



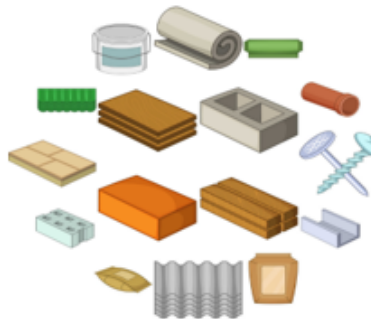













Year One



EVERYDAY MATERIALS



KNOWLEDGE ORGANISER

Overview	What are Objects Made From?
 <ul style="list-style-type: none"> - Materials are the <u>substances</u> that things are made from. - We use lots of different materials every day, e.g. metal, plastic, wood, and glass. - Composites are made from two or more materials together. - Different materials have different <u>physical properties</u>, which make them useful for different things. - Some materials are used to make many things. 	<p>Have a look around your house/ classroom and investigate what objects are made from. Often (but not always) objects are made from the materials shown below:</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <ul style="list-style-type: none"> - Tables, chairs, desks, benches and book cases are often made from <u>wood</u>. - Keys, taps, screws, nails, saucepans and radiators are often made from <u>metal</u>. <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <ul style="list-style-type: none"> - Windows, mirrors and drinking glasses are often made from <u>glass</u>. - Bins, toys, food packaging and shopping bags are often made from <u>plastic</u>. <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  </div> </div> <ul style="list-style-type: none"> - Diaries, planners, exercise books and posters are often made from <u>paper</u>.
Types of Materials	
<div style="border-bottom: 1px dashed black; padding-bottom: 5px;"> <p style="text-align: center;">Metal</p>  <ul style="list-style-type: none"> - Metals are made from rocks. - Metal is strong and shiny. - Metals include aluminum, iron and steel. </div> <div style="border-bottom: 1px dashed black; padding-bottom: 5px;"> <p style="text-align: center;">Wood</p>  <ul style="list-style-type: none"> - Wood is made from trees. - Wood is a hard and strong material. - Woods include oak, pine and ash. </div> <div> <p style="text-align: center;">Water</p>  <ul style="list-style-type: none"> - Water is a natural material, found all over the world. - Water is clear and can take many shapes. It can be frozen into ice or heated into gas. </div>	<div style="border-bottom: 1px dashed black; padding-bottom: 5px;"> <p style="text-align: center;">Glass</p>  <ul style="list-style-type: none"> - Glass is made from fine sand. - Glass is very strong and clear (transparent). - Glass is used for windows and glasses. </div> <div style="border-bottom: 1px dashed black; padding-bottom: 5px;"> <p style="text-align: center;">Plastic</p>  <ul style="list-style-type: none"> - Plastics can be made from lots of different materials. - Plastic can be tough or bendy, and so it is used for many different purposes. </div> <div> <p style="text-align: center;">Paper</p>  <ul style="list-style-type: none"> - Paper is made from trees. - Paper is normally thin and can be made into different shapes. Lots of different things are made from paper. </div>
Composites	
	<ul style="list-style-type: none"> - A composite is a material that is made from two or more different materials. - Composites are often made because they are stronger, lighter, or less expensive than other materials. - For example, concrete is made out of water, cement, and either rock, sand or gravel. It is very strong. - Fibreglass is another type of composite. It is used to make things like showers, sinks and toilets.
	
Soft Materials	Hard Materials
Wool Fabric Cotton Polystyrene Paper Rubber	Plastic Glass Wood Concrete Metal Diamond

Year 2

LIVING THINGS and their habitats KNOWLEDGE ORGANISER Y2

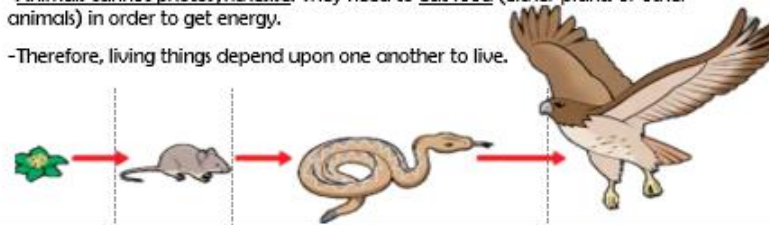
Overview



- All around us, there are some things that are alive, some things that are dead, and some things that have never been alive.
- All living things have certain characteristics that help to keep them alive and healthy.
- Living things live in habitats that suit them, and which provide for their basic needs.
- Living things depend on other living things in order to survive.

Food Chains

- Every living thing needs food in order to create energy. This process is called nutrition.
- Plants achieve nutrition by photosynthesising, using water, carbon dioxide and light.
- Animals cannot photosynthesise. They need to eat food (either plants or other animals) in order to get energy.
- Therefore, living things depend upon one another to live.



Characteristics of Living Things

M-R-S-G-R-E-N

You can remember the seven features of living things by using the acronym MRS CREN.

M	Movement	Animals move in many different ways. Plants grow and turn towards light.
R	Respiration	Plants and animals use oxygen in the air to turn food into energy.
S	Sensitivity	Living things can detect changes in their surroundings.
G	Growth	Living things get bigger and grow.
R	Reproduction	Animals have young. Plants create seeds from which new plants grow.
E	Excretion	Living things get rid of things that they make but don't need.
N	Nutrition	Living things need food/nutrients for energy.

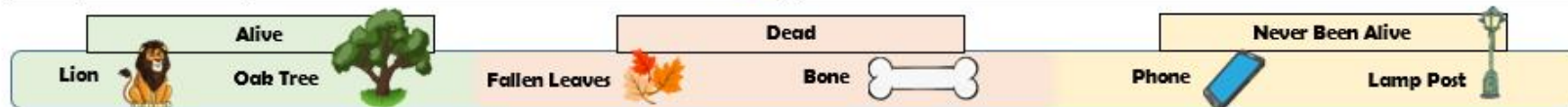
Habitats



- A habitat is a home environment for plants, animals, and other living things.
- Examples of habitats include:
 - Desert: Rainforest;
 - Woodland: Ocean;
 - Meadow: Seashore.



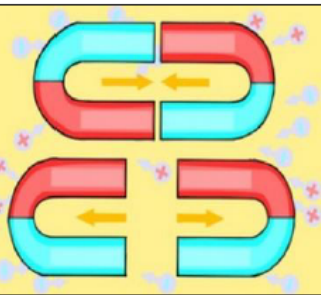
- Micro-habitats are small, specific home environments, e.g. individual trees, a pond, under a rock, or a pile of logs.
- Habitats contain features that make them suitable to the things that live there, e.g., food, shelter, or temperature.
- Habitats can change over the year & over time, so some animals migrate.



Year 3





FORCES AND MAGNETS KNOWLEDGE ORGANISER V3

Overview

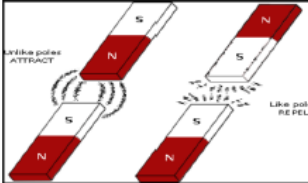


- Forces are pushes and pulls which make things move and stop moving.
- Most forces need contact between objects, but magnets can act at a distance.
- Magnets are made of materials that create a magnetic field (the area in space where the force of magnets can be detected).
- Magnets have at least one north pole and one south pole.
- Magnets can attract or repel one another. They attract some materials & not others.

Magnets

magnetic	non-magnetic
	
	

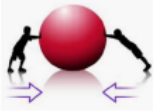
- A magnet is an object that is made of materials that create a magnetic field.
- Magnets create a 'magnetic force' – this is a force that causes objects to attract (pull closer together) or repel (push further apart).
- Unlike most other forces, 'magnetic force' does not require objects to touch one another – magnets can act at a distance.
- Magnets have two poles – a north pole and a south pole.
- The north pole of one magnet will repel the north pole of another magnet. However, it will attract the south pole of another magnet.





Forces

What are forces?

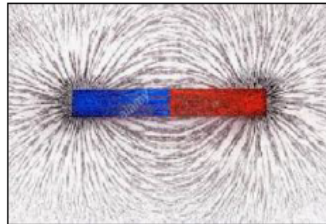
- A force is the push or pull of an object in a particular direction.
- Forces are shown by arrows in diagrams. The bigger the arrow, the bigger the force. The direction of the arrow shows the direction of the force.




Pushes and Pulls	Balanced and Unbalanced Forces
 <ul style="list-style-type: none"> - A push is the force that moves an object away from something. 	<ul style="list-style-type: none"> - If two forces are balanced, they are the same size but are acting in opposite directions. If the two forces are acting on an object, then its motion will not change.
 <ul style="list-style-type: none"> - A pull is the force that brings an object towards something. 	<ul style="list-style-type: none"> - When two forces acting on objects are not equal in size, they are called unbalanced. Unbalanced forces change the way and/or speed that something is moving, e.g. they can make objects speed up/slow down.
<ul style="list-style-type: none"> - A push and a pull are opposite forces, moving objects in different directions. 	

Magnetic Fields


- A magnetic field is the area in which a magnetic force can be felt. A magnet will only attract or repel a magnetic object when it enters its magnetic field.
- Magnetic fields cannot be seen with the human eye. However, spreading iron filings over the magnetic field allows us to see the magnetic field, as the filings cling to it.
- Magnetic fields can pass through air. Some can even have an effect through solids and liquids (depending on the strength of the magnet).



Magnetic Materials					Non-Magnetic Materials				
Iron	Steel	Nickel	Cobalt	Gadolinium	Copper	Gold	Rubber	Wood	Leather



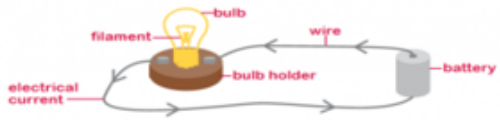




ELECTRICITY



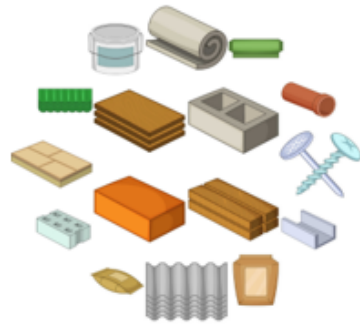
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V4

Overview	Creation and Uses of Electricity										
 <ul style="list-style-type: none"> -Electricity is a type of energy. -It is used to power lots of different things, including many items that we use in everyday life. -Electricity can flow through wires and cables, and can be stored in batteries (sometimes called cells). -Electricity can flow in simple series electrical circuits. -Some materials conduct electricity, and others do not (insulators). 	 <p>Electricity can be created in a number of different ways, for example:</p> <ul style="list-style-type: none"> -Burning fossil fuels (oil, gas, etc.) in power stations; -Using solar power generated from the sun; -Using wind power from wind turbines; -Using water power (hydropower). <p>Electricity is used to power numerous household appliances, for example laptops, TVs, fridges, microwaves, toasters, ovens and lights/ lamps. Life would be very different without it!</p>										
Simple Series Electric Circuits	Electrical Safety										
<p>This diagram shows a battery with wires connecting it to a battery (or cell).</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 20%; padding: 5px;">Circuit</td> <td style="padding: 5px;">-A circuit is the path the electric current follows. It must have no breaks in it (a closed circuit) for electricity to flow.</td> </tr> <tr> <td style="padding: 5px;">Current</td> <td style="padding: 5px;">-A current is the electricity flowing through the circuit.</td> </tr> <tr> <td style="padding: 5px;">Battery (Cell)</td> <td style="padding: 5px;">-A battery (or cell) is something in which electricity can be stored.</td> </tr> <tr> <td style="padding: 5px;">Wire/Cable</td> <td style="padding: 5px;">-Wires and cables are thin flexible threads that transport electricity.</td> </tr> <tr> <td style="padding: 5px;">Conductor/Insulator</td> <td style="padding: 5px;">-Conductors allow electricity to flow through freely. Insulators do not allow electricity to flow through freely.</td> </tr> </table>	Circuit	-A circuit is the path the electric current follows. It must have no breaks in it (a closed circuit) for electricity to flow.	Current	-A current is the electricity flowing through the circuit.	Battery (Cell)	-A battery (or cell) is something in which electricity can be stored.	Wire/Cable	-Wires and cables are thin flexible threads that transport electricity.	Conductor/Insulator	-Conductors allow electricity to flow through freely. Insulators do not allow electricity to flow through freely.	 <p>Electricity can be extremely dangerous if it is not used safely. It can cause burns, shocks, serious injury and (in extreme cases) even death.</p> <p>There are many electrical dangers, both in the home and outdoors.</p> <p style="text-align: center;">Some Important Electrical Safety Trips</p> <ul style="list-style-type: none"> -Do not put fingers and other objects in an outlet; -Never use anything with a cord or plug around water; <li style="padding-left: 20px;">-Keep metal objects away from toasters; -Stay away from power stations and power lines; <li style="padding-left: 20px;">-Never pull a plug out by its cord; -Never touch or climb trees near power lines; -Go indoors when there is thunder and lightning. -Look out for signs like the one on the left. 
Circuit	-A circuit is the path the electric current follows. It must have no breaks in it (a closed circuit) for electricity to flow.										
Current	-A current is the electricity flowing through the circuit.										
Battery (Cell)	-A battery (or cell) is something in which electricity can be stored.										
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Conductor/Insulator	-Conductors allow electricity to flow through freely. Insulators do not allow electricity to flow through freely.										
Conductors	Insulators										
Silver Gold Copper Steel Sea Water	Rubber Glass Oil Diamond Dry Wood										

PROPERTIES AND CHANGES OF MATERIALS KNOWLEDGE ORGANISER

What you should already know...



- Materials are the substances that things are made from.
- The properties of materials make them useful for different purposes.
- Materials have more than one property and can be natural or man-made. Properties can include the hardness, whether it conducts electricity, the shininess, or whether it is magnetic.
- There are three main states of matter – solids, liquids, and gases.
- The state of matter of materials can change, through processes such as freezing and melting.

Solutions and Separation

A solution is a specific type of mixture where one substance is dissolved into another.



- A solvent is a substance that dissolves a solid, liquid, or gaseous solute.
- A solute is the substance dissolved in the solvent. When it dissolves, it looks as though it has disappeared, but in fact it has been broken down to become a part of the liquid.
- One example of a solution is salt water. You cannot see the salt, and the solution will remain if left alone.
- Some mixtures and solutions can be separated, e.g. through processes such as sieving, filtering & evaporating. Salt and water can be separated by evaporation.

Grouping Materials by Properties

PROPERTY	YES	NO
ELECTRICAL CONDUCTOR	Copper, aluminum, gold, silver, steel, sea water	Glass, air, plastic, rubber, wood, oil, diamond
MAGNETIC	Steel, nickel, cobalt, iron, uranium, platinum	Paper, glass, plastic, rubber, wood, wool
TRANSPARENT	Glass, water, clear plastic	Wood, rubber, oil, steel, copper, iron, silver
WATERPROOF	Plastic, rubber, metal, glass	Tissue, sponge, fabric

Reversible and Irreversible Changes

REVERSIBLE CHANGES



- There are many ways in which materials can be changed, for example through heating, cooling, or mixing with other substances.

- Some changes can be reversed (e.g. the material can be returned to its previous form). These are known as reversible changes. An example of this is the freezing of water into ice – it can be melted to become water again.

IRREVERSIBLE CHANGES



- Other changes are irreversible. This means that the changes cannot be 'undone.' Examples of this include cooking, baking, frying and burning materials. For example, you can fry a raw egg to cook it. You can't return it back to a raw egg again.

- Changes that involve the formation of new materials (e.g. mixing cement) are not normally reversible.

Reversible Changes

Dissolving

Mixing



Changes of State

Burning



Rusting

Irreversible Changes

Decaying



ANIMALS including Humans KNOWLEDGE ORGANISER

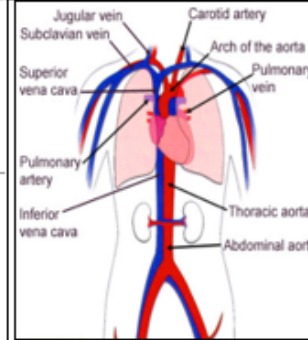


What you should already know...



- Humans and animals go through life stages, including birth, growth, reproduction and death.
- Humans go through puberty as they move beyond childhood into adulthood, and their bodies age as they get older. You should know the different changes that take place.
- Different foods contain various quantities of carbohydrates, fats, proteins, fibre, vitamins and minerals. It is important to have the right balance.
- Humans (and many animals) have skeletons, muscular systems and digestive systems. You should know the basic parts and purposes of these systems for humans.

The Circulatory System



- The circulatory system is your body's delivery system. It is made up of your heart, blood and blood vessels.
- The human body needs a constant supply of blood to keep working. Blood delivers oxygen to all of the body's cells – without this, cells would die. The circulatory system gets blood (and the oxygen) all around your body.
- The heart pumps blood to the lungs via the pulmonary artery, where it picks up oxygen. It is then returned to the heart through the pulmonary vein.
- The heart then pumps the oxygenated blood to the rest of the body through the aorta and the other arteries.
- Veins are vessels that bring blood back to the heart.

Impact of Diet, Exercise, and Drugs

Diet



-A healthy, balanced diet can have a huge effect on a person's health. People who eat the right balance of fresh, healthy foods are less prone to chronic illnesses and diseases.

-Carbohydrates are used by the body to create glucose, the body's main energy source. Fat is also helpful for energy, but too much fat in a person's diet causes them to gain weight. Protein helps to build and repair muscles, but too much can cause indigestion and intestinal problems.

Exercise



-As we exercise, our muscles need more oxygen. So, we breathe quicker, helping our lungs to take in more oxygen.

-Our heart needs to pump blood more quickly to get all of the oxygen around the body. In order to do this, our heart rate increases.

-Regular exercise helps our bones and muscles to become stronger. It also helps the heart and lungs to become healthier.

Drugs

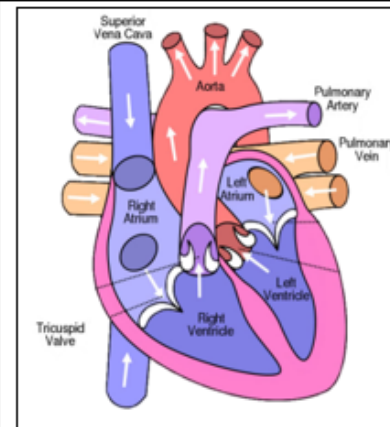


-A drug is a chemical that has an effect on your body.

-Some drugs are prescribed by doctors to make people healthy. Other, illegal drugs can have a dangerous effect on our health.

-Alcohol is a depressant. Alcohol can cause damage to the liver and brain. Cigarettes contain nicotine, which is a stimulant, and is addictive. Cigarettes cause damage to the lungs and heart.

The Heart



- The circulatory system is centred on the heart, an organ that works constantly to pump blood around the body.
- The heart is made up of four sections, called chambers. There are two sides to the heart (right and left) each of which have an atrium (at the top) and a ventricle (at the bottom).
- The job of the 'atria' (the word for the two atriums) is to fill with the blood returning to the heart before pushing it to the ventricles.
- The left atrium receives blood from the lungs and the right atrium receives it from the rest of the body.
- The job of the ventricles is to push the blood out of the heart. The left ventricle pushes blood to the lungs and the right ventricle pushes blood to the rest of the body.

Transportation of Water in the Body

Rehydration – water is drunk through the mouth.



Absorption – water is absorbed by the intestines and is carried in the bloodstream.



Transportation – water is taken in blood to different parts of the body.

Excretion – waste water is passed out as urine.