Knowledge Organiser: **Living things and their habitats**

Careers connected to Living things and their habitats: Animal Care Practitioner, Biologist, Zoologist

Lesson Sequence

1. Explore different habitats

2. Research a habitat

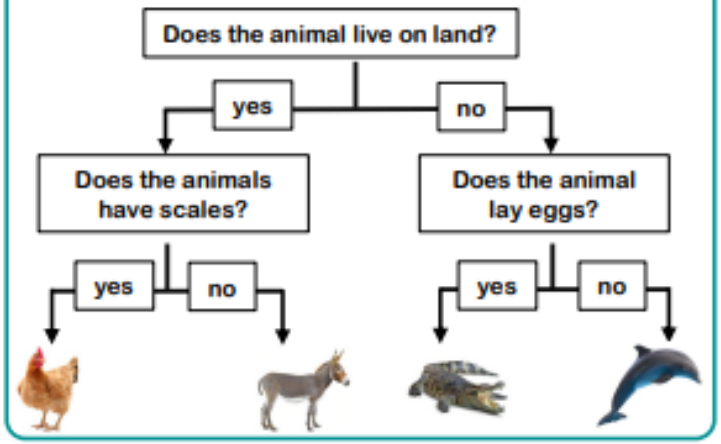
3. Explore how animals can be classified

4. Create a classification key

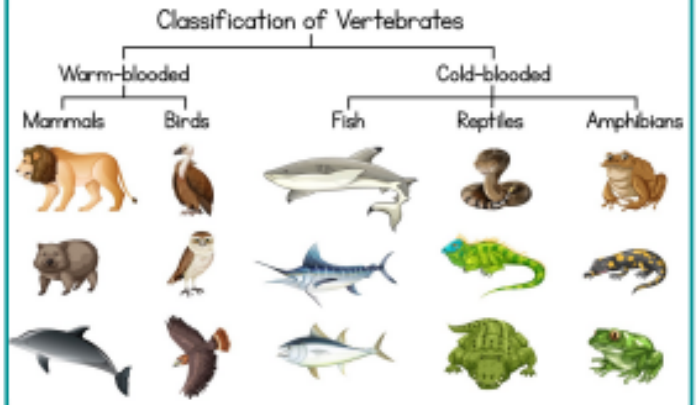
5. Adaptations and classification within species

6. Explore and classify pond plants

Classification Keys

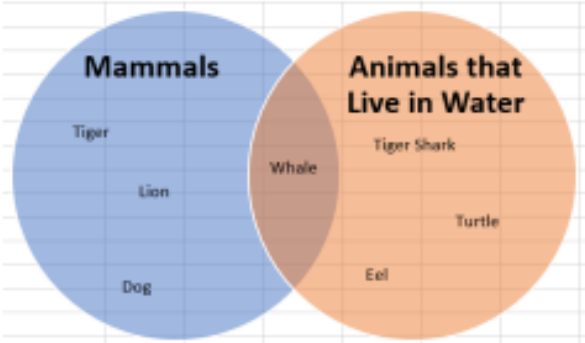


Classification

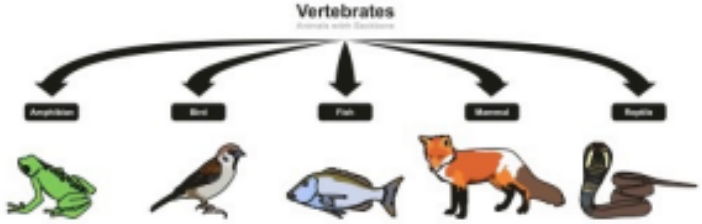


Venn Diagrams

Animals can be sorted, or classified, in a number of different ways. A 'branched' diagram or a venn diagram, like those shown below, are just two examples.



What is a Classification Key?

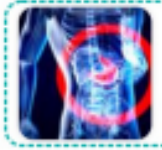


A classification key is a series of questions that determine an organism's physical characteristics. **When you answer one question, it either branches off to another question or identifies the organism**. Ultimately, they help to identify an unknown organism, or work out how to categorise groups of similar organisms.

Knowledge Organiser: **Animals including humans**

Careers connected to animals:

Lesson Sequence



1. Learn about the digestive system

2. Explore the digestive system in humans

3. Know about your teeth

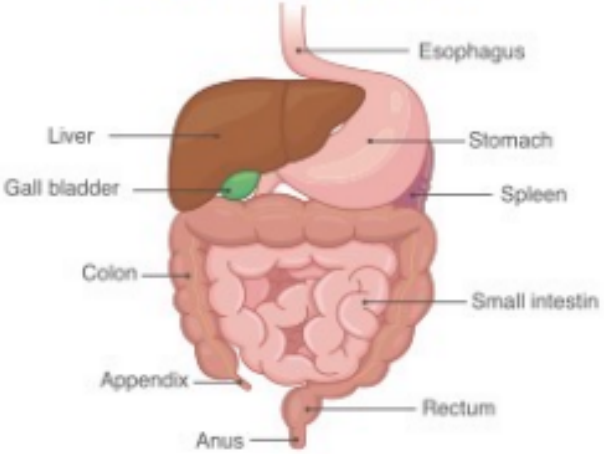
4. Understand how to care for your teeth

5. Investigate food chains

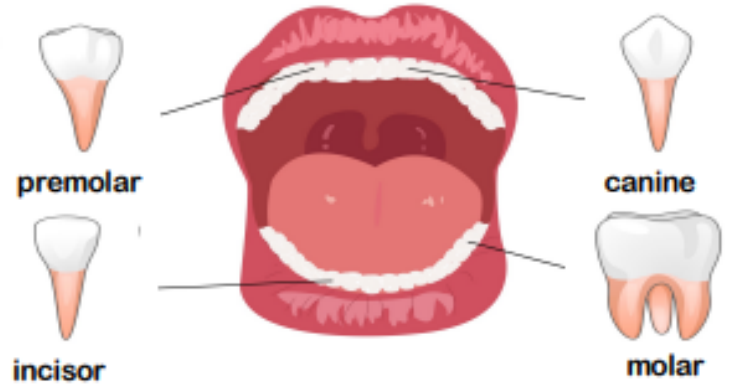
6. Explore food webs

The Digestive System

- The digestive system begins with the **mouth** and **teeth** where food is ingested and chewed.
- Saliva is mixed with the food which helps to break it up.
- When the food is small enough to be swallowed, it is pushed down the **oesophagus** by muscles to the stomach.
- In the stomach, food is mixed further.
- The mixed food is then sent to the **small intestine** which absorbs nutrients from the food.
- Any leftover broken down food then moves on to the **large intestine**.
- The food minus the nutrients arrives in the **rectum** where muscles turn it into faeces (poo). It is stored here until it is pushed out by the **anus**. This is called excretion.



Types of Teeth and their function

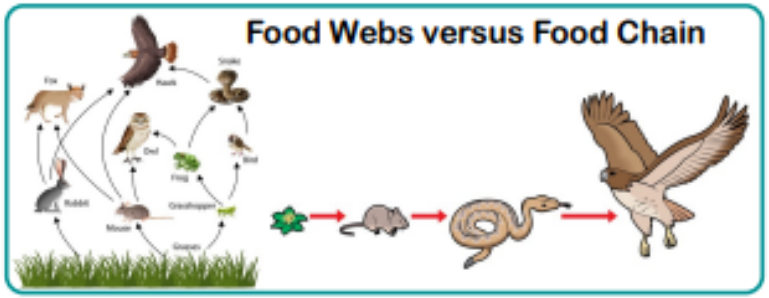


Different teeth have different functions
Teeth of animals are designed for the foods they eats

- **Herbivores** (e.g., horses) have little use for canines and mainly use incisors and molars
- **Carnivores** (e.g., Lion) mainly use canines and incisors, they don't have molars (have premolars – small molars)
- **Omnivores** (e.g., humans) use all three

Tooth enamel is the hardest substance in the human body
Humans have two sets of teeth; milk teeth and adult teeth

Food Webs versus Food Chain



Knowledge Organiser: Year 4 - States of Matter

Careers connected to States of Matter:
Chemical Engineer, Pharmacologist, Pharmaceutical pharmacist, Chemist.

Lesson Sequence

1. Compare and group the 3 states of matter

2. Explore how particles behave in solids, liquids and gases

3. Investigate melting points

4. Explore freezing and boiling points

5. Explore evaporation and condensation

6. Understand the water cycle

States of Matter

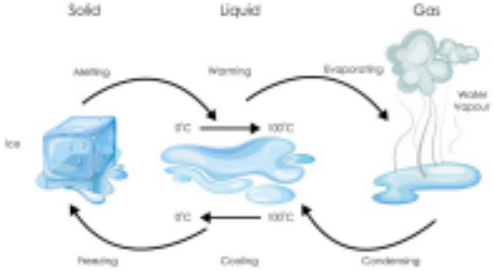
Everything in our universe is made of **matter**. There are 3 states of matter:

Solid **Liquid** **Gas**

Solid particles have **strong** bonds so solids have a fixed shape. **Liquid** particles have **weaker** bonds and more energy so liquids can change shape. **Gas** particles have **really weak** bonds so gases can spread out and move freely.

Changes of state

States of matter can change.
Substances can be **heated** or **cooled** to change from one state to another.



Ice **Water** **Water Vapour**

In water, the **melting** and **freezing point** is **0˚C** and the **boiling point** is **100 ˚C.**
Different substances have different melting, freezing and boiling points.

Condensation

When **water vapour (gas)** touches a **cold** surface, the particles **lose energy** and the bonds become **stronger**, turning the gas into a **liquid**.

Evaporation

Heating liquid water **increases** the particle's energy and the bonds become **weaker**, turning it into a **gas**. The **hotter** the temperature, the **faster** the rate of evaporation.

Knowledge Organiser: **Sound**

Careers connected to sound: audiologist, sound engineer

Lesson Sequence

1. Identify how sound is made

2. Explore how vibrations from sounds travel through a medium to the ear

3. Explore sound insulation

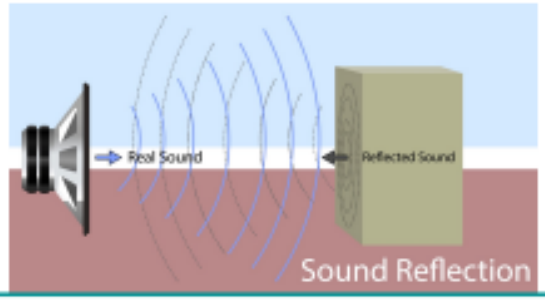
4. Explore volume

5. Explore pitch

6. Explore sounds

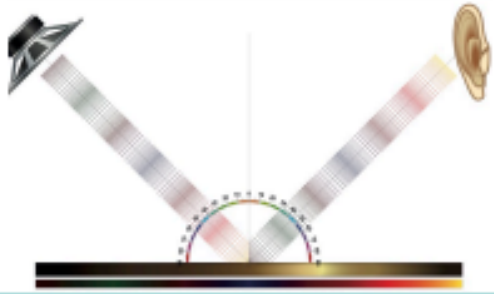
How sounds are made and travel

When objects vibrate, a sound is made. The vibration makes the air around the object vibrate and the air vibrations enter your ear. These are called sound waves. If an object is making a sound, a part of it is vibrating, even if you cannot see the vibrations. Sound waves travel through a medium (such as air, water, glass, stone, and brick).



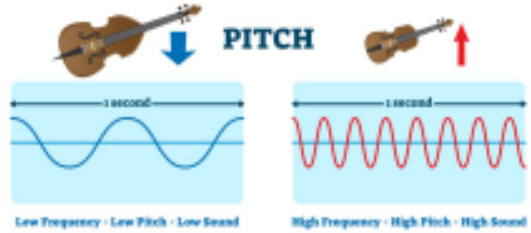
How do we hear?

The sound waves travel to the ear and make the eardrums vibrate. Messages are sent to the brain which recognises the vibrations as sounds.



Pitch

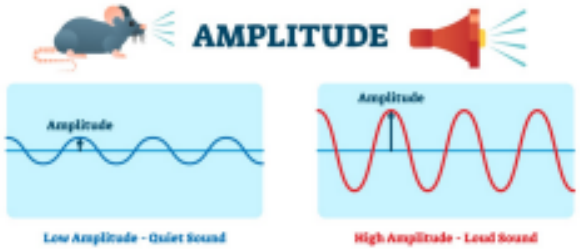
The pitch of a sound is how high or **low** it is. A squeak of mouse has a high pitch A roar of a lion has a low pitch.



A high pitch sound is made because it has a high frequency. The sound source vibrates many times a second.

Volume

The volume of a sound is how **loud** or **quiet** it is. Quieter sounds have a smaller **amplitude** and less energy (**smaller vibrations**) and louder sounds have a bigger amplitude and more energy. The **closer** we are to a sound source the louder it will be. A train arriving at a station sounds loud. The further away from a sound the fainter it will be. A train in the distance sounds quieter.



Knowledge Organiser: **Electricity**

Careers connected to electricity: electrician, electrical engineer

Lesson Sequence

1. Understand electrical appliances and safety

2. Learn about electrical compounds in a series circuit

3. Investigate electrical circuits

4. Explore conductors and insulators

5. Learn about electrical switches

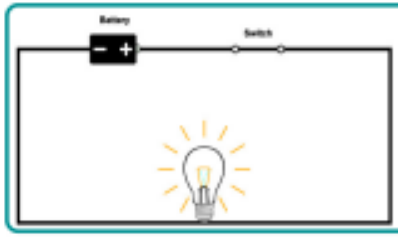
6. Investigate how electrical components can change within a circuit

Key Facts

1. A circuit contains a battery (cell), wires and a component that requires electricity to work (bulb, motor or buzzer).
2. Electrical current flows through the wires from the battery (cell) to the bulb, motor or buzzer.
3. A switch can break or reconnect a circuit.
4. A switch controls the flow of the electrical current around the circuit. When the switch is off, the current cannot flow. This is not the same as an incomplete circuit.

Conductors and Insulators

- Materials that allow electricity to pass through to create a complete circuit are called electrical conductors.
- Materials that do not allow electricity to pass through and do not complete a circuit are called electrical insulators.

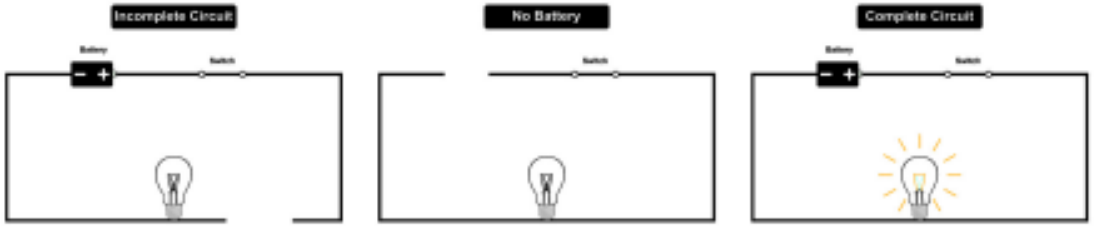


Simple Circuit

A **complete** circuit is a **loop** that allows electrical current to flow through wires.

Simple Electrical Circuit

These are complete circuits - they have a battery (cell) and a component (bulb). The wires are placed in the right places of the battery for the circuit to work.



These circuits will not work as they are incomplete.

Electrical Components

Knowledge Organiser: **Living things and their habitat - Conservation**

Careers connected to habitats:

Lesson Sequence

1. **Describe ecosystems and how they are affected by changes in the seasons**

2. **Understand human impact on the environment through deforestation**

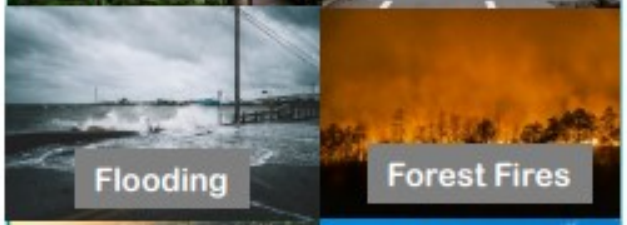
3. **Explore air pollution**

4. **Understand water pollution**

5. **Explore methods that can be used to conserve water**

6. **Understand that humans can have a positive impact on nature**

How environments change?



The water people use in their homes comes from nature and must be cleaned up to be returned to nature so it can be used again. This is an important part of our water cycle.

Why environments change

NATURAL CHANGES – different seasons can change habitats. Greenhouse gases cause climate change and climate change has caused our planet to get a lot warmer over a very short period of time. This has caused more extreme weather events like hurricanes, floods and droughts. It has also caused the extinction of many living things.

HUMAN CHANGES – How humans live and what they do can impact habitats both negatively and positively.

Negative ways:
- Deforestation - cutting down trees for a range of reasons
- Littering – dropping rubbish or leaving large objects lying in the environment
- Pollution – introducing harmful substances into the environment.
- Air pollution from cars, e.g., carbon monoxide, and the burning of fossil fuels.
- Water pollution through industrial waste and farm fertilisers that can pollute rivers and streams.
- Rubbish—Plastic and household waste ends up on the streets, in the sea or in rubbish dumps, destroying habitats and wildlife.

Positive ways:
- Protecting endangered species via conservation projects
- Cleaning bodies of water
- Recycling
- Creating nature reserves