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| Scientists and research programmes | If you would like to find out more... |
| Max Planck Institute for Heart and Lung Research | https://www.mpg.de/149809/heart-lung-research |
| Professor Barbara Casadei | https://www.bhf.org.uk/information-support/heart-matters-magazine/research/barbara-casadei |
| William Harvey | https://kids.britannica.com/students/article/William-Harvey/274787 |

Sticky Knowledge

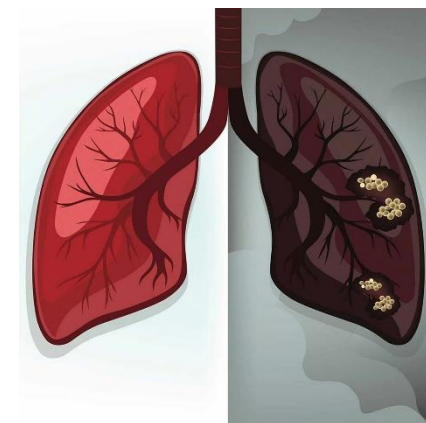
The heart is referred to as a double pump because it pumps blood to the lungs and the heart.

Blood is what is used to transport oxygen, waste, nutrients and more throughout the body.

The circulatory system includes the heart, blood and blood vessels and is vital for fighting disease and maintaining proper temperature.

Because your heart is crucial to your survival, its important to keep it healthy with a well-balanced and exercise, and avoiding things that can damage it – like smoking.

Your heart affects every part of your body. That also means that diet, lifestyle and your emotional well-being can affect your heart.



Subject: Science Concept: Biology - Animals Including Humans Topic: Circulatory System

Online Activities (videos, games, facts and activities)

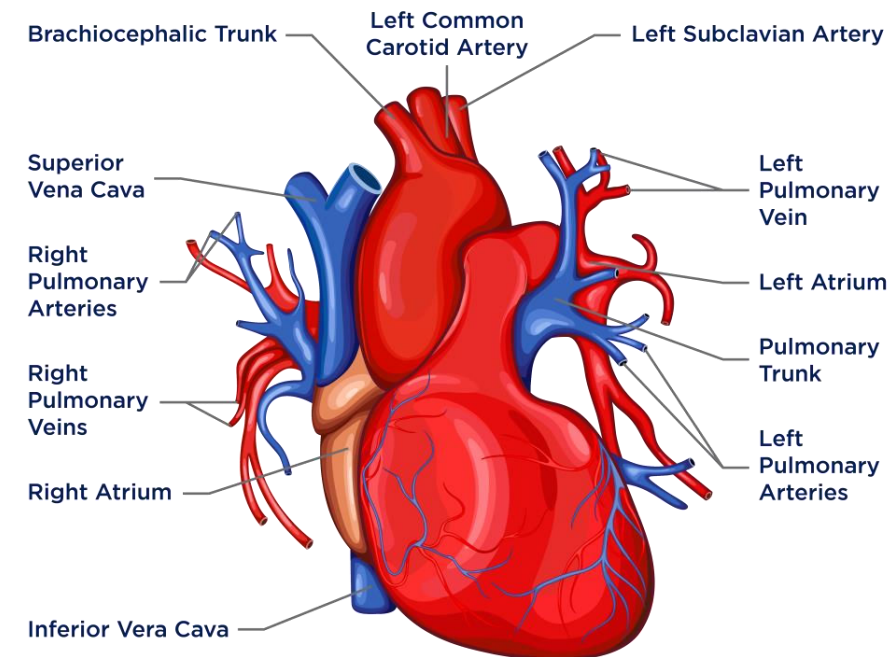
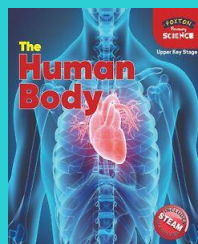
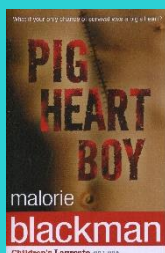
<https://youtu.be/LZIV1ZGrtww>

https://www.softschools.com/matching_games/science/the_circulatory_system/1413/

Activities you could do at home

- Monitor how your heart rate changes throughout the day depending on the activities you are doing.
- Create a model of the human heart from natural resources.
- A lung capacity test – is there a correlation between your height and lung capacity?

Books you may like to read



| | |
|---------------------|---|
| Scientists | If you would like to find out more... |
| Karl Ernst von Baer | https://www.youtube.com/watch?v=NMRhnID50g |
| Miriam Menkin | https://www.bbc.com/future/article/20200103-the-female-scientist-who-changed-human-fertility-forever |

Sticky Knowledge

- 0-3 years of life are the most important for brain development.
- A mother gives birth at approximately nine months.
- Puberty begins in girls on average at 11 years of age and 12 years of age for boys.
- During puberty, girls develop breasts and start their periods and boys develop a deeper voice and grow facial hair.
- The larger a mammal the greater the gestation period (with the exception of humans).
- A human's average life expectancy is approximately 80 years in the UK.

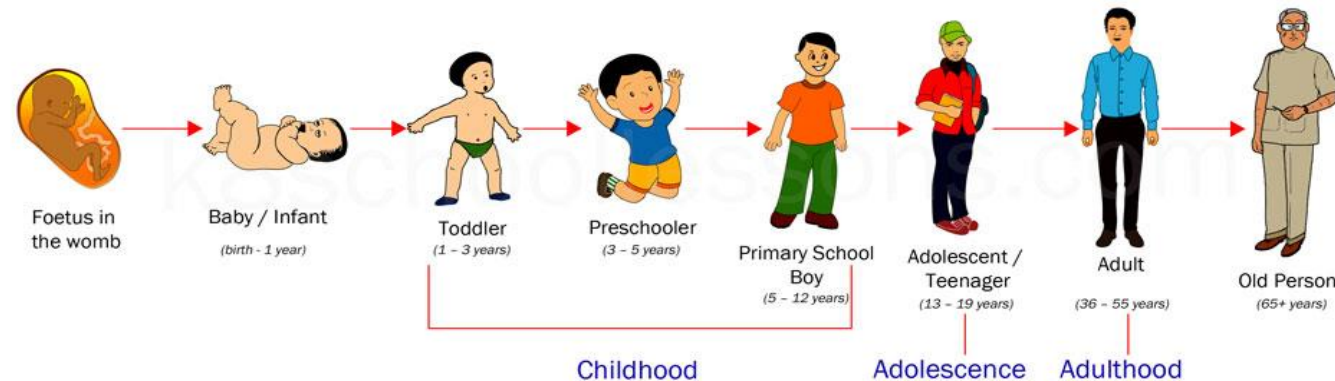
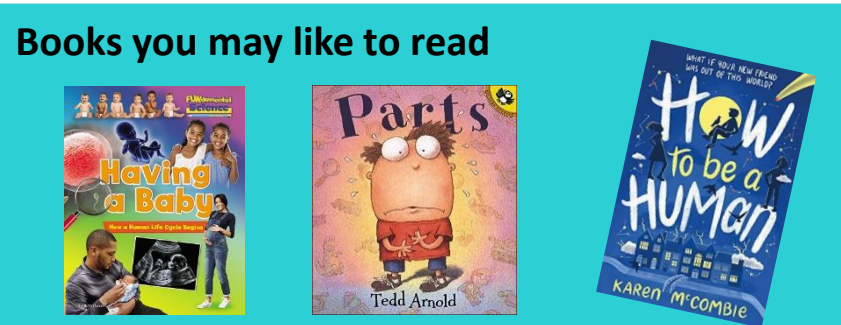


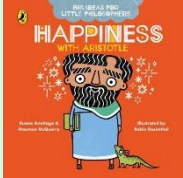
Subject: Science Concept: Biology – Animals Including Humans Topic: Human Lifecycle

V5/6

- ### Online Activities
- Boys and puberty: <https://kidshealth.org/en/kids/boys-puberty.html>
 - What is happening during puberty? <https://www.aboutkidshealth.ca/Article?contentid=328&language=English>
 - Breasts and Bras: <https://kidshealth.org/en/kids/breasts-bras.html>

- ### Activities you could do at home
- For an understanding of your body, and others' bodies, might be going through during puberty. Use this PDF link: <https://www.nhs.uk/livewell/puberty/documents/4youmarch2010nonprinting.pdf>
 - Monitor your mood and consider if there is a pattern to these behaviours. Consider: What makes you feel calm? How can you calm yourself during these times when your emotions are changing?
 - Generate a list of three things that you could advise to people going through puberty – you could call it your top tips.
 - If you know someone who is pregnant, you could ask them to keep a diary of how they are feeling during pregnancy and research how the body and fetus are changing during this time.



| Scientists | If you would like to find out more... |
|---------------|--|
| Carl Linnaeus | In 1735, Swedish Scientist Carl Linnaeus first published a system for classifying all living things. An adapted version of this system is still used today: The Linnaeus System https://www.youtube.com/watch?v=-LVunulOT4w |
| Aristotle | https://kids.britannica.com/kids/article/Aristotle/352779  |

Online Activities

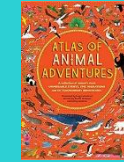
(Videos, games, facts and activities)

- Have a look at this website to widen your understanding:
<http://www.oum.ox.ac.uk/thezone/index.htm>
- David Attenborough: Life cycles of desert animals:
<https://www.youtube.com/watch?v=oSSUA2r-cXk>

Activities you could do at home

- Create your own classification system to organise the plants in you local area.
- Use the Linnaeus system to challenge your family to find different species and categorise these.
- Go on a nature walk and identify different amphibians, mammals, birds and insects. Can you identify the stage they are in, in their life cycle?
- Can you spot any animals who experience metamorphosis and if so, what is their current habitat like?

Books you may like to read:



Subject: Science Concept: Biology – Living Things including Humans Topic: Life cycles and classification

Sticky Knowledge

- Living things can be classified into eight categories and the number of living things in each level gets smaller until the one animal is left in it's species.
- Microorganisms are viruses, bacteria, moulds and yeast. Some animals (dust mites) and plants (phytoplankton) are also microorganisms.
- Microorganisms are very tiny living things that can only be seen using a microscope. They can be found in and on our bodies, in the air, in water and on objects around us.

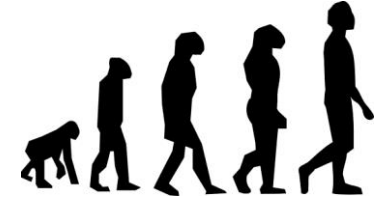
Sticky Knowledge

- Humans develop inside their mothers and are dependent on their parents for many years until they are old enough to look after themselves
- Amphibians such as frogs are laid in eggs then, once hatched, go through many changes until they become an adult.
- Some animals, such as butterflies, go through metamorphosis to become an adult.
- Birds are hatched from eggs and are looked after by their parents until they are able to live independently.
- Some plants, such as strawberry plants, potatoes, spider plants and daffodils use asexual reproduction to create a new plant. They are identical to the parent plant.
- Some living things, such as plants, contain both the male and female sex cells. In others, such as humans, they contain either the male or female sex cell.

| | |
|-----------------------|--|
| Scientists | If you would like to find out more... |
| Charles Darwin | Charles Darwin and the Tree of Life https://www.dailymotion.com/video/xsxbk |
| Mary Leakey | https://www.britannica.com/biography/Mary-Douglas-Leakey |

Sticky Knowledge

- Evolution is the gradual process by which different kinds of living organism have developed from earlier forms over millions of years.
- Animals and plants produce offspring that are similar but not identical to them.
- Adaptive (environmental) characteristics are characteristics that are influenced by the environment the living things live in.
- Inherited characteristics are eye colour is an example of an inherited trait, but so are things like hair colour, the shape of your earlobes.
- Fossils are the preserved remains, or partial remains, of ancient animals and plants. Fossils let scientists know how plants and animals used to look millions of years ago.



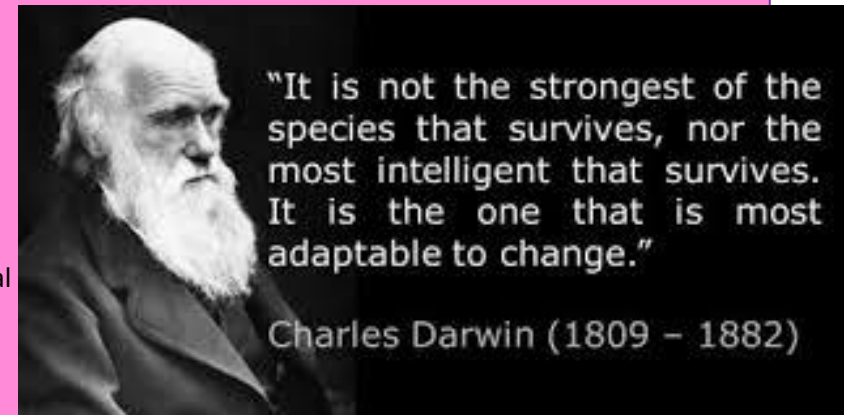
Subject: Science Concept: Biology Topic: Evolution and Inheritance Y5/6

Online Activities

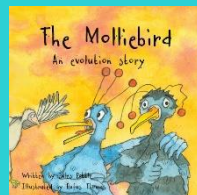
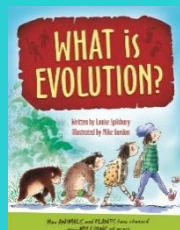
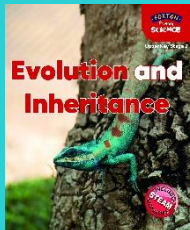
- Widen your horizons: <https://evolution.berkeley.edu>
- BBC bitesize – What is evolution?
<https://www.bbc.co.uk/bitesize/topics/zvhhvcw/articles/zxwcbqt>
- BBC bitesize – What do fossils tell us?
<https://www.bbc.co.uk/bitesize/topics/zvhhvcw/articles/ztbshcw>

Activities you could do at home

- Create your family tree and see which characteristics you have inherited from across (at least) three generations.
- Have a scroll through the National History Museum online and learn more about natural selection: <https://www.nhm.ac.uk/discover/what-is-natural-selection.html>
- What's your favourite animal (excluding your pets)? Research how an animal has adapted to his habitat. What characteristics does it have to help it survive?
Some good ones to look at are camels, penguins and giraffes. You could even look at how different species of the same animal differ in their adaptations. E.g. foxes and bears. How can you creatively present what you have found?
- Selective breeding of dogs has become incredibly popular in recent years with people pairing up specific breeds for reproduction, so that desirable traits are inherited by the offspring. Watch this video on selective breeding. <https://www.bbc.co.uk/teach/class-clips-video/science-ks1-ks2-what-is-selective-breeding/z6cs382> Look up your favourite or unusual dog crossbreeds and create a presentation about how they've inherited specific features from their parents.



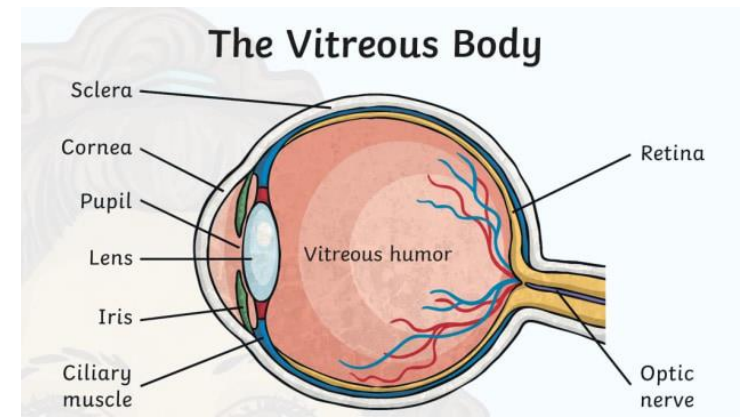
Books you may like to read



| Scientists | If you would like to find out more... |
|---------------|---|
| Thomas Edison | https://www.theschoolrun.com/homework-help/thomas-edison |
| Lewis Latimer | https://kids.britannica.com/kids/article/Lewis-Latimer/443664 Lewis Latimer extended the work of Thomas Edison and the African American inventor allowed for the further development of light. |

Sticky Knowledge

- Light travels in a straight line.
- We need light to see and therefore darkness is the absence of light.
- Light travels from the light source to an object and from the object to our eyes.
- Shadows have the same shape as the object that casts them.



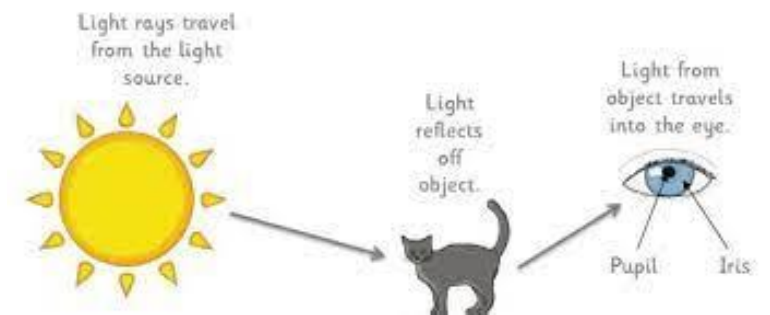
Subject: Science Concept: Physics Topic: Light Y5/6

Online Activities

- Can you create different light shadows:
<http://www.peepandthebigwideworld.com/en/kids/pathways/4/light-and-color/videos/20/juicy-light/>
- How did they create this illusion and story?
<https://www.youtube.com/watch?v=a4Fv98jttYA>

Activities you could do at home

- Create a puppet show using shadows – you could record this and send this to your teacher via dojo:
<http://www.peepandthebigwideworld.com/en/kids/pathways/4/light-and-color/videos/61/shadow-puppets/>
- What devices in your house emit light? Could you have a competition with the people in your house to find the most objects?
- Create your own spectroscope and have a go at the different activities linked to this file:
https://www.stem.org.uk/system/files/elibrary-resources/2016/05/PR06_The_magic_of_light_pupil_activities.pdf



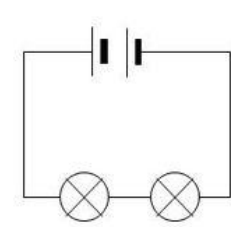
Books you may like to read



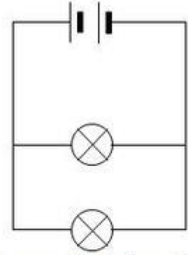
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| Scientists | If you would like to find out more... |
| Nikola Tesla | https://www.coolkidfacts.com/nikola-tesla/ |
| Benjamin Franklin | https://www.bbc.co.uk/programmes/b01ckmg8 https://www.youtube.com/watch?v=rriVOlbw8Tg |

Sticky Knowledge

- When a light is switched on, you are sending a flow of electrons around the circuit.
- Metals such as copper, aluminium, zinc and gold are good conductors of electricity
- Electricity is a type of energy that builds up in one place (static), or flows from one place to another - current electricity.
- A circuit that has only one route for the current to take is a series circuit. If more bulbs or buzzers are added, the power has to be shared and so they will be dimmer or quieter. If just one part of this series circuit breaks, the circuit is broken and the flow of current stops.



A series circuit



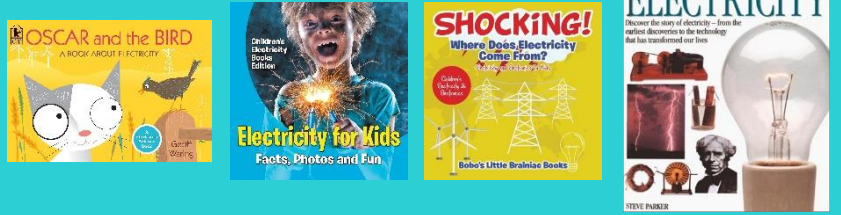
A parallel circuit

Subject: Science Concept: Physics Topic: Electricity Y5/6

Online Activities

- Can you spot the different electrical items: <https://www.stem.org.uk/resources/elibrary/resource/30647/things-use-electricity>
- Enhance your understanding of how electricity works: <http://powerup.ukpowernetnetworks.co.uk/powerup/en/>
- Circuit construction kit: https://phet.colorado.edu/sims/html/circuit-construction-kit-dc/latest/circuit-construction-kit-dc_en.html

Books you may like to read



Activities you could do at home

- How many electrical appliances do you have in your home? What could you do to reduce the amount of electricity you are using?
 - If you have a smart meter, you could monitor it on this.
- Could you answer these questions:
 - How is static electricity created?
 - How does a wind up torch work?
 - How are insulators helpful?

Brief answers below (don't peek – have a go first)!

| | | |
|---|--|---|
| Q1. How is static electricity created? A1. Friction on an object creates an electric charge. | Q2. How does a wind-up torch work? It works through a dynamo which turns mechanical energy to electrical energy through a simple electromagnet. | Q3. How are insulators helpful? They prevent electric flow so you don't receive an electric shock! |
|---|--|---|

- How many volts of electricity can lightning generate? How many lightbulbs is this equivalent to?

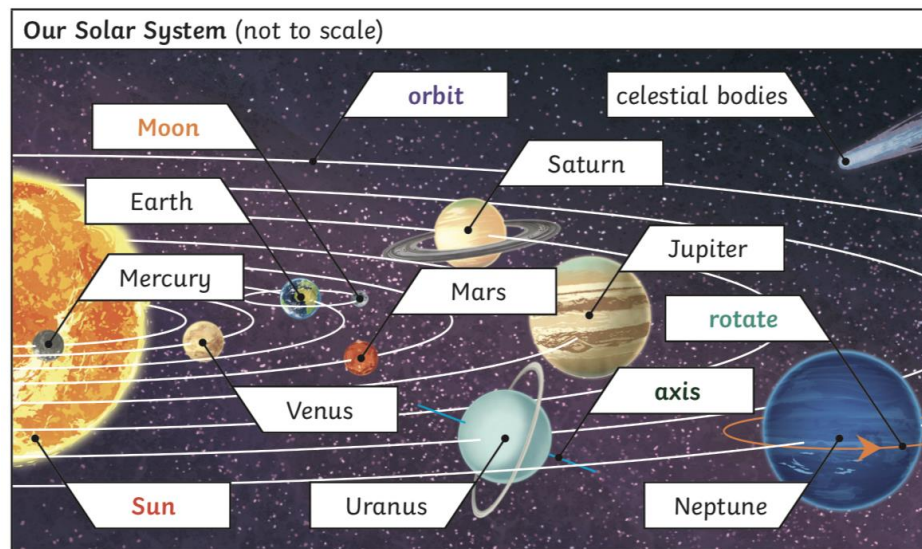
Key Knowledge

Components of a **Circuit** and Their **Symbols**

| | | |
|-----------------------|----------------------|-----------------|
| lamp/bulb (indicator) | lamp/bulb (lighting) | wire |
| motor | buzzer | switch (open) |
| cell | battery | switch (closed) |

These **symbols** can be used to create electrical **circuit** diagrams.

| | |
|---------------------|---|
| Scientists | If you would like to find out more... |
| Nicolaus Copernicus | https://www.bbc.co.uk/teach/class-clips-video/science-ks2-the-work-of-nicolaus-copernicus/z64skmn |
| Johannes Kepler | https://www.bbc.co.uk/programmes/b085xpzf https://www.youtube.com/watch?v=tp1WkB71-9k |



Subject: Science Concept: Physics Topic: Earth and Space Y5/6

Online Activities

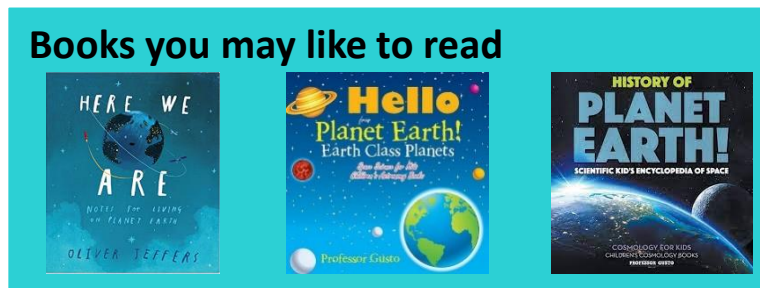
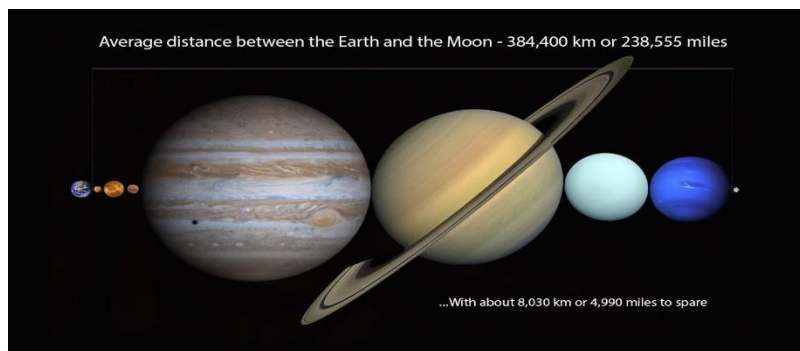
- Explore Mars on the Mars Rover: <https://spaceplace.nasa.gov/explore-mars/en/>
- Scope it out: <https://www.jwst.nasa.gov/content/features/educational/copeltOut/index.html>
- Build a NASA Spacecraft: <https://climatekids.nasa.gov/cubesat-builder-game/>

Activities you could do at home

- Could you recreate a model of the solar system? As a challenge, you could set a scale so it is representative in size.
- Phases of the moon oreo challenge: <https://sciencebob.com/oreo-cookie-moon-phases/>
- What am I? Why not try this link to get some ideas fo how to play the headband game: Who am I? All SPACE themed. <https://www.simpleeverydaymom.com/solar-system-for-kids-game/>
- Marshmallows constellation: <https://playteachrepeat.com/marshmallow-constellations/>

Sticky Knowledge

- 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 (spins) on its axis. It does a full rotation once in every 24 hours.
- At the same time that Earth is rotating, it is also orbiting (revolving) around the Sun.
- It takes a little more than 365 days to orbit the Sun.
- Daytime occurs when the side of Earth is facing towards the Sun.
- Night occurs when the side of Earth is facing away from the Sun.
- The Moon orbits Earth in an oval-shaped path while spinning on its axis.
- At various times in a month, the Moon appears to be different shapes. This is because as the Moon rotates round Earth, the Sun lights up different parts of it.



| | |
|-------------------|---|
| Scientists | If you would like to find out more... |
| Isaac Newton | https://www.bbc.co.uk/teach/class-clips-video/science-ks2-discovering-the-work-of-Sir-Isaac-Newton/zr4mf4j#:~:text=He%20was%20born%20in%201643,keeping%20the%20Moon%20in%20orbit. |
| Galileo Galilei | https://www.bbc.co.uk/teach/class-clips-video/science-ks2-the-work-of-galileo-galilei/zh69t39 |

Sticky Knowledge

- Mass is how much matter is inside an object. It is measured in kilograms (kg).
- Weight is how strongly gravity is pulling an object down. It is measured in Newtons (N).
- Water resistance and air resistance are forms of friction.
- Pulleys can be used to make a small force lift a heavier load. The more wheels in a pulley, the less force is needed to lift a weight
- Gears or cogs can be used to change the speed, force or direction of a motion
- Levers can be used to make a small force lift a heavier load. A lever always rests on a pivot.

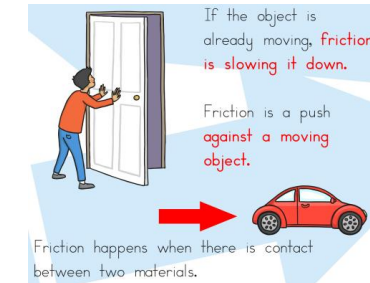
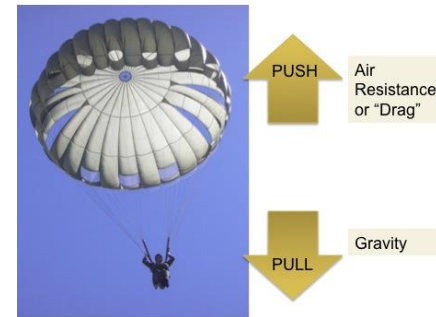
Subject: Science Concept: Physics Topic: Forces Y5/6

Online Activities

- Watch how bike gears work and compare to your bike at home or a friend's bike:
https://youtu.be/oauDylu_swM
- Air resistance online experiment:
<https://bpes.bp.com/air-resistance-online-experiment>

Activities you could do at home

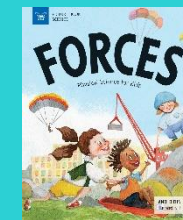
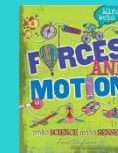
- Make a pulley:
https://www.youtube.com/watch?time_continue=8&v=rc0cpp3i8GA&feature=emb_logo
- Can you build a pulley system to take the Lighthouse Keeper his lunch? <https://youtu.be/46wCRq50Wwg>
- What activities at home create friction on a daily basis?
 - For example: Writing creates friction between the tip of the pen and the paper.



Examples of forces in action:








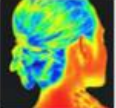

Books you may like to read



| | |
|-------------------|--|
| Scientists | If you would like to find out more... |
| Spencer Silver | https://kids.kiddle.co/Spencer_Silver https://www.invent.org/industries/spencer-silver |
| Ruth Benerito | https://kids.britannica.com/kids/article/Ruth-Benerito/629215 |

Sticky Knowledge

- A reversible change means something that has changed state can be changed back. Melting and dissolving, can be changed back again.
- An irreversible change, like burning, means something that has changed state cannot be changed back.
- Some materials will dissolve in liquid to form a solution.
- Mixtures might be separated, through filtering, sieving and evaporating

| | | |
|---------------------|---|--|
| soluble |  | When a material dissolves in a solvent. |
| conductivity |  | When a material allows electricity to pass through. |
| transparency |  | The ability to see through a material |
| evaporation |  | When a liquid changes to a gaseous state due to an increase in temperature. |
| dissolve |  | When a material disappears into something else. |
| thermal |  | Something that is thermal is hot. |
| filtering |  | To pass a substance through a device which is designed to separate certain particle. |

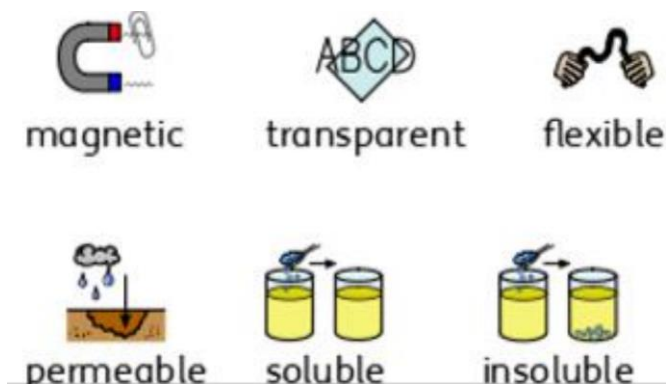
Subject: Science Concept: Chemistry Topic: Materials Y5/6

Online Activities

- How to identify materials:
https://www.bbc.co.uk/bitesize/topics/zryy_cdm/articles/zk2d96f
- Chemical reactions and reversible changes:
https://www.bbc.co.uk/bitesize/topics/zryy_cdm/articles/z7dcbqt

Activities you could do at home

- Have a go at this experiment at home!
file:///C:/Users/RLatham/Downloads/Separating_Solutions.pdf



Books you may like to read

