Science Curriculum Map – Key Stage 4

Year 9

Autumn 1 Teacher 1	Autumn 1 Teacher 2	Autumn 2 Teacher 1	Autumn 2 Teacher 2
CC1-2 States of Matter / Methods of Separating and Purifying Substances In this unit you will learn how materials can be separated from one another using their properties.	**CP1 Motion** In this unit you will learn about quantities that have direction. You will find out how to calculate speeds and accelerations, and how to represent changes in distance moved and speed on graphs.	**SB2 Cells and Control** In this unit you will discover how plants and animals develop from single cells the size of full stops to become complex organisms made of many different types of cells, which all need to be controlled and coordinated	**SB1 Key Concepts in Biology** In this unit you will learn about some of the central ideas in biology, including ideas about cells, microscopy, enzymes, nutrition, diffusion, osmosis and active transport.
Assessment: • End of topic test • Six mark question	**Assessment:** • End of topic test • Six mark question	**Assessment** • End of topic test • Six mark question	**Assessment** • End of topic test • Six mark question
Builds upon: • How particles are arranged in solids, liquids and gases and how their energy changes with change of state • How mixtures differ from pure substances • How to separate some mixtures using filtration, distillation and chromatography	**Builds upon:** • What forces are and the effects of balanced and unbalanced forces • How average speed, distance and time are related • How to represent a journey on a distance-time graph	**Builds upon:** • That cells divide • The structure of plant and animal cells (including the chromosomes in their nuclei) • How your nervous system helps to coordinate your action	**Builds upon:** • How to use a microscope • The differences between cells for different organisms • How some cells are specialised and adapted to their functions • How enzymes help to digest food in the digestive system • How substances can move by diffusion

Introduces: • How to use information to predict the state of a substance • Hoe the arrangement, movement and energy of particles change during changes of state • How to us melting points to tell the differences between mixtures and pure substances • How to identify substances using melting points and chromatography • How different methods of separation work • How to choose a separation method based on the properties of the substances in a mixture	**Introduces:** • The difference between vector and scalar quantities • How to calculate speed and acceleration • How to represent journeys on distance-time and velocity-time graphs • How to use graphs to calculate speed, acceleration and distance travelled	**Introduces:** • . Mitosis and its importance in growth repair and asexual reproduction • How cells become specialised, and the importance of stem cells • The structure and function of the brain and eyes • How to identify different specialised cells in the nervous system and explain how the system works	**Introduces:** • How developments in microscopy have allowed us to find out more about sub-cellular structures • The importance of enzymes in nutrition, growth and development • How chemical tests can be used to identify substances in food • How enzymes are affected by pH and temperature and why each enzyme only works on a certain type of molecule • How substances are carried by diffusion, osmosis and active transport

Year 9

Spring 1 Teacher 1	Spring 1 Teacher 2	Spring 2 Teacher 1	Spring 2 Teacher 2
SB2 Cells and Control continued In this unit you will discover how plants and animals develop from single cells the size of full stops to become complex organisms made of many different types of cells, which all need to be controlled and coordinated	**SB1 Key Concepts in Biology continued** In this unit you will learn about some of the central ideas in biology, including ideas about cells, microscopy, enzymes, nutrition, diffusion, osmosis and active transport.	**CC3-4 Atomic Structure / The Periodic Table** In this unit you will find out more about atoms and their structure and how to use the periodic table.	**CP2 Forces and Motion** In this unit we will learn about forces and how they determine the motion of objects. We will look at applying these ideas to car safety.
Assessment: • End of topic test • Six mark question	**Assessment:** • End of topic test • Six mark question	**Assessment:** • End of topic test • Six mark question	**Assessment:** • End of topic test • Six mark question
Builds upon: • That cells divide • The structure of plant and animal cells (including the chromosomes in their nuclei) • How your nervous system helps to coordinate your action	**Builds upon:** • How to use a microscope • The differences between cells for different organisms • How some cells are specialised and adapted to their functions • How enzymes help to digest food in the digestive system • How substances can move by diffusion	**Builds upon:** • The particle model of matter • Chemical symbols • How elements are arranged in the periodic table, periods and groups • The properties of metals and non-metals in the periodic table	**Builds upon:** • What forces are and the effects of balanced and unbalanced forces • What a resultant force is • Gravity as a non-contact force

Introduces: • . Mitosis and its importance in growth repair and asexual reproduction • How cells become specialised, and the importance of stem cells • The structure and function of the brain and eyes • How to identify different specialised cells in the nervous system and explain how the system works	**Introduces:** • How developments in microscopy have allowed us to find out more about sub-cellular structures • The importance of enzymes in nutrition, growth and development • How chemical tests can be used to identify substances in food • How enzymes are affected by pH and temperature and why each enzyme only works on a certain type of molecule • How substances are carried by diffusion, osmosis and active transport	**Introduces:** • How our ideas about atoms have changed • How to calculate relative atomic mass • How Mendeleev arranged the elements into a periodic table, predicting the existence and properties of undiscovered elements • How to use the periodic table to predict and model the arrangement of electrons in atoms	**Introduces:** • Newton's laws of motion • How to calculate an object's weight from its mass • The factors that affect the stopping distance of a vehicle • The dangers of large decelerations • How to calculate momentum and apply ideas about momentum to collisions (H)

Year 9

Summer 1 Teacher 1	Summer 1 Teacher 2	Summer 2 Teacher 1	Summer 2 Teacher 2
CC13-15 Groups / Rates of Reaction / Heat Energy Changes in Reactions This unit looks at some typical reactions of certain elements and general ideas about how chemical reactions can be controlled and used.	**CP2 Forces and Motion continued** In this unit we will learn about forces and how they determine the motion of objects. We will look at applying these ideas to car safety.	**CC13-15 Groups / Rates of Reaction / Heat Energy Changes in Reactions continued** This unit looks at some typical reactions of certain elements and general ideas about how chemical reactions can be controlled and used.	**CP3 Conservation of Energy** In this unit you will learn about the ways in which energy can be transferred and stored, how to reduce energy transfers and the renewable and non-renewable resources we use in everyday life.
Assessment: • End of topic test • Six mark question	**Assessment:** • End of topic test • Six mark question	**Assessment:** • End of topic test • Six mark question	**Assessment:** • End of topic test • Six mark question
Builds upon: • Elements, compounds and the periodic table • What happens during chemical reactions **From KS4 CC3** • The nature of atoms and ions	**Builds upon:** • What forces are and the effects of balanced and unbalanced forces • What a resultant force is • Gravity as a non-contact force	**Build upon:** • Elements, compounds and the periodic table • What happens during chemical reactions **From KS4 CC3** The nature of atoms and ions	**Build upon:** • Temperature differences lead to energy transfers • How energy can be transferred by conduction, convection and radiation • Ways of reducing energy transferred by heating • That energy is conserved
Introduces: • The properties and reactions of the elements in groups 1, 7 and 0 • How changes in conditions can affect the rates of reactions	**Introduces:** • Newton's laws of motion • How to calculate an object's weight from its mass	**Introduces:** • The properties and reactions of the elements in groups 1, 7 and 0	**Introduces:** • How energy is stored and transferred • How to represent energy transfers using diagrams • How to calculate efficiency

• The energy transfers that can occur during chemical reactions	• The factors that affect the stopping distance of a vehicle • The dangers of large decelerations • How to calculate momentum and apply ideas about momentum to collisions (H)	• How changes in conditions can affect the rates of reactions • The energy transfers that can occur during chemical reactions	• How to reduce transfers of wasted energy • How to calculate gravitational potential energy and kinetic energy • Different renewable and non-renewable energy resources