



Long Term Scheme of Work for Science: Chemistry

Curriculum Intent: At Dashwood, an exciting and engaging Science curriculum will both develop awe and wonder and will equip the children with an essential understanding of the world in which they live. A clear understanding of the three areas of Science (Chemistry, Physics and Biology) will allow children, as they are, as well as the adults they will become, to have a positive impact on the world; they will learn how to ask questions and solve problems.

Whole School thread:

- i) Children using different enquiry types to answer scientific questions about the world around them.
- ii) Children develop independence in asking questions, planning how to investigate them, carrying out and evaluating investigations
- iii) Children develop an understanding of key scientific concepts.
- iv) Children having the opportunity to understand the implications of science today and in the future.

Year group	'Need to knows' <i>Including: safety and programming</i>	Skills	Key Vocabulary
N	<u>Materials - describing textures</u> → To know simple vocabulary linked to describing materials - hard, soft, rough, smooth	<ul style="list-style-type: none">→ I can carry out simple tests→ I can use observations→ I can make comparisons→ I can ask simple questions→ I can make comments and ask questions about aspects of their familiar world such as the natural world.	Hard Soft Rough Smooth

	<p><u>Rocks and fossils (linked to stone age)</u></p> <ul style="list-style-type: none"> → To know that rocks can be compared and linked together on the basis of their appearance and physical properties. → To know that rocks have different uses based on their properties. → To know that fossils are particles of animals (things which have lived) which have been trapped in, and have decayed between layers of sediment. → To recognise that soils are made from rocks and organic matter, dead animals, weathered rocks, mineral particles, air, water and living organisms 	<p>including the use of standard units.</p> <ul style="list-style-type: none"> → I can use equipment, including thermometers and data loggers to make measurements. → I can gather, record, classify and present data in different ways to answer scientific questions. → I can use diagrams, keys, bar charts and tables; using scientific language. → I can use findings to report in different ways, including oral and written explanations, presentation. → I can draw conclusions and suggest improvements. → I can make a prediction with a reason. → I can identify differences, similarities and changes related to an enquiry. <ul style="list-style-type: none"> → I can compare and group rocks based on their appearance and physical properties, giving a reason. → I can describe how fossils are formed. → I can describe how soil is made. → I can describe and explain the difference between sedimentary and igneous rock. 	<p>results diagram conclusion enquiry</p> <p>Appearance Physical Properties hard/soft shiny /dull rough/smooth absorbent/ non absorbent Porous Fossils Sedimentary Rock Soils Organic matter Buildings Grains Crystals.</p>
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	<ul style="list-style-type: none"> → To know that water can be observed as a liquid, as solid ice below zero degrees celsius or as water vapour (steam) when it is boiled. → To know that other materials change state at different temperatures, For example, iron melting 1538 degrees celsius, or butter at 90-95 degrees celsius. <p><u>Water cycle</u></p> <ul style="list-style-type: none"> → To know the part played by evaporation and condensation in the water cycle. → To know that the rate of evaporation is affected by temperature. For example, that hair dries faster with a hair drier or that washing dries faster on a warm day. → To know that liquid evaporates into a gas and gas condenses into a liquid. This is a reversible process. 	<ul style="list-style-type: none"> → I can describe the water cycle. → I can explain the part played by evaporation and condensation in the water cycle. → I can make links between the rate of evaporation with temperature. 	<p>Changing state Heated Heat Cooled Cool Degrees Celsius C Thermometre</p> <p>Water cycle Gas Water Water vapour Cloud Precipitation Rain Snow Hail Evaporation Condensation</p>
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Working Scientifically: Key Investigations

Materials and their properties

Thermal insulation

Q: Which material would make the best lunchbox lining to keep your lunch fresh and cool?

Q: Which fabric would make the warmest coat?

Q: Which material would make the best blackout lining and thermal insulation?

Electrical conduction

Q: Which metal is best to power the brightest bulbs possible for the new floodlights at a football pitch?

Dissolving: reversible and irreversible changes

Q: Which materials dissolve the best?

Q: What affects the rate of dissolving?

Q: Supermarket mix up - How can different materials be separated?

Separating materials

Q: Based on the clues given as well as your knowledge of separating materials, which of these four soil samples has come from Mars?

Materials and their properties

- To know the properties of material and the effect they have
- To know that everyday materials can be compared and grouped together on the basis of their properties.
- To know that properties can be sorted, amongst others, their hardness, solubility, transparency, electrical conductivity, thermal conductivity, and response to magnets
- To know the uses of everyday materials, including wood, metal and plastic and fabric.

Dissolving, reversible and irreversible changes – Martian soil

- I can plan different types of scientific enquiry.
- I can control variables in an enquiry.
- I can measure accurately and precisely using a range of equipment.
- I can record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- I can use the outcome of test results to make predictions and set up a further comparative fair test.
- I can report findings from enquiries in a range of ways.
- I can explain a conclusion from an enquiry.
- I can explain causal relationships in an inquiry.
- I can relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory.
- I can read, spell and pronounce scientific vocabulary accurately.

- I can **compare and group** materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets).
- I can **test** materials based on their properties.
- I can **give evidenced reasons** why materials should be used for specific purposes.

fair test
dependent variable
independent variable
control variables
prediction
observation
accurate
average
reliable
pattern
relationship
rogue
conclusion
improvement
comparative test
trend
causal
precision

Properties
Hardness
Solubility
Electrical conductor/
insulator
Thermal conductor/
insulator
Response to magnets
Magnetism
transparency
flexibility
Permeability

	<p><u>investigation</u></p> <ul style="list-style-type: none"> → Know that some materials will dissolve in liquid to form a solution → To know how to recover a substance from a solution → Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating → To know that dissolving, mixing and changes of state are reversible changes → To know that some changes result in the formation of new materials and that this is not usually reversible eg: changes associated with burning toast, rust formation on a car and the action of vinegar on Bicarbonate of soda. 	<ul style="list-style-type: none"> ● I can describe how a material dissolves to form a solution; explaining the process of dissolving. ● I can describe and demonstrate how to recover a substance from a solution. ● I can describe how some materials can be separated. ● I can demonstrate how materials can be separated (e.g. through filtering, sieving and evaporating). ● I can explain/demonstrate that some changes are reversible and some are not. ● I can explain how some changes result in the formation of a new material and that this is usually irreversible including changes associated with burning and the action of acid on bicarbonate of soda. ● I can discuss reversible and irreversible changes. 	<p>Dissolve Solution Separate Seperating Solids Liquids Gases Evaporating Reversible changes Dissolving Filtering Sieving Melting Irreversible New material Burning Rusting Magnetism Electricity Conductivity Insulation</p>
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