

Science KS3 Pathway Statements

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Students will:

- Work through a knowledge-rich curriculum, covering the three domains of science, biology, chemistry and physics, ensuring a broad understanding of fundamental scientific concepts and the career pathways they could lead to.
- Develop disciplinary knowledge, practical skills, and analytical thinking through themed and interleaved topics.
- Take part in engaging experiments and activities, applying secure knowledge in problem-solving and enquiry-based problems
- Gain insights into the applications of science in real-world contexts, connecting classroom learning to everyday life and global challenges

	Working Scientifically	Biology	Chemistry	Physics
7	Students can do the following: • ID most risks & hazards in experiments & suggest controls. • Use repeats & key vocab in data analysis. • Plan & carry out a valid experiment, whilst recording results, evaluating methods & actioning improvements. • Record data in a table, plot a graph & evaluate the impact of errors. • ID a range of SI units, use equations & statistical techniques with proficiency.	Students have an increased awareness of the following; • Differences between cells, how to observe them, & the function of organelles. • Organ systems & their functions. • Respiration as a chemical reaction in plants & animals, & the differences between the two types. • Photosynthesis in plants & the structure of major plant organs & seed dispersal. • Pollination & fertilisation. • All living things contain DNA which is inherited 50/50 from parents, structure of DNA & how this was discovered. Also how cells divide, including the process of mitosis. • The process of evolution by natural selection, reasons for extinctions & their impacts. • How species interact in ecosystems & the dependence of species on one another.	Students have an awareness of the following: • Chemical reaction word & balanced symbol equations, with specific examples & state symbols. • Carbon's use in combustion & is an important molecule in living things. • Carbon cycle, with human impacts • Periodic table, its organisation, creators & trends. • Existence of elements, molecules & compounds, & their differences. • Sub-atomic particles, their positions, mass & charge. • How elements bond.	Students have an awareness of the following: • The energy stores, pathways, conservation (including heating curves) & calculations. • Types of waves & their properties. • Light wave behaviour in different mediums & deducing angles. • Particle model of matter, particle arrangement & behaviour, including changes of state & density. • Models of the atom & properties • Earth's position in the solar system, linking to day, night & seasons. • Differing impact of forces in the solar system • Other bodies in the solar system • Types of forces, their effects, unit of measure & resultant forces (including calculations). • Describe a journey of a moving object. • Relationship between force & extension. • Calculating work done. • Electric charge (including static) & magnetic fields, how they behave & how they link
6	Students can do the following: • ID most risks & hazards in experiments & suggest controls. • Use repeats & key vocab in data analysis. • Plan & carry out a valid experiment, whilst recording results & evaluating methods. • Record data in a table, plot a graph & evaluate the impact of errors. • ID a range of SI units, use equations & statistical techniques.	Students have an awareness of the following; • Differences between cells, how to observe them, & the function of organelles. • Organ systems & their functions. • Respiration as a chemical reaction in plants & animals, & the differences between the two types. • Photosynthesis in plants & the structure of major plant organs & seed dispersal. • Pollination & fertilisation. • All living things contain DNA which is inherited 50/50 from parents. The structure of DNA & how this was discovered, and how cells divide, including the process of mitosis. • The process of evolution by natural selection, reasons for extinctions & their impacts. • How species interact in ecosystems & the dependence of species on one another.	Students have an awareness of the following: • Chemical reaction word & symbol equations, with specific examples & state symbols. • Carbon's use in combustion & is an important molecule in living things. • Carbon cycle • Periodic table, its organisation & creators. • Existence of elements, molecules & compounds, & their differences. • Sub-atomic particles, their positions, mass & charge.	Students have an awareness of the following: • The energy stores, pathways & conservation. Including heating curves. • Types of waves & their properties. • Light wave behaviour in different mediums. • Particle model of matter, particle arrangement & behaviour, including changes of state & density. • Models of the atom • Earth's position in the solar system, linking to day, night & seasons. • Differing impact of forces in the solar system • The sun & galaxies • Types of forces, their effects, unit of measure & resultant forces (including calculations). • Electric charge (including static) & magnetic fields, how they behave & how they link • Conductors & insulators.

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5	Students can do the following: • ID most risks & hazards in experiments & suggest controls. • Use repeats & key vocab in data analysis. • Plan & carry out a valid experiment, whilst recording results & evaluating methods. • Record data in a table, plot a graph & ID errors. • ID a range of SI units & use equations.	Students have an awareness of the following; • Differences between cells, how to observe them, & the function of organelles. • Organ systems & their functions. • Respiration as a chemical reaction in plants & animals, & the differences between the two types. • Photosynthesis in plants & the structure of major plant organs & seed dispersal. • Pollination & fertilisation. • All living things contain DNA which is inherited 50/50 from parents. The structure of DNA & how this was discovered, and how cells divide, including the process of mitosis. • The process of evolution by natural selection, reasons for extinctions & their impacts. • How species are dependent on each other	Students have an awareness of the following: • Chemical reaction word & symbol equations, with specific examples. • Carbon's use in combustion & is an important molecule in living things. • Periodic table, its organisation & creators. • Existence of elements, molecules & compounds, & their differences. • Sub-atomic particles & their positions.	Students have an awareness of the following: • The energy stores, pathways & conservation. • Types of waves & their properties. • Light wave behaviour at a mirror. • Particle model of matter, particle arrangement & behaviour, including changes of state. • Density in relation to the particle model • Earth's position in the solar system, linking to day, night & seasons. • Differing impact of forces in the solar system • Types of forces, their effects, unit of measure & resultant forces (including calculations). • Electric charge (including static) & magnetic fields, & how they behave. • Conductors & insulators.
4	Students can do the following: • ID most risks & hazards in experiments & suggest controls. • Use repeats in data analysis. • Plan & carry out a valid experiment, whilst recording results. • Record data in a table & plot a graph. • ID a range of SI units & use equations.	Students have an awareness of the following; • Differences between cells, how to observe them, & the function of organelles. • Organ systems & their functions. • Respiration as a chemical reaction in plants & animals, & the differences between the two types. • Photosynthesis in plants & the structure of major plant organs & seed dispersal. • All living things contain DNA which is inherited 50/50 from parents. The structure of DNA & how this was discovered, and how cells divide, including the process of mitosis. • The process of evolution by natural selection & the reasons for extinctions	Students have an awareness of the following: • Chemical reaction word equations, with specific examples. • Carbon's use in combustion & is an important molecule in living things. • Periodic table & its organisation • Existence of elements, molecules & compounds, & their differences. • Sub-atomic particles	Students have an awareness of the following: • The energy stores, pathways & conservation. • Types of waves & their properties • Particle model of matter, particle arrangement & behaviour, including changes of state. • Density • Earth's position in the solar system, linking to day, night & seasons. • Impact of the moon on the Earth. • Forces, their effects, unit of measure & resultant forces (including calculations). • Electric charge & magnetic fields, & how they behave. • Conductors & insulators.

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3	Students can do the following: • ID several risks & hazards in experiments, & suggest controls. • Use repeats • Plan & carry out an experiment, whilst recording results. • Record data & ID patterns • ID a range of SI units.	Students have an awareness of the following: • Difference between plant & animal cells, how to observe them & some functions of organelles. • Organ systems & their functions. • Respiration provides energy. • Photosynthesis & structure of a flower. • DNA is inherited from mother & father. • Species change over time by natural selection & some species no longer exist.	Students have an awareness of the following: • Chemical reactions, with specific examples. • Carbon is a non-metal element & is an important molecule in living things. • Periodic table • Existence of elements, molecules & compounds, & their differences.	Students have an awareness of the following: • The energy stores & some pathways • Types of waves transferring energy • Particle model of matter, particle arrangement & behaviour. • Changes of state • Earth's position in the solar system, linking to day, night & seasons. • Forces, their effects, unit of measure & resultant forces. • Electric charge & magnetic fields, & how they behave.
2	Students can do the following: • Show an awareness of risks • ID some risks & hazards in science experiments. • Make predictions. • Record data & ID patterns. • ID some SI units.	Students have an awareness of the following: • Cells & their content. • Humans have a skeleton, muscles & need to breathe. • Life requires energy at varying levels. • Plants use sunlight to produce food & that flowers attract insects. • All living things are different & have DNA. • Life on Earth is put into groups & that they can change over time.	Students have an awareness of the following: • Chemical reactions & physical changes • Carbon is an element & is an important molecule in living things. • Existence of elements & compounds.	Students have an awareness of the following: • Some energy stores • Waves exist & transfer energy • Particle model of matter & arrangement • Earth's position in space, linking to day & night • Forces & their effects. • Electric charge & magnetic fields.
1	Students can do the following: • Show an awareness of risks • Pose questions about the world • Record data in a table.	Students have an awareness of the following: • Cells & basic human structure • Life required energy • Plants produce their own food & have different parts. • All living things are different • Life on Earth is put into groups.	Students have an awareness of the following: • Carbon is an important molecule in living things. • Chemistry involved analysis • How chemistry & physics link.	Students have an awareness of the following: • Waves exist • Particle model of matter • Space & objects above the Earth. • What a force is • Electricity & magnetism