



# Science Year 5 Curriculum Overview



## The Big Picture

In this unit, pupils will build on their learning from year 4 and will raise questions about their local environment throughout the year. They will observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment. They will find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. Pupils will also explore different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.

## What do we already know?

Knowledge Retrieval:

Children can compare the differences between things that are living, dead, and things that have never been alive. They are aware that most living things live in habitats to which they are suited and describe how the habitats provide for their basic needs. They can identify and name a variety of plants and animals in their habitats, including microhabitat. Children can recognise that living things can be grouped in a variety of ways and they will have explored classification keys to group living things in their environment. They will be aware that environments may change and that this can pose dangers to living things.

Year 5 Science – All Living Things

## NC objectives – Year 5

### Knowledge:

- To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- To describe the life process of reproduction in some plants and animals

### Working scientifically:

- To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- To use test results to make predictions to set up further comparative and fair tests
- To report and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- To identify scientific evidence that has been used to support or refute ideas or arguments

## Sticky Knowledge:

- Can they describe and compare the life cycles of a range of animals, including humans, amphibians, insects and birds?
- Can they describe the life cycles of common plants?
- Can they describe and explain the process of respiration in humans and plants?
- Can they talk with knowledge about birth, reproduction and death of familiar animals or plants?
- Can they explore the work of well know naturalists? (David Attenborough and Jane Goodall)
- **Challenge** - Can they observe their local environment and draw conclusions about life-cycles? (for example, the vegetable garden or plants in a shrubbery)
- **Challenge** - Can they compare the life cycles of plants and animals in their local environment with the life cycles of those around the world, e.g. rainforests?

## Working scientifically:

### Planning:

- Can they plan and carry out an investigation by controlling variables fairly and accurately?
- Can they make a prediction with reasons?
- Can they use test results to make further predictions and set up further comparative tests?
- Can they present a report of their findings through writing, display and presentation?
- **Challenging** – Can they explore different ways to test an idea and choose the best way, and give reasons?
- **Challenging** – Can they vary one factor whilst keeping the others the same in an experiment?
- **Challenging** - Can they use information to help make a prediction?
- **Challenging** - Can they explain (in simple terms) a scientific idea and what evidence supports it?

### Obtaining and presenting evidence:

- To can they take measurements using a range of scientific equipment with increasing accuracy and precision?
- Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?
- **Challenge** - Can they decide which units of measurement they need to use?
- **Challenge** - Can they explain why a measurement needs to be repeated?

### Considering evidence and evaluating:

- Can they report findings from investigations through written explanations and conclusions?
- Can they use a graph to answer scientific questions?
- **Challenge** – Can they find a pattern from their data and explain what it shows?
- **Challenge** - Can they link what they have found out to other science?
- **Challenge** -Can they suggest how to improve their work and say why they think this?

## Key unit objectives

### Knowledge

- To know the differences in the life cycles of a mammal, amphibian, insect and a bird.
- To explain the differences in the life cycles of a mammal, amphibian, insect and a bird.
- To describe the life process of asexual reproduction in some plants and animals including humans.
- To describe the life process of sexual reproduction in some plants and animals including humans. PSHE/RSE

### Types of scientific enquiry covered

- Identifying and classifying
- fair testing
- Changes overtime

## Key vocabulary and understanding for concept

### connectors

Reproduction  
Mammal  
Amphibian  
Life cycle

## Research/scientists/careers:

David Attenborough and Jane Goodall - naturalists



# Science Year 5 Curriculum Overview



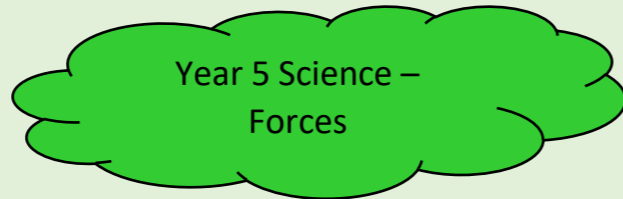
## The Big Picture

This unit will provide will explore falling objects and raise questions about the effects of air resistance by observing how different objects fall. They will experience forces that make things begin to move, get faster or slow down. Pupils will explore the effects of friction on movement and find out how it slows or stops moving objects. Pupils will also explore the effects of levers, pulleys and simple machines on movement. Pupils will find out how scientists helped to develop the theory of gravitation.

## What do we already know?

### Knowledge Retrieval:

Pupils will build on their knowledge of forces from year 3. They will be aware of and will be able to discuss how some magnets attract or repel each other. They will be able to classify which materials are attracted to magnets and they can describe the speed and direction of moving objects.



### Sticky knowledge:

- Can they explain what gravity is and its impact on our lives?
- Can they explain why a wheeled object that is initially pushed will slow down and stop?
- Can they explain the impact of friction on a moving object?
- Can they explain the effect of drag force on moving objects?
- Can they explain how force and motion can be transferred through gears, pulleys, levers and springs?
- **Challenge** - Can they describe and explain how motion is affected by forces? (including gravitational attractions, magnetic attraction and friction)
- **Challenge** - Can they design very effective parachutes?
- **Challenge** - Can they work out how water can cause resistance to floating objects?

### Working scientifically:

#### Planning:

- Can they plan and carry out an investigation by controlling variables fairly and accurately?
- Can they make a prediction with reasons?
- Can they use test results to make further predictions and set up further comparative tests?
- Can they present a report of their findings through writing, display and presentation?
- **Challenging** – Can they explore different ways to test an idea and choose the best way, and give reasons?
- **Challenging** – Can they vary one factor whilst keeping the others the same in an experiment?
- **Challenging** - Can they use information to help make a prediction?
- **Challenging** - Can they explain (in simple terms) a scientific idea and what evidence supports it?

#### Obtaining and presenting evidence:

- Can they take measurements using a range of scientific equipment with increasing accuracy and precision?
- Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?
- **Challenge** - Can they decide which units of measurement they need to use?
- **Challenge** - Can they explain why a measurement needs to be repeated?

#### Considering evidence and evaluating:

- Can they report findings from investigations through written explanations and conclusions?
- Can they use a graph to answer scientific questions?
- **Challenge** – Can they find a pattern from their data and explain what it shows?
- **Challenge** - Can they link what they have found out to other science?
- **Challenge** -Can they suggest how to improve their work and say why they think this?

## NC objectives – Year 5

### Knowledge:

- To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- To identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- To recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect

### Working scientifically: Upper Key Stage 2

- To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- To use test results to make predictions to set up further comparative and fair tests
- To report and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- To identify scientific evidence that has been used to support or refute ideas or arguments

## Key unit objectives

- To know that unsupported objects will fall towards the center of the Earth
- To explain that unsupported objects fall towards Earth because of gravity
- To know that forces act between moving objects
- To know and explain what air resistance is
- To know and explain what water resistance is
- To know and explain what friction is
- To identify the effects of air, water and friction as a resistance that act between moving surfaces
- To recognise that levers/gears and pulleys allow a small force to have a greater effect.

### Types of scientific enquiry covered

- Identifying and classifying
- Research
- Fair tests
- Pattern seeking

## Key vocabulary and understanding for concept connectors

air resistance, water resistance, friction, streamline, mechanism,

A **force** causes an object to start/stop moving, speed up, slow down or change direction.

**Air resistance, water resistance and friction** are contact forces – they act between moving surfaces.

**Gravity** acts without contact - acts at a distance. Everything is pulled to the Earth by gravity.

## Research/scientists/careers:

Galileo Galilei  
Isaac Newton



# Science Year 5 Curriculum Overview

## The Big Picture

This unit will provide pupils with the opportunity to draw a timeline to indicate stages in the growth and development of humans. They will also learn about the changes experienced in puberty.

## What do we already know?

### Knowledge Retrieval

Pupils will build on their knowledge of stages of growth from their History lessons where the children have created a timeline of their lives, looking at the different stages. The children will also build on their knowledge from PSHE lessons where they look at changes as we develop.

### Sticky knowledge:

- Can they create a timeline to indicate stages of growth in humans?
- Can they explain what puberty is?
- **Challenging** – Can they create a timeline to indicate stages of growth in certain animals, such as frogs and butterflies?

### Working scientifically:

#### Planning:

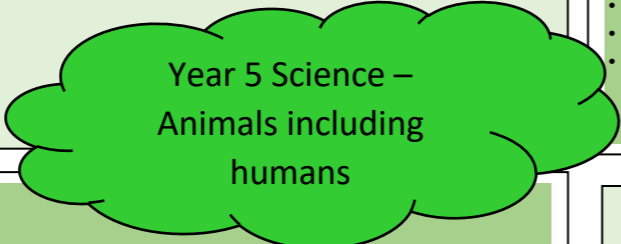
- Can they plan and carry out an investigation by controlling variables fairly and accurately?
- Can they make a prediction with reasons?
- Can they use test results to make further predictions and set up further comparative tests?
- Can they present a report of their findings through writing, display and presentation?
- **Challenging** – Can they explore different ways to test an idea and choose the best way, and give reasons?
- **Challenging** – Can they vary one factor whilst keeping the others the same in an experiment?
- **Challenging** - Can they use information to help make a prediction?
- **Challenging** - Can they explain (in simple terms) a scientific idea and what evidence supports it?

#### Obtaining and presenting evidence:

- To can they take measurements using a range of scientific equipment with increasing accuracy and precision?
- Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?
- **Challenge** - Can they decide which units of measurement they need to use?
- **Challenge** - Can they explain why a measurement needs to be repeated?

#### Considering evidence and evaluating:

- Can they report findings from investigations through written explanations and conclusions?
- Can they use a graph to answer scientific questions?
- **Challenge** – Can they find a pattern from their data and explain what it shows?
- **Challenge** - Can they link what they have found out to other science?
- **Challenge** -Can they suggest how to improve their work and say why they think this?



## NC objectives – Year 2

### Knowledge:

- To describe the changes as humans develop to old age.

### Working scientifically: Upper Key Stage 2

- To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- To use test results to make predictions to set up further comparative and fair tests
- To report and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- To identify scientific evidence that has been used to support or refute ideas or arguments

### Key unit objectives

- To create a timeline of growth for animals and humans.
- To describe the changes as human’s develop to old age.
- To be aware of what puberty is.
- To describe some of the changes that may happen during puberty.

### Types of scientific enquiry covered

- Identifying and classifying
- Research
- Pattern seeking
- Changes overtime

### Key vocabulary and understanding for concept connectors

Puberty, growth, age, development, changes,

### Research/scientists/careers:

Sigmund Freud – created psychoanalysis



## Science Year 5 Curriculum Overview

### The Big Picture

In this unit, pupils will build a more systematic understanding of materials by exploring and comparing their properties, relating these to what they learnt about magnetism in year 3 and about electricity in year 4. They will explore reversible changes, recognising that melting and dissolving are different processes. Pupils will also explore changes that are difficult to reverse. They will research to find out about how chemists create new materials.

### What do we already know?

Knowledge Retrieval:

Pupils have a basic knowledge of materials and their properties and uses from their work in Year 1 and Year 2. Pupils will also build on what they learnt about magnetism in year 3 and about electricity in year 4.

Year 5 Science –  
Properties and changes  
of materials

### NC objectives – Year 5

#### Knowledge:

- To compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- To demonstrate that dissolving, mixing and changes of state are reversible changes
- To explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda

#### Working scientifically:

- To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- To use test results to make predictions to set up further comparative and fair tests
- To report and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- To identify scientific evidence that has been used to support or refute ideas or arguments

#### Sticky Knowledge:

- Can they test and group materials based on scientific evidence? (hardness, solubility, transparency, conductivity, insulation, magnetism)
- Can they explain the process of dissolving?
- Can they recover a substance from a solution?
- Can they decide how a mixture would best be separated? (filtering, sieving, evaporating)
- Can they give reasons for the uses of everyday materials based on scientific evidence?
- Can they show what they know about the properties of different materials?
- Can they use their knowledge of materials to suggest ways to classify? (solids, liquids, gasses)
- Can they describe changes using scientific words? (evaporation, condensation)
- Can they use the terms 'reversible' and 'irreversible'?
- **Challenge** – Can they describe methods for separating mixtures? (filtration, distillation)
- **Challenge** - Can they work out which materials are most effective for keeping us warm or for keeping something cold?

#### Working scientifically:

##### Planning:

- Can they plan and carry out an investigation by controlling variables fairly and accurately?
- Can they make a prediction with reasons?
- Can they use test results to make further predictions and set up further comparative tests?
- Can they present a report of their findings through writing, display and presentation?
- **Challenging** – Can they explore different ways to test an idea and choose the best way, and give reasons?
- **Challenging** – Can they vary one factor whilst keeping the others the same in an experiment?
- **Challenging** - Can they use information to help make a prediction?
- **Challenging** - Can they explain (in simple terms) a scientific idea and what evidence supports it?

##### Obtaining and presenting evidence:

- To can they take measurements using a range of scientific equipment with increasing accuracy and precision?
- Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?
- **Challenge** - Can they decide which units of measurement they need to use?
- **Challenge** - Can they explain why a measurement needs to be repeated?

##### Considering evidence and evaluating:

- Can they report findings from investigations through written explanations and conclusions?
- Can they use a graph to answer scientific questions?
- **Challenge** – Can they find a pattern from their data and explain what it shows?
- **Challenge** - Can they link what they have found out to other science?
- **Challenge** -Can they suggest how to improve their work and say why they think this?

### Key unit objectives

#### Knowledge

- To compare and group together everyday materials on the basis of their properties.
- To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- To know the uses and give reasons based on fair tests for the uses of everyday materials.
- To demonstrate that dissolving, mixing and changes of state are reversible changes
- To use their knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- To know that some changes result in the formation of new materials and that the change is not usually reversible (burning).

#### Types of scientific enquiry covered

- Identifying and classifying
- fair testing
- Changes overtime

### Key vocabulary and understanding for concept connectors

**Transparent, Evaporation, Dissolving, sediment, conductor, irreversible, reversible, insulator, permeable, soluble**  
Mixtures can be separated by **filtering, sieving and evaporation.**

### Research/scientists/careers:

Spencer Silver (invented glue for sticky notes)

Ruth Benerito (invented wrinkle-free cotton)





## Science Year 5 Curriculum Overview

### The Big Picture

In this unit, pupils will explore space and the Earth they live on. They will look at a model of the sun and Earth and they will explore how we have day and night. Pupils will learn that the sun is a star at the centre of our solar system and that there are 8 planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. They will be made aware that a moon is a celestial body that orbits a planet and they will know that Earth has 1 moon; Jupiter has 4 large moons and numerous smaller ones. Pupils will also be warned that it is not safe to look directly at the sun, even when wearing dark glasses.

### What do we already know?

### Knowledge Retrieval:

The children will build upon their knowledge from light in Year 3, looking at the dangers of looking at the sun. They will also build upon their knowledge from Geography about the Earth that we live on.

Year 5 Science -  
Earth and Space

### NC objectives – Year 5

#### Knowledge:

- To describe the movement of the Earth and other planets relative to the sun in the solar system
- To describe the movement of the moon relative to the Earth
- To describe the sun, Earth and moon as approximately spherical bodies
- To use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

#### Working scientifically: Upper Key Stage 2

- To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- To use test results to make predictions to set up further comparative and fair tests
- To report and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- To identify scientific evidence that has been used to support or refute ideas or arguments

#### Sticky knowledge:

- Can they identify and explain the movement of the Earth relative to the sun?
- Can they explain how seasons and the associated weather is created?
- Can they identify and explain the movement of the moon relative to the Earth?
- Can they explain the size, shape and position of the earth, sun and moon?
- Can they explain how night and day are created and use diagrams to show this?
- Can they explain how planets are linked to stars?
- **Challenging** – Can they compare the time of day at different places on the earth?
- **Challenging** – Can they create shadow clocks?
- **Challenging** – Can they begin to understand how older civilizations used the sun to create astronomical clocks?
- **Challenging** – Can they explore the work of some space pioneers?

#### Working scientifically:

##### Planning:

- Can they plan and carry out an investigation by controlling variables fairly and accurately?
- Can they make a prediction with reasons?
- Can they use test results to make further predictions and set up further comparative tests?
- Can they present a report of their findings through writing, display and presentation?
- **Challenging** – Can they explore different ways to test an idea and choose the best way, and give reasons?
- **Challenging** – Can they vary one factor whilst keeping the others the same in an experiment?
- **Challenging** - Can they use information to help make a prediction?
- **Challenging** - Can they explain (in simple terms) a scientific idea and what evidence supports it?

##### Obtaining and presenting evidence:

- To can they take measurements using a range of scientific equipment with increasing accuracy and precision?
- Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?
- **Challenge** - Can they decide which units of measurement they need to use?
- **Challenge** - Can they explain why a measurement needs to be repeated?

##### Considering evidence and evaluating:

- Can they report findings from investigations through written explanations and conclusions?
- Can they use a graph to answer scientific questions?
- **Challenge** – Can they find a pattern from their data and explain what it shows?
- **Challenge** - Can they link what they have found out to other science?
- **Challenge** - Can they suggest how to improve their work and say why they think this?

### Key unit objectives

- To know that the sun is a star in the centre of the solar system.
- To know that there are 8 planets and to know their order from the sun.
- To know that the Earth and other planets orbit the sun in the solar system.
- To know that the moon orbits the Earth in about 28 days.
- To know that the sun, Earth and moon are approximately spherical bodies.
- To use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

### Types of scientific enquiry covered

- Identifying and classifying
- Research

### Key vocabulary and understanding for concept connectors

Axis, Rotation, constellation, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, planets, solar system, rotate, orbit

### Research/scientists/careers:

Claudius Ptolemaeus (Ptolemy) (Astronomer who developed the theory that the Earth was at the centre of the Solar System around which the Sun and other planets orbited)

Nicolaus Copernicus (Astronomer who developed the theory that the Sun was at the centre of the Solar System around which the planets orbited)

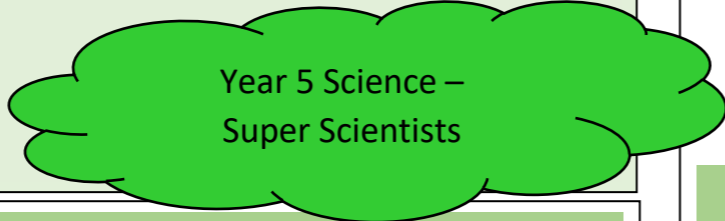
Galileo Galilei - search document for information (Astronomer, Mathematician & Physicist who made the first telescope and discovered Neptune and the rings of Saturn)



# Science Year 5 Curriculum Overview

## The Big Picture

Children will have built up an understanding of science over the year. This time allows the teacher to identify and fill any gaps that may still be present. The 'super scientists' topic allows the children time to use their creative side and come up with their own scientific enquiry-based questions and allows them the time to plan and investigate these ideas. The whole topic is child centred and allows the children to have fun whilst learning the fundamental skills working scientifically.



## Working scientifically:

### Planning:

- Can they plan and carry out an investigation by controlling variables fairly and accurately?
- Can they make a prediction with reasons?
- Can they use test results to make further predictions and set up further comparative tests?
- Can they present a report of their findings through writing, display and presentation?
- **Challenging** – Can they explore different ways to test an idea and choose the best way, and give reasons?
- **Challenging** – Can they vary one factor whilst keeping the others the same in an experiment?
- **Challenging** - Can they use information to help make a prediction?
- **Challenging** - Can they explain (in simple terms) a scientific idea and what evidence supports it?

### Obtaining and presenting evidence:

- To can they take measurements using a range of scientific equipment with increasing accuracy and precision?
- Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models?
- **Challenge** - Can they decide which units of measurement they need to use?
- **Challenge** - Can they explain why a measurement needs to be repeated?

### Considering evidence and evaluating:

- Can they report findings from investigations through written explanations and conclusions?
- Can they use a graph to answer scientific questions?
- **Challenge** – Can they find a pattern from their data and explain what it shows?
- **Challenge** - Can they link what they have found out to other science?
- **Challenge** -Can they suggest how to improve their work and say why they think this?

## Working scientifically: Upper Key Stage 2

- To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- To use test results to make predictions to set up further comparative and fair tests
- To report and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- To identify scientific evidence that has been used to support or refute ideas or arguments

## Types of scientific enquiry covered

- Identifying and classifying
- Pattern seeking
- Comparative tests
- Observations over time
- research

## Key vocabulary and understanding for concept connectors

**Prediction** – Where you say what you think will happen.  
**Change, measure**  
**Equipment** – What we use.  
**Conclusion**  
**Research**

## Research/scientists/careers:

Linked to children's interests and ideas.