchising is used.

3.3.4 Good customer services	
Content	**Additional information**
Methods of good service: • Product knowledge • Customer engagement (creating a positive experience for the customer) • Post sales services (eg user training, help lines, servicing). Benefits of good customer service, including: • Increase in customer satisfaction • Customer loyalty • Increased spend • Profitability Dangers of poor customer service, including: • Dissatisfied customers • Poor reputation via word of mouth	• understand the sales process • understand the importance of providing good service to customers and analyse the techniques businesses use to provide good customer service.

• Reduction in revenue	
The ways in which advances in ICT have allowed customer services to develop: • Websites • E-commerce • Social media	

3.5 Marketing (year 10)

3.5.1 identifying and understanding customers	
Content	**Additional information**
The importance of identifying and satisfying customer needs	the importance of identifying and satisfying customer needs, in order to: • Provide a product or service that customers will buy • Increase sales • Select the correct marketing mix • Avoid costly mistakes • Be competitive

3.5.2 segmentation	
Content	**Additional information**
Types of segmentation	understand how and why different businesses use segmentation to target customers, including: • Gender • Age • Location • Income

3.5.3 The purpose and methods of market research	
Content	**Additional information**
Purpose of market research Collect information about: • Demand • Competition • Target market	• understand why businesses conduct market research, such as to identify market opportunities and to get a better insight into their customers and competitors.
Methods of market research to include primary and secondary: • Questionnaires • Surveys • Interviews • Focus groups • Internet research • Printed press eg newspapers	• identify the benefits and drawbacks for various market research techniques and select the best method for a given business.
Use of market research: information that may help decision making	• interpret and use qualitative and quantitative market research findings to help make appropriate decisions for different types of business. • manipulate and interpret data from tables and charts. • identify market size and market share.

3.5.4 The elements of the marketing mix: Price, Product. Promotion and Place (4Ps)	
Content	**Additional information**
Pricing methods, including: • Price skimming • Price penetration • Competitive pricing • Loss leader • Cost-plus	• understand the main features of the pricing methods and the impact they will have on a business.
The factors that include pricing decisions, including: • Costs • Nature of the market • Degree of competition • Product life cycle	• recognise the factors, internal and external, which might influence the pricing decision, particularly as businesses grow and expand. • evaluate these factors and use them to assess the suitability of pricing methods for a given business. • understand the basic relationship between price and demand ie as prices rise demand is likely to fall.
Product	• benefits and risks of developing new products. importance of product design, image and the needs of the target market when designing new products.
Product differentiation: • Unique Selling Point (USP) • Brand image	• significance of having a USP in a competitive market and the importance of a good brand image.

The product lifecycle:
• Research and development
• Introduction
• Growth
• Maturity
• Decline
• Extension strategies:
  • Updating package
  • Adding more or different features
  • Changing target market
  • Advertising
  • Price reduction
	• understand the product life cycle and demonstrate how demand for a product or service might change over time.
	• evaluate the effectiveness of extension strategies and when they would be suitable.

Product portfolio	• understand how and why businesses might broaden and balance their product portfolio using the Boston Matrix. • identify and explain the four categories of the Boston Box.

Promotional methods Advertising including: • Newspapers • Magazines • Television • Internet • Billboards PR: • Sales promotion • Point of sales displays • 2 for 1 offers • Free gifts • Samples • Coupons • Competitions • Sponsorship • Social media Factors influencing the selection of the promotional mix: • Finance available • Competitor actions • The nature of the product or service • The nature of the market • Target market Reasons for promotion: • Inform/remind customers about the product • Create or increase sales • Create or change the image of the product • Persuade customers to buy the product	• promotional methods which are likely to be used by a given business. • benefits and drawbacks of promotional methods used by businesses. • analyse factors influencing the selection of the promotion mix to assess their suitability for a given business.
Place (the different channels of distribution used by businesses): • Retailers • Wholesalers • Telesales	• different channels of distribution used by businesses to gain access to potential customers. • analyse the appropriateness of each distribution method for a given scenario.
E-commerce and m-commerce	• analyse the growing importance of e-commerce and m-commerce and how it can extend the reach of businesses to include international markets. • benefits and drawbacks of a business using e-commerce and m-commerce.
• Integrated nature of the marketing mix • Using the marketing mix to inform and implement business decisions	• importance of the four elements and how they work together. • recommend appropriate marketing activities for a given business. • recognise how the marketing mix evolves over time and evaluate how businesses may react to this.

3.6 Finance (year 10)

3.6.1 Sources of Finance	
Content	Additional information
• Methods businesses use to raise finance • Appropriateness of sources of finance	• Understand the main internal and external sources of finance available (including family and friends, retained profit, a new share issue, obtaining a loan or mortgage, selling unwanted assets, overdrafts, trade credit, hire purchase and government grants) • Analyse the advantages and disadvantages of each method for a given situation • Evaluate the suitability of sources of finance for new and established businesses.

3.6.2 Cash flow	
Content	Additional information
• Importance of cash to business • Interpreting cash flow forecasts • Difference between cash and profit	• Understand the consequences of cash flow problems and the effect of positive cash flow • Understand how and why cash flow forecasts are constructed • Complete and interpret sections of a cash flow forecast • Evaluate possible solutions to cash flow problems

3.6.3	
Content	Additional information
• Basic financial terms • Basic calculations • Average rate of return • Break-even	• Understand the difference between variable costs, fixed costs and total costs • Understand the concept of revenue, costs, profit and loss • Understand the main investment projects that businesses undertake and to be able to calculate the average rate of return for these projects • Understand the meaning of the term break-even output and interpret break-even charts • Identify the break-even level of output and margin of safety from a break-even chart • Evaluate the value of using break-even analysis to a business.

3.6.4 Analysing the financial performance of a business	
Content	Additional information
• Purpose of financial statements • Components of financial statements • Interpretation of data given on financial statements	• Understand the importance of financial statements for assessing business performance and helping make business decisions • Identify the main components of the income statement and the statement of financial position • Understand the difference between assets and liabilities and that statement of financial position is a snapshot in time • Make judgements on the performance of a business through the interpretation of the information contained in income statements • Consider current performance, performance against previous years, performance against competitors and performance from the perspective of a range of stakeholders • Calculate gross profit margin and net profit margin to help assess financial performance.

Child Development

Revision Check List

R018

Exam Technique:

- Underline key words in the question with a different colour.
- Look to see how many marks the question is worth.
- Check for command words e.g. **List** means name them, **explain,** requires detailed descriptions, examples and advantages and disadvantage regarding that topic.
- Longer answer questions:

  6 mark questions require 4 detailed points and examples.

  8 mark questions require 6 detailed points and examples

Topics to Revise: RO18

Learning Objective 1:

- Factors that affect the decision to have children
- Pre-conception Health
- Roles and responsibilities of parenthood
- Methods of contraception, their efficiency and reliability
- The structure and function of the male and female reproductive systems.

Learning Objective 2:

- The roles of the different health professionals supporting the pregnant mother.
- The importance of antenatal and parenting classes.
- Routine checks carried out at an antenatal clinic.
- Specialised diagnostic tests.
- The choices available for delivery.
- The stages of labour and the methods of delivery, including pain relief.

Learning Objective 3:

- The postnatal checks of the newborn baby.
- The specific needs of the pre-term (premature) baby.
- The postnatal provision available for the mother and baby, and the postnatal needs of the family.
- Conditions for development.

Learning Objective 4:

- How much immunity to disease and infection can be acquired.
- How to recognise and treat common childhood ailments and diseases.
- When to seek treatment by a doctor, and when emergency medical help should be sought.
- Diet-related illnesses.
- The needs of an ill child.
- How to prepare a child for a stay in hospital.

Learning Objective 5:

- How to create a safe, child-friendly environment.
- Safety labelling.
- To be aware of the most common childhood accidents.
- Social safety.

Lion Mark - Toy safety

OCR GCSE Computer Science (J276)

Specification: http://www.ocr.org.uk/qualifications/gcse-computer-science-j276-from-2016/

You will have two exam papers, each lasting 1 hour 30 minutes:

- Computer systems (J276/01)
- Computational thinking, algorithms and programming (J276/02)

You will need to attempt all questions; each exam paper will be a whole new unseen paper which is being provided by OCR. The papers will include a mixture of short and long answer questions, some of which will require you to write pseudocode/algorithms. Remember you will not be allowed to use a calculator.

You may find it useful to practice your programming skills – use https://www.codecademy.com/ and http://www.learnpython.org/

To prepare for the PPEs you should:

- Use the colour coding revision checklist to help you focus your revision (On N drive called "***GCSE REVISION HELPER.xlsx***")
    - To begin with go through all the sheets and type either:
        - Y = Yes I understand this topic
        - I = Improve knowledge – I have an idea but need to improve my knowledge
        - N = No – I need to look over this topic
    - Start your revision using the red coloured sections (the ones you identify as N), then do the orange ones (O), then the green ones (Y)
- Use the online textbook (Cambridge elevate) – attempt end of chapter questions as well as using your own notes/previous exam papers
    - Presentations on N:\Departments\Computing\LessonResources\GCSE Computer Science 2016. Go through the power points
    - Knowledge organiser power point slides are also in N:\Departments\Computing\LessonResources\GCSE Computer Science 2016\Revision
- Past Papers and mark schemes for the old specification can be found here under the subheading past papers, mark schemes and reports: http://www.ocr.org.uk/qualifications/gcse-computing-j275-from-2012/

Other useful resources:

GCSE MOOC – you should have already registered as a learner - https://www.cambridgegcsecomputing.org/

Teach-ict.com (Username – RG411EE, Password: binary9) :

http://www.teach-ict.com/2016/GCSE_Computing/OCR_J276/OCR_J276_home.html

BBC Bitesize GCSE Computer Science:

Although not specific to our course, there is a lot of useful information and quizzes to be used on there. http://www.bbc.co.uk/education/subjects/z34k7ty

You should be keeping up to date with technology news:

BBC Click: http://news.bbc.co.uk/1/hi/programmes/click_online/

BBC Technology news: http://www.bbc.co.uk/news/technology/

The Guardian Technology news: http://www.guardian.co.uk/technology

The Daily Telegraph technology news: http://www.telegraph.co.uk/technology/

How Stuff Works: http://electronics.howstuffworks.com/tech

Design & Technology – Core

(This applies to all material areas)

Key areas	I know this	Ask for support
1.1 The impact of new and emerging technologies		
1.2 Evaluating new and emerging technologies to inform design decisions		
1.3 Energy Generation, storage and choosing appropriate sources		
1.4 Smart and composite materials and technical textiles		
1.5 Mechanical devices used to produce movement – Levers and Cams		
1.9 Papers and Boards		
1.12 Timbers		
Basic Maths		

Design & Technology - Textiles

Key areas	In particular	I know this	Ask for support
6.1 Design contexts	Context Analysis Design Brief Research Specification Designs Development Final Design Planning Making Evaluating Testing Modification Use of ICT in designing		
6.2 Properties of fibres and social implications including Sustainability	The properties and uses of a larger range of natural and synthetic fibres and the origins The 6Rs Social moral and cultural issues Environmental issues Globalisation		
6.3 Selecting natural synthetic blended and mixed fibre textiles	The fabrics you chose have a social and ecological impact Types of finishing techniques and surface treatments Selection of the most appropriate fibres and textiles for projects		
6.4 the impact of forces and stresses on textiles and the processes of reinforcing and stiffening	That the materials will undergo forces when being used Different techniques used to reinforce textiles		
6.5 Stock forms, types sizes used	What the stock sizes are and how they are calculated		
6.6 Processes used to manufacture typical products to different scales of production and Construction methods Industrial production	Weaving Knitting Joining fabrics Patterns and marking Care labelling and symbols Job, batch, mass, and JIT production Dyeing and printing Patterns grading and lay planning Health and safety QA & QC Use of ICT in production- CAD/CAM		
6.7 Specialist techniques for high quality textiles prototypes	The different techniques used to assemble high quality prototypes		
6.8 Surface treatments/ finishes	Finishing techniques and surface treatments Decorative techniques Printing techniques Chemical treatments		
There will be some long answer questions so please be prepared to write a few paragraphs, check spelling (sometimes the words you use are in the exam paper already so copy the correct spelling!), grammar and punctuation.			

Design & Technology – Resistant Materials

Key areas	In particular	I know this	Ask for support
4.1 Design Contexts	Key words – definitions and examples and reasons for each Context Analysis Design Brief Research Specification Designs Development Final Design Planning Making Evaluating Testing Modification		
4.2 Sources and properties and Environmental impact of plastics	The types properties and structures of polymers not outlined in the core section of polymers Components and manufacturing processes, advantages and disadvantages of using polymers The social and ecological footprint of polymers, plastic disposal, plastic production and transportation		
4.3 Selecting polymers	The various factors affecting the selection of polymers, how aesthetic, environmental, availability , cost and social factors can influence the selection of polymers		
4.4 Impact of forces and stresses	Context with which polymers need to withstand forces and stresses, how polymer items are reinforced and stiffened and the forces and stresses that act upon products made from polymers		
4.5 Calculating quantities	Standard forms that polymers are available, how to calculate cross sectional areas and diameters of materials		
4.6 Alternative Manufacturing processes	Plastic moulding techniques		
4.7 Specialist techniques for making prototypes of products	Techniques to shape and form polymers, the tools used, techniques to bend and vacuum forming methods to form polymers.		
4.8 Surface treatments	The different surface treatment and finishes that can be applied to the different polymers		
Basic Maths	To apply to questions areas, use of basic formulas		
There will be some long answer questions so please be prepared to write a few paragraphs, check spelling (sometimes the words you use are in the exam paper already so copy the correct spelling!), grammar and punctuation.			

Design & Technology – Graphics

Key areas	In particular	I know this	Ask for support
3.1 Design contexts	Key words – definitions and examples and reasons for each: *Context* *Analysis* *Design Brief* *Research* *Specification* *Designs* *Development* *Final Design* *Planning* *Making* *Evaluating* *Testing* *Modification*		
3.2 The sources origins and properties od papers and boards	Different materials used to package products – reasons – advantages and disadvantages		
3.3 Selection of papers & boards	The various factors affecting the selection of papers and boards		
3.4 Forces and stresses	That the materials will undergo forces when being processed and used Different techniques used to reinforce materials		
3.5 Stock forms, types sizes and calculations required	What the stock sizes are		
3.6 Manufacturing processes for different scales of production Manufacturing systems	Different types fo production e.g. Offset Lithography, Flexography, Gravure, and screen printing, Low level production e.g. Photocopying, digital and letter press. One off / batch / mass – costs JIT		
3.7 Specialist techniques for high quality paper.	Range of hand processes, and the differences in letter forms.		
3.8 Surface treatments and finishes of papers and boards	Types of finishing techniques and surface treatments that can be applied to paper and board.		
Basic Maths	To apply to questions areas, use of basic formulas		
There will be some long answer questions so please be prepared to write a few paragraphs, check spelling (sometimes the words you use are in the exam paper already so copy the correct spelling!), grammar and punctuation.			

Drama GCSE (AQA)

What's in the exam? The exam is 1 hour 45 minutes long and you must answer Section A, Section B and Section C. **You will be provided with a clean copy of your set text, '*The 39 Steps*' which you need, to answer questions in Section B.**

Section A - You must have knowledge of: stage positioning, theatre roles and responsibilities and types of staging. You will be asked 4 multiple choice questions, worth 1 mark each.

-Use your GCSE pocket revision book and your 'theatre roles and responsibilities' hand out to revise this.

Section B is about your set text, **'*The 39 Steps'.*** A clean copy of this play script will be provided for you in the exam**.** In this section, you will be given an extract from a scene and asked to write about how you would design the lighting/set/costume for the extract and how as an actor, you would play the parts of the characters within the extract, using your physical and vocal skills, the stage space and your interaction with other characters. You will also have to make reference to other parts of the play to justify your interpretations.

You will have 4 questions to answer - worth 4, 8 12 and 20 marks. You will have a fifth question to answer which will be a choice between acting or a design– worth 20 marks.

You will need to use your class notes to revise the dramatic objective of every scene in the play, the BMFVG skills of playing the part, the set, props, sound, costume and lighting choices of every scene. Use the NDrive/Shared area to access shared notes on certain scenes and video clips of your interpretations of key scenes.

-Re-read the play to be secure on your knowledge of action and character.

-Revisit your notes on the context: 1930s fashion, furniture, Alfred Hitchcock, John Buchan

- Watch the Alfred Hitchcock film, *The 39 Steps.*

-Practise questions from your exam question list, incorporating WHAT, HOW and WHY into your answers.

Section C is your response to live theatre**.** You will write about '*Things I Know to be True'* by Frantic Assembly. You will answer one question from a choice of three – worth 32 marks. You will be asked to focus on how an actor (/S) used their vocal and physical skills and stage space to communicate their character. You will be asked about how costume, lighting or sound was used to support the action of the play or reflect the style of the play.

- **You should revise all the notes you made on acting, lighting, costume, sound and set.**
- **You should read the play and learn quotes from key scenes.**
- **Read the 'Frantic Assembly' resource pack on FROG to further your understanding of interpretations.**
- **Read theatre reviews on the performance to further your knowledge of the play.**
- **Study the pictures on FROG to remember key scenes where actors' physicality, facial expressions, costumes, use of set or lighting communicated mood.**

-Use your GCSE pocket revision book to revise key drama terminology to support this question.

Watch the full length play on Digital Theatre, and use this to revise key scenes where actors' physicality, facial expressions, costumes, use of set or lighting communicated mood.

Further suggestions:

-Exemplar answers: Read through them again (we've looked at them in class) and compare the higher mark answers to yours. What have you missed and where are you doing well? What do you need to do to make improvements?

-Your previous work which has been marked in detail, and you have often completed FIT time on it. You may like to re-do one or two of those answers and hand them in to be marked so you can get more feedback.

-Your teachers! Before you leave for the Christmas break, see your teacher if you need extra help! We are happy to help you.

Economics - Part 1 and Part 2 Checklist

	☺	😐	☹
Part 1 - Introduction to Economics			
Main economic groups			
Explain the role of the main economic groups: consumers, producers and the government, including their interdependence			
Factors of Production			
Explain the factors of production: land, labour, capital and enterprise including how they might be combined			
The basic economic problem			
Explain what is meant by scarce resources and unlimited wants			
Explain the economic problem, including the questions of how resources should be allocated, what, for whom and how goods and services should be produced			
Explain what is meant by opportunity cost			
Evaluate the costs and benefits of economic choices, including the impact on economic, social and environmental sustainability			
Part 2 – The role of markets and money			
The role of markets			
Explain what is meant by a market			
Explain the features of the primary, secondary and tertiary sectors, including the difference between the production of goods and services			
Explain the difference between factor and product markets, including their interdependence			
Evaluate the costs and benefits of specialisation and exchange in markets including for producers, workers, regions and countries			
Demand			
Explain what is meant by demand			
Draw and explain a demand curve using data, including individual and market demand			
Draw shifts of, and movements along, the demand curve			
Analyse the causes and consequences for consumers and producers, of shifts of, and movements along, the demand curve			
Explain price elasticity of demand			
Draw demand curves of different elasticity			
Evaluate the importance of price elasticity of demand for consumers and producers			
Supply			
Explain what is meant by supply			
Draw and explain a supply curve using data, including individual and market demand			
Draw shifts of, and movements along, the supply curve			
Analyse the causes and consequences for consumers and producers, of shifts of, and movements along, the supply curve			
Explain price elasticity of demand			
Draw supply curves of different elasticity			
Evaluate the importance of price elasticity of supply for consumers and producers			
Price			
Explain price as a reflection of worth and its role in determining an efficient			

distribution of resources			
Explain what is meant by equilibrium in price and quantity			
Draw and analyse the interaction of demand and supply			
Explain the role of markets in the determination of price and the allocation of resources			
Analyse how the market forces of demand and supply affect equilibrium price and quantity			
Competition			
Explain competition between producers in a market economy, including the reasons why producers compete			
Analyse how competition affects price			
Evaluate the economic impact of competition on producers and consumers			
Explain the meaning of monopoly and oligopoly and how they differ from competitive markets			
Production			
Explain the role of producers, including individuals, firms and the government			
Evaluate the importance of production and productivity for the economy			
Calculate and explain total cost, average cost, total revenue, average revenue, profit and loss			
Evaluate the importance of cost, revenue, profit and loss for producers, including how costs and revenues affect profit and supply			
Explain what is meant by economies of scale			
The Labour Market			
Explain the role and operation of the labour market, including the interaction between workers and employers			
Analyse the determination of wages through supply and demand, including factors affecting the supply and demand of labour			
Explain and calculate gross and net pay, including deductions through income tax, national insurance and pension contributions			
The role of money and financial markets			
Explain the role of money as a medium of exchange			
Explain the role of the financial sector for the economy, including financial institutions such as banks, building societies and insurance companies			
Evaluate the importance of the financial sector for consumers, producers and government			
Analyse how different interest rates affect the levels of saving, borrowing and investment			
Calculate the effect on savings and borrowings of changes in the rate of interest			

Economics - Part 3 and Part 4 Checklist

	☺	😐	☹
Part 3 – Economic objectives and the role of government			
Economic growth			
Explain what is meant by economic growth			
Calculate and explain how economic growth is measured with reference to Gross Domestic Product (GDP) and GDP per capita			
Analyse recent and historical GDP data			
Analyse the determinants of economic growth, including investment, changes in technology, size of workforce, education and training, availability of natural resources and government policies			
Evaluate the costs and benefits of economic growth, including the impact on economic, social and environmental sustainability			
Low unemployment			
Explain what is meant by employment and unemployment			
Explain how unemployment is measured using the Claimant Count			
Calculate the unemployment rate			
Analyse recent and historical unemployment figures			
Explain the types of unemployment, including cyclical, frictional, seasonal and structural unemployment			
Evaluate the causes and consequences of unemployment for individuals, regions and the government			
Fair distribution of income			
Explain what is meant by the distribution of income, including different types of income and the difference between income and wealth			
Calculate income and wealth			
Evaluate the causes of differences in the distribution of income and wealth and the consequences for an economy			
Price Stability			
Explain what is meant by price stability and inflation, including the difference between real and nominal values			
Explain how inflation is measured using the Consumer Price Index (CPI)			
Calculate the effect of inflation on prices			
Analyse recent and historical inflation figures			
Evaluate the causes of inflation and the consequences for consumers, producers, savers and the government			
Fiscal Policy			
Explain purposes of government spending and sources of government revenue, including direct and indirect taxes			
Explain what is meant by a balanced government budget, budget surplus and budget deficit			
Explain what is meant by fiscal policy and how it can be used to achieve economic objectives			
Calculate and analyse how taxes and government spending can affect markets as well as the overall economy			
Evaluate the costs, including opportunity cost, and the benefits of fiscal policy on the economy to achieve economic objectives			
Evaluate economic consequences of measures to redistribute income and wealth, including progressive taxes			
Monetary Policy			

Explain what is meant by monetary policy and how it can be used to achieve economic objectives			
Analyse how monetary policy can affect growth, employment and price stability			
Evaluate the effects of monetary policy on consumer spending, borrowing, saving and investment			
Supply Side Policies			
Explain what is meant by supply side policy and how it can be used to achieve economic objectives			
Evaluate the costs, including opportunity cost, and the benefits of supply side policies for the economies			
Limitations of markets			
Explain what is meant by positive and negative externalities			
Explain government policies to correct positive and negative externalities, including taxation and subsidies, state provision, legislation and regulation and information provision			
Evaluate the use and impact of government policies to correct positive and negative externalities			
Evaluate the costs, including opportunity cost, and the benefits of government policies to correct positive and negative externalities			
Part 4 – International trade and the global economy			
Importance of international trade			
Explain why countries import and export goods and services and the benefits of this for consumers and producers			
Explain free trade agreements including the European Union			
Balance of Payments			
Explain the balance of payments on current account			
Explain the meaning of a balanced current account, a current account surplus and current account deficit			
Calculate deficits and surpluses			
Analyse recent and historical data on exports and imports			
Evaluate the importance of the balance of payments on current account to the UK economy			
Evaluate the causes of surpluses and deficits of the BoP on current account			
Exchange Rates			
Draw and analyse how exchange rates are determined through the interaction of supply and demand			
Calculate currency conversion			
Analyse recent and historical exchange rate data			
Evaluate the effect of changes in the exchange rate on consumers and producers			

FOOD AND NUTRITION
GUIDANCE AND REVISION IDEAS FOR YEAR 11

Pre – Public Examination 2018

- Read the questions carefully before you begin, high-light the key words in a coloured pen to show you understand the meaning of a question.
  It is essential you do not isolate the knowledge you have gained so far in your controlled assessment. You should be able to transfer skills and knowledge to the demands of some of the questions on the paper.
- One word answers are rarely sufficient; you are advised to make use of the mark allocation on the paper as an indication of the depth of response required. This will also give you an idea of how long to spend on each question.
- Look at all of the work we have covered since the beginning of Year 10.
- Think clearly about your answers - check both sides of the paper so you do not miss anything out.
- Be as neat as you can.

KEY AREAS FOR YOU TO FOCUS ON:

- **NSP**
- **The Eat well Plate**
- **Considerations relating to obesity, health concerns and low foods**
- **Energy Balance / Energy Requirements**
- **Methods of Cooking / Heat transfer**
- **Locally sourced ingredients / Red tractor**
- **Gelatinisation**
- **Lactose intolerance choice of food products instead of dairy**

Food Preparation & Nutrition GCSE

Personal Learning Checklist

		R	A	G
Nutrition and Health				
	Balanced Diet/eatwell guide			
	Macronutrients			
	Carbohydrates (Sources and function of)			
	Monosaccharides and Disaccharides (sugars)			
	Polysaccharides (starch)			
	NSP/Non Soluble Polysaccharides (fibre)			
	Protein (Sources and function of)			
	High Biological Value			
	Low Biological Value			
	Protein complementation			
	Fats (Sources and function of)			
	Saturated fats			
	Unsaturated fats			
	Micronutrients			
	Fat soluble vitamins			
	Vitamin A (sources and function of)			
	Vitamin D (sources and function of)			
	Vitamin E (sources and function of)			
	Vitamin K (sources and function of)			
	Water soluble vitamins			
	B vitamins (sources and function of)			
	Vitamin C (sources and function of)			
	Minerals			
	Calcium (sources and function of)			
	Sodium (sources and function of)			
	Iron (sources and function of)			
	Phosphorus (sources and function of)			
	Fluoride (sources and function of)			
	Iodine (sources and function of)			
	Fortification			
	Nutrition related health conditions			
	Affects of nutrient deficiency or excess			
	Energy balance and PAL			
	Water intake			
Cooking and heat transfer				
	Why food is cooked			
	Heat transfer methods			
	Conduction			
	Convection			
	Radiation			
	Selecting appropriate cooking methods			
	Water based			
	Fat based			
	Dry heat			
Food choice				
	Physical Activity Level			
	Life style influences			
	Seasonality			
	Religion, culture and moral belief			
	Medical conditions			
	Food labelling and marketing			

Food Preparation & Nutrition GCSE contd. - Personal Learning Checklist				R	A	G
Functional and chemical properties of foods						
	Protein					
		Protein structure				
		Protein denaturation and coagulation				
			Heat – setting (baked cheesecake)			
			Acid – setting (chilled lemon cheesecake)			
			Acid – marinating meat proteins			
			Agitation – gluten formation			
			Aeration and agitation - foams			
			Heat, acid and agitation – Cheese making			
	Carbohydrates					
		Structure of Carbohydrates				
			Monosaccharides, disaccharides & polysaccharides			
		Gelatinisation				
		Dextrinisation				
		Caramelisation				
	Fats					
		Structure of fats				
			Plasticity			
			Shortening			
			Aeration			
			Emulsions			
	Aeration					
		Biological raising agents (how yeast aerates)				
		Chemical raising agents (understanding the differences, pros & cons)				
			Bicarbonate of Soda			
			Baking Powder			
		Methods and examples of mechanical aeration				
		Process of steam aeration				
Food Safety						
	Food Spoilage					
		Enzymic browning and oxidisation of fruit and vegetables				
		Micro-organisms				
			Mould			
			Pathogenic bacteria			
			Conditions needed for micro-organisms			
	Preventing cross-contamination					
	Preservation and food storage					
	Temperatures for storing, cooking and serving foods					
	Packaging, best before and use by dates					
Food provenance and sustainability						
	Food sources					
	Primary and secondary processes					
	Genetically modified foods					
	Environmental and Sustainability impact of food production and processing					
		Organic farming				
		Fair trade				
		Food miles				
		Carbon footprint				
		Livestock conditions				
		Sustainable fishing				

French

Revision for Higher Writing PPE

This exam will involve-

- one 90 word essay on 4 bullet points
- one 150 word essay on 2 bullet points
- translation from English to French

In addition to general revision on the topics we have covered so far in the course and grammar structure, focus on the following -

- What you do in your free time
- Your house, town and region
- Family and Relationships
- School
- Holidays

Revision for Foundation Writing PPE

This exam will involve-

- 4 statements describing a picture
- one 40 word response on 4 bullet points
- translation from English to French
- one 90 word essay on 4 bullet points

In addition to general revision on the topics we have covered so far in the course and grammar structure, focus on the following -

- House, town and region
- Holidays
- School
- What you do in your free time
- Family and Relationships

For both tiers of entry please:

Ensure that you can give a range of opinions and explain your views in detail.

Revise how to connect your sentences effectively.

Check that you can include examples of a range of tenses (even if the question does not explicitly request them).

Prepare to make use of a wide range of vocabulary and structures in your work.

YEAR 11 French GCSE PPE 2018 FOUNDATION READING VOCAB

As part of your revision, fill in the English meanings.

Why not make a Quizlet to revise the words?

Section A	
Passer ma vie	
Doux	
Un ensoleillement	
Une colline	
La gastronomie	
Prête	
La rentrée	
Avoir besoin	
Rencontrer	
Gagner du temps	
Le gout	
Le metier	
Tard	
Tôt	
Le patron	
Le chômage	
Perdre	
Rien	
Les études	
Les loisirs	
Des meubles	
La mort	
Le propriétaire	
Voir	
Les déchets	
Les transports en commun	
Le chauffage	
La matière	
Gratuity	
Une séance	
Avoir envie ds	
Pleurer	
Suivre	
Le travail bénévole	
Les affaires	
dépenser	

YEAR 11 French GCSE PPE 2018 FOUNDATION LISTENING VOCAB

As part of your revision, fill in the English meanings.

Why not make a Quizlet to revise the words?

Section A	
Les loisirs	hobbies
Une entreprise	business
Se reposer	to relax
étrangers	stranger, foreigner
Un réveil	alarm clock
À la mode	fashionable
Ce n'est pas juste	It's not fair
En désordre	untidy, in disarray
Argent de poche	pocket money
Ouvert	open
La faim	hunger
l'incendie	fire
Voler	to steal, to fly
En grève	on strike
La pluie	rain
Propre	clean, own
L'eau du robinet	tap water
Pollué	polluted
Section B	
Né	born
Essayer	to try
rejoindre	to meet, to catch up with
J'ai envie de	I want to …

YEAR 11 French GCSE PPE 2018 HIGHER READING VOCAB

As part of your revision, fill in the English meanings.
Why not make a Quizlet to revise the words?

Section A	
en avoir marre	
vol	
l'hôtesse	
louer	
le trajet	
quant	
construire	
réussir	
inquiet	
égal	
une telle chose	
gestes	
rémunéré	
compter	
ne … aucune	
faculté	
loyer	
chômage	
essayer	
aussitôt	
licenciée	
se sentir	
coupable	
pire	
laisser tomber	
endroit	
en colère	
se conseiller	
fauteuil	
perte de temps	
espérait	
m'ennuie	
bijou	
au milieu	
tort	
sauf	
pleurer	
se détendre	
semble	
la circulation	
gaz d'échappement	
malgré	
sans-abris	
puisque	

YEAR 11 French GCSE PPE 2018 HIGHER LISTENING VOCAB

As part of your revision, fill in the English meanings.

Why not make a Quizlet to revise the words?

Section A	
l'incendie	
Voler	
En grève	
La pluie	
La commande	
Sauf	
Les pistes cyclables	
Les embouteillages	
(les voitures)Rouler	
Moins	
Furieux	
Plus d'emplois	
Enfermer	
Couteuse	
N'assure pas	
Télécharger	
Le grand écran	
À voix haute	
Même si	
Ne compter pas	
Un baccalauréat	
Rendre intéressant	
La bijouterie	
Attirer	
Abondantes	
Les produits locaux	
Propre	
L'eau du robinet	
Section B	
Né	
Essayer	
rejoindre	
Rêver	
Quelque chose	
Un bout de papier	
Le sommeil	
Trop tard	
Trop tot	
La fatigue	

OPINIONS (French)

Opinion phrases

Je pense que ……..- I think that
Je crois que…….- I believe that
Il me semble que…….. – It seems to me that

J'aime – I like
J'adore - I love

Je n'aime pas - I don't like
Je déteste - I hate

Je préfère – I prefer

Explanation of opinions

Parce que c'est drôle	because it is fun
Parce que c'est fascinant	because it is interesting
Parce que c'est facile	because it is easy
Parce que c'est plus …. que	because it is more than…….
Bienque c'est stupide	although it is stupid

CONNECTIVES

Basic

mais - but
et - and
ou - or
car because

Advancing

cependant - however
donc- so
d'abord- first
après- after that
enfin– finally
aussi - also
malheureusement– unfortunately
heureusement - fortunately
plus tot– earlier
plus tard- later

Subordinating conjunctions

bienque - although
que- that
quand- when
si- if
pendant que- while

TENSES –

1) **Present**

1. Aujourd'hui - today
2. normalement - normally
3. le matin- in the morning
4. dans l'après-midi- in the afternoon
5. samedi - on Saturday
6. le samedi- on Saturdays
7. à huit heures – at 8.00
8. à une heure- at 1.00

Present tense verbs

ê– to be	**avoir– to have**
Je suis - I am	J'ai- I have
Tu es - you are	Tu as - you have
Il/elle est - he / she is	Il / elle / on a - he / she / it has
Ils / elles sont - they are	Ils/elles ont -they have

Useful present tense verbs

1. je joue – I play
2. je mange – I eat
3. je bois – I drink
4. je porte – I wear
5. Je reste – I stay
6. Je lis – I read
7. Je vois – I see
8. Il y a – there is/are
9. Je peux…….jouer - I can play; on peut…….jouer – one/you can play

2) **Past tense**

Past time phrases –

1. hier - yesterday
2. la semaine dernière - last week
3. l'année dernière - last year
4. il y a ….ans - … years ago
5. quand j'étais plus jeune - when I was younger

Perfect tense verbs

J'ai mangé une pizza	I ate pizza
J'ai bu un coca cola	I drank coke
J'ai regardé des films	I watched films

J'ai fait mes devoirs	I did my home learning
J'ai joué au tennis	I played tennis
C'était marrant / drôle	It was fun
J'ai fait les magasins	I went shopping
Je suis allé(e) aux Etats-Unis	I went to America
Je suis resté) dans un hôtel	I stayed in a hotel

3) Imperfect tense (used to)

Je mangeais de la pizza	I used to eat pizza
Je buvais du coca	I used to drink coke
Je regardais des film	I used to watch films
Je faisais mes devoirs	I used to do my home learning
Je jouais au tennis	I used to play tennis
Je faisais du shopping	I used to go shopping
Je visitais les Etats-unis	I used to go to America
Je logeais dans un hôtel	I used to stay in a hotel

Useful phrases
Il y avait – there was/were
Il faisait beau/chaud/froid – It was sunny/hot/cold
Il pleuvait- It was raining
Il neigeait- It was snowing
C'était rigolo/barbant – it was fun/boring

4) Future tense

Future time phrases
1. demain- tomorrow
2. dans l'avenir - in the future
3. la semaine prochaine - next week
4. la semaine prochaine - next year
5. quand je suis plus agé(e) - when I'm older

To form the future tense
For the 'I' form add ai to the end of the infinitive for most regular verbs
Je jouerai- I will play
Je visiterai- I will visit

Watch out for the irregulars: j'aurai- I will have
Je sortirai- I will go out
Je serai riche – I will be rich
Nous irons en Australie – we will go to Australia

5) Conditional tense – what would you do, if...?

The conditional tense
J'aurais – I would have
Je serais – I would be
Je voudrais – I **would like**

3.5.1 Rubrics and instructions AQA German GCSE

The following is a guide to the sort of rubrics and instructions which will be used in Section B of the Listening and Reading exams. The list is indicative, not exclusive.

German	English
Achtung! Du kannst die Buchstaben mehr als ein Mal benutzen.	**N.B.** You can use the same letter more than once.
Beantworte **die beiden Teile der Frage.**	Answer **both parts of the question.**
Beantworte die Fragen auf **Deutsch**.	Answer the questions in **German.**
Beantworte diese Fragen.	Answer these questions.
Ergänze ... auf **Deutsch**.	Complete... in **German**.
Ergänze den folgenden Text mit jeweils **einem** Wort von der Liste unten.	Complete the following gap-text with **one** word for each gap from the list below.
Ergänze die Lücken.	Fill in the gaps/blanks.
Ergänze die Tabelle auf **Deutsch**.	Complete the table in **German**.
Erwähne einen postiven Aspekt/einen Vorteil/einen negativen Aspekt/einen Nachteil.	Mention one positive aspect/one advantage/one negative aspect/one disadvantage.
Es ist welche Person? Schreibe den Namen ins Kästchen.	Which person is it? Write the name in the box.

German	English
Füll die Tabelle auf **Deutsch** aus.	Complete the table in **German**.
Für eine negative Meinung, schreib **N**, für eine positive Meinung, schreib **P**, für eine positive und negative Meinung, schreib **P + N.**	For a negative opinion, write **N**, for a positive opinion, write **P**, for a positive and negative opinion, write **P + N.**
Gib (zwei) Details.	Give (two) details.
Hör das folgende Gespräch/die folgende Diskussion/das folgende Interview/den folgenden Bericht.	Listen to the following conversation/discussion/interview/report.
Lies ...	Read...
Schreib den richtigen Buchstaben ins Kästchen.	Write the correct letter in the box.
Schreib **R**, wenn die Aussage richtig ist, **F**, wenn die Aussage falsch ist, **NT**, wenn die Aussage nicht im Text ist.	Write **(R),** if the statement is correct, **(F),** if the statement is false and **(NT)**, if the statement is not mentioned.
Vollständige Sätze sind **nicht** nötig.	It is not necessary to write in full sentences.
Wähle die richtige Aktivität und schreib den Buchstaben ins Kästchen.	Choose the correct activity and write the correct letter in the box.
Welche **(sechs)** Aussagen sind richtig?	Which **(six)** statements are correct?
Welche Antwort ist richtig?	Which answer is correct?

The following is a guide to the sort of rubrics and instructions which will be used in the Writing exam. The list is indicative, not exclusive.

German	English
Beschreib...	Describe...
Du musst ungefähr **40** Wörter auf **Deutsch** schreiben.	You must write approximately **40** words in **German**.
Du musst ungefähr **90** Wörter auf **Deutsch** schreiben. Scheib etwas über alle Punkte der Aufgabe.	You must write approximately **90** words in **German**. Write something about each bullet point.
Du musst ungefähr **150** Wörter auf **Deutsch** schreiben. Schreib etwas über beide Punkte der Aufgabe.	You must write approximately **150** words in **German**. Write something about both bullet points.
Schreib…	Write…
Schreib etwas über…	Write something about…
Schreib **vier** Sätze auf **Deutsch** über das Foto.	Write **four** sentences in **German** about the photo.
Vergleich...	Compare...

Revision for Foundation Writing PPE in German

This exam will involve-

- **Writing 4 sentences in German about a picture**
- **Writing 40 words in German about 4 bullet points**
- **Translation from English to German**
- **Writing one 90 word essay on 4 bullet points**

Revise the following topics -

- Family
- School
- What you do in your free time
- Helping the environment
- Holidays
- Mobile phones
- Where you live

Ensure that you can give an opinion and explain why you think that.

Revise how to connect your sentences effectively.

Check that you can use three tenses. We would suggest past, present and future.

Use the grammar notes below to help you.

Year 11 PPE German Foundation Reading revision list 2018

Ein Geschenk	A present
morgen	tomorrow
Mit der Straβenbahn/mit der U-bahn	By tram/ by tube
treffen	To meet
Mit dem Auto/mit dem Zug	By car/by train
zurückfahren	To travel back
Um etwa	At about
Halb fünf/halb sechs	4.30/5.30
Das macht Spaβ	It is fun
Die Gesundheit	health
Eisstadion	Ice rink
In der Nähe	nearby
Ich kann das nicht leiden	I cannot bear that
reisen	To travel
Fremdsprachen	Foreign languages
Im Ausland	abroad
arbeiten	To work
Naturwissenschaften	sciences
Mit Tieren	With animals
Vor allem	Above all
Ich mag/er mag	I like/ he likes
wichtig	important
Jeden Montag/Mittwoch/ Freitag/Monat	Every Monday/Wednesday/ Friday/month
Die Ehe	marriage
geschieden	divorced
traurig	sad
Sich gut verstehen	To get along well
sammeln	To collect
Müll trennen	To separate rubbish
Wasser sparen	To save water
zuerst	first
Gute Noten im Abitur	Good A level grades
Teilzeitjob	Part-time job
Arzt	doctor
fertig	finished
Ausbildung als Krankenpfleger	To train as a nurse
viel Geld verdienen	To earn lots of money
Bankkaufmann	Banker
Die schöne Landschaft	The beautiful countryside
Im Frühling	In the spring
Alpenblumen	flowers
Auf den Feldern	In the fields
Das Dorf	The village
In einem Tal	In a valley
Ein Bach voller Forellen	A stream full of trout
flieβen	To flow
Kuchen	cake
Weniger Kalorien	Fewer calories
wandern	To walk/hike

anstrengend	tiring
im Mittelmeer segeln	To sail on the Mediterranean
Das Mädchen	The girl
Nichts/genug	Nothing/enough
in den Wald gehen	To go to the woods
Eine Frau/eine Dame	An lady
Der Topf	Cooking pot
Geben/gegeben	To give/gave
Man sollte sagen	You should say
Koche/steh	Cook/stand (commands)
aufhören/aufgehört	To stop/ stopped
arm	poor
helfen/geholfen	To help/helped
Am Anfang	At the start
Glücklich/froh	happy
einsteigen	To get on board
losfahren	To set off
Schloss/Schlösser	Castle/castles
plötzlich	suddenly
Heimweh	homesickness
An etwas denken	To think about something
unterwegs	On the move
stehen	To stand
Unter hohen Bäumen	Under high trees
Allein/tot	Alone/dead
Aussteigen/ausgestiegen	To get out of means of transport/got out
Fenster	window
Viele	Lots of
hineingehen	To go in
Ein Mann/ein Herr	A man
Auf die Schulter klopfen	To tap someone's shoulder
fragen	To ask
Schweizer Jugendlichen	Swiss young people
Ein eigenes Handy	Their own mobile
Nachrichten	news
Eine Uhr	watch
Handyrechnung	Mobile phone bill
Die Hälfte	half
Handy-Abos	Mobile contracts
Die Kontrolle verlieren	To lose control
Einfach/nützlich	Simple/useful
gesund	healthy
Leichtathletik	athletics
an die Küste fahren	To go to the coast
im Garten arbeiten	To work in the garden
am Wochenende	At the weekend
letzten Samstag	Last Saturday

Year 11 PPE Foundation Listening revision list 2018/2019

- Revise numbers 1-100 and be able to understand prices;
- For section B – revise questions in German.

Gast/ Gäste	Guest/guests
Heute/heute Nachmittag	Today/this afternoon
Klassenlehrer	Class teacher
unterrichten	To teach
Geschichte	history
Erdkunde	geography
Fach	subject
Österreich	Austria
Die Schweiz	Switzerland
geboren	born
Straβe	street
gegenüber	opposite
Tore schiessen	To shoot goals
Vor zwei Jahren	2 years ago
seit	since
klug	clever
nett	nice
Kunden	customers
anbieten	To offer
Sonderangebot	Special offer
Erdbeeren	strawberries
frisch	fresh
gekühlt	chilled
Wassermelone	watermelon
Weintrauben	grapes
süβ	sweet
saftig	juicy
Richtung	Going towards/direction
Haltestelle	stop
Marktplatz	marketplace
umsteigen	To change (means of transport)
Hauptbahnhof	Main station
Stadion	stadium
brauchen	To need
Kein/keinen/keine	**no**
heiraten	To get married
altmodisch	Old-fashioned
allein	alone
Tankstelle	Petrol station
Handy	mobile
benutzen	To use
Fahrer	Driver(s)
tanken	To put petrol in
explodieren	To explode

sofort	immediately
brennen	To burn
kaputt	broken
Leicht verletzt	Slightly injured
Zu Hause	home
gewonnen	won
Blödsinn	rubbish
hassen	To hate
Eine Krawatte	A tie
eng	tight
Der Hals	neck
Die Jacke	The jacket
Eine Tasche(n)	A pocket/bag
Das Hemd	The shirt
besonders	especially
etwas Ruhiges	Something quiet
etwas Lautes	Something loud
irisch	Irish
einschlafen	To fall asleep
Ein Geschenk	A present
Der Gastgeber	The host
Ich weiβ nie	I never know
anziehen	To wear
sollen	ought
Ein Kleid	A dress
Ein Rock	A skirt
Angst haben	To be worried
wer	who
Es ist mir lieber	I prefer it
nur	only
meistens	mostly
Die Leute	people
sich betrinken	To get drunk
Wir sind umgezogen	We moved house
Wir hatten neulich	We had recently
Jetzt/zur Zeit	now
Ein Reihenhaus/ein Einfamilienhaus	A terraced house/a detached house
Eine Wohnung/ ein Bauernhof	A flat/a farm
Ein Altenheim	An old people's home
In den Bergen	In the mountains
Gar nichts	nothing
ein Krimi/ein Horrorfilm	crime film/horrorfilm
Lungenkrebs bekommen	To get lung cancer
Mir schmeckt das gut	I like the taste of that
probieren	To try
ekelhaft	disgusting
Geldverschwendung	Waste of money
Wie ein Aschenbecher stinken	To smell like an ashtray
Nicht so schlimm	Not so bad
Frische Luft	Fresh air

Revision for Higher Writing PPE in German

This exam will involve-

- **Writing one 90 word essay on 4 bullet points**
- **Writing one 150 word essay on 2 bullet points**
- **Translation from English to German**

In addition to general revision on the topics we have covered so far in the course and grammar structure, focus on the following -

- Where you live
- Family
- What you do in your free time
- Environmental problems and solutions
- Voluntary work

Ensure that you can give a range of opinions and explain your views in detail.

Revise how to connect your sentences effectively.

Check that you can include examples of the perfect tense, the imperfect (simple past), the future tense and the conditional.

Prepare to make use of a wide range of vocabulary and structures in your work

Use the grammar notes below to help you.

Year 11 PPE German Higher Reading revision list 2018

zuerst	first
Gute Noten im Abitur	Good A level grades
Teilzeitjob	Part-time job
Arzt	doctor
fertig	finished
Ausbildung als Krankenpfleger	To train as a nurse
viel Geld verdienen	To earn lots of money
Bankkaufmann	Banker
Kuchen	cake
weniger Kalorien	Fewer calories
wandern	To walk/hike
anstrengend	tiring
im Mittelmeer segeln	To sail on the Mediterranean
Synchronsprecher	Dubbing actor
Schauspieler	Actor(s)
kennen	To know (a person)
An der Kinokasse	At the box office
Mit der Stimme/mit dem Körper	With your voice/ with your body
Wenige/weniger	A few/less or fewer
davon leben	To live from it
noch nie	Not yet
Ich mache mir keine Sorgen	I am not worried
Recht haben	To be right
In deinem Alter	At your age
Das Mädchen/ die Mädchen	The girl/ the girls
Es wäre	It would be
eher	rather
Erwachsen werden	To be grown up
Bewegungsmöglichkeiten	Opportunities for exercise
Der Unfall/ die Unfälle	Accident/accidents
Angst haben	To be afraid
sich verletzen	To injure themselves
schützen	To protect
erlauben	To allow
Klettergerüste	Climbing frames
Die Erfahrung	The experience
Selbstvertrauen	Self-confidence
Noch ein Vorteil	Another advantage
Das Gehirn	brain
Sportunterricht	Sports lesson
lernbereiter	More ready to learn
Ein Abenteuerspielplatz	An adventure playground
Bilder	pictures
mitsprechen	To join the conversation
Außenseiter	outsiders
Nicht nur…sondern auch	Not only….but also
jeder	everyone
Auf etwas aufpassen	To pay attention to
Sicherheitseinstellungen	Security settings

Suchmaschinen	Search engines
Die Praxis	Practical experience
kennenlernen	To get to know
Ausbildung	training
entwickeln	To develop
Auf eignen Beinen stehen	To stand on your own two feet
Viel Möglichkeiten/ Wege	Lots of possibilities/ ways
Am Anfang	At the start
Glücklich/froh	happy
einsteigen	To get on board
losfahren	To set off
Schloss/Schlösser	Castle/castles
plötzlich	suddenly
Heimweh	homesickness
An etwas denken	To think about something
unterwegs	On the move
stehen	To stand
unter hohen Bäumen	Under high trees
allein	alone
aussteigen/ausgestiegen	To get out of means of transport/got out
Fenster	window
Viele	Lots of
hineingehen	To go in
Ein Mann/ein Herr	A man
Auf die Schulter klopfen	To tap someone's shoulder
fragen	To ask
tot	dead
Die Tür	door
Aus Holz	Made of wood
Er ging/baute/fand/kam/stand/saβ/spielte	He went/built/found/came/stood/sat/played
Der Traum/ Träume	Dream(s)
von zu Hause fortlaufen	To run away from home
Treffen	To meet
überall	everywhere
obdachlos	homeless
aufwecken	To wake someone up
Die ganze Nacht	The whole night
Woher?	Where from?
betteln	To beg
Koffer tragen	To carry suitcases
sich kümmern um	To care for
Im Herbst	In the autumn
In einer Pension	In a guest house
ausprobieren	To try (out)
Dorthin/dahin	To that place/there
zurückfahren	To go back
umziehen (umgezogen)	To move(moved

Year 11 PPE Higher Listening revision list 2018/9

Klassenzimmer	classrooms
hell	bright
Naturwissenschaften	sciences
Geschichte/Geschichten	History/stories
egal	It does not matter
Noten	grades
kurz	short
dauern	To last
etwas Ruhiges/etwas Lautes	Something quiet/something loud
irisch	Irish
einschlafen	To fall asleep
ein Geschenk	A present
Der Gastgeber	The host
Ich weiβ nie	I never know
anziehen	To wear
sollen	ought
Ein Kleid/ein Rock	A dress/ a skirt
Angst haben	To be worried
Es ist mir lieber	I prefer it
nur	only
meistens	mostly
Die Leute/die Menschen	people
sich betrinken	To get drunk
umziehen/wir sind umgezogen	To move house/ we moved house
Wir hatten neulich	We had recently
Jetzt/zur Zeit	now
Ein Reihenhaus/ein Einfamilienhaus	A terraced house/a detached house
Eine Wohnung/ ein Bauernhof	A flat/a farm
Ein Altenheim/ein Seniorenheim	An old people's home
In den Bergen	In the mountains
Umweltschutz	Environmental protection
Zähne putzen	To clean your teeth
Imbissstube	Fast food outlet
Bürgersteig	pavement
Weihnachtsbaum	Christmas tree
Das Licht ausschalten	To switch the light off
Regale auffüllen	To stack shelves
An der Kasse arbeiten	To work on the till
Lebensmittel	groceries
das Mindesthaltbarkeitsdatum	Sell by date
verkaufen	To sell
nicht mehr	No longer
mit Kunden sprechen	To speak to customers
Trinkgeld bekommen	To get tips
total müde	exhausted
Zeitungen austragen	To deliver papers
Herbst	autumn
dunkel	dark
schwer	difficult

früh aufstehen	To get up early
Militärdienst	Military service
Abitur	A levels
töten	To kill
beschliessen/sich entscheiden	To decide
Freiwilliges Soziales Jahr	Volunteer work for a year
Feuerwehr	Fire brigade
anziehen	To get dressed
füttern	To feed
angenehm	pleasant
dankbar	thankful
reden	To talk
peinlich	embarrassing
was für einen Quatsch	What rubbish
fehlen	To be missing
zeigen	show
missbrauchen	To misuse
häβliche Kommentare	Hateful comments
gemein	mean
Markenkleider	Designer clothes
Billige Kleider/teure Kleider	Cheap clothes/expensive clothes
Am billigsten/am teuersten	The cheapest/most expensive
Mir tut das leid/mir tun dies Personen leid	I am sorry about it/ I am sorry for these people
Abenteuerfilme/ Zeichentrickfilme	Adventure films/ Cartoon films
Krimis	Crime/detective films
Ton	sound
Feuerwerke/Raketen	Fireworks/rockets
Die Miete bezahlen	To pay the rent
Dünn/schwach	Thin/weak
Nahrung	food
schützen	To protect
Kriegsgebiete	War areas
Verletzungen	injuries
Lungenkrebs bekommen	To get lung cancer
Mir schmeckt das gut	I like the taste of that
probieren	To try
Ekelhaft/schlimm	Disgusting/bad
Geldverschwendung	Waste of money
Wie ein Aschenbecher stinken	To smell like an ashtray
Frische Luft	Fresh air
Ansichten	views
zurückschicken	To send back
Sich beschweren	To complain
stimmt	That is right
Sich wohl fühlen	To feel well
berühmt	famous
zufrieden	satisfied

Grammar notes for revision for PPE Writing in German

OPINIONS

Opinion phrases

ich denke, dass ……..- I think that
Ich meine, dass……- I think that
ich finde, dass…….. - I find that

Ich mag – I like
ich liebe - I love

Ich mag nicht - I don't like
ich hasse - I hate

ich mag lieber – I prefer

Explanation of opinions

,weil es lustig ist	because it is fun
,weil es interessant ist	because it is interesting
,da es enfach ist	because it is easy
,da es besser als…….ist	because it is better than…….
,obwohl es doof ist	although it is stupid

CONNECTIVES

Coordinating connectives - DO NOT CHANGE THE WORD ORDER

aber - but
und - and
denn - because
oder - or

PUT THE VERB NEXT AFTER THESE

jedoch - however
also - so
zuerst - first
danach - after that
endlich – finally
auch - also
leider – unfortunately
zum Glück - fortunately
früher – previously
später - later

Subordinating conjunctions - SEND THE VERB TO THE END

weil - because
obwohl/obgleich - although

dass - that
wenn - when / if
als - when (past!)

TENSES –

6) **Present**

Present time phrases – verb comes next if these start the sentence

9. heute - today
10. normalerweise - normally
11. morgens - in the mornings
12. nachmittags - in the afternoons
13. am Samstag - on Saturday
14. um acht Uhr – at 8.00

Present tense verbs

sein – to be	**haben – to have**
ich bin - I am	ich habe - I have
du bist - you are	du hast - you have
er / sie ist - he / she is	er / sie hat - he / she has
Sie / sie sind you / they are	Sie / sie haben -you / they have

Useful present tense verbs

10. Ich spiele – I play
11. Ich esse – I eat
12. Ich trinke – I drink
13. Ich trage – I wear
14. Ich bleibe – I stay
15. Ich lese – I read
16. Ich sehe – I see
17. Es gibt – there is/are
18. Ich kann…….spielen - I can play; man kann…….spielen – one/you can play

7) **Past tense**

Past time phrases – verb comes next if these start the sentence

6. gestern - yesterday
7. letzte Woche - last week
8. letztes Jahr - last year
9. vor … Jahren - … years ago
10. als ich jünger war - when I was younger

Perfect tense verbs

ich habe Pizza gegessen	I ate pizza
ich habe Cola getrunken	I drank coke

ich habe Filme gesehen	I watched films
ich habe Hausaufgaben gemacht	I did my home learning
ich habe Tennis gespielt	I played tennis
es hat Spaβ gemacht	It was fun
ich bin einkaufen gegangen	I went shopping
ich bin nach Amerika gefahren	I went to America
ich bin in einem Hotel geblieben	I stayed in a hotel

8) Imperfect tense (simple past)

Ich and er/sie/es have the same ending eg ich hatte – I had/ er hatte – he had
Ich hatte – I had / Ich war – I was

Useful phrases

Es gab – there was/were
Das Wetter war – the weather was
Es war lustig/ langweilig – it was fun/boring

9) Future tense

Future time phrases

6. morgen - tomorrow
7. in der Zukunft - in the future
8. nächste Woche - next week
9. nächstes Jahr - next year
10. wenn ich älter bin - when I'm older

To form the future tense

Use the appropriate form of 'werden' and add an infinitive to the end of the clause

ich werde
du wirst
er / sie wird
Sie / sie werden

Ich werde reich sein – I will be rich
Wir werden nach Australien fahren – we will go to Australia

10) Conditional tense – what would you do, if…..?

Sentence starters – **next verb comes immediately after this**

Eg. Wenn ich Zeit **hätte**, **würde** ich mehr arbeiten – if I had time, I would work more
Wenn ich reich wäre, - if I were rich
Wenn ich im Lotto gewinnen würde, – if I won the lottery

The conditional tense

Ich hätte – I would have /Ich wäre – I would be/**Ich möchte** – I **would like to**

Year 11 Spanish Vocabulary lists

We have taken some of the key vocabulary from the reading paper which you will be doing as your pre public exam.

We have decided not to give you the translation as looking up the word is part of the learning process. Remember some words have more than one meaning. Use a dictionary not a translator to find the meanings.

You should know which level you are entered for – ask your teacher if not sure.

This list does not contain ALL the words you will need, only some of the less frequently seen ones.

Some learning techniques to try:

- ✓ **Look, cover, say, repeat, check.**
- ✓ **Make vocab cards with English on one side and Spanish on the other.**
- ✓ **Use post it notes.**
- ✓ **Play hangman.**
- ✓ **Use apps such as Memrise or Quizlet on your phone.**
- ✓ **Get someone to test you.**
- ✓ **Colour code the words, Green for go, orange for not sure, red for don't know. Write out the word 20 times in different colours saying the word out loud.**
- ✓ **Try using the word in a sentence 3 times over 24 hours.**
- ✓ **Look for synonyms.**
- ✓ **Attach an image to a word to help you remember it.**

Spanish: Vocabulary for Year 11 Foundation Reading PPE

Revise: Holidays, music, celebrations, family members, food, sports, new technology, charity work and volunteering, school, problems facing young people, healthy living.

Apellido		Horario	
Edad		Asistir	
Dirección		Casarse	
Casado		Nadie	
Soltero		Solo	
Una entrevista		Lejos	
Cantante		Cerca	
Grabar		La soledad	
Content		Hermosa	
La boda		Querer	
La iglesia		Marido	
La novio/a		Lo mejor	
Escoger		Una excursion	
El casamiento		Un parquet temático	
Entrenamiento		El campo	
Concurso		Un lajo	
Un premio		El paisaje	
El ganador		El malgasto	
Acompañado		Preocupante	
Olvidar		Lanzar	
Guantes		El medio ambiente	
Empezar		Apagar	
La red		El paro	
Anoche		La formación professional	
Un portátil		¡Qué ilusión!	
Un correo electrónico		La cena	
Mandar		Ganar	
Contestar		Un partido	
En seguida		Una asignatura	
Los pobres		Acceder	
Siguiente		Correr	
Juguetes		Ligera	
Bolsos		Llueve	
El fondo de		Quedarse	
Mar		Las redes sociales	
Saludar		Temas	
Un ramo de		Un anuncio	
Un pulpo		Cuidar	
Guiños			
El bosque			
Las sirenas de nácar			
Obligatorio			
Nocturno			
Igual			

Spanish: Vocabulary for Year 11 Higher Reading PPE

As for Foundation paper plus …

Plata		Un premio	
Orgulloso		Una entrada	
Descansar		Un periódico	
Una carrera		Una sala de chat	
Ni siquiera		La ayuda	
Mudarse		Una tarea	
Quejarse		Colgar	
Pedir		Confundir	
Dejar		Ambos	
Disputa		Esforzarse	
Repasar		Manifestar	
Es culpa de		Un pensamiento	
Llorar		Un sentimiento	
Suspendido		Conseguir	
Una herramienta		Una amistad	
Un aparato		Los celos	
Una encuesta		Enemigo	
Dirigido a		Merecer	
Despertadores		La seguridad	
Un hecho		El autoestima	
Puertas		Contar el uno con el otro	
Puentes		Equilibrada	
Cumplirse		El deseo	
Una pelea		Cambiar	
Alojamiento		Sencillo	
El escaso		Una actuación	
Una organización benéfica			
Obras			
Un andén			
Una maleta			
Una taquilla			
La consigna			
El cerebro			
El corazón			
Los pulmones			
La felicidad			
La cuesta			
La esquina			
Un título			
Casarse			

Spanish: Vocabulary for Year 11 Foundation Listening PPE

Revise: Holidays, music, celebrations, family and relationships, food, sports, new technology, charity work and volunteering, school, problems facing young people, healthy living and environment.

Gastar		Loco	
La paga		Las corridas	
Fuera		Disfrutar	
Ahorrar		Soltero	
Descargar		Una boda	
El esquí acuático		Las parejas	
La vela		Punto	
Los restos		Novio/a	
Un contenedor		La iglesia	
Tirar		El matrimonio	
Deportista		Seprararse	
El almuerzo		Una ambición	
Preocuparse		Los Juegos Olímpicos	
Pájaros		Llegar a ser	
Estar en peligro		Recogedor de pelotas	
Cortar		Cocinera	
Árboles		Ama de casa	
Los pobres		Un concurso	
La Tierra		Periodista	
Tanto		Vendedor de periódicos	
La gente		El ejercicio	
Llevarse bien con		Dar un paseo	
El mismo		Aprender	
Una cosa		Sin prisa	
Discutir		Engordarse	
La libertad		Tomar una copa	
Caerse bien con		Decepcionarse	
Las redes sociales			
Las noticias			
Compartir			
Estar en contacto con			
Buscar			
Circular			
El bachillerato			
Los idiomas			
Estar de acuerdo			
El clima			
Mucho que hacer			
Fascinarse			
Un tema			
Desagradable			
Alegre			
El humor			

Spanish: Vocabulary for Year 11 Higher Listening PPE

As for Foundation paper plus …

Cruzar		Sospechar	
Probar		Acabar con	
Sabroso		Borrar	
Navegar un río		Tomarse en serio	
Un crucero		Reírse	
Un puerto		Rebajas	
Una canción		Suspender	
Sacar un título/disco		Aprobar	
La esperanza		Buenas notas	
Un éxito		El acoso cibernético	
Un ladrón		Aconsejar	
Contestar		Molestarse	
Una llamada perdida		Llevarse bien con	
Reconocer		La fecha de nacimiento	
Reunir		La mitad	
Alimentos		Acabar de	
Los necesitados		A pesar de	
Llenar		Una sonrisa	
Una bolsa		Marcharse	
Un vecino		Los bosillos	
Mi hijo		Vacío	
Ir de botellón		El hogar	
Advertirse		El peligro	
Jamás		El camino	
Algo		La frontera	
Inaceptable		Detener	
Con permiso		Deportar	
Estar equivocado		Acoger	
Por desgracia		Adelante	
Estar mal visto		Orgulloso	
Dejar		Enfadarse	
Tocar		El maquillaje	
Fastidiarse		Chicle	
Grabar		Un portátil	
Estropear		Dejar de	
El ambiente		Pesar	
Gritar		Lento	
Los demás		Señal	
Promocionar		fuerte	
La publicidad			

Revision for Higher Writing PPE (Spanish)

This exam will involve-

- **one 90 word essay on 4 bullet points**
- **one 150 word essay on 2 bullet points**
- **translation from English to Spanish**

In addition to general revision on the topics we have covered so far in the course and grammar structure, focus on the following -

- Use of new technologies
- School
- Visits abroad
- What you do in your free time
- Celebrations and special occasions
- Family and Relationships

Revision for Foundation Writing PPE

This exam will involve-

- **4 statements describing a picture**
- **one 40 word response on 4 bullet points**
- **translation from English to Spanish**
- **one 90 word essay on 4 bullet points**

In addition to general revision on the topics we have covered so far in the course and grammar structure, focus on the following -

- House, town and region
- School
- Visits abroad
- What you do in your free time
- Celebrations and special occasions

For both tiers of entry please:

Ensure that you can give a range of opinions and explain your views in detail.

Revise how to connect your sentences effectively.

Check that you can include examples of a range of tenses (even if the question does not explicitly request them).

Prepare to make use of a wide range of vocabulary and structures in your work.

OPINIONS

Opinion phrases
Pienso que ……..- I think that
Creo que……- I believe that
Me parece que…….. – It seems to me that

Me gusta(n) – I like
Me encanta(n) - I love

Ne me gusta(n) - I don't like
Odio - I hate

Prefiero – I prefer

Explanation of opinions

Porque es divertido/a	because it is fun
Porque es interesante	because it is interesting
Porque es fácil	because it is easy
Porque es mejor que	because it is better than…….
Aunque es tonto/a	although it is stupid

CONNECTIVES

Basic

pero - but
y - and
porque- because
o - or

Advancing

sin embargo - however
asi que- so
primero- first
después- after that
finalmente– finally
también - also
desafortunadamente– unfortunately
afortunadamente - fortunately
más temprano– earlier
más tarde- later

Subordinating conjunctions

aunque - although
que- that
cuando- when
si- if
mientras- while

TENSES –

11) **Present**
15. hoy - today
16. normalmente - normally

17. por la mañana- in the morning
18. por la tarde- in the afternoon
19. el sábado - on Saturday
20. los sábados- on Saturdays
21. A las ocho – at 8.00
22. A la una- at 1.00

Present tense verbs

ser– to be	**tener– to have**
soy - I am	tengo- I have
eres - you are	tienes - you have
es - he / she is	tiene - he / she / it has
son - they are	tienen -they have

Useful present tense verbs

19. Juego – I play
20. Como – I eat
21. Bebo – I drink
22. Llevo – I wear
23. Me quedo – I stay
24. Leo – I read
25. Veo – I see
26. Hay – there is/are
27. Puedo…….jugar - I can play; se puede…….jugar – one/you can play

12) Past tense

Past time phrases – verb comes next if these start the sentence

11. ayer - yesterday
12. la semana pasada - last week
13. el año pasado - last year
14. hace ….años - … years ago
15. cuando era más joven - when I was younger

Preterite tense verbs

Comí una pizza	I ate pizza
Bebí una coca cola	I drank coke
Vi unas películas	I watched films
Hice mis deberes	I did my home learning
Jugué al tenis	I played tennis
Fue divertido/a	It was fun
Fui de compras	I went shopping
Fui a los Estados Unidos	I went to America
Me quedé en un hotel	I stayed in a hotel

13) Imperfect tense (used to)

Comía la pizza	I used to eat pizza
Bebía la coca cola	I used to drink coke
Veía las películas	I used to watch films
Hacía mis deberes	I used to do my home learning

Jugaba al tenis	I used to play tennis
Era divertido/a	It used to be fun
Iba de compras	I used to go shopping
Iba a los Estados Unidos	I used to go to America
Me quedaba en un hotel	I used to stay in a hotel

Useful phrases
Había – there was/were
Hacía + sol/viento/calor/frío – It was sunny/windy/hot/cold
Llovía- It was raining
Nevaba- It was snowing
Era divertido/aburrido – it was fun/boring

14) Future tense

Future time phrases
11. mañana- tomorrow
12. en el futuro - in the future
13. la semana que viene - next week
14. el año que viene - next year
15. cuando sea mayor - when I'm older

To form the future tense
For the 'I' form add é to the end of the infinitive for most regular verbs
Jugaré- I will play
Visitaré- I will visit

Watch out for the irregulars: Tendré- I will have
Saldré- I will go out

Seré rica – I will be rich
Iremos a Australia – we will go to Australia

15) Conditional tense – what would you do, if…..?

Sentence starters
E.g. Si tuviera tiempo, trabajaría más – if I had time, I would work more
Si fuera rica, compraría una casa- if I were rich, I would buy a house
Si ganara la lotería, no trabajaría – if I won the lottery, I wouldn't work

The conditional tense
Tendría – I would have
Sería – I would be
Me gustaría – I would like

Understanding the Spanish GCSE examination rubrics and instructions

The following is a guide to the sort of rubrics and instructions that will be used in Section B of the Listening and Reading exams. The list is indicative, not exclusive.

Spanish	English
Completa/Rellena la tabla/el texto/el espacio blanco en **español**.	Complete/Fill in the table/the text/the blank space in **Spanish**.
Completa la frase/las frases…	Complete the phrase(s)/sentence(s)...
Contesta a las preguntas en **español**.	Answer the questions in **Spanish**.
Da (dos) detalles...	Give (two) details...
Empareja…	Match…
Escribe la(s) letra(s) correcta(s) en cada casilla.	Write the correct letter(s) in each box.
Escribe la letra correcta/el número correcto en la casilla.	Write the correct letter/number in the box.
Escribe todos los detalles.	Write all the details/Give full details.
Escoge...	Choose…
Escucha la descripción/la opinión/la entrevista/las noticias…	Listen to the description/the opinion/the interview/the news…
Indica…	Indicate…
Indica las…frases verdaderas.	Indicate the …true phrases/sentences.
Lee el texto / el artículo / la lista de actividades / la lista de instrucciones / la información.	Read the text/the article/the list of activities/the list of instructions/the information.

Spanish	English
Lee lo que dicen…	Read what they say…
Menciona una ventaja/desventaja…	Mention one advantage/disadvantage…
No es necesario escribir con frases completas.	It is not necessary to write in full sentences.
Escribe: **P** si la opinión es positiva **N** si la opinión es negativa **P+N** si la opinión es positiva y negativa	Write: **P** if the opinion is positive **N** if the opinion is negative **P+N** if the opinion is positive and negative
Puedes escribir la misma letra más de una vez.	You can use the same letter more than once.
¿Quién…?	Who…?
Responde a las dos partes de la pregunta.	Answer both parts of the question.
Selecciona/Escoge el párrafo…	Select/Choose the paragraph…

The following is a guide to the sort of rubrics and instructions that will be used in the Writing exam. The list is indicative, not exclusive.

Spanish	English
Escribe aproximadamente **40** palabras en **español**.	Write approximately **40** words in **Spanish**.
Escribe aproximadamente **90** palabras en **español**. Responde a todos los aspectos de la pregunta.	Write approximately **90** words in **Spanish**. Write something about each bullet point.
Escribe aproximadamente **150** palabras en **español**. Responde a los dos aspectos de la	Write approximately **150** words in **Spanish**. Write something about both bullet points.

Spanish	English
pregunta.	
Escribe **cuatro** frases en **español** que describan la foto.	Write **four** sentences in **Spanish** about the photo.
Escríbele sobre…	Write to him/her about…
Escríbele una carta/un email.	Write a letter/email to him/her.
Menciona…	Mention...

Y11 Geography PPE Revision Check List

Note: In addition to the content below, you will also need to revise both your human and physical fieldworks.

Natural Hazards

Key Ideas	Specification Content
Natural hazards pose major risks to people and property.	Definition of a natural hazard. Types of natural hazard. Factors affecting hazard risk.
Earthquakes and volcanic eruptions are the result of physical processes.	Plate tectonics theory. Global distribution of earthquakes and volcanic eruptions and their relationship to plate margins. Physical processes taking place at different types of plate margin (constructive, destructive and conservative) that lead to earthquakes and volcanic activity.
The effects of, and responses to, a tectonic hazard vary between areas of contrasting levels of wealth.	Primary and secondary effects of a tectonic hazard. Immediate and long-term responses to a tectonic hazard. Use named examples to show how the effects and responses to a tectonic hazard vary between two areas of contrasting levels of wealth.
Management can reduce the effects of a tectonic hazard.	Reasons why people continue to live in areas at risk from a tectonic hazard. How monitoring, prediction, protection and planning can reduce the risks from a tectonic hazard.
Global atmospheric circulation helps to determine patterns of weather and climate.	General atmospheric circulation model: pressure belts and surface winds.
Tropical storms (hurricanes, cyclones, typhoons) develop as a result of particular physical conditions.	Global distribution of tropical storms (hurricanes, cyclones, typhoons). An understanding of the relationship between tropical storms and general atmospheric circulation. Causes of tropical storms and the sequence of their formation and development. The structure and features of a tropical storm. How climate change might affect the distribution, frequency and intensity of tropical storms.
Tropical storms have significant effects on people and the environment.	Primary and secondary effects of tropical storms. Immediate and long-term responses to tropical storms. Use a named example of a tropical storm to show its effects and responses. How monitoring, prediction, protection and planning can reduce the effects of tropical storms.
The UK is affected by a number of weather hazards.	An overview of types of weather hazard experienced in the UK.

Extreme weather events in the UK have impacts on human activity.	An example of a recent extreme weather event in the UK to illustrate: •• causes •• social, economic and environmental impacts •• how management strategies can reduce risk. Evidence that weather is becoming more extreme in the UK.
Climate change is the result of natural and human factors, and has a range of effects.	Evidence for climate change from the beginning of the Quaternary period to the present day. Possible causes of climate change: •• natural factors – orbital changes, volcanic activity and solar output •• human factors – use of fossil fuels, agriculture and deforestation. Overview of the effects of climate change on people and the environment.
Managing climate change involves both mitigation (reducing causes) and adaptation (responding to change).	Managing climate change: •• mitigation – alternative energy production, carbon capture, planting trees, international agreements •• adaptation – change in agricultural systems, managing water supply, reducing risk from rising sea levels.

The Living World

Key Ideas	Specification Content
Ecosystems exist at a range of scales and involve the interaction between biotic and abiotic components.	An example of a small scale UK ecosystem to illustrate the concept of interrelationships within a natural system, an understanding of producers, consumers, decomposers, food chain, food web and nutrient cycling. The balance between components. The impact on the ecosystem of changing one component. An overview of the distribution and characteristics of large scale natural global ecosystems.
Tropical rainforest ecosystems have a range of distinctive characteristics.	The physical characteristics of a tropical rainforest. The interdependence of climate, water, soils, plants, animals and people. How plants and animals adapt to the physical conditions. Issues related to biodiversity.
Deforestation has economic and environmental impacts.	Changing rates of deforestation. A case study of a tropical rainforest to illustrate: •• causes of deforestation – subsistence and commercial farming, logging, road building, mineral extraction, energy development, settlement, population growth •• impacts of deforestation – economic development, soil erosion, contribution to climate change.
Tropical rainforests need to be managed to be sustainable.	Value of tropical rainforests to people and the environment. Strategies used to manage the rainforest sustainably – selective logging and replanting, conservation and education, ecotourism and international agreements about the use of tropical hardwoods, debt reduction.

Hot desert ecosystems have a range of distinctive characteristics.	The physical characteristics of a hot desert. The interdependence of climate, water, soils, plants, animals and people. How plants and animals adapt to the physical conditions. Issues related to biodiversity.
Development of hot desert environments creates opportunities and challenges.	A case study of a hot desert to illustrate: •• development opportunities in hot desert environments: mineral extraction, energy, farming, tourism •• challenges of developing hot desert environments: extreme temperatures, water supply, inaccessibility.
Areas on the fringe of hot deserts are at risk of desertification.	Causes of desertification – climate change, population growth, removal of fuel wood, overgrazing, over-cultivation and soil erosion. Strategies used to reduce the risk of desertification – water and soil management, tree planting and use of appropriate technology.

Urban Issues and Challenges

Key Ideas	Specification Content
A growing percentage of the world's population lives in urban areas.	The global pattern of urban change. Urban trends in different parts of the world including HICs and LICs. Factors affecting the rate of urbanisation – migration (push–pull theory), natural increase. The emergence of megacities.
Urban growth creates opportunities and challenges for cities in LICs and NEEs.	A case study of a major city in an LIC or NEE to illustrate: •• the location and importance of the city, regionally, nationally and internationally •• causes of growth: natural increase and migration •• how urban growth has created opportunities: •• social: access to services – health and education; access to resources – water supply, energy •• economic: how urban industrial areas can be a stimulus for economic development •• how urban growth has created challenges: •• managing urban growth – slums, squatter settlements •• providing clean water, sanitation systems and energy •• providing access to services – health and education •• reducing unemployment and crime •• managing environmental issues – waste disposal, air and water pollution, traffic congestion. An example of how urban planning is improving the quality of life for the urban poor.
Urban change in cities in the UK leads to a variety of social, economic and environmental opportunities and challenges.	Overview of the distribution of population and the major cities in the UK. A case study of a major city in the UK to illustrate: •• the location and importance of the city in the UK and the wider world •• impacts of national and international migration on the growth and character of the city •• how urban change has created opportunities: •• social and economic: cultural mix, recreation and

	entertainment, employment, integrated transport systems •• environmental: urban greening •• how urban change has created challenges: •• social and economic: urban deprivation, inequalities in housing, education, health and employment •• environmental: dereliction, building on brownfield and greenfield sites, waste disposal •• the impact of urban sprawl on the rural–urban fringe, and the growth of commuter settlements. An example of an urban regeneration project to show: •• reasons why the area needed regeneration •• the main features of the project.
Urban sustainability requires management of resources and transport.	Features of sustainable urban living: •• water and energy conservation •• waste recycling •• creating green space. How urban transport strategies

Physical Landscapes in the UK: Coasts and Rivers

Key Ideas	Specification Content
The UK has a range of diverse landscapes.	An overview of the location of major upland/lowland areas and river systems.
The coast is shaped by a number of physical processes.	Wave types and characteristics. Coastal processes: •• weathering processes – mechanical, chemical •• mass movement – sliding, slumping and rock falls •• erosion – hydraulic power, abrasion and attrition •• transportation – longshore drift •• deposition – why sediment is deposited in coastal areas.
Distinctive coastal landforms are the result of rock type,structure and physical processes.	How geological structure and rock type influence coastal forms. Characteristics and formation of landforms resulting from erosion – headlands and bays, cliffs and wave cut platforms, caves, arches and stacks. Characteristics and formation of landforms resulting from deposition – beaches, sand dunes, spits and bars. An example of a section of coastline in the UK to identify its major landforms of erosion and deposition.
Different management strategies can be used to protect coastlines from the effects of physical processes.	The costs and benefits of the following management strategies: •• hard engineering – sea walls, rock armour, gabions and groynes •• soft engineering – beach nourishment and reprofiling, dune regeneration •• managed retreat – coastal realignment. An example of a coastal management scheme in the UK to show: •• the reasons for management •• the management strategy •• the resulting effects and conflicts.

The shape of river valleys changes as rivers flow downstream.	The long profile and changing cross profile of a river and its valley. Fluvial processes: •• erosion – hydraulic action, abrasion, attrition, solution, vertical and lateral erosion •• transportation – traction, saltation, suspension and solution •• deposition – why rivers deposit sediment.
Distinctive fluvial landforms result from different physical processes.	Characteristics and formation of landforms resulting from erosion – interlocking spurs, waterfalls and gorges. Characteristics and formation of landforms resulting from erosion and deposition – meanders and ox-bow lakes. Characteristics and formation of landforms resulting from deposition – levées, flood plains and estuaries. An example of a river valley in the UK to identify its major landforms of erosion and deposition.
Different management strategies can be used to protect river landscapes from the effects of flooding.	How physical and human factors affect the flood risk – precipitation, geology, relief and land use. The use of hydrographs to show the relationship between precipitation and discharge. The costs and benefits of the following management strategies: •• hard engineering – dams and reservoirs, straightening, embankments, flood relief channels •• soft engineering – flood warnings and preparation, flood plain zoning, planting trees and river restoration. An example of a flood management scheme in the UK to show: •• why the scheme was required •• the management strategy •• the social, economic and environmental issues.

The Challenge of Resource Management

Key Ideas	**Specification Content**
Food, water and energy are fundamental to human development.	The significance of food, water and energy to economic and social well-being. An overview of global inequalities in the supply and consumption of resources.
The changing demand and provision of resources in the UK create opportunities and challenges.	An overview of resources in relation to the UK. Food: •• the growing demand for high-value food exports from low income countries and all-year demand for seasonal food and organic produce •• larger carbon footprints due to the increasing number of 'food miles' travelled, and moves towards local sourcing of food •• the trend towards agribusiness.

	Water: •• the changing demand for water •• water quality and pollution management •• matching supply and demand – areas of deficit and surplus •• the need for transfer to maintain supplies. Energy: •• the changing energy mix – reliance on fossil fuels, growing significance of renewables •• reduced domestic supplies of coal, gas and oil •• economic and environmental issues associated with exploitation of energy sources.
Demand for food resources is rising globally but supply can be insecure, which may lead to conflict.	Areas of surplus (security) and deficit (insecurity): •• global patterns of calorie intake and food supply •• reasons for increasing food consumption: economic development, rising population •• factors affecting food supply: climate, technology, pests and disease, water stress, conflict, poverty. Impacts of food insecurity – famine, undernutrition, soil erosion, rising prices, social unrest.
Different strategies can be used to increase food supply.	Overview of strategies to increase food supply: •• irrigation, aeroponics and hydroponics, the new green revolution and use of biotechnology, appropriate technology •• an example of a large scale agricultural development to show how it has both advantages and disadvantages. Moving towards a sustainable resource future: •• the potential for sustainable food supplies: organic farming, permaculture, urban farming initiatives, fish and meat from sustainable sources, seasonal food consumption, reduced waste and losses •• an example of a local scheme in an LIC or NEE to increase sustainable supplies of food.

BTEC Tech Award Health and Social Care Revision List for External Exam

Component 3:

A Factors that affect health and wellbeing

A1 Factors affecting health and wellbeing

• Definition of health and wellbeing: a combination of physical health and social and emotional wellbeing, and not just the absence of disease or illness.
• Physical and lifestyle factors that can have positive or negative effects on health and wellbeing:
- genetic inheritance, including inherited conditions and predisposition to other conditions
- ill health (acute and chronic)
- diet (balance, quality and amount)
- amount of exercise
- substance use, including alcohol, nicotine, illegal drugs and misuse of
- prescribed drugs
- personal hygiene.

• Social, emotional and cultural factors that can have positive or negative effects on health and wellbeing:
- social interactions, e.g. supportive/unsupportive relationships,
- social integration/isolation
- stress, e.g. work-related
- willingness to seek help or access services, e.g. influenced by culture,
- gender, education.

• Economic factors that can have positive or negative effects on health and wellbeing:
- financial resources.

• Environmental factors that can have positive or negative effects on health and wellbeing:
- environmental conditions, e.g. levels of pollution, noise
- housing, e.g. conditions, location.

• The impact of life events relating to relationship changes and changes in life circumstances.

B Interpreting health indicators

B1 Physiological indicators

• Physiological indicators that are used to measure health:
- pulse (resting and recovery rate after exercise)
- blood pressure
- peak flow
- body mass index (BMI).

• Using published guidance to interpret data relating to these physiological indicators.
• The potential significance of abnormal readings: risks to physical health.

B2 Lifestyle indicators

• Interpretation of lifestyle data, specifically risks to physical health associated with:
- smoking
- alcohol consumption
- inactive lifestyles.

C Person-centred health and wellbeing improvement plans

C1 Health and wellbeing improvement plans

• The importance of a person-centred approach that takes into account an individual's needs, wishes and circumstances.
• Information to be included in plan:
- recommended actions to improve health and wellbeing
- short-term (less than six months) and long-term targets
- appropriate sources of support (formal and/or informal).

C2 Obstacles to implementing plans

• Potential obstacles:
- emotional/psychological – lack of motivation, low self-esteem, acceptance of
- current state
- time constraints – work and family commitments
- availability of resources – financial, physical, e.g. equipment
- unachievable targets – unachievable for the individual or unrealistic timescale
- lack of support, e.g. from family and friends
- other factors specific to individual – ability/disability, addiction
- barriers to accessing identified services.

History: America 1920-73 Revision checklist (2018)

Topic	Red	Amber	Green
Part 1: The American people and the 'Boom'			
1. Mass Production and the motor industry			
2. Other reasons for the boom e.g. hire purchase, tariffs, consumerism			
3. Who did and did not benefit from the boom			
4. Entertainment and Jazz			
5. Women in the 20's			
6. organised crime, prohibition and its effect on society			
7. Causes of racial tension/immigration			
8. KKK and the Red Scare			
Part 2:Bust- Americans experiences of the Great Depression and the New Deal			
9. The Great depression: unemployment, farmers and business men			
10. Hoover's response to the depression and his unpopularity			
11. Roosevelt's election as President			
12. Successes and limitations of the New Deal			
13. Opposition to the New Deal and the Supreme Court			
14. Was the New Deal successful or not?			
15. Culture in the 1930s (literature, movies and music)			
16. The impact of the Second World War on the economy			
17. Women and Black Americans during World War two			
Part 3: Post-war American society and economy			
18. The American Dream and economic growth			
19. McCarthyism			
20. Popular culture, Rock and Roll and television			
21. The Civil Rights Movement in the 60s			
22. Martin Luther King and the Civil Rights movement			
23. Malcolm X and Black Power movement			
24. The Civil Rights Acts of 1964 and 1968			
25. Social Policies of Presidents Kennedy and Johnson			
26. Feminism in the 60s			

History: Conflict and Tension 1918-39 Revision checklist (2018)

Topic	Red	Amber	Green
Part 1: Peace making			
1. Aims of the Big Three			
2. Why the Big Three disagreed			
3. Terms of the Treaty of Versailles			
4. Allied reaction to the Treaty			
5. Judging who got the most from the Treaty			
6. German reaction to the Treaty			
7. Was the Treaty fair?			
Part 2: League of Nations and International Peace			
9. Structure and aims of the League of Nations			
10. Weaknesses of the League of Nations			
11. How the League helped people			
12. Successes and failures of the League in the 1920s			
13. Locarno Treaty and the Kellogg-Briand Pact			
14. Why Japan invaded Manchuria			
15. How the League reacted to the Japanese invasion of Manchuria			
16. Why Italy invaded Abyssinia			
17. How the League reacted to the Italian invasion of Abyssinia			
Part 3: Origins and outbreak of the Second World War			
18. Hitler's aims and how other countries reacted			
19.Hitler's early policies a): Disarmament conference, Dolfuss Affair, Rearmament			
Hitler's early policies b): Saar, Stresa Front, Anglo-German naval Agreement			
20. The remilitarisation of the Rhineland			
21. Anschluss with Austria			
22. Reasons for and against appeasement			
23. The Sudentenland crisis			
24. The Munich agreement			
25. The Collapse of Czechoslovakia			
26. The Nazi Soviet Pact			

Music GCSE (Edexcel)

The exam will be 1 hour 45 minutes long and will consist of:

- **6 listening questions** on set works
- **1 listening question** on an unknown piece**.**
- **1 long answer question** comparing a set work to an unknown piece (which you will hear)
- **1 melodic and rhythmic dictation question.**

You will need to revise the key features from all 8 set works:

- Queen- Killer Queen
- Purcell- Music for a While
- J Williams- Star Wars
- Schwartz- Defying Gravity
- Beethoven- Movement 1 from 'Pathetique' sonata.
- Afro Celt Sound System – 'Release'
- Esperanza Spalding- 'Samba Em Preludio'
- J.S Bach- Brandenburg Concerto No.5, 3rd movement.

For each set work you will need to be familiar with the key features such as:

- Structure
- Harmony/tonality
- Dynamics
- Texture
- Instrumentation
- Rhythm
- Tempo/metre

Top tips for music revision:

- **Categorise your revision notes** into the different musical features above- make sure you know at least a few features for each set work in each category.
- **Active listening** to the set works is the key. Don't just have them on in the background as you do other revision. Listen carefully to different features each time you play the set work, e.g. focus on the texture one time, instruments another time etc.
- **Listen to small chunks** of the music. In the exam you will only hear a 30 second extract of the music. Practice writing down the features to 30 second sections. **Remember**- musical features are not always the same all the way through so the features may change depending on which section of the set work you listen to.
- **Analyse** features of the music**.** When writing or revision notes, always ask '**why**' a musical feature is used, this will help for the **long answer** section.
- Make sure you are confident on key **vocabulary**. Check the list on the next page and make sure you understand what each word means, and what each word would **sound like** in a set work.

Vocabulary list for Music

TEMPO

ADAGIO → SLOW
ALLEGRO → FAST
PRESTO → VERY FAST
LARGO → VERY SLOW
ANDANTE → WALKING PACE
ALLEGRETTO → QUITE FAST

DYNAMICS

PP MP P MF
F FF SF
CRESCENDO
DIMINUENDO
TERRACED DYNAMICS

TEXTURE

MONOPHONIC
POLYPHONIC
HOMOPHONIC
HETEROPHONIC
CONTRAPUNTAL
MELODY AND ACCOMPANIMENT

RHYTHM

SYNCOPATION
SWING RHYTHM
TRIPLETS
CROSS RHYTHMS
ANACRUSIS
POLYRHYTHMS

INSTRUMENTATION

BRASS STRING
PERCUSSION WOODWIND
KEYBOARDS
HARPSICHORD CONTINUO
SYNTHESISER

HARMONY/TONALITY

MAJOR MINOR
KEY SIGNATURE ATONAL
MODAL CHROMATIC
DIATONIC DISSONANCE
CONSONANCE
FIGURED BASS DRONE

MELODY

SEQUENCE
CHROMATIC
ORNAMENTATION
DISJUNCT
CONJUNCT
DESCENDING/ASCENDING

WORD SETTING

WORD PAINTING
MELISMA
SYLLABIC

STRUCTURE

TERNARY
SONATA FORM
EXPOSITION
DEVELOPMENT
RECAPITULATION
CODA

TECHNOLOGY

SYNTHESISER
MULTI TRACKING
PANNING
DISTORTION
FLANGING
EQ

Year 11 Physical Education 2019

Component 1: Fitness and Body Systems
Written examination: 1 hour and 45 minutes
36% of the qualification
90 marks
Content overview
- Topic 1: Applied anatomy and physiology
- Topic 2: Movement analysis
- Topic 3: Physical training
- Topic 4: Use of data

Component 2: Health and Performance
Written examination: 1 hour and 15 minutes
24% of the qualification
70 marks
Content overview
- Topic 1: Health, fitness and well-being
- Topic 2: Sport psychology
- Topic 3: Socio-cultural influences
- Topic 4: Use of data

COMPONENT 1 MOCK EXAM POTENTIAL CONTENT

The structure and functions of the musculoskeletal system

1.1.1 The functions of the skeleton
1.1.2 Classification of bones: long (leverage), short (weight bearing), flat (protection, broad surface for muscle attachment), irregular (protection and muscle attachment)
1.1.3 Structure and their classification and use applied to performance in physical activities and sports
1.1.4 Classification of joints: pivot, hinge, ball and socket, condyloid, and their impact on the range of possible movements.
1.1.5 Movement possibilities at joints dependent on joint classification: flexion, extension, adduction, abduction, rotation, circumduction, plantar-flexion, dorsi-flexion
1.1.6 The role of ligaments and tendons, and their relevance to participation in physical activity and sport
1.1.7 Classification and characteristics of muscle types
1.1.8 Location and role of the voluntary muscular system
1.1.10 Characteristics of fast and slow twitch muscle fibre types (type I, type IIa and type IIx) and how this impacts on their use in physical activities
1.1.11 how the skeletal and muscular systems work together to allow participation in physical activity and sport

1.2 The structure and functions of the cardiovascular system

1.2.1 Functions of the cardiovascular system
1.2.2 Structure of the cardiovascular system and their role in maintaining blood circulation
1.2.3 Structure of arteries, capillaries and veins and how this relates to function and importance during physical activity and sport in terms of blood pressure, oxygenated, deoxygenated blood and changes due to physical exercise
1.2.4 The mechanisms required (vasoconstriction, vasodilation) and the need for redistribution of blood flow (vascular shunting) during physical activities compared to when resting
1.2.5 Function and importance of red and white blood cells, platelets and plasma

1.3 Anaerobic and aerobic exercise

1.3.1 Energy: the use of glucose and oxygen to release energy aerobically with the production of carbon dioxide and water, the impact of insufficient oxygen on energy release, the byproduct of anaerobic respiration (lactic acid)
1.3.2 Energy sources: fats as a fuel source for aerobic activity, carbohydrates as a fuel source for aerobic and anaerobic activity

3.1 The relationship between health and fitness and the role that exercise plays in both

3.1.1 Definitions of fitness, health, exercise and performance and the relationship between them

3.2 The components of fitness, benefits for sport and how fitness is measured and improved

3.2.1 Components of fitness and the relative importance of these components in sports
3.2.2 Fitness tests: the value of fitness testing, the purpose of specific fitness tests, the test protocols, the selection of the appropriate fitness test for components of fitness
3.2.3 Collection and interpretation of data from fitness test results and analysis and evaluation of these against normative data tables
3.2.4 Fitness tests for specific components of fitness
3.2.5 How fitness is improved – see section 3.3.1–3.3.3

3.3 The principles of training and their application to personal exercise/ training programmes

3.3.1 Planning training using the principles of training: individual needs, specificity, progressive overload, FITT (frequency, intensity, time, type), overtraining, reversibility, thresholds of training (aerobic target zone: 60–80% and anaerobic target zone: 80%–90% calculated using simplified Karvonen formula i.e. (220) – (your age) = MaxHR; (MaxHR) x (60% to 80%) = aerobic training zone; (MaxHR) x (80% to 90%) = anaerobic training zone)
3.3.2 Factors to consider when deciding the most appropriate training methods and training intensities for different physical activities
3.3.3 The use of different training methods for specific components of fitness, physical activity and sport. The advantages and disadvantages of different training methods.

3.4 The long-term effects of exercise
3.4.1 Long-term effects of aerobic and anaerobic training and exercise and the benefits to the muscular-skeletal and cardio-respiratory systems and performance
3.4.2 Long-term training effects: able to train for longer and more intensely
3.4.3 Long-term training effects and benefits: for performance of the muscular-skeletal system: increased bone density, increased strength of ligaments and tendons, muscle hypertrophy, the importance of rest for adaptations to take place.
3.4.4 Long-term training effects and benefits: for performance of the cardio-respiratory system: decreased resting heart rate, faster recovery, increased resting stroke volume and maximum cardiac output, increased size/strength of heart, increased capilliarisation, increase in number of red blood cells, drop in resting blood pressure due to more elastic muscular wall of veins and arteries, increased lung capacity/volume and vital capacity, increased number of alveoli, increased strength of diaphragm and external intercostal muscles

How to optimise training and prevent injury
3.5.1 The use of a PARQ
3.5.2 Injury prevention
3.5.3 Injuries that can occur in physical activity and sport: concussion, fractures, dislocation, sprain, torn cartilage and soft tissue injury
3.5.5 Performance-enhancing drugs (PEDs) and their positive and negative effects on sporting performance and performer lifestyle.

3.6 Effective use of warm up and cool down
3.6.1 The purpose and importance of warm-ups and cool downs to effective training sessions and physical activity and sport
3.6.2 Phases of a warm-up and their significance in preparation for physical activity and sport
3.6.3 Activities included in warm-ups and cool downs

4.1 Use of data
4.1.1 Develop knowledge and understanding of data analysis in relation to key areas of physical activity and sport
4.1.2 Demonstrate an understanding of how data is collected in fitness, physical and sport activities – using both qualitative and quantitative methods
4.1.3 Present data (including tables and graphs)
4.1.4 Interpret data accurately
4.1.5 Analyse and evaluate statistical data from their own results and interpret against normative data in physical activity and sport

COMPONENT 2 MOCK EXAM POTENTIAL CONTENT

1.1 Physical, emotional and social health, fitness and well-being

1.1.1 Physical health: how increasing physical ability, through improving components of fitness can improve health/reduce health risks and how these benefits are achieved
1.1.2 Emotional health: how participation in physical activity and sport can improve emotional/psychological health and how these benefits are achieved
1.1.3 Social health: how participation in physical activity and sport can improve social health and how these benefits are achieved
1.1.4 Impact of fitness on well-being: positive and negative health effects
1.1.5 How to promote personal health through an understanding of the importance of designing, developing, monitoring and evaluating a personal exercise programme to meet the specific needs of the individual
1.1.6 Lifestyle choices in relation to: diet, activity level, work/ rest/sleep balance, and recreational drugs (alcohol, nicotine)
1.1.7 Positive and negative impact of lifestyle choices on health, fitness and well-being, e.g. the negative

1.2 The consequences of a sedentary lifestyle

1.2.1 A sedentary lifestyle and its consequences: overweight, overfat, obese, increased risk to long-term health, e.g. depression, coronary heart disease, high blood pressure, diabetes, increased risk of osteoporosis, loss of muscle tone, posture, impact on components of fitness
1.2.2 Interpretation and analysis of graphical representation of data associated with trends in physical health issues

1.3 Energy use, diet, nutrition and hydration

1.3.1 The nutritional requirements and ratio of nutrients for a balanced diet to maintain a healthy lifestyle and optimise specific performances in physical activity and sport
1.3.2 The role and importance of macronutrients (carbohydrates, proteins and fats) for performers/players in physical activities and sports, carbohydrate loading for endurance athletes, and timing of protein intake for power athletes
1.3.3 The role and importance of micronutrients (vitamins and minerals), water and fibre for performers/players in physical activities and sports
1.3.4 The factors affecting optimum weight: sex, height, bone structure and muscle girth
1.3.5 The variation in optimum weight according to roles in specific physical activities and sports
1.3.6 The correct energy balance to maintain a healthy weight
1.3.7 Hydration for physical activity and sport: why it is important, and how correct levels can be maintained during physical activity and sport

2.1 Classification of skills (basic/ complex, open/closed)

2.1.1 Classification of a range of sports skills using the open-closed, basic (simple)-complex, and low organisation-high organisation continua
2.1.2 Practice structures: massed, distributed, fixed and variable
2.1.3 Application of knowledge of practice and skill classification to select the most relevant practice to develop a range of skills

2.2 The use of goalsetting and SMART targets to improve and/or optimise performance

2.2.1 The use of goal setting to improve and/or optimise performance
2.2.2 Principles of SMART targets (specific, measureable, achievable, realistic, time-bound) and the value of each principle in improving and/or optimising performance
2.2.3 Setting and reviewing targets to improve and/or optimise performance

2.3 Guidance and feedback on performance

2.3.1 Types of guidance to optimise performance: visual, verbal, manual and mechanical
2.3.2 Advantages and disadvantages of each type of guidance and its appropriateness in a variety of sporting contexts when used with performers of different skill levels
2.3.3 Types of feedback to optimise performance: intrinsic, extrinsic, concurrent, terminal
2.3.4 Interpretation and analysis of graphical representation of data associated with feedback on performance

2.4 Mental preparation for performance

2.4.1 Mental preparation for performance: warm up, mental rehearsal