Science at Sir Charles Parsons School

Across the curriculum, for each pathway of learners, expectations and learning intentions are highly adapted to meet the needs of individual students, whilst providing an appropriate amount of challenge and skills development to support their next steps.
Throughout all unit, students should develop skills of working scientifically, take part in investigations and practical experiments. Within each unit students will also learn about significant scientists and their discoveries and achievements. Across the curriculum students will be introduced to links to careers and the applications in the world of work.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7	**Working scientifically /lab skills** **Key vocabulary**: Scientist, investigation, experiment, fair test, questioning, predicting prediction, plan, carryout, record, analyse, review. **Key skills**: Explore elements of the investigations cycle. Practice asking questions, making predictions and planning experiments. Work together to carry out experiments. Record results. Review plans and results to inform actions next time. Use equipment safely.	**Everyday materials** **Key vocabulary**: Wood, plastic, glass, paper, metal, fabric. Waterproof, strong, transparent, reflective, magnetic. **Key skills**: Explore and describe a range of materials. Sort materials based on characteristics. Show uses and functions of materials. Investigate properties of materials. Investigate basic changes to materials.	**Season changes** **Light** **Key vocabulary**: Earth, sun, moon, autumn, winter, spring, sunny summer, tilt, close, weather. Light, torch, candle, sun, TV, Fire. Reflection, mirror, moon. Eye, bright, dim, dark, shadow. **Key skills**: Describe and experience typical seasonal weathers, clothes and events. Explore the relationship between the Earth and Sun. Explore light sources. Describe light travelling to our eyes. Explore reflective materials.	**Light continued.** **Sound** **Key vocabulary**: Sound, radio, CD, vibrations, instruments, nature, machine, voice. bang, flow, pluck, shake, loud, quiet. Ear, waves, echo. **Key skills**: Explore sound sources. Describe sound travelling to our ears. Explore making sounds with different instruments. Investigate the behaviour of sound with materials. Investigate the behaviour of sound over distance.	**Plants** **Key vocabulary**: Grow, root, stem, leaf, flower, seed. Light, water, warmth, nutrients, soil. Care, gardening, horticulture. **Key skills**: Develop care for living things. Explore different types of plants. Grow a plant from seeds. Explore what a plant needs to survive. Label the key parts of a plant.	**Human body** **Key vocabulary**: External body parts e.g. head, arm, leg, toes, ears, nose. 5 senses, taste, smell, touch, sight and hearing. Internal organs heart, lungs, stomach, brain, blood. Skeleton including key bones of the body and teeth. **Key skills**: Develop care for living things. Label the key parts of the human body. Explore things that impact health and fitness. Explore stimuli for 5 senses. Investigate heart rate and breathing. Practice good oral hygiene routine.

	Follow lab rules correctly.		Investigate the behaviour of light. Investigate the creation of shadows.			
Year 8	**Plants continued** **Key vocabulary**: Seed, bulb, dispersal, life-cycle, germination, pollination. Photosynthesis food production. **Key skills**: Explore the key differences between bulbs and seeds. Investigate germination. Investigate pollination. Explore activities to represent seed dispersal. Explore plants producing their own food.	**Habitats & interdependence** **Key vocabulary**: Habitat, woodland, pond, rockpool, grassland. Food chain, food web carnivore, herbivore, omnivore, predator, pray, producer. **Key skills**: Explore local habitats. Investigate plants and animals that would be found in local habitats. Understand food chains and food webs and the factors that impact them. Explore what different animals need to eat.	**States of matter** **Changing materials** **Key vocabulary**: Solid, liquid, gas, particles, movement, energy. Melting, freezing, evaporation, condensation, boiling. Dissolving, separation, filtration, chromatography, powder. **Key skills**: Consolidate learning about materials. Explore different states of matter. Explore the movement of particles in different states of matter. Investigate changing states with differences in temperature. Investigate dissolving substances. Investigate separating substances. Investigate the behaviour of powders.	**Acids and alkalis** **Key vocabulary**: Acid, alkali, neutral, indicator, pH, litmus, beetroot, cabbage, turmeric, neutralisation, indigestion, toothpaste, gardening, eating, cleaning. **Key skills**: Explore everyday acids and alkalis. Investigate a variety of chemical indicators. Investigate a variety of natural indicators. Explore the strength of different substances. Explore mixing acids and alkalis to create a neutralisation reaction. Investigate everyday neutralisation reactions.	**Electricity** **Key vocabulary**: Electricity, energy, appliances, safety, sound, light, movement, heat, circuit, batteries, switch, wires, bulb, buzzer, motor. Insulator, conductor. **Key skills**: Know about electrical safety. Explore electrical devices. Investigate building electrical circuits. Investigate why circuits might be broken. Investigate materials that insulate and conduct electricity.	**Forces** **Magnets** **Key vocabulary**: Forces, push, pull, twist, bend, squash. Stop, start, change direction, speed. Magnets, attract, repel, poles, magnetic, metal, iron. **Key skills**: Explore the simple forces such as push, pulls, bend, squeeze and twist. Investigate the effect of forces on objects. Explore objects that are magnetic and how they behave together. Investigate which materials are magnetic and which are not magnetic.

Year 9	**Earth & space** **Key vocabulary:** Solar system, the Sun, the Earth, the Moon, stars, Mercury, Venus, Mars, Jupiter, Saturn, Neptune, Uranus. Astronaut, rocket, space exploration. **Key skills:** Consolidate learning about the Earth and Sun. Explore the objects in the Solar system. Investigate and compare the characteristics of the planets. Explore the relationship between the Sun, the Earth and the Moon. Investigate what it is like to be an astronaut in space. Explore the history of space exploration.	**Forces continued** **Waves** **Key vocabulary:** Forces, direction, arrows, air resistance, water resistance, gravity, Isaac Newton, Newtons. Waves, peak, trough, wavelength, amplitude, ripple, vibration. **Key skills:** Consolidate learning about forces. Explore more than one forces acting on an object. Investigate air resistance. Investigate water resistance. Investigate gravity. Research Isaac Newton and his law's about forces. Explore waves and related this to previous learning about physical phenomenon.	**Human body continued** **Cells** **Key vocabulary**: Cells, animal cell, plant cell, nucleus, cytoplasm, cell membrane, vacuole, cell wall. Microscope, slide, magnification dye. **Key skills**: Consolidate learning about the human body. Explore the key roles of the major organs in the body. Explore organ systems Explore the key parts of a cell and compare plant and animal cells. Investigate magnifying objects with a microscope. Make your own slide.	**Inheritance & genetics** **Adaption & variation** **Key vocabulary**: Adaption, variation, species, changes, time, benefit, evolution, breeding, extinction, inheritance, environment, DNA, chromosomes, genes. **Key skills**: Consolidate learning about the human body. Explore familial inheritance. Explore DNA and how it passes on information in the human body. Explore modern genetics in medicine. Investigate common differences between us. Explore changes over time in species. Explore evolution. Explore extinction.	**Earth & atmosphere** **Key vocabulary**: Earth, rock, core, mantle, crust, ocean, land, atmosphere, air, oxygen, nitrogen, carbon dioxide. **Key skills**: Explore the structure of the Earth. Explore the content of the atmosphere. Research human impact on the Earth and atmosphere. Find out about fossil fuels.	**Rocks** **The environment** **Key vocabulary**: Rock cycle, volcano, sedimentary, igneous, metamorphic, soils, characterising, sorting, testing. Global warming, climate change, impact, environment, future, renewable energy, reducing waste, recycling. **Key skills**: Explore the creation of different rock types in the rock cycle. Explore the names and uses of common rock types. Investigate the characteristics of the different rock types. Explore soil formation and different types of soil. Explore human impact on the environment and changes that can be made to reduce this.

<table>
<tr><td rowspan="2">Year 10

Red & orange pathways</td><td>OCR Entry level biology units level 1 & 2

Developing knowledge and understanding of the key concepts in a selection of the units below, as per OCR course specification, including Can do tasks as appropriate.

ELB1: Dead or alive (cells) – the role of cells
ELB3: Control systems – control systems of the human body
ELB4: Fooling your senses – sight, smell, taste, touch and reflex reactions
ELB5: Gasping for breath – human respiration and respiratory diseases
ELB6: Casualty – human circulatory system
ELB7: You can only have one life (look after it) – digestive system and drugs</td><td>OCR Entry level chemistry units level 1 & 2

Developing knowledge and understanding of the key concepts in a selection of the units below, as per OCR course specification, including Can do tasks as appropriate.

ELC1: Physical or chemical change – using the particle model
ELC2: Acids and alkalis – acidity and alkalinity in everyday science
ELC3: Everything in its place – the periodic table
ELC4: Clean air and water – environmental chemistry
ELC5: Novel materials – alloys, composites and carbon compounds
ELC6: Sorting out – purifying mixtures</td><td>OCR Entry level physics units level 1 & 2

Developing knowledge and understanding of the key concepts in a selection of the units below, as per OCR course specification, including Can do tasks as appropriate.

ELP1: Getting the message – using waves to communicate
ELP2: Full spectrum – electromagnetic waves
ELP3: Medical rays – using waves in medicine
ELP4: Hot stuff – heat, temperature and states of matter
ELP5: Alternative energy – renewable and non-renewable energy sources
ELP6: Nuclear power – atomic model and radioactivity</td></tr>
<tr><td colspan="3">Practical investigation project and write up.</td></tr>
<tr><td>Year 10

Yellow, green & blue pathways</td><td>AQA unit award – Human body

Key vocabulary:
external body parts. 5 senses, taste, smell, touch, sight and hearing. Internal organs heart, lungs, stomach, brain, blood, liver, kidneys.

Key skills:
Be self-aware of your own body.

Explore 5 senses.

Explore the location of internal organs in the body.

Investigate the keys roles for each of the major organs in the body.

Explore that organs work towards in organ systems.

Accreditation gained via AQA unit award scheme.</td><td>AQA unit award – Acids and alkalis

Key vocabulary:
acid, alkali, neutral, indicator, pH, litmus, beetroot, cabbage, turmeric, neutralisation, indigestion, toothpaste, gardening, eating, cleaning.

Key skills:
Know about lab safety.

Investigate everyday acids and alkalis.

Investigate colour change as an indicator.

Explore mixing acids and alkalis to create a neutralisation reaction.

Investigate everyday examples of neutralisation reactions.

Accreditation gained via AQA unit award scheme.</td><td>AQA unit award – Electricity

Key vocabulary: Electricity, energy, appliances, safety, sound, light, movement, heat, circuit, batteries, switch, wires, bulb, buzzer, motor. Insulator, conductor.

Key skills:
Know about electricity safety

Investigate different electrical devices.

Explore where electricity comes from.

Explore everyday energy transfer within devices.

Investigate devices that use batteries or mains electricity.

Accreditation gained via AQA unit award scheme.</td></tr>
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Year 10 Indigo & violet pathways	**AQA unit award –** **Experiencing learning about the human body** Engage with and experience learning activities that explore the topic of the human body, whilst being assessed for personal development in the areas of the engagement profile. • exploration – can a student build on their initial reaction to a new stimulus or activity. • realisation – how a student interacts with a new stimulus or activity or aspect. • anticipation – how much a student predicts, expects, or associates a stimulus or activity with an event. • persistence – can s student sustain their attention in a stimulus or activity. • initiation – how much a student investigates a stimulus or activity in order to bring about a desired outcome. Accreditation gained via AQA unit award scheme.	**AQA unit award –** **Experiencing learning about the acid and alkalis** Engage with and experience learning activities that explore the topic of acids and alkalis, whilst being assessed for personal development in the areas of the engagement profile. • exploration – can a student build on their initial reaction to a new stimulus or activity. • realisation – how a student interacts with a new stimulus or activity or aspect. • anticipation – how much a student predicts, expects, or associates a stimulus or activity with an event. • persistence – can s student sustain their attention in a stimulus or activity. • initiation – how much a student investigates a stimulus or activity in order to bring about a desired outcome. Accreditation gained via AQA unit award scheme.	**AQA unit award –** **Experiencing learning about the electricity** Engage with and experience learning activities that explore the topic of electricity, whilst being assessed for personal development in the areas of the engagement profile. • exploration – can a student build on their initial reaction to a new stimulus or activity. • realisation – how a student interacts with a new stimulus or activity or aspect. • anticipation – how much a student predicts, expects, or associates a stimulus or activity with an event. • persistence – can s student sustain their attention in a stimulus or activity. • initiation – how much a student investigates a stimulus or activity in order to bring about a desired outcome. Accreditation gained via AQA unit award scheme.
Year 11 Red & orange pathways	**OCR Entry level chemistry units level 1 & 2** Developing knowledge and understanding of the key concepts in a selection of the units below, as per OCR course specification, including Can do tasks as appropriate. ELC7: Let's get together – salts (NaCl), reactions and electrolysis ELC8: Heavy metal – reactivity and the extraction and recycling of metals ELC9: Fuels – hydrocarbons and polymers ELC10: Are you overreacting – using periodic table to predict rates of reaction ELC11: How fast? How slow? – practical laboratory skills and rates of reaction ELC12: CSI plus – forensic science	**OCR Entry level physics units level 1 & 2** Developing knowledge and understanding of the key concepts in a selection of the units below, as per OCR course specification, including Can do tasks as appropriate. ELP7: Our electricity supply – domestic electricity supply and Ohm's law ELP8: Attractive forces – magnetic fields and electromagnetism ELP9: Pushes and pulls – forces and Newton's laws of motion ELP10: Driving along – motion, forces and energy transfer ELP11: Fly me to the moon – rockets and the solar system ELP12: Final frontier – astronomy and astrophysics	**OCR Entry level biology units level 1 & 2** Developing knowledge and understanding of the key concepts in a selection of the units below, as per OCR course specification, including Can do tasks as appropriate. ELB8: Body wars – human immune system ELB9: Creepy crawlies – ecosystems and fieldwork ELB10 Extinction – fossils, evolution and biodiversity ELB11: My genes – DNA and genetics ELB12: Food factory – plants and food production

Year 11 Yellow, green & blue pathways	**AQA unit award – Changes of state** **Key vocabulary**: solid, liquid, gas, particles, movement, energy. Melting, freezing, evaporation, condensation, boiling. **Key skills**: Explore everyday examples of solids, liquids and gases. Explore changes in temperature. Investigate everyday examples of melting and freezing. Investigate everyday examples of evaporation and condensation. Observe boiling using lab equipment. Accreditation gained via AQA unit award scheme.	**AQA unit award – Space** **Key vocabulary:** Solar system, the Sun, the Earth, the Moon, stars, Mercury, Venus, Mars, Jupiter, Saturn, Neptune, Uranus. Astronaut, rocket, space exploration. **Key skills:** Explore the different parts of the Solar System. Explore and compare the different planets with in the Solar System. Explore stars and their constellations. Research the myths and stories behind the constellations. Investigate what a journey to space would be like. Experience learning within Starlab. Accreditation gained via AQA unit award scheme.	**AQA unit award – Habitats** **Key vocabulary**: Habitat, woodland, pond, rockpool, grassland. Food chain, food web carnivore, herbivore, omnivore, predator, pray, producer. **Key skills**: Develop respect and care for living things. Explore local habitats and the plants and animals found there. Explore global habitats and the plants and animals found there. Investigate relationships within these habitats. Investigate how we can protect our environment to preserve important habitats. Accreditation gained via AQA unit award scheme.
Year 11 Indigo & violet pathways	**AQA unit award – Experiencing learning about the changes of state** Engage with and experience learning activities that explore the topic of states of matter, whilst being assessed for personal development in the areas of the engagement profile. • exploration – can a student build on their initial reaction to a new stimulus or activity. • realisation – how a student interacts with a new stimulus or activity or aspect. • anticipation – how much a student predicts, expects or associates a stimulus or activity with an event. • persistence – can a student sustain their attention in a stimulus or activity. • initiation – how much a student investigates a stimulus or activity in order to bring about a desired outcome. Accreditation gained via AQA unit award scheme.	**AQA unit award – Experiencing learning about the space** Engage with and experience learning activities that explore the topic of space, whilst being assessed for personal development in the areas of the engagement profile. • exploration – can a student build on their initial reaction to a new stimulus or activity. • realisation – how a student interacts with a new stimulus or activity or aspect. • anticipation – how much a student predicts, expects or associates a stimulus or activity with an event. • persistence – can a student sustain their attention in a stimulus or activity. • initiation – how much a student investigates a stimulus or activity in order to bring about a desired outcome. Accreditation gained via AQA unit award scheme.	**AQA unit award – Experiencing learning about the habitats** Engage with and experience learning activities that explore the topic of habitats, whilst being assessed for personal development in the areas of the engagement profile. • exploration – can a student build on their initial reaction to a new stimulus or activity. • realisation – how a student interacts with a new stimulus or activity or aspect. • anticipation – how much a student predicts, expects or associates a stimulus or activity with an event. • persistence – can a student sustain their attention in a stimulus or activity. • initiation – how much a student investigates a stimulus or activity in order to bring about a desired outcome. Accreditation gained via AQA unit award scheme.

Year 12- 14 Orange & yellow pathways	**Crest Award Superstar** Students will develop their use of STEM skills (Self-management, Team working, Problem solving, Research, Communication, Reflective practice.) whilst carrying out a practical investigation around an everyday problem. Students will focus on one or more aspects of the investigation cycle during their practical activity. Students will successfully carry out the practical task as described. Students will reflect on and self-assess their learning and development of skills. Student learning will be led by the group who will be given a choice to challenges to work towards.
Year 12- 14 Green & blue pathways	**Crest Award Star** Students will develop their use of STEM skills (Self-management, Team working, Problem solving, Research, Communication, Reflective practice.) whilst carrying out a practical investigation around an everyday problem. Students will focus on one or more aspects of the investigation cycle during their practical activity. Students will successfully carry out the practical task as described. Students will reflect on and self-assess their learning and development of skills. Student learning will be led by the group who will be given a choice to challenges to work towards.
Year 12- 14 Indigo & violet pathways	**Experiencing learning about working scientifically, developing science themes within the engagement model.** Engage with and experience learning activities that explore the topic of working scientifically, whilst being assessed for personal development in the areas of the engagement profile. • exploration – can a student build on their initial reaction to a new stimulus or activity. • realisation – how a student interacts with a new stimulus or activity or aspect. • anticipation – how much a student predicts, expects, or associates a stimulus or activity with an event. • persistence – can a student sustain their attention in a stimulus or activity. • initiation – how much a student investigates a stimulus or activity in order to bring about a desired outcome. Accreditation gained via AQA unit award scheme.