Curriculum Map: Year 7 Science

Half Term 1

Topic	Transition skills	Cells	Changes of state
Intent	Students are introduced to concept of working scientifically which will be taught through and clearly related to the substantive science taught throughout the year. They will be introduced to the use of scientific vocabulary, including the use of scientific nomenclature and units of mathematical representations.	Students develop an understanding of cells as the fundamental unit of living organisms. Students will learn the structure and function of cell components of animal, plant, and bacterial cells. They will develop their ability to use a microscope to identify cells and record observations.	Learn key knowledge about the particulate nature of matter. They will learn how particles are arranged in the three states of matter and how these states can be changed in relation to the particle model.
Key Knowledge	• How to identify and minimise risks in a lab • How to safely use a Bunsen burner in a lab. • Name different pieces of equipment used in science including how to draw 2d scientific diagrams of them. • Identify variables in an investigation which would include independent, dependent and control. • Making accurate measurements using different pieces of equipment used in science. • Making simple observations as well as recording data for an investigation.	• How to observe, interpret and record cell structure using a light microscope. • The functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria, and chloroplasts. • The similarities and differences between plant and animal cells. • The structure of a bacterial cell. • The structure and function of specialised animal and plant cells.	• The three states of matter which include solids, liquids, and gas. • The properties of the different states of matter (solid, liquid and gas) in terms of the particle model. • The changes of state in terms of the particle model.
Retrieval Practice	• Use of Do now with this unit, last unit and last year	• Use of Do now with this unit, last unit and last year	• Use of Do now with this unit, last unit and last year
Key Skills	• Use scientific vocabulary, terminology, and definitions confidently in both written and spoken work. • Comparisons. • Data interpretation. • Making observations	• Use scientific vocabulary, terminology, and definitions confidently in both written and spoken work when recalling and comparing cells. • Develop ability in method writing.	• Use scientific vocabulary, terminology, and definitions confidently in both written and spoken work. • Interpreting particle diagrams • Descriptive writing.

	• Recording data	• Practical skills: Develop use of the microscope to make accurate observations. • Maths' skills: calculating magnification of cells.	
Key Vocabulary	Safety, risks, variables, independent, dependent, control, observations, prediction, scientific equipment.	Cell, nucleus, cytoplasm, cell membrane, chloroplast, mitochondria, ribosome, cell wall, permanent or large vacuole, specialised, plasmid, capsule, flagellum, magnify, objective lens, coarse focus, fine focus, stage.	Solids, liquids, gas, physical change, state, particles, vibrate, regular, irregular, fixed shape, random.
Key Reading	BBC bitesize key stage 3 Exploring science Knowledge organiser Reading comprehension articles	BBC bitesize key stage 3 Exploring science Knowledge Organiser Reading comprehension articles	BBC bitesize key stage 3 Exploring science Knowledge organiser Reading comprehension articles
End Point	Students are competent in answering structured and longer response exam style questions.	Students are competent in answering structured and longer response exam style questions. Students are competent in answering graph-based questions. Able to structure comparative sentences.	Students are competent in answering structured and longer response exam style questions. Able to structure evaluations. Can interpret diagrams and flow charts.
Form of Assessment	End of topic test	End of topic test with synoptic questions from the previous topic	Exam Phrasing and individualised teacher feedback dirt questions
Enrichment Opportunities	Use of outdoor classroom. As Universities start to offer science-based workshops again Y7 will be given the opportunity to take part in trips to local Universities to gain insights into scientific courses and careers. Stem provision in school providing opportunities for workshops and outside speakers. British Science Week Link to science careers.		
Leadership Opportunities	Chances to formally present within lessons and take ownership of that process. Student examples to demonstrate good quality work. Group work within lessons where students think about how to take up a role within a group.		

Curriculum Map: Year 7 Science

Half Term 2

Topic	Energy stores	Organisation in animals
Intent	Students to learn about Energy changes and other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels.	Students to learn about the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms.
Key Knowledge	• Describe the different types of energy stores using examples. • Describe energy transfers between different stores. • Describe the Conservation of energy. • Calculate the efficiency of different appliances using the formula useful energy output ÷ total energy input. • Planning how to find out the energy in food by burning it. • Interpreting results from an investigation and writing conclusions and evaluations based upon those results.	• Describe the link between cells, tissues, organs, and organ systems. • Describe different animal organ systems using examples such as the circulatory system looking at the structure and function of the heart, blood, and blood vessels. • the structure and functions of the human skeleton, to include support, protection, movement and making blood cells. • biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles. the function of muscles and examples of antagonistic muscles.
Retrieval Practice	• Use of Do now with this unit, last unit and last year	Use of Do now with this unit, last unit and last year
Key Skills	• Use scientific vocabulary, terminology and definitions confidently in both written and spoken work. • Graph skills. • Calculations to work out efficiency. • Problem solving. • Analysis of data.	• Use scientific vocabulary, terminology and definitions confidently in both written and spoken work. • Graph skills. • Descriptive writing. Describe and explain specified examples of the technological applications of science.
Key Vocabulary	Energy stores, dissipate, gravitational, kinetic, thermal, nuclear, radiation, efficiency, power, electrical, elastic potential , sound, light, chemical.	Cell, tissue, organ, organ system, organism, atrium, ventricles, arteries, veins, capillaries, platelets, plasma, white blood cells, red blood cells, muscles, antagonistic,
Key Reading	BBC bitesize key stage 3 Exploring science Knowledge Organiser	BBC bitesize key stage 3 Exploring science Knowledge organiser

	Reading comprehension articles	Reading comprehension articles
End Point	Students are competent in answering structured and longer response exam style questions. Students can plot and analyse line graphs.	Students are competent in answering structured and longer response exam style questions.
Form of Assessment	End of topic test with synoptic questions from the previous topic	Exam phrasing and individualised dirt questions
Enrichment Opportunities	Use of outdoor classroom. As Universities start to offer science-based workshops again Y7 will be given the opportunity to take part in trips to local Universities to gain insights into scientific courses and careers. Stem provision in school providing opportunities for workshops and outside speakers. British Science Week Link to science careers.	
Leadership Opportunities	Chances to formally present within lessons and take ownership of that process. Student examples to demonstrate good quality work. Group work within lessons where students think about how to take up a role within a group.	

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Curriculum Map: Year 7 Science

Half Term 3

Topic	Separating Techniques	Forces
Intent	Students will learn about atoms, elements compounds and mixtures. They will also learn about simple techniques for separating mixtures: filtration, evaporation, distillation, and chromatography.	Learn key knowledge about what forces are and how they act on all objects around us. Students learn about motion, driving safety and how reaction times are affected by drugs and alcohol.

Key Knowledge	• differences between atoms, elements, and compounds • mixtures, including dissolving. • simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography	• forces as pushes or pulls, arising from the interaction between two objects • using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces • moment as the turning effect of a force • forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water • forces measured in newtons, measurements of stretch or compression as force is changed force-extension linear relation; Hooke's Law as a special case • work done and energy changes on deformation Science – key stage 3 11 • non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets and forces due to static electricity
Retrieval Practice	• Use of Do now with this unit, last unit and last year	Use of Do now with this unit, last unit and last year
Key Skills	• Use scientific vocabulary, terminology and definitions confidently in both written and spoken work. • Graph skills. • Descriptive writing. • Describe and explain specified examples of the technological applications of science.	• Use scientific vocabulary, terminology and definitions confidently in both written and spoken work. • Graph skills. • Calculations to work out efficiency. • Problem solving. Analysis of data.
Key Vocabulary	Atoms, elements, compounds, mixtures, dissolve, chromatography, evaporations, crystallisation, filtrations, distillation.	forces, gravity, air resistance, mass, weight, friction, upthrust, resultant force, streamlined.
Key Reading	BBC bitesize key stage 3 Exploring science Knowledge organisers Reading comprehension articles	BBC bitesize key stage 3 Exploring science Knowledge Organisers Reading comprehension articles
End Point	Students are competent in answering structured and longer response exam style questions.	Students are competent in answering structured and longer response exam style questions. Students can plot and analyse line graphs.
Form of Assessment	Exam phrasing and individualised dirt questions	Exam phrasing and individualised dirt questions

Enrichment Opportunities	Use of outdoor classroom. As Universities start to offer science-based workshops again Y7 will be given the opportunity to take part in trips to local Universities to gain insights into scientific courses and careers. Stem provision in school providing opportunities for workshops and outside speakers. British Science Week Link to science careers.
Leadership Opportunities	Chances to formally present within lessons and take ownership of that process. Student examples to demonstrate good quality work. Group work within lessons where students think about how to take up a role within a group.

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Curriculum Map: Year 7 Science		
Half Term 4		
Topic	Organisation in plants	Transport in living organisms
Intent	Students to learn about the organisation of multicellular organisms. Their focus here will be on plants. They will be looking at the importance of plants and how there are able to function with their levels of organisation from cells to tissues to organ systems.	Students will learn about the role diffusion, osmosis, and active transport play in the movement of materials in and between cells. The will learn about specific examples where this takes place in both animals and plants.
Key Knowledge	• The Importance of plants and comparisons to animals. • Xylem and phloem tissue in the transport of water, dissolved minerals and glucose in plants • Plants organ systems	• Diffusion being the movement of particles from a high to a low concentration. • Osmosis being the movement of water particles from a high to a low water concentration.

	• Observing plant tissue from celery under the microscope. • The process and importance of germination linking this with the role agronomists play.	• Active transport being the movement of particles from a low to a high concentration. • Diffusion and osmosis are both passive processes which don not require energy. • Active transport requires energy.
Retrieval Practice	• Recap levels of organisation • Use of Do now with this unit, last unit and last year • Synoptic assessment at the end of this topic	Use of Do now with this unit, last unit and last year
Key Skills	• Use scientific vocabulary, terminology and definitions confidently in both written and spoken work. • Observational skills. • Drawing scientific diagrams. • Descriptive writing.	• Use scientific vocabulary, terminology, and definitions confidently in both written and spoken work. • Graph skills. • Analysis of data.
Key Vocabulary	Cells, tissues, organs, organ systems, leaf, stem, roots, flower, seeds, germination, xylem, phloem, minerals, dissolved	Diffusion, osmosis, active transport, energy, passive, concentration, partially permeable.
Key Reading	BBC bitesize key stage 3 Exploring science Knowledge organisers Reading comprehension articles	BBC bitesize key stage 3 Exploring science Knowledge Organisers Reading comprehension articles
End Point	Students are competent in answering structured and longer response exam style questions.	Students are competent in answering structured and longer response exam style questions. Students can plot and analyse line graphs.
Form of Assessment	End of topic assessment with synoptic questions	Exam phrasing and individualised dirt questions
Enrichment Opportunities	Use of outdoor classroom. As Universities start to offer science-based workshops again Y7 will be given the opportunity to take part in trips to local Universities to gain insights into scientific courses and careers. Stem provision in school providing opportunities for workshops and outside speakers. British Science Week Link to science careers.	
Leadership Opportunities	Chances to formally present within lessons and take ownership of that process. Student examples to demonstrate good quality work.	

	Group work within lessons where students think about how to take up a role within a group.

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Curriculum Map: Year 7 Science		
Half Term 5		
Topic	Atoms and periodic table	Energy resources
Intent	Students will learn about the development of the atom and periodic table over time. They will look at the work of different scientists and how this work led to new discoveries about the atom and the periodic table.	Students learn about the use of energy resources for generating electricity, transport, and heating. They will look at renewable and non-renewable energy resources. They will consider how decisions they make could impact on the environment they live in. i.e., walking/ cycling to school to using appliances at home.
Key Knowledge	• The development of the atomic model • The structure of the atom • differences between atoms, elements, and compounds • The Periodic Table • The varying physical and chemical properties of different elements • The principles underpinning the Mendeleev Periodic Table	• Recap of energy stores and transfers • Use of fossil fuels and the impacts of this on the environment • Renewable energy resources and the advantages and disadvantages. • Non-Renewable energy resources and the advantages and disadvantages. • Evaluating the use of different energy resources.

	• The Periodic Table: periods and groups; metals and non-metals • How patterns in reactions can be predicted with reference to the Periodic Table • The properties of metals and non-metals	
Retrieval Practice	• Recap atoms, elements, and compounds • Use of Do now with this unit, last unit and last year	• Recap of energy stores • Use of Do now with this unit, last unit and last year
Key Skills	• Use of the relevant scientific vocabulary compose explanations and justifications. • This historical context provides an opportunity for students to show an understanding of why and describe how scientific methods and theories develop over time.	• Use scientific vocabulary, terminology, and definitions confidently in both written and spoken work. • Graph skills. • Analysis of data.
Key Vocabulary	Atoms, elements, nucleus, protons, neutrons, electrons, positive, negative, mass, shells, rows, periods, properties, groups, metals, nonmetals.	Renewable, non-renewable, replenished, resources, electricity, heating, transport, fossil fuels
Key Reading	BBC bitesize key stage 3 Exploring science Knowledge organiser Reading comprehension articles	BBC bitesize key stage 3 Exploring science Knowledge Organiser Reading comprehension articles
End Point	Students are competent in answering structured and longer response exam style questions.	Students are competent in answering structured and longer response exam style questions. Students can plot and analyse line graphs.
Form of Assessment	End of topic assessment with synoptic questions	End of topic assessment with synoptic questions
Enrichment Opportunities	Use of outdoor classroom. As Universities start to offer science-based workshops again Y7 will be given the opportunity to take part in trips to local Universities to gain insights into scientific courses and careers. Stem provision in school providing opportunities for workshops and outside speakers. British Science Week Link to science careers.	

Leadership Opportunities	Chances to formally present within lessons and take ownership of that process. Student examples to demonstrate good quality work. Group work within lessons where students think about how to take up a role within a group.

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Curriculum Map: Year 7 Science			
Half Term 6			
Topic	Digestion	Acids and alkalis	Speed
Intent	Students will learn about the tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts)	Students will learn how to define acids and alkalis in terms of neutralisation reactions. They will learn about the pH scale for measuring acidity/alkalinity; and indicators.	Students will learn about describing motion, speed and the quantitative relationship between average speed, distance, and time (speed = distance ÷ time). They will be analysing the representation of a journey on a distance-time graph
Key Knowledge	• Recap organisation, specialised cells, and transport • The journey of food through the digestive system • Modelling the digestive system	• The pH scale can be used to determine whether a substance is an acid, alkali or neutral. • Acids have a pH of 0-6 • Neutral substances have a pH of 7.	• Recap forces • The relationship between speed distance and time. • Calculate the speed using the distance and time.

	• The structure and function of the small intestine • The different enzymes and their role in digestion	• Alkalis have a pH of 8-14 • Acids and alkalis can combine to form a neutral solution. • Testing different substances using universal indicator solution.	• Draw a distance time graph. • Analyse the representation of a journey on a distance time graph.
Retrieval Practice	• Recap organisation, specialised cells, and transport	• Use of Do now with this unit, last unit and last year	• Recap forces • Use of Do now with this unit, last unit and last year
Key Skills	• Use scientific vocabulary, terminology, and definitions confidently in both written and spoken work. • Using models in science to help understand more challenging concepts or processes.	• Use of the relevant scientific vocabulary compose explanations and justifications. • This historical context provides an opportunity for students to show an understanding of why and describe how scientific methods and theories develop over time.	• Use scientific vocabulary, terminology, and definitions confidently in both written and spoken work. • Graph skills. • Analysis of data.
Key Vocabulary	Oesophagus, stomach, small intestine, large intestine, rectum, anus, enzymes, hydrochloric acid, large surface area, blood supply.	Acids, alkalis, neutral, pH scale, indicator	Speed, distance, time, seconds, metres, meters/second, graph, stationary.
Key Reading	BBC bitesize key stage 3 Exploring science Knowledge organiser Reading comprehension articles	BBC bitesize key stage 3 Exploring science Knowledge organiser Reading comprehension articles	BBC bitesize key stage 3 Exploring science Knowledge Organiser Reading comprehension articles
End Point	Students are competent in answering structured and longer response exam style questions.	Students are competent in answering structured and longer response exam style questions.	Students are competent in answering structured and longer response exam style questions. Students can plot and analyse line graphs.
Form of Assessment	Exam phrasing and individualised dirt questions	Exam phrasing and individualised dirt questions	Exam phrasing and individualised dirt questions
Enrichment Opportunities	Use of outdoor classroom. As Universities start to offer science-based workshops again Y7 will be given the opportunity to take part in trips to local Universities to gain insights into scientific courses and careers. Stem provision in school providing opportunities for workshops and outside speakers. British Science Week Link to science careers.		

Leadership Opportunities	Chances to formally present within lessons and take ownership of that process. Student examples to demonstrate good quality work. Group work within lessons where students think about how to take up a role within a group.