

Year 5—Science- Material World

Spring 2 Knowledge Organiser

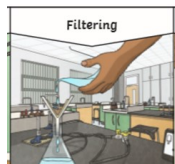
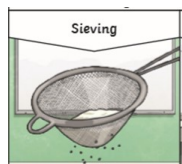


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This Science unit builds on the knowledge that children learned about how to observe, describe, group and compare the changing state of materials in Year 4. This unit will teach the children how to compare and group materials linked to their everyday 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?

Year 5—Science- Circle of life
Summer 2 Knowledge Organiser

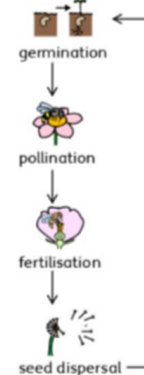


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This Science unit builds on knowledge that the children learned about living things and the seven life processes in previous years. This topic will introduce the life process of reproduction in some plants and animals. The children will be able to distinguish between sexual and asexual reproduction and identify the differences between these. They will understand that mammals sexually reproduce and some plants will reproduce asexually while others will reproduce sexually. Life cycles will be explored and the children will be able to explain the life cycle of a mammal, an amphibian, an insect (complete and incomplete metamorphosis) and a bird.

Key knowledge

- Sexual reproduction in plants occurs through pollination and seeds are formed.
- Asexual reproduction in plants occurs when bulbs or tubers are developed underground. Daffodils and potatoes are examples of plants that reproduce this way.
- Other plants, like strawberry plants, reproduce asexually by sending out runners with small plantlets on. These will each grow into a new plant.
- Mammals reproduce sexually—a sperm fuses with the ovum and the fertilised cell continues to split in half and eventually a baby is formed.
- Amphibians, insects and birds all start life as an egg. Mammals start life as an embryo.
- Mammals, insects that undergo incomplete metamorphosis and birds have 3 stages in their life cycle. Amphibians have 6 stages and insects that undergo complete metamorphosis have 4 stages.
- Mammals, insects that undergo incomplete metamorphosis and birds all produce young that look like their adults. Amphibians (frogs-tadpoles) and insects that undergo complete metamorphosis (butterflies-caterpillars) do not produce young that look like the adult.



Key Vocabulary

Reproduction: When an animal or plant produces one or more individuals similar to itself

Sexual reproduction: Requires two parents with male and female gametes and produces similar offspring (not identical to the parent).

Asexual reproduction: Requires only one parent and will produce offspring that is identical to the parent.

Gestation period: The period of pregnancy that the baby will grow inside the female.

Complete Metamorphosis

The life cycle of these insects has four stages: egg, larva, pupa and adult. Insects in this category include beetles, butterflies and flies.



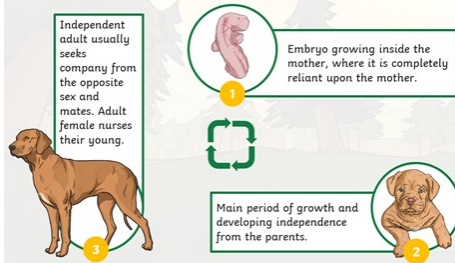
Incomplete Metamorphosis

The life cycle of these insects has three stages: egg, nymph and adult. Insects in this category include grasshoppers, crickets and cockroaches.

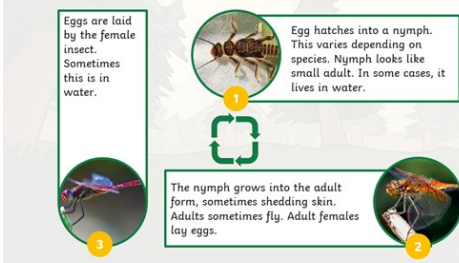


Key Questions

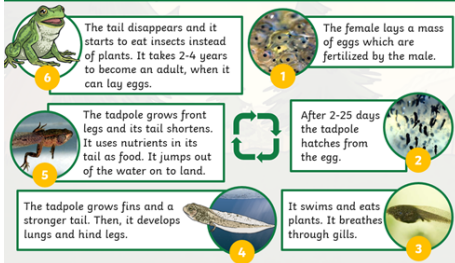
The Life Cycle of a Mammal



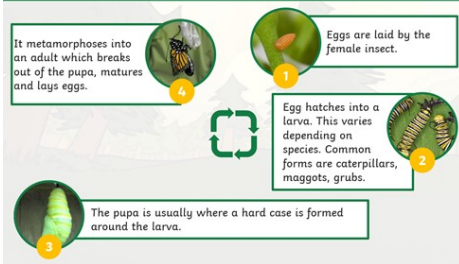
The Life Cycle of an Insect (Incomplete Metamorphosis)



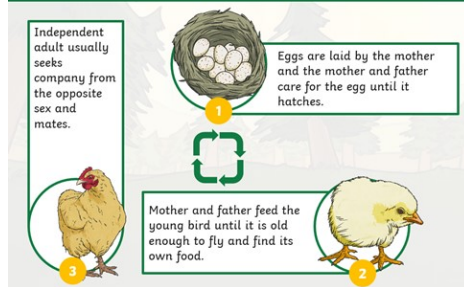
The Life Cycle of an Amphibian



The Life Cycle of an Insect (Complete Metamorphosis)



The Life Cycle of a Bird



- What is reproduction?
- What is sexual reproduction?
- What is asexual reproduction?
- What happens in sexual reproduction in a plant?
- What are the two possible ways a plant can reproduce asexually?
- What happens in sexual reproduction in a mammal?
- Explain what happens in the life cycle of a mammal.
- Explain what happens in the life cycle of an amphibian.
- Explain what happens in the life cycle of an insect (complete metamorphosis)
- Explain what happens in the life cycle of an insect (incomplete metamorphosis).
- What are the differences between the life cycle of an insect that undergoes complete metamorphosis and an insect that undergoes incomplete metamorphosis?
- Explain what happens in the life cycle of a bird.
- What are the similarities between the life cycle of a bird, amphibian, insect and mammal?
- What are the differences between the life cycle of a bird, amphibian, insect and mammal?

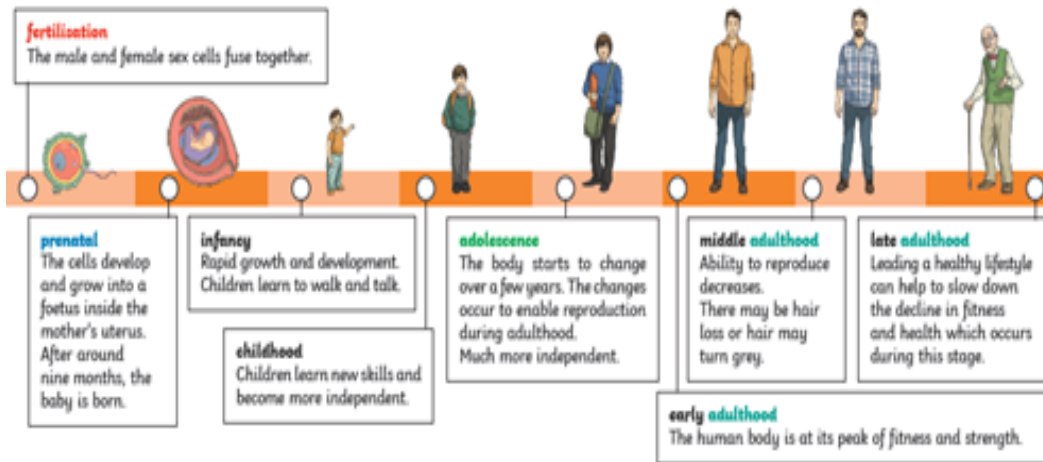
Year 5—Science- Growing pains
Summer 2 Knowledge Organiser



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This Science topic introduces children to stages of human life and they will be able to describe changes as humans develop from birth to old age. Developing on from knowledge learned in their *Living Things and Their Habitat* unit, the children will learn about what happens in the different stages of life, including puberty. They understand similarities and differences between girl and boy puberty.

Key knowledge



Puberty for girls	Puberty for boys
<ul style="list-style-type: none"> • Skin becomes oilier • Larynx grows • Grow hair under armpits • Grow breasts • Start to menstruate • Grow pubic hair • Gain hair on arms and legs 	<ul style="list-style-type: none"> • Skin becomes oilier • Larynx (voice box) grows- Adam's apple • Grow facial hair • Grows hair on chest • Grow hair under armpits • Grow pubic hair • Gain hair on arms and legs • Become more muscular • Scrotum, testes and penis develop

Key Questions

- What are the different stages in life?
- What happens in each different stage of life?
- What happens to girls during puberty?
- What happens to boys during puberty?
- What happens to boys and girls during puberty?

Science – Enquiry Approaches

Knowledge Organiser



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

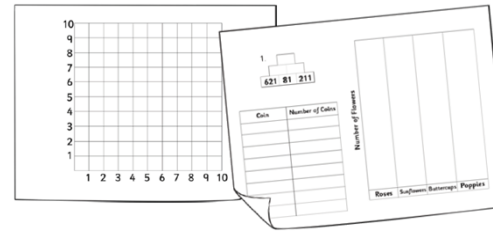
Observing over time



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?

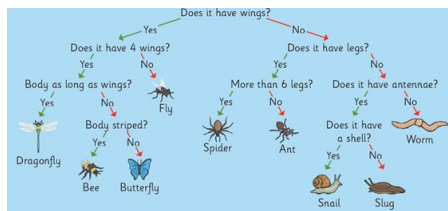
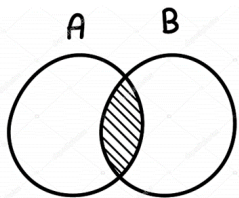
Researching using Secondary Sources



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?