

# Year 5—Science- Out of this World

## Spring I Knowledge Organiser

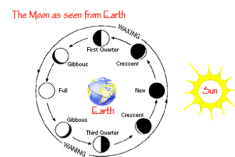


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This Science unit builds and extends the knowledge that children learned about the seasons in Year 1. This unit will teach the children new information about the solar system, and the movement of the Earth and other planets in relation to the sun. They will learn how our historical understanding has changed from the geocentric to the heliocentric model. Children will also learn how to describe the movement of the moon and the sun in relation to the Earth.

### Key knowledge

- Our solar system consists of Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune and Uranus.
- These planets orbit the Sun, which is the largest star in our solar system. It takes a little more than 365 days for Earth to orbit the Sun.
- Mercury, Venus, Earth and Mars are rocky planets. They are mostly made up of metal and rock. Jupiter, Saturn and Neptune are mostly made up of gases (helium and hydrogen), although they do have cores made up of rock and metal. Pluto used to be considered a planet, but was reclassified as a dwarf planet in 2006.
- Years ago, people believed that planets move around the Earth. This is called the geocentric model. The structure of the solar system where the planets orbit around the Sun is called the heliocentric model and is the model that we currently believe.
- The Moon orbits Earth. It takes approximately 29 days (close to a month) for the moon to complete one whole orbit of Earth. At different times in a month, the Moon appears to be different shapes. This is because as the Moon orbits round Earth, the sun lights up different parts of it.
- The Sun, Earth and Moon are spheres. People have not always believed this in the past. Many people believed the earth was flat until scientists used evidence to prove them wrong.
- It appears to us that the Sun moves across the sky during the day, but the Sun does not move at all. It seems to us that the Sun moves, because of the movements of Earth.
- Earth rotates on its axis. The Earth does a full rotation in 24 hours. Daytime occurs when the side of the Earth is facing towards the Sun. Night occurs when the side of the Earth is facing away from the Sun.



### Key Vocabulary

**Solar System:** The sun and everything (including planets) that orbits around it

**Orbits:** The path of an object around another object in space

**Heliocentric:** An idea about the solar system that has the sun as its centre

**Geocentric:** The incorrect idea that the Earth is fixed at the centre of the solar system

**Astronomers:** A scientist who studies the universe and everything in it.

**Axis:** An imaginary line that an object, such as a planet, turns around.

**Rotates:** When something, such as a planet, turns or spins around a point.

**Spherical body:** An astronomical object that is shaped like a sphere.

### Key Questions

What planets are there in our solar system and what do they orbit?

What is the Sun?

How long does it take for the Earth to orbit the Sun? What planets are made up mostly of rock and metal?

What planets are made up mostly of the gases-hydrogen and helium?

What is the geocentric model?

What is the heliocentric model? Which scientists and astronomers contributed to developing this model?

What does the Earth's moon do?

How long does it take for the Moon to orbit Earth?

Why does the Moon appear to be different shapes? What are the different phases of the Moon?

What are spherical bodies?

# Year 5—Science- Material World

## Spring 2 Knowledge Organiser

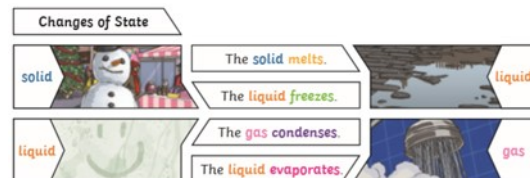
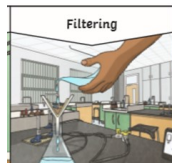
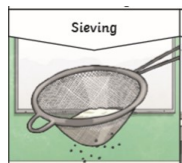


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This Science unit builds on the knowledge that children learned about how to observe, describe, group and compare the changing state of materials in Year 4. This unit will teach the children how to compare and group materials linked to their everyday properties. Scientific enquiry skills will be used to investigate uses of different materials such as wood, metals and plastic. Children will also explore how some materials will dissolve to form a solution and investigate how to recover a substance from a solution. Reversible and irreversible changes will be explored as will other ways of separating materials.

### Key knowledge

- That materials can be grouped according to properties such as: hardness, solubility, electrical and thermal conductors or insulators, transparency and magnetism.
- Metals are good thermal conductors, as they allow heat to move through them. Thermal conductors are used to make items that need heat to travel through them, like a pan or a radiator. Wood, plastics and wool are good thermal insulators.
- Thermal insulators can keep heat out or in. For example, a plastic vacuum flask stops heat from the air travelling through to the food or drink inside, keeping it cool. A coat stops the heat from your body travelling through to the air outside, keeping you warm.
- Dissolving involves a liquid and another material, often a solid. In dissolving, the solid mixes into the liquid to make a new liquid, called a solution.
- Materials that easily dissolve (called soluble) in a liquid are sugar, gravy, coffee granules. If the material does dissolve, the water will be transparent. If the material does not dissolve, you will still see the particles of the solid in the water. This is called a suspension. When a material does not dissolve it is insoluble.
- Dissolving is a reversible change. Mixing a liquid with a solid is reversible because you can use sieving or filtration to separate the solid from the liquid.
- Materials can be separated using: sieving, filtering, and evaporating
- In an irreversible change, new materials are always formed. Heating can cause an irreversible change e.g. heating an egg to cook it. The cooked egg cannot be changed back to a raw egg again. Mixing and burning can cause chemical reactions that are irreversible.



### Key Vocabulary

**Material:** The matter from which something can be made.

**Property:** Words we use to describe the material e.g. wood is hard.

**Hardness:** Materials that are difficult to scratch are hard. Materials that are easy to scratch are soft

**Solubility:** Solids that easily dissolve in a liquid (generally water) are soluble.

**Conductors:** Materials that allow electricity or heat to pass through

**Insulators:** Materials that do not allow electricity or heat to pass through

**Transparency:** How well you can see through a material

**Reversible:** A change to materials that can be undone

**Irreversible:** A change to materials that cannot be undone

### Key Questions

- What properties can you use to compare and group materials?
- What are electrical conductors? What are electrical insulators?
- What are thermal conductors? What are thermal insulators?
- What is the property of transparency? What is the property of magnetism?
- What is a use of a metal?
- What is a use of a plastic or wood?
- What is dissolving? What is a solution?
- How can you tell if a solid has dissolved? What is a solid called if it dissolves?
- What solids dissolve easily? What happens when a solid does not dissolve?
- What is a reversible change?
- What is sieving/filtering/evaporating and how do they separate materials
- What is an irreversible change? How is heating / mixing / burning irreversible?

# Science—Enquiry Approaches

## Knowledge Organiser



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ambitious for the future

Scientific enquiry approaches are part of our science curriculum and are the different ways that we can carry out scientific investigations.

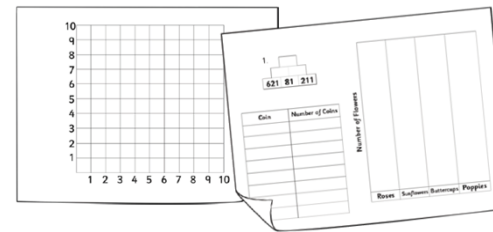
### Observing over time



We measure events and changes in living things, processes or materials. These observations (using our senses) may take place over different periods of time; minutes, hours, weeks or months. several weeks or months.

**How does the moon appear to change shape during a week?**

### Pattern Seeking



We conduct investigations where there are variables we cannot control (practically or ethically).

We don't look for cause and effect in Pattern Seeking, but possible relationships may be identified.

**Do sounds get quieter the further away you are from the sound source?**

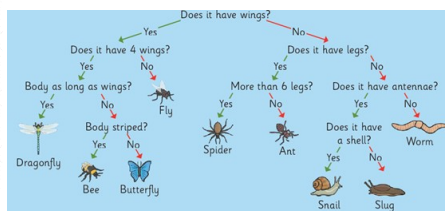
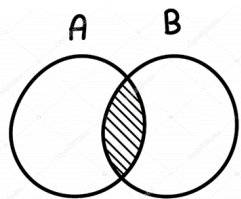
### Researching using Secondary Sources



Sometimes we research when we ask questions that can not be answered practically. We can use secondary sources, such as books, the internet, or an expert.

**What are the main parts of the circulatory system and what are their functions?**

### Identifying and Classifying



**Identification:** Naming

things by looking at differences.

**Classification:** Organising things into group by making connections and looking at similarities or differences.

**How can we classify animals using a classification key?**

### Fair testing



One variable (independent variable) is changed and all other variables must be controlled. The variable that is changed is quantitative (**numbered**).

**How does the size of the parachute effect the time it takes to fall?**

### Comparative testing



One variable (independent variable) is changed and all other variables must be controlled. The variable that is changed is qualitative (**words**).

**Which material is the best thermal insulator?**