Year group: 5 Topic: Earth and Space

## What should I already know?

Pupils will not have studies space before but will have studies shadows and their formation in Year 3

## What will I know by the end of the unit? (Substantive Knowledge)

know that the Sun, planets and moons in the solar system are approximately spherical in shape

describe the relative motion of the Earth, the Moon and the Sun

explain how ideas about the solar system have changes through the centuries including how the geocentric model of the solar system gave way to the heliocentric model

identify the eight planets within the solar system and their positions relative to the Sun

compare planets in terms of atmosphere, time to orbit the Earth, period of rotation, number of moons etc.

explain night and day in terms of the rotation of the Earth and identify patterns in data about sunrise and sunset

investigate differences in the time of day and the length of day in different parts of the World

describe and explain in simple terms how the appearance of the Moon in the sky changes over the course of 28 days

investigate factors that affect the formation of craters, taking measurements with increasing accuracy and precision, taking repeat readings

## Common misconceptions

It is not self-evident that the Earth is a planet orbiting the sun. The Sun's apparent movement across the sky shows it rising, coming up, going down, setting going behind clouds etc. whilst we are in one place, all of which imply that it is the Sun rather than the Earth that is moving.

Children sometimes think there is no gravity on the Moon or that things will float away.

They often think that we have summer when the Earth is close to the Sun rather than because of the tilt of the axis.

## Key Vocabulary

| | |
|---|---|
| Earth | orbit |
| Sun | sphere |
| Planets | Horizon |
| Moon | day |
| astronomer | planet |
| Astronomy | moon |
| heavenly body | rotation |
| Distance | season |
| star | Winter |
| sun | shadow |
| Year | spring |
| *asteroid* | Daylight |
| orbit | full moon |
| Rotation | half moon |
| *atmosphere* | Wax |
| Gravity | Light |
| | dark side |
| axis | wane |
| sunrise | position |
| Summer | crater |
| orbit | impact |
| sunset | Phase |
| Autumn | crescent |
| | new moon |

## Working Scientifically (Disciplinary Knowledge)

Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms.

Use displays and other presentations identifying scientific evidence that has been used to support or refute ideas or arguments.

Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

Year group: 5 Topic: Animals including humans

## What should I already know?

## What will I know by the end of the unit? (Substantive Knowledge)

The suggested lessons from Engaging Science are covered as followed:

Lesson 1 - Year 3 Jigsaw life cycles

Lesson 2 - Year 5 Puberty

Lesson 3 - conception is covered in Year 6

This will be covered in RSE from Jigsaw and not by using the science curriculum 'Engaging Science'. There will not be an explicit science topic for this.

## Common misconceptions

## Key Vocabulary

## Working Scientifically (Disciplinary Knowledge)

Year group: 5 Topic: Forces

## What should I already know?

Pupils studied friction in Year 3 and should know that friction is a force and that it acts against movement. They should know that forces can change the shape, speed and direction of objects.

## What will I know by the end of the unit? (Substantive Knowledge)

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

## Common misconceptions

Some children think that gravitational attraction only occurs on Earth and that gravity does not act through water

They sometimes think that an object has force, and when it runs out of force it stops moving.

## Key Vocabulary

| | |
|---|---|
| Force | Upthrust |
| Gravity | float |
| Speed | Keel |
| Acceleration | Self-righting |
| Attract | Anomalous |
| Variation | Accuracy |
| Planet | Line graph |
| Newtons | Conclusion |
| Force meter | Evaluation |
| Weightless | Axle |
| Air resistance | Pulley |
| Balance | Inclined plane |
| Reliability | Lever |
| Tension | Fulcrum |
| | Ratio |

## Working Scientifically (Disciplinary Knowledge)

planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

recording data and results of increasing complexity using scientific diagrams and labels, tables, bar and line graphs

using test results to make predictions to set up further comparative and fair tests

reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as dis-

Year group: 5 Topic: Living Things

## What should I already know?

Pupils will have learned the main parts of the plant and the basic life cycle of plants but will not have studied the structure of a flower in detail. They should know how seeds re dispersed.

In Key Stage 1 they will have observed the growth of animals and will have

## What will I know by the end of the unit? (Substantive Knowledge)

Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird

Describe the life process of reproduction in some plants and animals

Compare and contrast the life cycles of mammals, insects, birds and amphibians

## Working Scientifically (Disciplinary Knowledge)

planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

reporting and presenting findings from enquiries, including conclusions, explanations of and degree of trust in results, in oral and written forms such as displays and other presentations

identifying scientific evidence that has been used to support or refute ideas or arguments.

## Key Vocabulary

| | |
|---|---|
| evidence | ovules |
| observation | sepals |
| measurement | nectary |
| life cycle | pollination |
| stage | fertilisation |
| offspring | insect |
| metamorphosis | asexual reproduction |
| growth | sexual reproduction |
| germination | life cycle |
| structure | nectary |
| Habitat | pollination |
| plant | egg |
| stem | birth |
| seed | hatch |
| root | grow |
| photosynthesis | diet |
| seed dispersal | adult |
| life cycle | maturity |
| structure | chick |
| stamen | baby |
| carpel | Rear |
| anther | |
| filament | |
| stigma | |
| ovary | |
| wind | |

## Common misconceptions

Children sometimes know that sexual reproduction occurs in animals but do not think it happens in plants.

They may believe that asexual reproduction produces weak offspring and sexual reproduction produces superior offspring.

# Year group: 5 Topic: Materials

## What should I already know?

Pupils have studied the properties of materials in year 1 and 2 and have studied the states of matter in year 4

## What will I know by the end of the unit? (Substantive Knowledge)

Compare and group together everyday materials on the basis of their properties including their hardness, solubility, transparency, conductivity and response to magnets

know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
use knowledge of solids, liquids and gases to decide how mixtures might be separated,
give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials.
Demonstrate that dissolving, mixing and changes of state are reversible changes
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.

## Common misconceptions

Children sometimes only understand changes of state in terms of water and find it hard to recognise they occur in other substances. Chemical changes can be perceived as adding to substances rather than changing them, so that children believe that, after chemical change, the original substances remain even though they are altered.

## Key Vocabulary

| | |
|---|---|
| Property | Solution |
| Material | Solute |
| Glass | Soluble |
| Ceramic | Insoluble |
| Rubber | Saturated |
| Steel | Crystals |
| Aluminium | Crystallisation |
| Characteristic | Filtration |
| Magnetic attraction | Settling |
| | Particle |
| Opacity | Precautions |
| Thermal conductivity | Chemical change |
| | Irreversible |
| Electrical conductivity | Reaction |
| | Product |
| Flexibility | Patent |
| Dissolve | manufacture |
| Solvent | |

## Working Scientifically (Disciplinary Knowledge)

planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

using test results to make predictions to set up further comparative and fair tests

reporting and presenting findings from enquiries,

identifying scientific evidence that has been used to support or refute ideas or arguments.