



**St George's School**  
**SCIENCE Department**  
**Year 8 Curriculum Map**

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p><b>THE BIG IDEAS &amp; KNOWLEDGE</b></p> <p><i>Overview of topics or key questions</i></p>	<p><b>Electricity &amp; magnetism:</b>            Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects.            Non-contact forces due to static electricity.            Electric current, measured in Amperes in circuits, current as a flow of charge.            Potential difference, measured in Volts.            Series and parallel circuits, currents add where branches meet.            Resistance, measured in Ohms, as the ratio of potential difference (p.d.) to current.            The differences in resistance, between conducting components and insulating components.            Magnetic poles, attraction and repulsion.            Drawing magnetic fields using a plotting compass, representation by field lines.            The Earth's magnetism; compasses and navigation.            Non-contact forces: forces between magnets.            The magnetic effect of current, electromagnets and D.C. motors</p> <p><b>Health &amp; lifestyle</b> Content</p>	<p><b>Periodic table &amp; Metals and acids</b>            The Periodic Table: periods and groups.            The principles underpinning the Mendeleev Periodic Table.            The varying physical and chemical properties of different elements.            How patterns in reactions can be predicted with reference to the Periodic Table.</p> <p>Metals and acids in this topic considers the order of metals and carbon in the reactivity series.            Combustion, thermal decomposition, oxidation, and displacement reactions.            The order of metals and carbon in the reactivity series.            The use of carbon in obtaining metals from metal oxides.            Properties of ceramics, polymers and composites.</p>	<p><b>Separation techniques</b>            The concept of a pure substance.            Mixtures, including dissolving.            The identification of pure substances.            Mixtures, including dissolving.            The identification of pure substances.            Mixtures, including dissolving.            Simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography.</p> <p><b>Energy</b>            Comparing energy values of different foods (from labels) (kJ).            Fuels and energy resources.            Energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change.            Processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels.            Energy changes on deformation.            Heating and thermal</p>	<p><b>Ecosystem processes</b>            The reactants in, and products of, photosynthesis, and a word summary for photosynthesis.            The dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere.            The adaptations of leaves for photosynthesis.            The role of leaf stomata in gas exchange in plants.            Plants make carbohydrates in their leaves by photosynthesis and gaining minerals, nutrients, and water from the soil via their roots.            Chemosynthesis in bacteria and other organisms.            Aerobic and Anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life.            The process of anaerobic respiration in humans and microorganisms, including</p>	<p><b>Motion &amp; pressure</b>            Speed and the quantitative relationship between average speed, distance, and time (speed = distance ÷ time).            Relative motion: trains and cars passing one another.            The representation of a journey on a distance–time graph.            Atmospheric pressure decreases with increase of height as weight of air above decreases with height.            Pressure in liquids, increasing with depth; upthrust effects, floating and sinking.            Pressure measured by ratio of force over area – acting normal to any surface.            Moment as the turning effect of a force.</p> <p><b>Adaptation &amp; inheritance</b>            The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection.            Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully</p>	<p><b>The Earth</b>            The formation of sedimentary, igneous and metamorphic rocks.            The rock cycle and carbon cycle.            The production of carbon dioxide by human activity and the impact on climate.            Earth as a source of limited resources and the efficacy of recycling.</p>

	<p>of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre, and water, and why each is needed.</p> <p>Simple food tests for starch, sugars, protein and lipids.</p> <p>Calculations of energy requirements in a healthy daily diet.</p> <p>The consequences of imbalances in the diet, including obesity, starvation, and deficiency diseases.</p> <p>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).</p> <p>The importance of bacteria in the human digestive system.</p>		<p>equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one, through contact (conduction) and radiation.</p> <p>Domestic fuel bills, fuel use, and costs.</p> <p>Fuels and energy resources.</p> <p>Comparing power ratings of appliances in watts (W, kW).</p> <p>Comparing amounts of energy transferred (J, kJ, kWh).</p> <p>Work done, examples of processes that cause change with forces (work = force × distance) levers and gears.</p>	<p>fermentation, and a word summary for anaerobic respiration.</p> <p>The differences between aerobic and anaerobic respiration in terms of the reactants, the products formed, and the implications for the organism.</p> <p>The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops.</p> <p>How organisms affect, and are affected by, their environment, including the accumulation of toxic materials.</p> <p>The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops.</p>	<p>and reproduce, which in turn may lead to extinction. The differences between species.</p>	
<p><b>SKILLS &amp; STRATEGIES</b> <i>Procedural knowledge, literacy and numeracy skills</i></p>	<p>Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.</p> <p>Use appropriate techniques, apparatus, paying attention to health and safety.</p> <p>Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate.</p> <p>Make and record</p>	<p>Apply mathematical concepts and calculate results.</p> <p>Make and record observations and measurements using a range of methods for different investigations.</p> <p>Evaluate risks.</p> <p>Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.</p> <p>Use appropriate techniques, apparatus, and materials during fieldwork and laboratory</p>	<p>Present reasoned explanations, including explaining data in relation to predictions and hypotheses.</p> <p>Make and record observations and measurements using a range of methods for different investigations.</p> <p>Evaluate data, showing awareness of potential sources of random and systematic error.</p> <p>Interpret observations and data, including identifying patterns and using observations, measurements, and data</p>	<p>Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.</p> <p>Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate.</p> <p>Make predictions using scientific knowledge and understanding.</p> <p>Present observations and data using appropriate</p>	<p>Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety.</p> <p>Present observations and data using appropriate methods, including tables and graphs.</p> <p>Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.</p> <p>Make predictions using scientific knowledge and understanding.</p>	<p>Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.</p> <p>Make predictions using scientific knowledge and understanding.</p> <p>Apply mathematical concepts and calculate results</p>

	<p>observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements. Make predictions using scientific knowledge and understanding.</p>	<p>work. Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate.</p>	<p>to draw conclusions. Evaluate risks. Make predictions using scientific knowledge and understanding. Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety. Undertake basic data analysis including simple statistical techniques. Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas. Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate. Present observations and data using appropriate methods, including tables and graphs. Apply sampling techniques.</p>	<p>methods, including tables and graphs.</p>	<p>Identify further questions arising from their results.</p>	
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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>FEEDBACK</b> <i>Noteworthy tasks and assessments</i>	End of topic test. Assessed homework.	End of topic test. Assessed homework.	End of topic test. Assessed homework.	End of topic test. Assessed homework.	End of topic test. Assessed homework.	End of topic test. Assessed homework. End of year assessment.
<b>BREADTH</b> <i>Opportunities, trips, wider reading, cultural capital</i>	Watch TV programs about healthy diets. Eg 'You are what you eat'.	Properties of metals – uses around the home and why they are used as pans or hot water pipes. Cooking pasta; linked with food tech. Purification of salty water for drinking water in desert regions in the world.	View current TV series presented by David Attenborough about climate change; the green planet.  Plant a series of seeds, experiment with the conditions to see how these affect the seedlings growth. Conditions you could; change/adapt amount light, growing medium, amount of water.	Project on climate change and pollution causing acid rain; corrosion of metals by acid rain in the environment and the implication for structures such as bridges.		View current TV series presented by David Attenborough about climate change; 'The green planet'.
<b>KEY VOCABULARY</b> <i>Important words and phrases</i>	<b>Electricity &amp; magnetism:</b> ammeter amps atom attract battery cell conductor core current electric charge electrical field electromagnet electron insulator lightning magnetic field magnetic field lines magnetic material magnetise motor negative neutral neutron north pole ohms	<b>Periodic table</b> acid rain chemical property density displace displacement reaction group Group 0 Group 1 Group 7 halogen metal metalloid noble gases non-metal period physical property reactive unreactive  <b>Separation techniques</b> chromatogram chromatography dissolve distillation filtering	<b>Energy</b> chemical store conduction conductor convection convection current dissipated elastic store energy energy resources energy store equilibrium fossil fuel gear gravitational potential store infrared radiation insulator joules kilojoules kilowatt hours kilowatts kinetic store law of conservation of energy lever non-renewable	<b>Metals &amp; acids</b> carbon fibre ceramic composite displace displacement reaction metal natural polymer ore polymer reactive reactivity series state symbol synthetic polymer thermite reaction	<b>Motion &amp; pressure</b> acceleration atmospheric pressure average speed centre of gravity centre of mass compressed density distance-time graph gas pressure incompressible instantaneous speed law of moments liquid pressure metres per second moment newton metres newtons per metre squared pivot pressure relative motion speed  <b>Adaptation &amp; inheritance</b> adaptation	<b>The Earth</b> atmosphere biological weathering carbon cycle carbon store cementation chemical weathering climate change combustion compaction crust deforestation deposition durable erosion freeze-thaw global warming greenhouse effect greenhouse gas igneous inner core lava magma mantle metamorphic outer core

parallel  
positive  
potential difference  
proton  
rating  
relay  
repel  
resistance  
series  
south pole  
switch  
voltage  
voltmeter  
volts

**Health and lifestyle**

anus  
balanced diet  
bile  
carbohydase  
carbohydrate  
catalyst  
deficiency  
digestion  
digestive system  
drug  
enzyme  
ethanol  
fibre  
food test  
gullet  
hypothesis  
large intestine  
lipase  
lipids  
malnourishment  
mineral  
nutrient  
obese  
protease  
protein  
rectum  
small intestine  
starvation  
stimulant  
stomach  
villi  
vitamin

filtrate  
filtration  
impure  
insoluble  
mixture  
pure  
residue  
saturated solution  
solubility  
solute  
solution  
solvent

power rating  
radiation  
renewable  
simple machine  
temperature  
thermal imaging camera  
thermal power station  
thermal store  
thermometer  
watt  
work

**Ecosystem processes**

aerobic respiration  
algae  
anaerobic respiration  
bioaccumulation  
chemosynthesis  
chlorophyll  
co-exist  
community  
consumer  
deficiency  
ecosystem  
fermentation  
fertiliser  
food chain  
food web  
habitat  
haemoglobin  
interdependence  
magnesium  
niche  
nitrates  
oxygen debt  
phosphates  
photosynthesis  
plasma  
population  
potassium  
predator  
prey  
producer  
stomata

chromosome  
competition  
continuous variation  
discontinuous variation  
DNA  
evolution  
extinct  
fossil  
gene  
gene bank  
interdependence  
natural selection  
species  
variation

photosynthesis  
physical weathering  
porous  
radiation  
recycling  
respiration  
rock cycle  
sediment  
sedimentary  
transport  
troposphere  
uplift  
weathering