



Stocksbridge Junior School Science Concepts & End Points

“The important thing is to never stop questioning.”

Albert Einstein

SJS Science Concepts

<p>Concept 1:</p>	<p>Scientific Enquiry</p> <ul style="list-style-type: none"> • Comparative/Fair testing – Carrying out fair tests to see the effect of a changing variable. • Research – Using secondary sources of information to answer questions. • Observation over time – Observe changes that occur over a period of time (minutes to months). • Pattern-seeking – Identifying patterns and looking for relationships in enquires. • Identifying, grouping and classifying – Identifying patterns and looking for relationships in enquires. • Problem Solving – Applying scientific knowledge to find answers to problems.
<p>Concept 2:</p>	<p>Biology</p> <ul style="list-style-type: none"> • Understand plants – This concept involves becoming familiar with different types of plants, their structure and reproduction. • Understand animals and humans – This concept involves becoming familiar with different types of animals, humans and the life processes they share. • Investigate livings things – This concept involves becoming familiar with a wider range of livings things, including insects and understanding life processes. • Understand evolution and inheritance – This concept involves understanding that organisms come into existence, adapt, changes and evolve and become extinct.
<p>Concept 3:</p>	<p>Chemistry</p> <ul style="list-style-type: none"> • Investigate materials – This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.
<p>Concept 4:</p>	<p>Physics</p> <ul style="list-style-type: none"> • Understand movement, forces and magnets – This concept involves understanding what causes motion. • Understand the Earth’s movement in space – This concept involves understanding what causes seasonal changes, day and night. • Investigate light and seeing – This concept involves understanding how light and reflection affect sight. • Investigate sound and hearing – This concept involves understanding how sound is produced, how it travels and how is it heard. • Understand electrical circuits – This concept involves understanding circuits and their role in electrical applications.

End Points in Learning in the Science Curriculum

Y3/4 End Points

Comparative/Fair testing:

- To set up a fair test and explain why it is fair.
- To set up a test to compare two things.

Research:

- To ask relevant scientific questions

Observation over time:

- To make careful and accurate observations, including the use of standard units.
- To use equipment, using thermometers and data loggers to make measurements.
- To use findings to report in different ways, including oral and written explanations, presentation.
- To draw conclusions and suggest improvements.

Pattern Seeking:

- To use diagrams, keys, bar charts, and tables; using scientific language.
- To use findings to report in different ways, including oral and written explanations, presentation.

Identifying, grouping and classifying:

- To gather, record, classify and present data in different ways to answer scientific questions.
- To identify differences, similarities and changes related to an enquiry.

Problem Solving:

- To ask relevant scientific questions.
- To use observations and knowledge to answer scientific questions.
- To set up a simple enquiry to explore a scientific question.
- To use findings to report in different ways, including oral and written explanations, presentation.
- To draw conclusions and suggest improvements.

Year 3 End Points

Understand plants:

- To be able to describe the function of different parts of flowering plants and trees.
- To be able to explore and describe the needs of different plants for survival.
- To be able to explore and describe how water is transported within plants.
- To be able to describe the plant life cycle, especially the importance of flowers

Understand animals and humans:

- To be able to explain the importance of a nutritious, balanced diet.
- To be able to explain how nutrients, water and oxygen are transported within animals and humans.
- To be able to describe and explain the skeletal and muscular system of a human.
- To be able to describe the purpose of the skeleton in humans and animals.

Investigate materials:

- To be able to compare and group rocks based on their appearance and physical properties, giving a reason.
- To be able to describe how fossils are formed.
- To be able to describe how soil is made.
- To be able to describe and explain the difference between sedimentary and igneous rock.

Investigate light and seeing:

- To be able to describe what dark is (the absence of light).
- To be able to explain that light is needed in order to see.
- To be able to explain that light is reflected from a surface.
- To be able to explain and demonstrate how a shadow is formed.
- To be able to explore shadow size and explain.
- To be able to explain the danger of direct sunlight and describe how to keep protected.

Understand movement, forces and magnets:

- To be able to explore and describe how objects move on different surfaces.
- To be able to explain how some forces require contact and some do not, giving examples.
- To be able to explore and explain how objects attract and repel in relation to objects and other magnets.
- To be able to predict whether objects will be magnetic and carry out an enquiry to test this out.
- To be able to describe how magnets work and predict whether magnets will attract or repel and give a reason.

Year 4 End Points

Investigate living things:

- To be able to group living things in different ways.
- To be able to use classification keys to group, identify and name living things.
- To be able to create classification keys to group, identify and name living things (for others to use).
- To be able to describe how changes to an environment could endanger living things.

Understand animals and humans:

- To be able to identify and name the parts of the human digestive system and describe the functions of the organs in the human digestive system.
- To be able to identify and describe the different types of teeth in humans and describe the functions of different human teeth.
- To be able to use food chains to identify producers, predators and prey.
- To be able to construct food chains to identify producers, predators and prey.

Investigate materials:

- To be able to group materials based on their state of matter (solid, liquid, gas).
- To be able to describe how some materials can change state.
- To be able to explore how materials change state.
- To be able to measure the temperature at which materials change state.
- To be able to describe the water cycle and explain the part played by evaporation and condensation in the water cycle.

Investigate sound and hearing:

- To be able to describe how sound is made and explain how sound travels from a source to our ears.
- To be able to explain the place of vibration in hearing.
- To be able to explore the correlation between pitch and the object producing a sound.
- To be able to explore the correlation between the volume of a sound and the strength of the vibrations that produced it.
- To be able to describe what happens to a sound as it travels away from its source.

Understand electrical circuits:

- To be able to identify and name appliances that require electricity to function.
- To be able to construct a series circuit.
- To be able to identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers).
- To be able to draw a circuit diagram.
- To be able to predict and test whether a lamp will light within a circuit.
- To be able to describe the function of a switch in a circuit.
- To be able to describe the difference between a conductor and insulators; giving examples of each.

Y5/6 End Points

Comparative/Fair testing:

- To plan different types of enquiries.
- To control variables in an enquiry.
- To use the outcome of test results to make predictions and set up a further comparative test.

Research:

- To relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory.
- To read, spell and pronounce scientific vocabulary accurately.

Observation over time:

- To plan different types of enquiries.
- To measure accurately and precisely using a range of equipment.

Pattern Seeking:

- To explain a conclusion from an enquiry.

Identifying, grouping and classifying:

- To plan different types of enquiries.
- To record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- To report findings from enquiries in a range of ways.

Problem Solving:

- To explain a conclusion from an enquiry.
- To explain casual relationships in an enquiry.
- To relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory.

Year 5 End Points

Investigate living things:

- To be able to describe the life cycle of different living things, e.g. mammal, amphibian, insect bird.
- To be able to describe the differences between different life cycles.
- To be able to describe the process of reproduction in plants.

Understand animals and humans:

- To be able to describe the process of reproduction in animals.
- To be able to create a timeline to indicate stages of growth in humans.

Investigate materials:

- To be able to compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets).
- To be able to describe how a material dissolves to form a solution; explaining the process of dissolving.
- To be able to describe and show how to recover a substance from a solution.
- To be able to describe how some materials can be separated.
- To be able to demonstrate how materials can be separated (e.g. through filtering, sieving and evaporating).

Year 6 End Points

Investigate living things:

- To be able to classify living things into broad groups according to observable characteristics and based on similarities & differences.
- To be able to describe how living things have been classified.
- To be able to give reasons for classifying plants and animals in a specific way.

Understand animals and humans:

- To be able to identify and name the main parts of the human circulatory system.
- To be able to describe the function of the heart, blood vessels and blood.
- To be able to discuss the impact of diet, exercise, drugs and life style on health.
- To be able to describe the ways in which nutrients and water are transported in animals, including humans.

Understand evolution and inheritance:

- To be able to describe how the earth and living things have changed over time.
- To be able to explain how fossils can be used to find out about the past.
- To be able to explain about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents).

- I know and can demonstrate that some changes are reversible and some are not.
- To be able to explain how some changes result in the formation of a new material and that this is usually irreversible.
- To be able to discuss reversible and irreversible changes.
- To be able to give evidenced reasons why materials should be used for specific purposes.

Understand the Earth's movement in space:

- To be able to describe and explain the movement of the Earth and other planets relative to the Sun.
- To be able to describe and explain the movement of the Moon relative to the Earth.
- To be able to explain and demonstrate how night and day are created.
- To be able to describe the Sun, Earth and Moon (using the term spherical).
- To be able to explain what gravity is and its impact on our lives.

Understand movement, forces and magnets:

- To be able to identify and explain the effect of air resistance.
- To be able to identify and explain the effect of water resistance.
- To be able to identify and explain the effect of friction.
- To be able to explain how levers, pulleys and gears allow a smaller force to have a greater effect.

- To be able to explain how animals and plants are adapted to suit their environment.
- To be able to link adaptation over time to evolution.
- To be able to explain evolution.

Investigate light and seeing:

- To be able to explain how light travels.
- To be able to explain and demonstrate how we see objects.
- To be able to explain why shadows have the same shape as the object that casts them.
- To be able to explain how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.

Understand electrical circuits:

- To be able to explain how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer.
- To be able to compare and give reasons for why components work and do not work in a circuit.
- To be able to draw circuit diagrams using the correct symbols.

At Stocksbridge Junior School, every child is a scientist!