

**Investigative work** - design and carry out practical investigations safely, record data in a variety of formats, form detailed conclusions using scientific ideas and evaluate work to suggest improvements and further work which can be undertaken.

BIOLOGY	CHEMISTRY	PHYSICS
<p><b><u>Food &amp; Nutrition</u></b></p> <p>Evaluate the importance of a balanced diet and discuss the implications of food group deficiencies on health.</p> <p>Discuss how the digestive organs work alongside enzymes in the body to enable efficient digestion and absorption of food.</p> <p><b><u>Plants and their reproduction</u></b></p> <p>Discuss how key plant organs are adapted for efficient pollination, fertilisation, dispersal, and germination, including a comparison of plants in different ecosystems.</p> <p>Explain the role of photosynthesis in plant growth.</p> <p><b><u>Breathing and Respiration</u></b></p> <p>Discuss how aerobic and anaerobic respiration in animals and plants is facilitated by well adapted gas exchange systems and discuss the implications of smoking, asthma and exercise on effective gas exchange.</p> <p>Discuss a variety of human and natural uses for unicellular organisms.</p> <p>Explain how unicellular organisms reproduce and evaluate methods used to slow or prevent reproduction.</p>	<p><b><u>Combustion</u></b></p> <p>Analyse the formation of products produced during combustion reactions and justify methods to reduce risks.</p> <p>Model simple reactions using symbol equations.</p> <p>Evaluate the contribution made from combustion reactions linked to global temperature rise and carbon dioxide levels.</p> <p><b><u>Rocks</u></b></p> <p>Explain the formation of each rock type linked to their properties and landscape features.</p> <p><b><u>Metals and their uses</u></b></p> <p>Model chemical reactions using word and balanced symbol equations and define the formulae for a variety of chemical compounds formed in reactions.</p> <p>Interpret graphs of melting and boiling points for mixtures of varying compositions.</p> <p><b><u>The Periodic Table</u></b></p> <p>Explain the arrangement of the periodic table using ideas about the properties of elements.</p> <p>Deduce the atomic masses and chemical formulae of compounds and discuss their structures.</p>	<p><b><u>Fluids</u></b></p> <p>Use the particle model to explain how pressure and density changes and what causes contraction and expansion.</p> <p><b><u>Light</u></b></p> <p>Explain that light travels from a source as a transverse wave and interpret ray diagrams for mirrors, glass blocks and lenses.</p> <p><b><u>Energy Transfers</u></b></p> <p>Compare the ways heat can be transferred and calculate the efficiency of different appliances.</p> <p><b><u>Earth and Space</u></b></p> <p>Explain why the heliocentric model of the solar system is the current model, as well as how the relative motion of planets and the moons are responsible for years, day and night, seasons, eclipses and phases of the moon.</p>

Year 9 Pathway R		SCIENCE
<b>Investigative work</b> - design and carry out practical investigations safely, record data in a variety of formats, form detailed conclusions using scientific ideas and evaluate work to suggest improvements and further work which can be undertaken.		
BIOLOGY	CHEMISTRY	PHYSISCS
<p><b><u>Food &amp; Nutrition</u></b></p> <p>Explain the importance of a balanced diet including the impact of deficiencies.</p> <p>Explain the roles and adaptations of digestive organs in the digestion and absorption of food.</p> <p><b><u>Plants &amp; their Reproduction</u></b></p> <p>Explain the structure of plant organs and explain the adaptations plants have for pollination, fertilisation, dispersal, germination and plant growth including photosynthesis.</p> <p><b><u>Breathing &amp; Respiration</u></b></p> <p>Explain the importance of aerobic and anaerobic respiration in animals and plants and explain how the gas exchange system in humans can be affected by exercise and smoking.</p> <p><b><u>Unicellular Organisms</u></b></p> <p>Explain the function of unicellular organisms in food production and maintaining a stable ecosystem.</p> <p>Describe the key components of unicellular organisms and how they reproduce.</p>	<p><b><u>Combustion</u></b></p> <p>Explain the products of combustion reactions and explain how to effectively reduce risks.</p> <p>Explain the effects of combustion reactions on the atmosphere and how these effects can be reduced.</p> <p><b><u>Rocks</u></b></p> <p>Explain how the different rock types are formed linked to texture, crystal size and degree of sorting and the rock cycle.</p> <p><b><u>Metals and their uses</u></b></p> <p>Describe the uses of metals as catalysts in chemical reactions and explain methods used to prevent rusting.</p> <p>Compare the reactivity of different metals and explain the melting and boiling points of pure and impure substances.</p> <p><b><u>The Periodic Table</u></b></p> <p>Name compounds formed between metals and non-metals in chemical reactions and explain the impact of catalysts on the rates of chemical reactions.</p> <p>Explain how impurities in substances impact their melting, freezing and boiling points.</p>	<p><b><u>Fluids</u></b></p> <p>Explain how fluid pressure changes and state what is meant by density.</p> <p><b><u>Light</u></b></p> <p>Explain that light travels from a source as a transverse wave and how it is affected by mirrors, filters, lenses and prisms.</p> <p><b><u>Energy Transfers</u></b></p> <p>Use the particle model to explain how heat can be transferred and draw Sankey diagrams.</p> <p><b><u>Earth &amp; Space</u></b></p> <p>Describe the relative positions of the planets and how this is responsible for the changing seasons, day and night and phases of the moon as well as the relative sizes of celestial bodies outside the solar system.</p>

**Investigative work** - Describe variables in an investigation, carry out practical work safely, record data in tables and graphs, form conclusions and evaluate work.

## BIOLOGY

### Food and Nutrition

Describe the uses of key components of a balanced diet in our bodies and describe the function of our digestive organs in the break down and absorption of food.

### Plants and their reproduction

Describe the key characteristics of plants including the structure of reproductive organs and seeds.

Describe the processes of pollination, fertilisation, dispersal, germination and plant growth including photosynthesis.

### Breathing and Respiration

Describe the processes of aerobic and anaerobic respiration in animals and plants and describe how the human gas exchange system allows us to breathe.

### Unicellular organisms

Describe how unicellular organisms can be used in food production and decomposition and simply describe how these organisms can have an impact on ecosystems.

## CHEMISTRY

### Combustion

Describe a range of combustion reactions and the fire triangle.

Describe the effects of combustion reactions on our atmosphere and explain the greenhouse effect.

### Rocks

Describe the structure/properties of each rock type and how they are formed.

Describe the effects of each type of weathering.

### Metals and their uses

Relate the uses of different metals to their properties and explain the products formed in chemical reactions.

### The Periodic Table

Relate the uses of different elements of their chemical properties and explain the reactions between metals with oxygen and water.

## PHYSICS

### Fluids

Use the particle model to describe the causes of gas and fluid pressure.

### Light

Describe how white light can be split into colours and that it can travel in straight lines from a source.

Draw diagrams to show how light is affected by different media.

### Energy Transfers

Describe the ways in which heat can be transferred and what is meant by power.

### Earth and Space

Compare the heliocentric and geocentric models of the solar system as well as using models to explain the seasons.

**Investigative work** - Identify variables in an investigation, carry out practical work safely, record data, form simple conclusions and begin to evaluate work.

## BIOLOGY

### Food and Nutrition

State the key components of a balanced diet, name the important parts of the digestive system and simply describe the role of food in the body.

### Plants and their reproduction

State the key characteristics of plants and their reproductive organs.

Recall how plants reproduce and simply describe the processes of pollination, fertilisation, dispersal, germination and plant growth.

### Breathing and Respiration

Recall what happens during aerobic and anaerobic respiration in animals and plants.

State the key organs in the human gas exchange system and simply describe how this system can be affected.

### Unicellular organisms

Recall the uses of unicellular organisms in food production and decomposition.

## CHEMISTRY

### Combustion

State the meanings of fuel, combustion and oxidation, name the three sides of the fire triangle and describe how to stay safe.

Recall examples of pollution caused by burning fossil fuels and some of their effects on the atmosphere.

### Rocks

Recall and describe the formations of the different rock types and describe the effects of physical weathering.

### Metals and their uses

State some of the properties of metals and non-metals and simply describe the reaction of metals with oxygen, water and acids.

Recall the changes of state between the three types of matter and define the term 'pure'.

### The Periodic Table

Distinguish between pure and impure substances.

## PHYSICS

### Fluids

Describe the three states of matter. State what is meant by gas pressure and fluid pressure.

### Light

Recall that white light can be split into colours and travels in straight lines from a source.

Complete diagrams for reflections and refraction.

### Energy Transfers

Recall the ways heat can be transferred and state the meaning of efficiency.

### Earth and Space

Describe the positions and movements of the earth, moon and planets and how this is responsible for days, seasons and years.