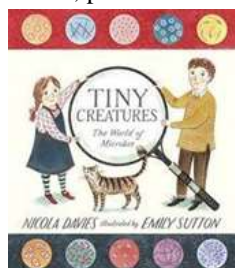




Key Ideas

- Describe how living things are classified into broad groups (e.g. microorganisms, plants and animals) according to common observable characteristics and based on similarities and differences.
- Give reasons for classifying plants and animals based on specific characteristics.



living thing and put it into a group.

- Classify:** to put plants and animals into groups with others that are similar to them.
- Plant groups:** Flowering plants and Non-flowering plants. Non-flowering plants do not make seeds.
- Keys:** identify unknown plants or animals.

Vocabulary

Bacteria, protists, fungi, plants, animals, kingdom, classify, vertebrates, invertebrates, feature, back bone, fish, amphibians, reptiles, birds, mammals, cold blood and warm blooded, adaptation

Important things to know/find out

- What are the **five kingdoms**?
- Living things can be divided into five groups called kingdoms. Plant, animal, [viruses,+ bacteria] **protocista** and **fungi**
- Protoctista:** single celled organisms. Plants such as algae because they contain chlorophyll can be classed under this heading. Plankton in the oceans.
- Fungi:** these used to be classed in the plant kingdom, but because they contain no chlorophyll, are excluded. The plant kingdom only contains green plants.
- Each of the five groups can be divided into smaller groups.
- Vertebrates** are animals with a backbone. fish, amphibians, reptiles, birds, mammals.
- Invertebrates** are animals with no backbone. (insects, arachnids, molluscs)
- What kind of **vertebrates** are there?
- How are the three groups of mammals different?
- Three types of mammal: **Placental** (babies grow inside mother), **Marsupial** (babies are born when very tiny and feed and grow inside mother's pouch), **Monotreme** (duck billed platypus lays eggs that hatch out later)
- Feature:** something that can be used to identify a

Questions to consider/Activities

- How can you make a classification key for vertebrates/invertebrates or microorganisms?
- What happens to a piece of bread if you leave it on the windowsill for two weeks?
- How does the temperature affect how much gas is produced by yeast?



- What do different types of microorganisms do?
- Are they always harmful?



Key Ideas

- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
- Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
- Describe the ways in which nutrients and water are transported within animals, including humans.



Important things to know/find out

- What things are moved around inside your body?
Dissolved water and nutrients from food are moved from the intestines to all parts of our body. Blood carries those and other things from place to place inside our bodies.
- What does blood do?
It carries oxygen, nutrients, water and keeps us warm.
- What is your circulatory system for?
All parts of the body are connected by tubes called blood vessels.
The circulatory system carries blood to all parts of the body.
- What does your heart do?
The heart pumps the blood around your body in blood vessels.
Regular exercise will make your heart grow bigger and stronger. The lungs job is to give oxygen to the blood and remove carbon dioxide.
- Who discovered blood circulation?
Early ideas about blood circulation were from Galen about 1800 years ago.
William Harvey finally understood blood circulation in 1628.
- How are exercise and pulse rates linked?
When you exercise, your muscles need more oxygen and food.
Pulse rate is a measure of how fast your heart is beating.
Your heart beats faster when you take exercise.
- Choices that can harm the circulatory system (e.g. smoking and drinking)
Alcohol can be harmful to our health.
Tobacco can cause short-term effects such as shortness of breath, difficulty sleeping and loss of

taste and long-term effects such as lung disease, cancer and death.

Alcohol can cause short-term effects such as addiction and loss of control and long-term effects such as organ damage, cancer and death.

- Why is exercise so important?
Exercise can:
tone our muscles and reduce fat
increase fitness
make you feel physically and mentally healthier
strengthen the heart
improve lung function
improve skin
- The circulatory system is made of the heart, lungs and the blood vessels.
- Arteries carry oxygenated blood from the heart to the rest of the body.
- Veins carry deoxygenated blood from the body to the heart.
- Nutrients, oxygen and carbon dioxide are exchanged via the capillaries.

Vocabulary

Intestines, blood, blood vessels, plasma, red blood cells, circulation, muscle, heart rate/pulse rate, experiment, dissection., artery, capillaries, vein, lungs, circulation, circulatory system.

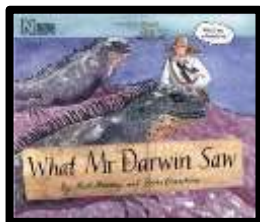
Questions to consider

- Which organs of the body make up the circulation system and where are they found?
- How does my heart rate change over the day?
- How much exercise do I do in a week?
- How does the length of time we exercise for affect our heart rate?
- Can exercising regularly affect your lung capacity?
- How have our ideas about disease and medicine changed over time?
- How does your pulse change with exercise? What is the most efficient way of presenting this data?
- Analyse line graphs that show the change in heart rate over time before, during and after exercise.
- Which exercise produces the fastest pulse? How would you make this a fair test?
- Identify the parts of the circulatory system and explain their functions.
- Create a presentation to show how our blood is pumped around the body.
- Write a persuasive text explaining the importance of exercise.



Key Ideas

- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
- Recognise that living things produce offspring of the same kind, but offspring vary and are not identical to their parents.
- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.



Important things to know/find out

- Where a plant or animal lives is called its habitat.
- Animals and plants are adapted to their habitat and can survive hot and cold environments.
- Fish are adapted to life in water. Gills let them breathe and they have a streamlined body shape.
- Frogs are adapted to life in water and on land. They have lungs, moist skin, powerful hind legs, webbed feet.
- Camouflage: colours and patterns that help animals blend into their background.
- How are plants adapted to where they live?
- Every different habitat has some difficulties that the plants need to deal with in order to survive.
- Plants have special features that let them survive in their own habitat.
- How are animals adapted to where they live?
- Animals have special features that let them survive in their own habitat.
- Do Plants and animals look like their parents?
- Baby animals and new plants sometimes look slightly different from their parents.
- How does variation help with adaptation?
- Small differences make a big difference to survival.
- Which are best-four legs or two?
- Most mammals walk on four legs but humans walk on only two.
- What special reasons are there for walking on

two legs? Stand to see what is coming, use arms to care for babies, hold food.

- What does the fossil record tell us?
- Different animals and plants appeared at different times.
- How do we know what lived long ago?
- We have worked out what animals look like from their bones and shells.
- We know what lived millions of years ago from digging up fossils.
- What is Darwin's theory of evolution?
- Only animals with the best adaptations will survive.
- Natural selection gives rise to a new species.
- How did Darwin make his discoveries?
- Darwin produced a clear explanation of evolution, with plenty of evidence. Galapagos Islands (1831) Finches.
- How did our skeleton change as we evolved?
- Humans evolved from ancient primates over millions of years.

Vocabulary

Adaptation, habitat, camouflage, webbed feet, similar, same, variation, adaptations, inherit, characteristics, extinct, dinosaur, fossils, Jurassic, survival of the fittest, evolution, natural selection.

Questions to consider

- Compare the skeletons of apes, humans and Neanderthals. How are they similar and how are they different?
- What happened when Charles Darwin visited the Galapagos Islands?

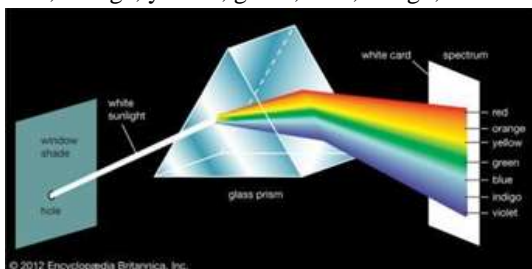


Key Ideas

- Recognise that light travels in straight lines.
- Use the idea that light travels in straight lines to explain that objects are seen because they emit or reflect light into the eye.
- Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.
- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Important things to know/find out

- What is Newton's spectrum?
Newton showed that previous ideas of light had been false.
There are seven main colours of the spectrum and many colours in between.
Red, orange, yellow, green, blue, indigo, violet.



- What do your eyes need to see things?
You see things because light travels from them into your eyes.
The size of the pupil in the centre of your eyes changes to help you get the right amount of light and a nerve at the back of the eye sends the image to the brain.
- How does light travel?
Light cannot bend round corners.
Light travels at a very fast speed.
Distance travelled = speed of light x time
(Speed of light = 299,792 km per second)
- How do light rays move?
Light rays travel in straight lines.
Drawings of light rays help you explain how you see things.

- What are reflections and shadows?
Reflections and shadows are formed in different ways. Reflections look lifelike and shadows do not.
An object that does not let light through is called opaque. One that lets some light through is called translucent.
- What can make white light change?
Light can cause different effects.
Objects might look bent in water or multi-coloured.
- Alhazen c. 1000AD - first explained that vision is produced by light entering the eye.



Vocabulary

Prism, pupil, dilate, astronomer, speed of light, light ray, reflect, image, shadow, white light.

Questions to consider

- Can you identify all the colours of light that make white light when mixed together?
- What colours do you get if you mix the different colours of light together?
- How does my shadow change over the day?
- How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface?
- Why do some people need glasses to see clearly?

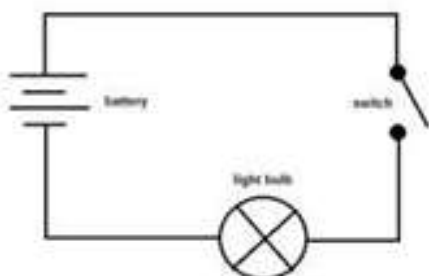


Key Ideas

- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.
- Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.
- Use recognised symbols when representing a simple circuit in a diagram.

Important things to know/find out

- What symbols are used in circuits?
Each electrical component has a special symbol.



You can draw electrical circuits more easily using symbols.

- Why do some circuits not work?
Circuits need an electrical pump to make them work.
Circuits might not work for a variety of reasons. Chemicals in cells make electricity. Cells push electricity round the circuit to make the components work.
- How should cells be connected together?
- What happens when you change components in a circuit?
The brightness of a bulb, loudness of a buzzer or speed of a motor can change.
- What happens when you change the number of cells in a circuit?
Changing the number of cells changes how well the components work.
Changing the voltage of the cells will also change how the components work.
- What happens when you change wires in a circuit?
Circuits can show how changing the wires can change a bulb's brightness.

Vocabulary

Circuit diagram, electrical symbol, cell, battery, +terminal, -terminal, components, circuit,

Questions to consider

- How would you group electrical components based on what electricity makes them do?
- Does the temperature of a light bulb rise the longer it is on?
- Which brand of battery lasts the longest?
- How does the voltage of the batteries in a circuit affect the brightness of the bulb?
- How does the voltage in a circuit affect the volume of the buzzer?
- How has our understanding of electricity changed over time?
- Match circuit symbols to their meanings and their words.
- Predict, and then investigate what happens when more batteries are added to a circuit. Explain why this happens.
- Predict, and then investigate what happens when more bulbs, motors are added to a circuit. Explain why this happens.
- Systematically identify the effect of changing one component at a time in a circuit.
- Use circuit symbols when representing a simple circuit in a diagram.
- Design and make a set of traffic lights, a burglar alarm or some other useful **circuit**.
- Investigate what happens when the **voltage** of the battery changes.
- Investigate what happens when the length of the wires changes.
- Investigate what happens when you add a resistor to a **circuit**.
- Use **ammeters** to measure the current in a **circuit**.