

Scientists and research programmes	If you would like to find out more...
Galen	https://kids.britannica.com/students/article/Galen/274474
Andreas Vesalius	https://www.bbc.co.uk/bitesize/guides/zyscng8/revision/3

Sticky Knowledge

- When we are born we have about 300 bones in our body by the time we are adults we have 206 because some bones have fused together.
- The longest bone in the human body is the thigh bone called the femur.
- Living things need food to grow and to be strong and healthy.
- To stay healthy, humans need to exercise, eat a healthy diet and be hygienic.
- Animals, including humans, need food, water and air to stay alive.
- Skeletal muscles work in pairs to move the bones they are attached to by taking turns to contract (get shorter) and relax (get longer).
- Skeletons do three important jobs:
 - protect organs inside the body;
 - allow movement;
 - support the body and stop it from falling on the floor.

Subject: Science Concept: Biology - Animals Including Humans Topic: Skeletal System and Muscles Y3/4

Online Activities (videos, games, facts and activities)

How bones work:
<https://kidshealth.org/en/kids/ssmovie.html>

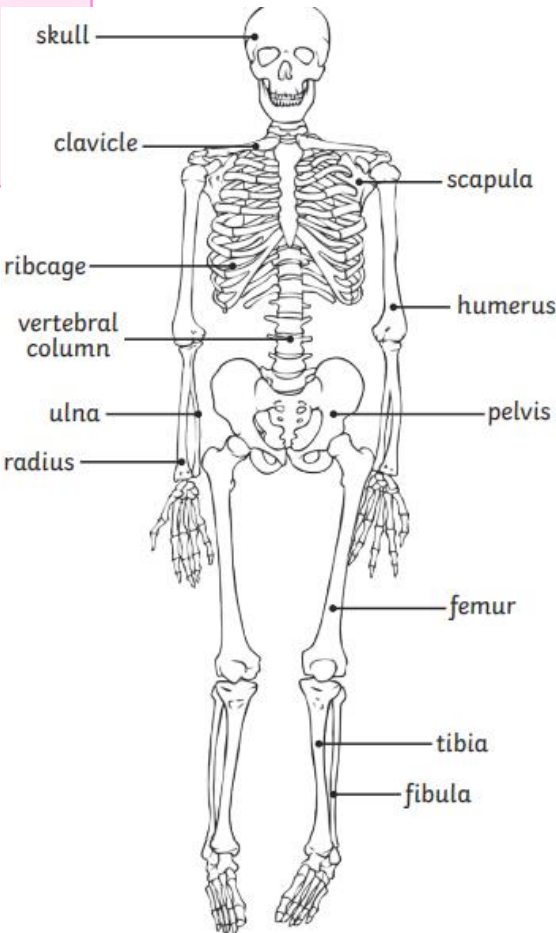
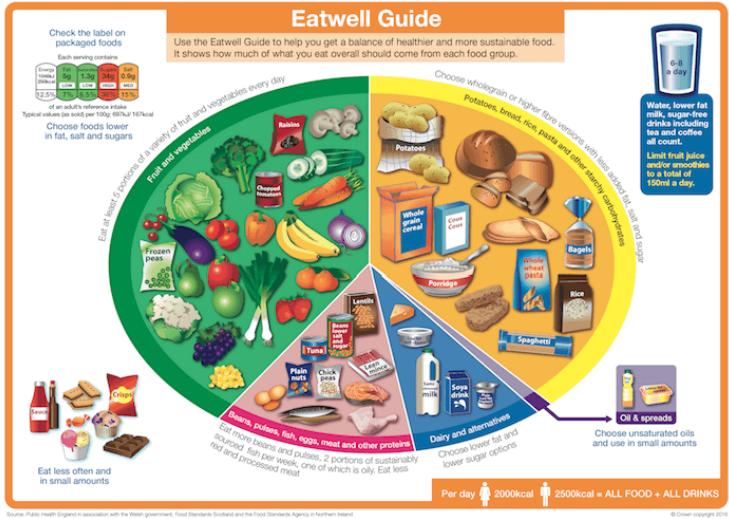
How muscles work:
<https://kidshealth.org/en/kids/msmovie.html>

How do your muscles work?
<https://www.bbc.co.uk/bitesize/topics/zcyycdm/articles/ztwcbqt>

Books you may like to read:

Activities you could do at home

- Draw around yourself and label the bones in your body. Compare this to somebody else in your family?
- Using play-dough, can you show how muscles and bones work together in the human body to allow movement?
- Make a diary of what you are eating and the food categories and see how you could improve your diet for a more balanced enriched diet the week after.



Scientists	If you would like to find out more...
Carl Linnaeus	https://www.bbc.co.uk/teach/class-clips-video/science-ks2-the-work-of-carl-linnaeus/zhnjf4j
Jean-Baptiste Lamarck	https://kids.britannica.com/students/article/Jean-Baptiste-Lamarck/275360

Online Activities

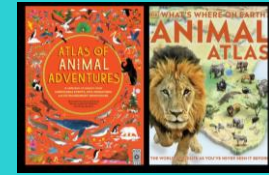
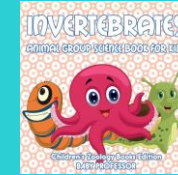
(Videos, games, facts and activities)

- Explore different habitats:
<https://www.bbc.co.uk/games/embed/earth-squad-go>
- What is a vertebrate?
<https://www.bbc.co.uk/bitesize/topics/zn22pv4/articles/zp6g7p3#z3ydpbk>

Activities you could do at home

- Searching your garden, or local park, how many different habitats can you explore and find? Create a poster about the different habitats in your local area and consider: What animals live there? Why do you think this is?
- Can you create a classification tree based off the different living things you have found in your garden or local area?
- Design a new species that could live in a habitat in your garden and explain how it will survive and thrive in those conditions.

Books you may like to read:



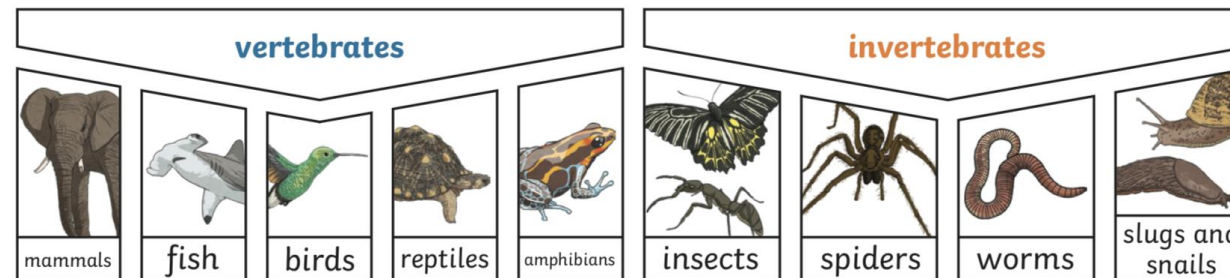
Subject: Science Concept: Biology – Living Things including Humans Topic: Classification Y3/4

Sticky Knowledge

- To stay alive and healthy, all living things need certain conditions that let them carry out the seven life processes:
 1. Movement
 2. Respiration
 3. Sensitivity
 4. Nutrition
 5. Excretion
 6. Reproduction
 7. Growth

Sticky Knowledge

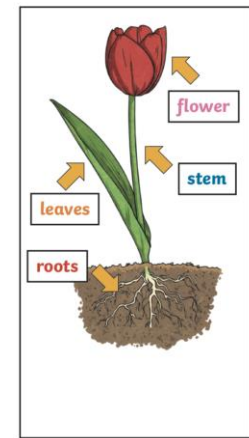
- Plants and animals rely on the environment to give them everything they need. Therefore, when habitats change, it can be very dangerous to the plants and animals that live there.
- Changes to an environment can be natural or caused by humans. Changes to an environment can have positive as well as negative effects.
- Animals can be grouped in lots of different ways based upon their characteristics.
- You can use classification keys to help group, identify and name a variety of living things.



Scientists	If you would like to find out more...
Stephen Hales (Botanist)	https://study.com/academy/lesson/what-is-botany-definition-history-uses.html
Anna Atkins - Botanist & Photographer	https://www.nhm.ac.uk/discover/anna-atkins-cyanotypes-the-first-book-of-photographs.html

Sticky Knowledge

- Plants are producers, they make their own food.
- Their leaves absorb sunlight and carbon dioxide.
- Plants have roots, which provide support and draw water from the soil.
- Flowering plants have specific adaptations which help it to carry out pollination, fertilisation and seed production.
- Seed dispersal improves a plant's chances of successful reproduction.
- Seeds/bulbs require the right conditions to germinate and grow.
- Seeds contain enough food for the plant's initial growth
- Transpiration: the roots absorb water, which then moves up the stem from the soil.

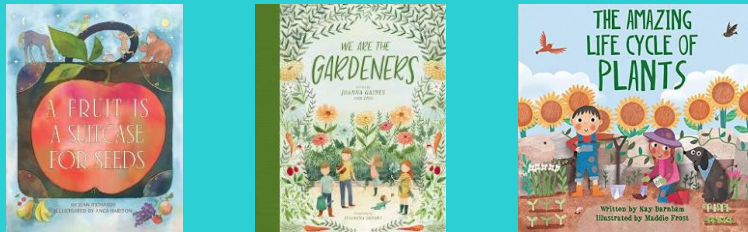


Subject: Science Concept: Biology Topic: Plants Y3/4

Online Activities

- Plants and life on earth:
<https://www.mbgnet.net/bioplants/earth.html>
- The great plant escape:
<https://web.extension.illinois.edu/gpe/index.cfm>
- Why do plants grow in the spring?
<https://www.topmarks.co.uk/Spring/PlantsGrowInSpring.aspx>

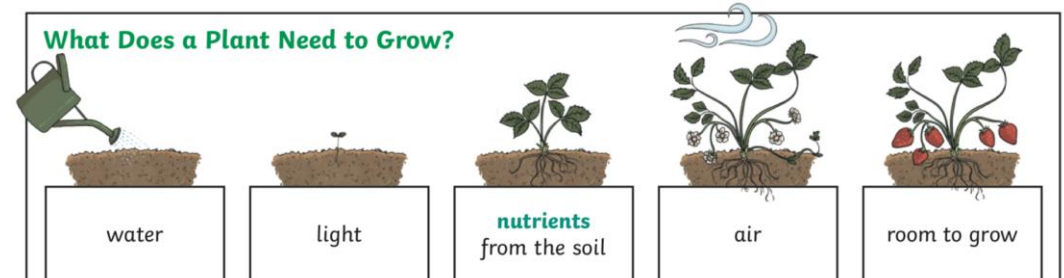
Books you may like to read



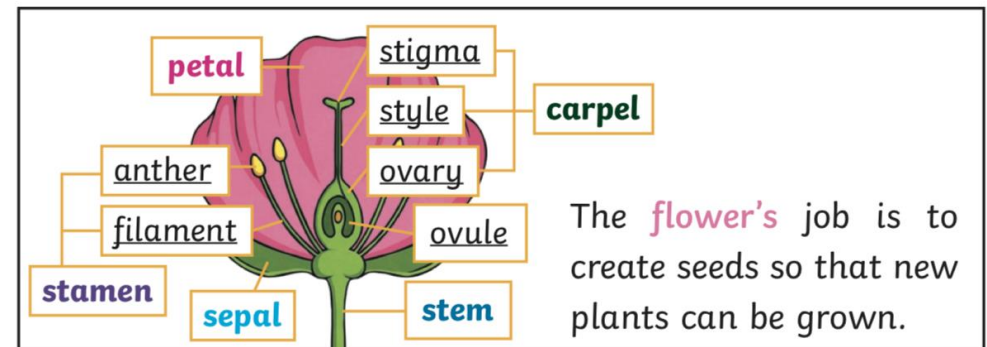
Activities you could do at home

- Have a go at planting and looking after your own plant from a seed or bulb. Record its growth over several weeks and months.
- Can you create a collage of the different plants and flowers you can find on your way to school?
- Create a poster about the importance of bees. Consider:
 - Do you notice any bees in your garden?
 - What are the bees wanting?
 - Why do we need bees?

What Does a Plant Need to Grow?



Different plants vary in how much of these things they need. For example, cacti can survive in areas with little water, whereas water lilies need to live in water.



The **flower's** job is to create seeds so that new plants can be grown.

Scientists	If you would like to find out more...
William Gilbert	https://www.bbc.co.uk/history/historic_figures/gilbert_william.shtml
Professor David Tabor	https://www.theguardian.com/science/2006/jan/19/obituaries.highereducation
Isaac Newton	https://www.youtube.com/watch?v=2ydh7AShMzM You will find out more about Isaac Newton in Y5/6!!

Online Activities

- Fish force – can you help to rescue to the fish?
<https://pbskids.org/ruff/games/fish-force>
- What is a magnet?
<https://www.bbc.co.uk/bitesize/topics/zvr3nrd/articles/zpvcrdm>

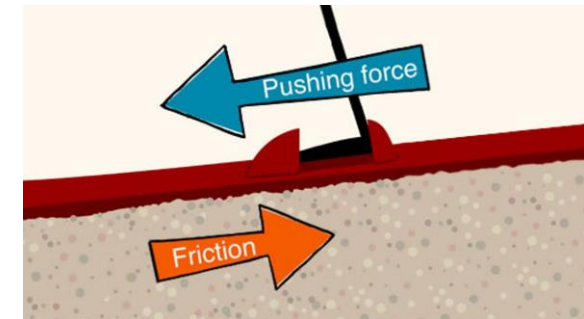
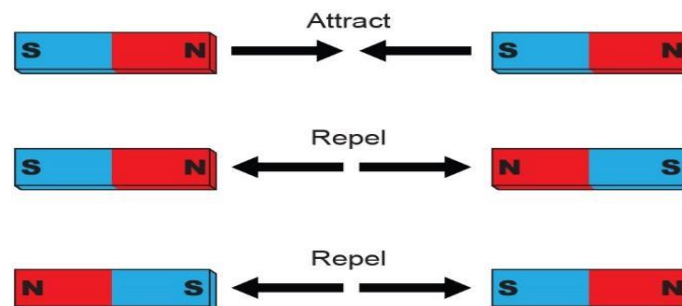
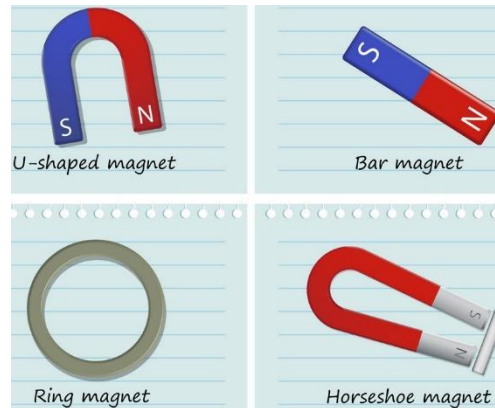
Activities you could do at home

- Can you find out which objects in your home are magnetic and which are not? How many can you find?
- Use a toy car or other moving object and explore which surface in your house creates the most friction? Why do you think this is?
 - Present your findings as a poster!

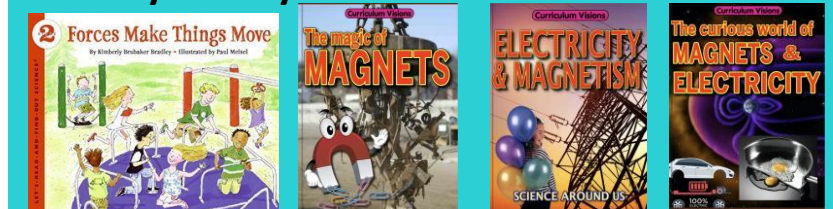
Subject: Science Concept: Physics Topic: Forces and Magnets Y3/4

Sticky Knowledge

- Different surfaces create different amounts of friction. The amount of friction created by an object moving over a surface depends on the roughness of the surface and the object, and the force between them.
- Forces will change the motion of an object. They will either make it start to move, speed up, slow it down or even make it stop.
- **MAGNETS** - are objects or materials that produce a magnetic field and attract or repel magnetic objects.
- Magnets have 2 poles: north and south.
- Not all materials are magnetic. Some everyday materials which are magnetic are:
 - Fridges
 - Metal table legs at school
 - Paper clips



Books you may like to read



Scientists	If you would like to find out more...
Nikola Tesla	https://www.coolkidfacts.com/nikola-tesla/
Benjamin Franklin	https://www.bbc.co.uk/programmes/b01ckmg8 https://www.youtube.com/watch?v=rriVOlbw8Tg

Sticky Knowledge

- Many everyday appliances rely on electricity for them to work. Some appliances use mains electricity (are plugged into a socket) and others have a battery to make them work.
- A circuit where the components are connected in a loop.
- Electricity flows through each component in a single pathway.
- If there is a break in the circuit, that prevents the electricity from flowing, the components will not work.
- Switches can be used to open or close a circuit. When off, a switch 'breaks' the circuit to stop the flow of electricity. When on, a switch 'completes' the circuit and allows the electricity to flow.
- Two or more cells joined together form a battery.
- Materials can be tested in a series circuit to see if they are conductors or insulators.

Subject: Science Concept: Physics Topic: Electricity Y3/4

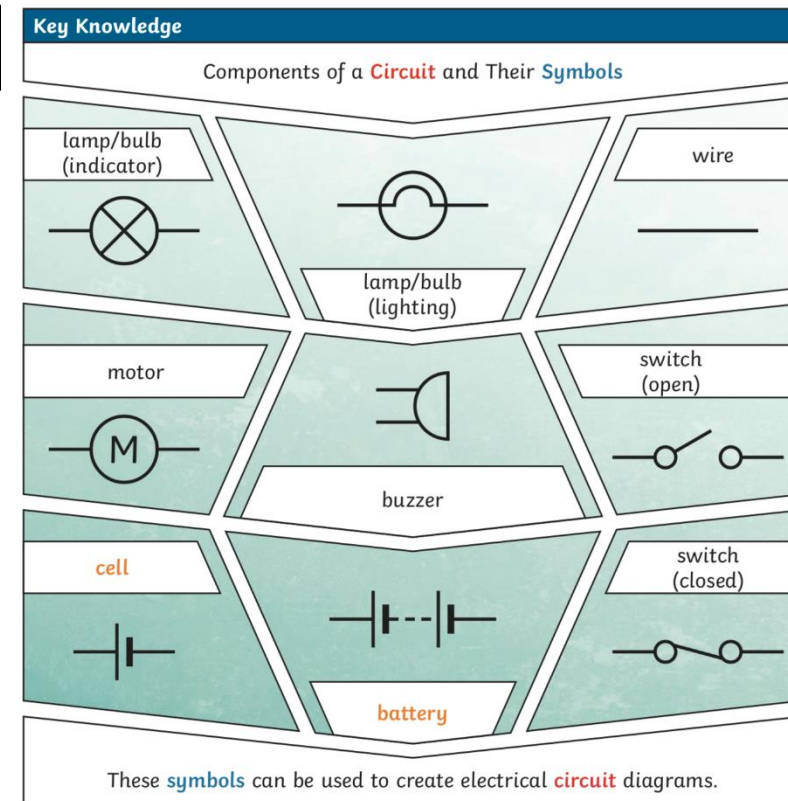
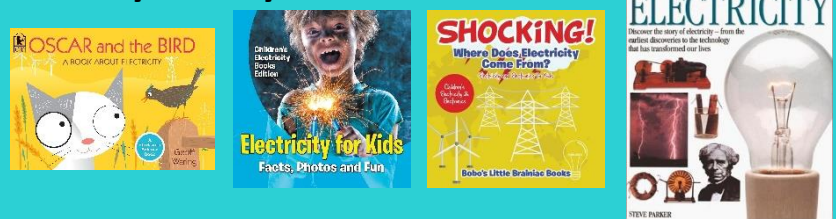
Online Activities

- Can you spot the different electrical items:
<https://www.stem.org.uk/resources/elibrary/resource/30647/things-use-electricity>
- Power up!
<http://powerup.ukpowernetworks.co.uk/powerup/en/under-11/>
- Spot the electrical hazard!
<http://powerup.ukpowernetworks.co.uk/powerup/en/over-11/danger/spot-the-hazard/>

Activities you could do at home

- How many electrical appliances do you have in your home?
- Have you got more electrical appliances that are main-powered or are battery-powered?
- Have you got a smart meter? If so, see which items in your house use the most electricity and which use the least. Think about why this is the case.
 - What could you do to reduce the amount of electricity you are using?

Books you may like to read



Scientists	If you would like to find out more...
Marie Curie	https://www.bbc.co.uk/bitesize/topics/zd4dy9q/articles/z6bnd6f
Alice Ball	https://kids.kiddle.co/Alice_Ball
Joseph Priestly	https://kids.kiddle.co/Joseph_Priestley
Robert Boyle	https://www.famousscientists.org/robert%20boyle/

Sticky Knowledge

Matter makes up our planet and the whole universe. On Earth, all matter exists in one of three main states: solid, liquid or gas.

A **solid** can hold its shape (for example, water in solid form is ice).

A **liquid** like water forms a pool: it flows or runs but it can't be stretched or squeezed.

A **gas** can flow, expand and be squeezed; if it is in an unsealed container it escapes (water in gas form is steam).

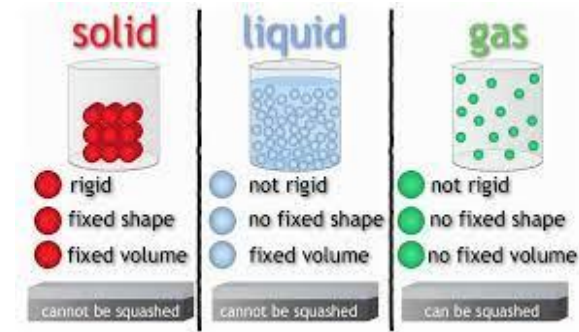
Depending on its temperature, matter can change state; heating, cooling, evaporating and condensation are ways in which a material changes state

Melting is the process of changing a solid into a liquid.

Evaporation is the process of changing a liquid into a gas.

Condensation is the process of changing a gas into a liquid.

Freezing is the process of changing a liquid into a solid.



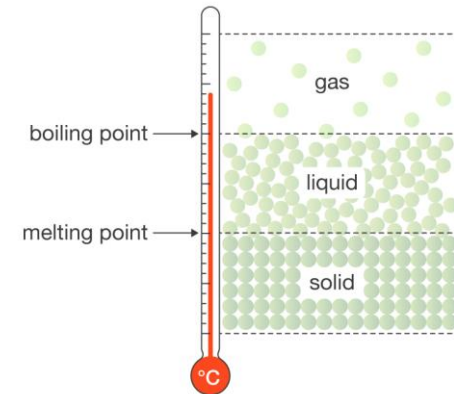
Subject: Science Concept: Chemistry Topic: States of Matter Y3/4

Online Activities (videos, games, facts and activities)

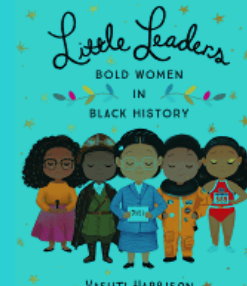
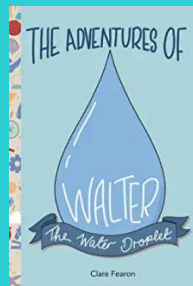
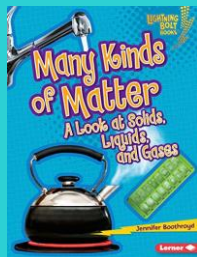
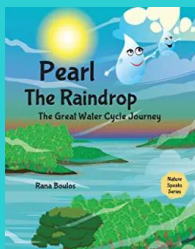
- [Material melting points interactive game](#)
- [Changing the state of water interactive game](#)
- Play the [Solid, liquid and gases game](#)

Activities you could do at home

- Make jelly (solid melts into liquid, then solidifies)
- Make ice lollies using molds or ice cream (liquid freezing to a solid)
- Make chocolate crispie cakes (melting & solidifying)
- Measure the size of a puddle over a number of days (evaporation)
- [Make non-Newtonian fluid](#) (a liquid that doesn't act like a liquid!)



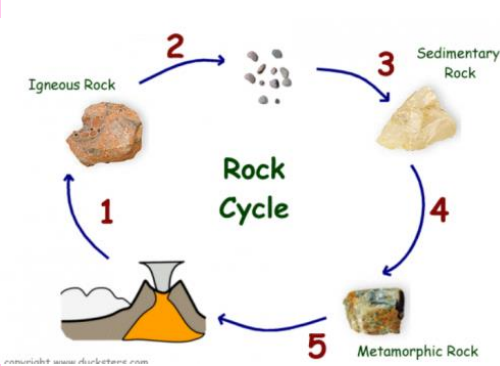
Books you may like to read



Scientists	If you would like to find out more...
William Smith	https://kids.kiddle.co/William_Smith_(geologist)
Mary Anning	https://www.bbc.co.uk/bitesize/topics/zd8fv9q/articles/zf6vb82
James Hutton	https://www.youtube.com/watch?v=KKTXXZS-9s
Marguerite Williams	https://kids.kiddle.co/Marguerite_Williams#:~:text=Marguerite%20Thomas%20Williams%20(born%20Marguerite,geology%20in%20the%20United%20States.

Sticky Knowledge

- There are 3 different types of rocks; igneous, sedimentary and metamorphic.
- Igneous rock** is formed when magma or lava from volcanoes cools. Examples include basalt and granite.
- Sedimentary rocks** are formed over millions of years when sediments (tiny pieces of rocks and animal skeletons) are pressed together at the bottom of seas and rivers. Examples include sandstone, coal and chalk. Some sedimentary rocks contain fossils (bones or shells of living things that were buried long ago and have turned to stone).
- Metamorphic rocks** are formed when other rocks are changed due to heat or pressure. Examples include slate and marble. Metamorphic rocks are very hard but can be damaged by acids like acid rain (on buildings) or even lemon juice
- Fossils are the remains of once-living plants or animals, preserved in rocks.
- Soils are made from rocks and organic matter.



Subject: Science

Concept: Chemistry

Topic: Rocks Y3/4

Online Activities

(videos, games, facts and activities)

[What is a paleontologist? Watch this short video](#)

[What is soil? Watch this clip](#)

[Lots of facts and activities about soil](#)

Activities you could do at home

- Go on a walk around your local area and look for different types of rocks. Are the buildings made from rocks? What about the roof tiles?
- Visit your local graveyard and look at the gravestones; discuss how the weather has affected them.
- At the seaside, you could look at the sand and types of rock at the beach
- Go on a rock hunt and create an egg box rock collection<https://earlylearningideas.com/activities-with-rocks/>

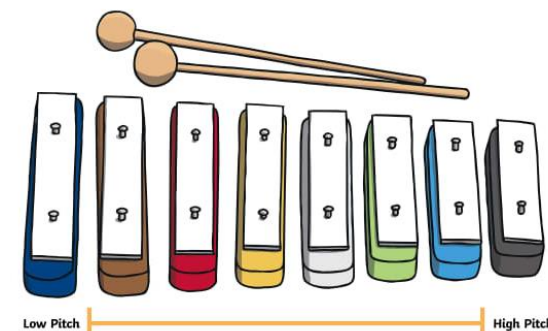
Books you may like to read

TYPES OF ROCKS					
IGNEOUS		SEDIMENTARY		METAMORPHIC	
Granite	Scoria	Sandstone	Limestone	Marble	Slate
Pumice	Obsidian	Shale	Gypsum	Quartzite	Gneiss

Scientists	If you would like to find out more...
Christian Doppler	https://kids.kiddle.co/Christian_Doppler https://www.youtube.com/watch?v=ofsHRQnJ8as
Alexander Graham Bell	https://www.bbc.co.uk/bitesize/topics/zxwxvcw/articles/z4vp7nb https://www.bbc.co.uk/teach/class-clips-video/true-stories-alexander-graham-bell/zf7gd6f
George Beauchamp	https://kids.kiddle.co/Electric_guitar
Chester Greenwood	https://www.youtube.com/watch?v=HpHRwXXkZnw

Sticky Knowledge

- **Sound** is created when **something vibrates and sends waves of energy (vibration) into our ears.**
- The vibrations travel through the air or another medium (solid, liquid or gas) to the ear.
- The stronger the vibrations, the louder the sound. Sounds are fainter the further you get from the sound source.
- Sound changes depending on how fast or slow an object vibrates to make sound waves.
- **Pitch is the quality of a sound (high or low) and depends on the speed of the vibrations.**
- Different materials produce different pitches; if an object vibrates quickly we hear a high-pitched sound, and if an object vibrates slowly we hear a low-pitched sound.



Subject: Science Concept: Physics Topic: Sound Y3/4

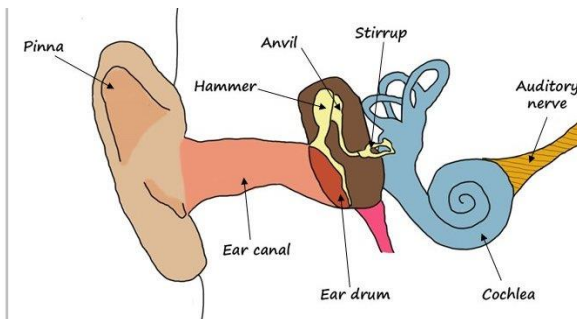
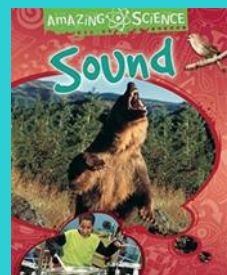
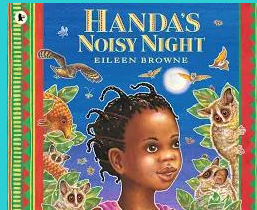
Online Activities (videos, games, facts and activities)

Investigate the [British Library's Sound Archive](#) (see the video above) and [explore new and wonderful recorded sounds with some sensory activities for kids](#), including [creating story soundtracks](#). See [soundwaves](#) in a video filmed at the Science Museum in London.

Activities you could do at home

- Use recyclable items (cardboard boxes, cardboard tubes, plastic yoghurt pots, etc) to make your own musical instruments.
- Make your own telephone using a long piece of string and two yoghurt pots.
- Go on a sound walk and write down or record the sounds you hear in your local environment.
- Make a sound game by recording a selection of sounds and seeing who can guess what each sound is.

Books you may like to read



Scientists	If you would like to find out more...
Ibn al-Haytham	https://www.dkfindout.com/uk/science/famous-scientists/ibn-haytham/ https://www.bbc.co.uk/teach/class-clips-video/science-ks2-the-work-of-the-father-of-optics-alhazen/zry7vk7
Thomas Edison	https://www.youtube.com/watch?v=KgSi_R1Wcyk
Patricia Bath	https://www.youtube.com/watch?v=KgSi_R1Wcyk
George R Caruthers	https://kids.britannica.com/students/article/George-R-Carruthers/471103

Sticky Knowledge

- Reflection is how we use light to see around us.
- **Reflection** is when light hits the surface of an object and then that light travels to our eyes so we can see.
- Smooth surfaces such as mirrors, water and some metals reflect the most light which is why they appear shiny.
- **The moon reflects sunlight** so we can see it shining brightly in the sky.
- **Shadows are created when an opaque (non see-through) object blocks the light source.**
- Shadows change depending on the distance the object is from the light source and the position of the light source.
- Light appears to travel in straight lines, travelling from light sources until it hits the surface of an object.
- Looking directly at sun light/ light sources, even when wearing sunglasses



Subject: Science Concept: Physics Topic: Light Y3/4

Online Activities (videos, games, facts and activities)

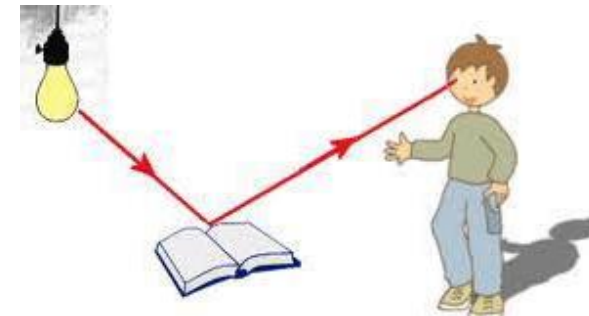
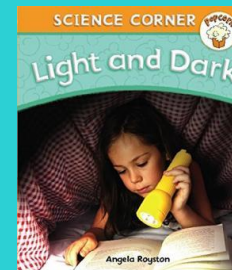
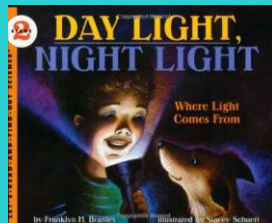
- Try a [BBC Terrific Scientific investigation into light and shadows](#)
- [Watch a video about how we see](#)
- [Match the shadow and object game](#)

Activities you could do at home

- Go on a shadow walk; look for shadows and discuss the shapes created
- Use chalk to draw around your shadows outside
- Discuss and find different light sources around the house
- Blow bubbles to see rainbow colours in them
- [Make shadow puppets](#) and discuss how to make the shadows bigger and smaller



Books you may like to read



Scientists	If you would like to find out more...
Pierre Fauchard	https://southburypediatricdentist.com/who-was-pierre-fauchard
Ida Gray Nelson Rollins	https://blackfacts.com/fact/rollins-ida-gray-nelson-1867-1953
Lucy Beaman Hobbs Taylor	https://www.sindecusemuseum.org/lucy-beaman-hobbs-taylor
Lillian Lindsay	https://bda.org/news-centre/blog/lilian-lindsay-a-woman-who-didnt-take-no-for-an-answer

Sticky Knowledge

- Humans have 4 different types of teeth
- **Incisors** cut food, **canines** tear food, **pre-molars** crush food, and **molars** grind food.
- Humans are omnivores, which means we eat a mixed diet of plants and meat – this is why our teeth are designed and laid out in our mouths the way they are.
- Teeth are made of two main parts: the **crown** (the bit you can see) and the **root** (the bit inside your gum that holds your tooth in place).
- A tooth is made of four different substances: **enamel**, **dentine**, **pulp** and **cementum**.
- The enamel is the bit on the outside of your tooth (it is very hard), while the dentine and pulp are found inside the tooth.
- The pulp contains the nerves and blood vessels of the tooth.
- Cementum is the substance at the bottom of the tooth root which helps to anchor it into the jaw bone.



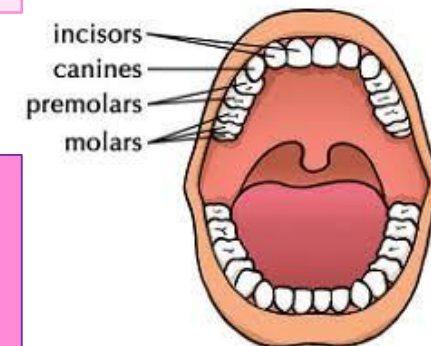
Subject: Science Concept: Biology Topic: Teeth Y3/4

Online Activities (videos, games, facts and activities)

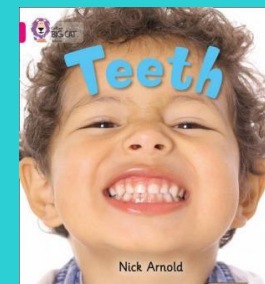
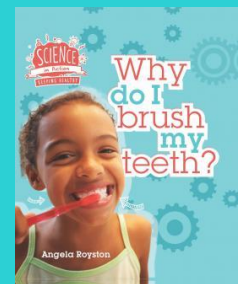
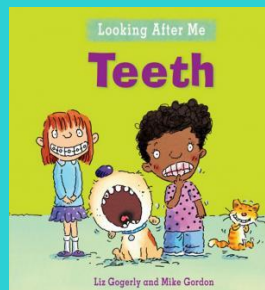
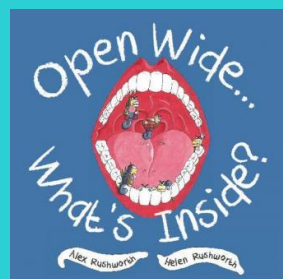
- Play some [dental health games](#)
- [Take a teeth quiz](#)
- Complete a [BBC Bitesize activity to choose which teeth are best at breaking up different kinds of food](#)
- [Label different kinds of teeth](#) online
- [Meet the Tooth Defenders](#) in a Colgate cartoon for kids

Activities you could do at home

- Next time you clean your teeth, time yourself. You should be spending 2-3 minutes. Time the other members of your family and see how long they brush for!
- Design a poster promoting good dental care
- Try a [toothy activity pack](#) with wordsearches, mazes and more
- [Make an origami tooth](#)



Books you may like to read



Scientists	If you would like to find out more...
William Beaumont	https://kids.kiddle.co/William_Beaumont
Roger Arliner Young	https://kids.kiddle.co/Roger_Arliner_Young
Louis Pasteur	https://easyscienceforkids.com/best-louis-pasteur-video-for-kids/
Andreas Vesalius	https://kids.britannica.com/kids/article/Andreas-Vesalius/627265

Sticky Knowledge

- The human digestive system is a **complex series of organs and glands that processes food**.
- In order to use the food we eat as **energy**, our body has to break the food down into smaller molecules that it can process; it also has to excrete (or get rid of) **waste**.
- Most of the digestive organs (like the **stomach** and **intestines**) are tube-like and contain the food as it makes its way through the body.
- The digestive system is essentially a long, twisting tube that runs from the mouth to the anus, plus a few other organs (like the **liver** and **pancreas**) that produce or store digestive chemicals.
- Without the digestive system, our bodies would not be able to get nutrients from the food we eat or get rid of the waste products that food makes and we would soon become ill!
- A food chain shows us how plants and animals within a habitat rely on each other for food.
- Food chains usually start with a green plant (a **producer**) which is eaten by an animal (a **consumer/prey**), which is then eaten by another animal (predator)

Subject: Science Concept: Biology Topic: Digestive System Y3/4

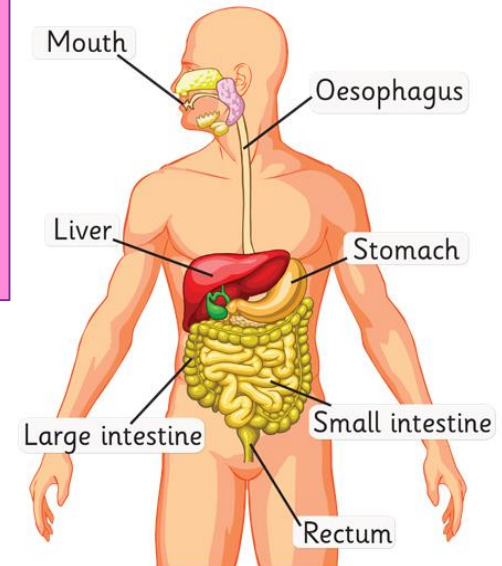
Online Activities (videos, games, facts and activities)

- A [fun digestion game](#)
- [Guide food through the digestive system](#)
- Play [Chewed-up Food Race](#)
- Play [Centre of the Cell's Poo Racer](#): collect bacteria points and fuel up with food and drink pit stops and help your poo vehicle travel through the gut
- A [food chain building game](#)
- [Put the plants and animals in the right order to open the food chain lock](#) in an RSPB gam

Activities you could do at home

- Download free [digestion quizzes, puzzles and memory games](#) from Curiscope
- A [printable food chain game](#)
- TheSchoolRun has worksheets on [Understanding food chains](#), [Food chains and interdependence](#) and [Food chain diagrams](#)

The digestive system



Books you may like to read

