Purple - PSHE content

Yellow – key words

KS 3 Science Curriculum 2022-2023

Curriculum Intent

The science curriculum will provide all pupils, regardless of starting point with the foundation of knowledge needed to allow them to critically analyse and engage with science, technology and nature in the modern world.

Curriculum Implementation

Year	Start When	No of lessons	Topic	Summary	Big Questions	Assessment for learning	Key Practicals
7	Autumn 2	12	Systems and health	This topic builds on students' knowledge of anatomy then transitions into the understanding of gas exchange and digestion	• What is the muscoskeletal system? • What are organs? • What are the functions of the skeleton? • How does the skeleton support an organism? • How does the skeleton protect an organism? • What cells are produced by the skeleton? • How might red blood cells be specialised? • How does the skeleton allow movement? • What are joints? • What are ligaments? • What are tendons? • What is cartilage? • What are muscles? • How are muscle cells specialised? • What can muscles do? • What does contract mean? • What is an antagonistic pair? • Why do muscles work in antagonistic pairs? • How do muscles cause movement?	• Cold calling • Core questions as the plenary of every lesson. • 10 low stakes multiple choice Questions on key content half way through topic. • 20 low stakes multiple choice questions at the end of the topic.	RP- Activity of trypsin 1 - Select equipment to ensure accurate data RP - Activity of Trypsin 2 - Collect accurate and valid data

					• What are forces measured in? • What is respiration? • What is needed for respiration? • What is produced by respiration? • What is gas exchange? • Where does gas exchange occur? • What is breathing? • What is muscle tissue made from? • What can muscles do? • Describe the process of inhalation. • Describe the process of exhalation. • What is ventilation? • What is the role of the heart? • What tissue is the heart made of? • What structures are found in the heart? • What are the three types of blood vessels? • What is the function of an artery? • What is the function of a vein? • What is the function of a capillary? • How are capillaries adapted? • What are the four components of blood? • What is the function of the plasma? • What is the function of the red blood cells? • How are red blood cells adapted? • Where are red blood cells produced? • Why does the body need nutrients • What is the function of the digestive system? • What does insoluble mean? • What does soluble mean? • What does absorbed mean?	• Exam style questions for homework. • Termly 60 minute test on previous content.	

					• What organs are found in the digestive system? • What is the function of the mouth? • How is the mouth specialised to carry out its function? • What is the function of the oesophagus? • How is the oesophagus specialised to carry out its function? • What is the function of the stomach? • How is the stomach specialised to carry out its function? • What is the function of the liver? • What is the function of the pancreas? • What is the function of the small intestine? • How is the small intestine specialised to carry out its function? • What is the function of the large intestine? • What is the function of the rectum? • What tissues are found in the stomach? • What is the function of the muscle tissue? • What is the function of the glandular tissue? • What is the function of the epithelial tissue?		
7	Autumn 2	18	Matter, energy and particles	KS2- States of matter and forces and magnets- they have covered almost all content in this topic at key	• What is matter? • What is volume? • What is mass? • What is matter made up of? • What are particles? • What is an atom? • What is a molecule? • What is a bond?	• Cold calling • Core questions as the plenary of every lesson. • 10 low stakes multiple choice Questions on	RP1 Investigating energy in food: Pre-practical tasks Explain how to measure accurately

				stage 2 but in less detail.	• Give an example of a particle. • What is energy? • How is energy stored? • What is chemical energy? • What is kinetic energy? • How is kinetic energy measured? • What is gravitational potential energy? • What is elastic potential energy? • How is energy transferred? • What is the conservation of energy? • What are the conventions for drawing energy transfer diagrams? • What is a force? • What is the unit for measuring forces? • What is a contact force? • What is a non-contact force? • How are the particles in a solid arranged? • How are the particles in a liquid arranged? • How are the particles in a gas arranged? • How can the particle model explain the properties of a solid? • How can the particle model be used to explain the properties of a liquid? • How can the particle model be used to explain the properties of a gas? • What is a change of state? • What terms are used for changes of state? • Why do changes of state occur? • Why does the internal temperature of the particles not change during a change of state?	key content half way through topic. • 20 low stakes multiple choice questions at the end of the topic. • Exam style questions for homework. • Termly 60 minute test on previous content.	RP1 Practical task - Choose variables Measure and record accurate data RP1 Follow-up Explain why graphs are used in science Suggest ways to improve an investigation

					• How can the particle model be used to explain changes of state? • What is expansion and contraction? • How does the particle model explain expansion and contraction • What is density? • How does the particle model explain density changes? • Why is the density of liquid water higher than that of solid water? • What is Brownian motion? • What is diffusion? • How does concentration affect the rate of diffusion?		
7	Spring 1	21	Atoms, molecules and mixtures	This topic builds on concepts learned in topic 1. There is a review of atomic structure and the periodic table and further work on the concept of molecules. This leads into an explanation of types of mixtures and how to separate different types of mixtures. The finals lessons introduce acids and alkalis as	• What is an atom? • What is a subatomic particle? • What are the three subatomic particles? • How are the subatomic particles arranged in an atom? • What are the charges of protons, neutrons, and electrons? • How can atoms be different to each other? • How many different atoms are there? • What is an element? • What is the periodic table of the elements? • What is a chemical symbol? • What are the conventions for writing chemical symbols? • What are the chemical symbols for oxygen, carbon, hydrogen, calcium, chlorine, magnesium, sodium	Cold calling • Core questions as the plenary of every lesson. • 10 low stakes multiple choice Questions on key content half way through topic. • 20 low stakes multiple choice questions at the end of the topic. • Exam style questions for homework. • Termly 60 minute test on previous content.	RP 3 Solubility: Pre-practical tasks Define and identify control variables Explain how to obtain a valid conclusion RP3 Practical task "Use appropriate apparatus consistently to measure and record measurements " Use and develop systematic tables in which to record observations and data

				examples of solutions.	• Why is it important to represent elements as symbols on the periodic table? • What is a molecule? • What is a chemical bond? • What is a Compound? • What are the signs of a chemical reaction? • Use particle diagrams to describe the difference between atoms and molecules using carbon, oxygen and carbon dioxide • What is a property? • Why is an initial input of energy needed in order for a chemical reaction to take place? • How do compounds get their names? • What is a pure substance? • What is a mixture? • What is a suspension? • Describe filtration • What is a colloid? • How can the substances in a colloid be separated? • What is a solution? • What happens when a solute dissolves? • What is a solvent? • What is a solute? • What is solubility? • What factors affect solubility? • When is distillation used? • Explain how distillation separates a mixture • What is the principle behind chromatography		Follow-up Draw an interpret scatter graphs Use collected data and scientific knowledge to draw conclusions RP 4 Separating substances: Practical task 1 Separate an insoluble solid froma liquid RP4 Practical task 2 Separate a solute from a solution RP4 Follow-up Calculate percentage efficiency RP4 Practical task 3 Describe how to separate a mixture of solutes RP4 Follow-up Describe how to analyse a chromatogram

					• Explain how chromatography can be used to tell if a substance is pure or a mixture • What are some further uses for chromatography • what are acids and alkalis? • How can you test if something is acid or alkali? • What are some examples of acids or alkalis? • What is the pH scale? • What is the pH range for acids? • What is the pH range for bases? • Where on the scale are the strongest acids and bases • Explain how neutralisation occurs • What are the products of neutralisation? • Give some uses of neutralisation		
7	Spring 1	14	Forces and motion	This topic is an introduction to forces and motion. It looks at both contact and non-contact forces. It then goes on to look at Newton's first law of motion and balanced forces, and how this	• What is a force? • What is a contact force? • What is friction? • How can we increase friction? • How can we reduce friction? • What is air resistance? • What is water resistance? • What is upthrust? • What is a non-contact force? • What is gravity? • What is static electricity? • What is magnetism? • What is the unit for measuring forces? • What is weight? • How are mass and weight different? • What is the unit for measuring mass?	Cold calling •Core questions as the plenary of every lesson. •10 low stakes multiple choice Questions on key content half way through topic. •20 low stakes multiple choice questions at the end of the topic.	2. RP 2 Investigating Friction: Pre-practical tasks Define and identify anomalies Explain how to improve the accuracy of an investigation 3. RP2 Practical taskMake predictions based on previous knowledge

				affects the motion of an object. It then looks at resultant forces and how these affect motion. Finally, it looks at speed and the equation for speed before finishing on distance-time graphs, and how to interpet them.	• What are balanced forces? • What are unbalanced forces? • How can you show balanced and unbalanced forces diagramatically? • What is a resultant force? • How do you calculate resultant force? • What is another way of saying the forces are balanced? • What are some examples of forces in equilibrium? • How do balanced forces affect motion? • How do unbalanced forces affect motion? • What is top speed? • What is relative speed? • What is speed? • What are the units for time? • How do you calculate speed? • What is the mean(averagae) speed • On a distance-time graph: What does a steep gradient show? • On a distance-time graph: What does a shallow gradient show? • On a distance-time graph, what does a horizontal line show? • What is a fluid? • What is pressure in the context of fluids? • What is atmospheric pressure? • How does height affect atmospheric pressure? • How does depth affect water pressure? • What else can affect pressure? • Under what conditions will an object float?	•Exam style questions for homework. •Termly 60 minute test on previous content.	Make sufficient observations and readings from measuring equipment 4. RP2 Follow-up Draw and interpret scatter graphs Use collected data and scientific knowledge to draw conclusions

					• How does density affect floating and sinking?		
7	Spring 2	15	Chemical reactions 1	This topic looks at chemical reactions, chemical symbols and how to use these in a balanced symbol equation. Word equations and identifying reactants and products. This then leads onto the specific ideas about respiration and phosotyntheiss as two main chemical reactions that students need to know about.	• What are the features of a physical change? • How is a chemical change different to a physical change? • What is a chemical reaction? • How can elements be changed into compounds? • What observations are proof of chemical reactions? • What is a word equation? • What are reactants? • What are products? • What is a molecular substance? • Name five molecular substances • What is a chemical formula? • What do the small numbers in a chemical formula represent? • What is the chemical formula for hydrogen? • What is the chemical formula for oxygen? • What is the chemical formula for water? • What is the chemical formula for methane? • What is the chemical formula for carbon dioxide? • What is the chemical formula for nitrogen? • What is air? • What is a symbol equation? • How do you balance an equation?	Core questions as the plenary of every lesson. • 10 low stakes multiple choice Questions on key content half way through topic. • 20 low stakes multiple choice questions at the end of the topic. • Exam style questions for homework. • Termly 60 minute test on previous content.	RP5 Investigating photosynthesis: Pre-Practical tasks Describe how scientific hypotheses and theories develop Plan experiments to test ideas RP5 Pratical TaskMake sufficient observations with an appropriate degree of accuracy RP5 Follow-up Interpret and plot line graphs and scatter graphs Identify patterns, correlations and linear relationships

					• What is the law of conservation of mass? • What is photosynthesis? • What are the reactants of photosynthesis? • What are the products of photosynthesis? • Represent photosynthesis with a word equation. • Represent photosynthesis with a symbol equation. • What type of chemical reaction is photosynthesis? • Why do plants photosynthesise? • Where does the energy needed for photosynthesis come from? • Where is the energy transferred too? • What is aerobic respiration? • What does aerobic mean? • What are the reactants of respiration? • What are the products of respiration? • Represent respiration with a word equation. • Represent respiration with a symbol equation. • What type of chemical reaction is respiration? • Why does respiration occur? • Where is the energy released from?		
7	Summer 1	15	Energy and Ecosystems	This topic builds on the foundations of energy and how it is transferred	• What do food chains represent? • What is at the beginning of all food chains? • Why are photosynthetic organisms important? • What is meant by biomass?	Core questions as the plenary of every lesson. • 10 low stakes multiple	RP 2- Energy in fuel 1

				through life in different ecosystems.	• Give two examples of photosynthetic organisms. • Define a producer. • Define a primary consumer. • Define a secondary consumer. • Define a tertiary consumer. • What is meant by a trophic level? • What do food webs represent? • What does interdependence mean? • How much energy is transferred from light by plants during photosynthesis? • How much energy is transferred from one trophic level to the next? • What is useful energy? • What is wasted energy? • What is energy dissapation? • What is power? • How do we calculate power? • What do we use energy for? • What resources do we use for energy? • What are renewable energy resources? • What are non-renewable energy resources? • How do fossil fuel power stations generate electricity? • What chemical reaction occurs in power stations? • What is the equation for this reaction?	choice Questions on key content half way through topic. • 20 low stakes multiple choice questions at the end of the topic. • Exam style questions for homework. • Termly 60 minute test on previous content.	RP 2- Energy in fuel 2 RP 2- Energy in fuel 3