

SCIENCE SPRING 1 KNOWLEDGE ORGANISERS



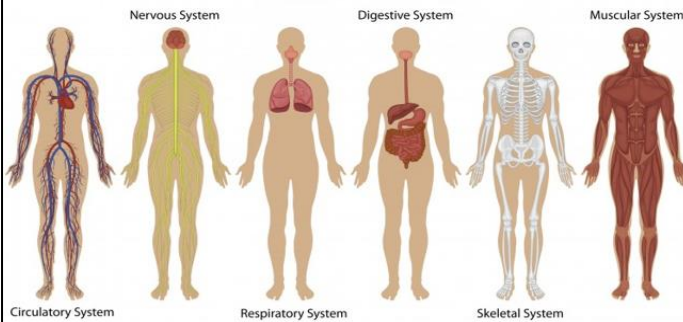
Y5 SCIENCE KNOWLEDGE ORGANISER

TOPIC: Unit 3 [SPRING]

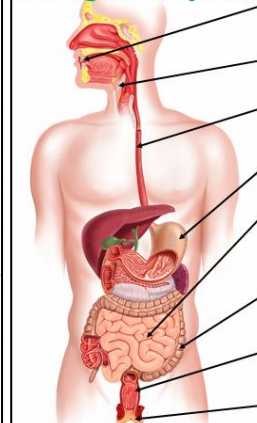


A system is a group of organs that work together on the same job

Human Body Systems



The digestive system



- Teeth** Chewing breaks food into smaller pieces
- Salivary Glands** Adds saliva to moisten food
- Gullet** Muscular food that pushes food along
- Stomach** Churns food with acid to chemically break it down
- Small Intestine** Continues chemical breakdown and absorbs digested nutrients
- Large Intestine** Absorbs water from digested waste
- Rectum** Stores and compacts waste [faeces]
- Anus** Exit hole for faeces

Blood contains plasma, a liquid that contains many things

- **Red blood cells**, which transport oxygen absorbed in the lungs
- **White blood cells**, which protect against disease
- **Platelets**, which help the blood to clot
- **Plasma**, which contain our digested food and our waste products

Blood vessels transport the blood around our body:

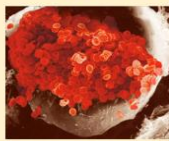
Thick Arteries



Very thin Capillaries



Veins with valves



The Heart!



- An organ made of muscle
- As big as your fist
- Has two sides
- Pumps blood around the body
- Pumps about 60 times a minute, which can be measured by recording our pulse on our wrist
- Protected by ribs

Key Vocabulary	Definition
Fair test	An investigation where only <u>one</u> factor or variable is changed. If more than one factor is changed, you do not know which one has caused your results.
Balance	A device used to measure mass [how heavy something is]. Remember to let a balance settle at 0g before adding the object that you are measuring. Measured in grams [g]
Volume	The amount of space an object or material takes up. Measured in cm ³ or ml.

Thermometers measure **temperature**.

The units for measuring temperature are **Degrees Celsius** [the symbol is °C].

Water freezes at 0°C and boils at 100°C.

How do you use a thermometer?

Place it where you want to know the temperature and **wait for the liquid to stop moving** inside the thermometer.

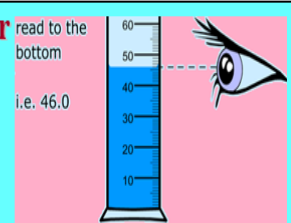


Minutes
Seconds
Parts of Seconds
[Hundredths]

How to read a stopwatch

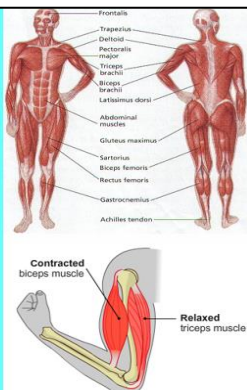
Using a Measuring Cylinder

- Stand it on a flat surface.
- Make sure that your eye is level with the surface.
- You then read the volume at the **flat part** as shown above.



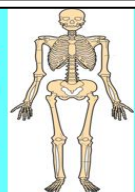
Muscles!

- They can only pull your bones in one direction
 - This is called **contracting**.
- They can't push, but just **relax** when not pulling
- Muscles often work in pairs that pull in **opposite** directions
 - These are called **antagonistic** [means 'against']
- There are some muscles you don't control like in your stomach and heart



What does the skeleton do?

- It protects your important organs
- It allows you to move [along with muscles]
- It stop your body from collapsing



How can we look after our skeleton?

for Calcium Vitamin D

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TOPIC: UNIT 3 [SPRING]



- Light travels in **STRAIGHT** lines with no gaps
- Light **REFLECTS INTO** our eyes for us to see all objects
- We show light by drawing **ARROWS**
- Light always starts at the **SOURCE** and ends in our **EYES**

Periscopes allow you to see over objects as they reflect the light twice

PITCH is how **HIGH** or **LOW** a sound is

It is controlled by changing how fast the vibrations causing the sound are

Smaller or tighter objects = **Faster vibrations** = **HIGHER** pitched

Bigger or looser objects = **Slower vibrations** = **LOWER** pitched

Volume is how **LOUD** a sound is

How do we make sounds louder?

Easy! Hit or pluck instruments **HARDER!!!**

Key Vocabulary	Definition
Light Source	An object that produces light. Examples include fire, a torch, a candle and the Sun.
Reflect	When light bounces off an object. We can see most objects because they reflect light.
Mirror	A very smooth surface designed to reflect light very evenly
Soundproof	When soft materials are be used to block or absorb sound
Sound damage	Big sound vibration can damage your ears and limit your hearing
Circuit	A complete loop that electricity can flow around. Any breaks in the circuit will stop the electricity from flowing.
Conductor	A material that allows electricity to flow through it. Metals are the best conductors.
Insulator	A material that will not allow electricity to flow through it. Plastic and wood are insulators.
Michael Faraday	Famous British scientist who created the first electrical generator and motor.

Shadows
Shadows form when opaque objects **block** the light.

They have no features.

You can increase a shadow's size by moving closer to the light source.

All circuits need:

- A **complete loop** with no gaps
- Power source** [cell] - If you have more than one cell, always connect **+** to **-** and attach wires at both ends
- An **Output** to show you the circuit works [bulb, buzzer]

	Bulb	We use circuit symbols to represent circuit parts.
	Wire	
	Motor	It is an international language that all countries recognise.
	Switch	
	Cell	
	Buzzer	It makes the drawing of circuits much easier and clearer to understand.
	2 Cells	

Circuit Diagram Rules

- **Circuits should be a rectangle and drawn with a pencil and ruler**
- **No gaps**
- **No parts on corners**

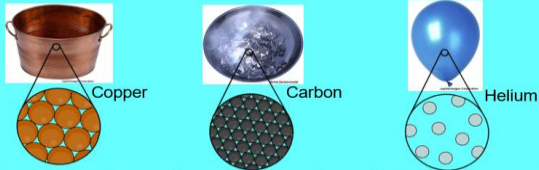
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UNIT 3 [SPRING]



What is an element?

All substances are made of very tiny particles called **atoms**. There are about one hundred substances that are made up of just **one type of atom**. These are the **elements**.



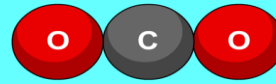
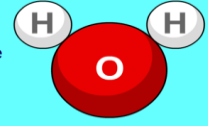
The elements are the purest and simplest substances in the universe. Each element has different sized atoms.

The elements are the building blocks of all other substances.

What is a compound?

A compound is the substance produced when two or more elements combine in a chemical reaction in set amounts.

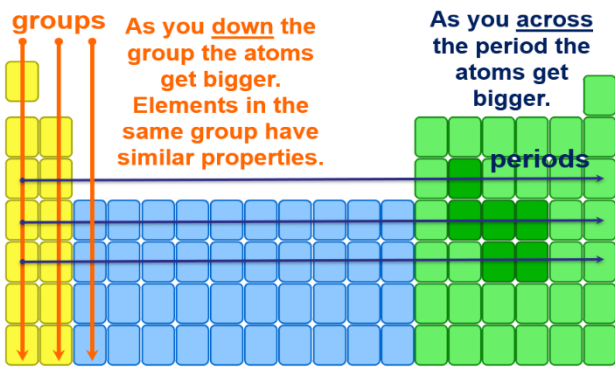
Two elements, hydrogen (H) and oxygen (O), combine to make the compound, water [H₂O].



Which two elements combine to make the compound carbon dioxide [CO₂]? **Carbon and Oxygen**

A compound is always made up of two or more different types of atom in a set amount.

Periodic Table Structure

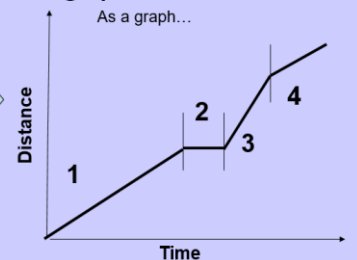


How to use distance / time graphs

My journey to work

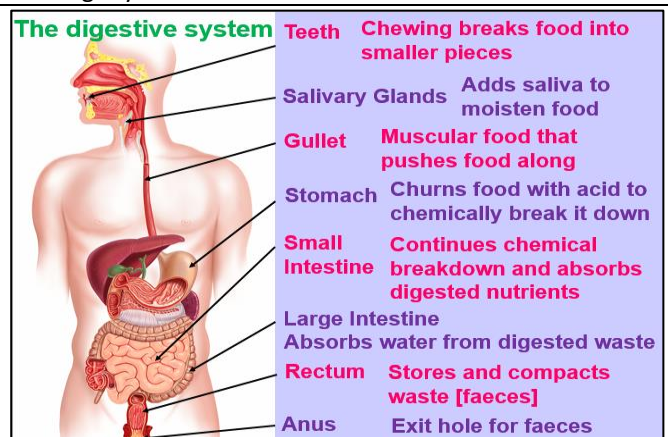
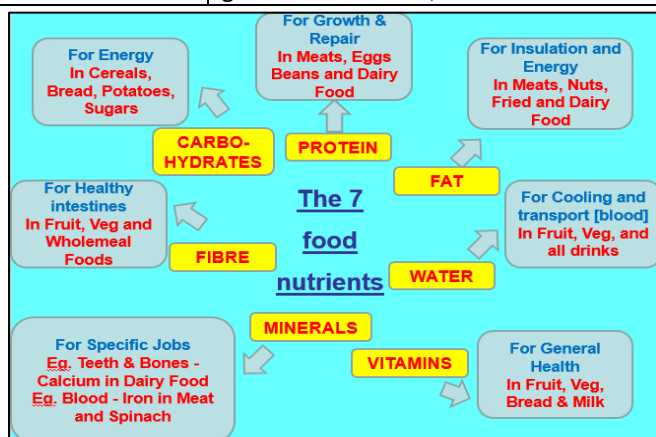
- 1] Drive 3 miles in 30 zone
- 2] Stop at traffic lights
- 3] Drive 2 miles in 60 zone
- 4] Drive 1 mile in 30 zone

video



KEY: Flat line = Not Moving [2]
Shallow slope = Moving slowly [1 & 4]
Steep slope = Moving quickly [3]

Balanced Diet	A diet with all the food nutrients in the correct amounts. Fats and sugars should be limited but lots of fruit and veg for vitamins, minerals and fibre are needed for good health. Deficiency illnesses can arise from an unbalanced diet, such as scurvy [lack of vitamin C] and constipation [lack of fibre].
Digestion	The process of breaking down large insoluble food particles into smaller, soluble food particles that can be absorbed in the small intestine.
Villi [sing. Villus]	Small, thin projections on the small intestine wall that massively increase surface area for the rapid absorption of food nutrients into the bloodstream
Enzyme	A chemical that helps to speed up the breakdown of food particles. They work best at 37°C, our internal body temperature.
Metal	A material that is a good conductor of heat and electricity, ductile and malleable. Non-metals have opposite properties, Individual metals have specific properties – gold, for examples is non-reactive.
Mixture	A material composed of different particles that are not chemically joined. Because of this, they can be separated in their constituent parts easily. Examples include air, sea water and milk
Speed	The measurement of how fast something is going. It is calculated by dividing distance by time taken . Units are metres per second [m/s], miles per hour [mph] or kilometres per hour [km/h]
Relative Speed	The speed of two objects travelling compared to each other. The relative speed of two objects going in the same direction is equal to the difference between the two speeds. The relative speed of two objects going in different directions is equal to the two speeds added together.
Light Year	A unit of distance used when discussing the vastness of space. It is the distance light can travel in one whole year. It is equal to about 9.5 trillion kilometres.
Universe	The universe is all of space, composed of the many stars, planets, moons and galaxies. It is held together by gravitational forces, and is estimated to be 93 billion light years wide



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Unit 3 [Spring]



What are the useful features of leaves?

Leaves often have many features that make them suitable for **photosynthesis**, including:

- A leaf is **broad** and **flat** to capture lots of sunlight.
- **Veins** carry water to the leaf and take food from the leaf to the rest of the plant. Veins also help to support the leaf.
- Palisade plant cells contain many **chloroplasts** filled with **chlorophyll**.
- Small holes called **stomata** in the underside of a leaf allow gases in and out.
- The leaves are **thin** so gases don't have far to travel



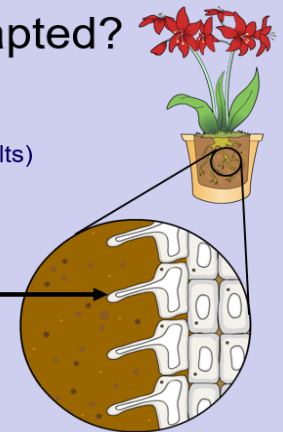
How are roots adapted?

Roots are branched and spread out for two reasons:

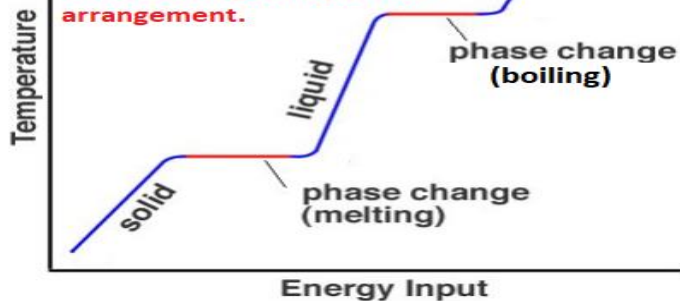
- to absorb water (and mineral salts) from a large amount of soil
- to anchor the plant in the soil.

Taking a closer look, roots are covered in **root hair cells**.

Root hair cells have thin walls and a **large surface area** to help them absorb lots of water.

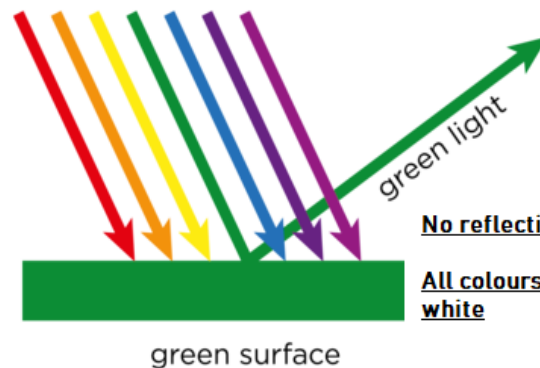


This shows what happens when you heat any material. The temperature stops increasing when the particle arrangement is changing as the energy is used to change the particle arrangement.



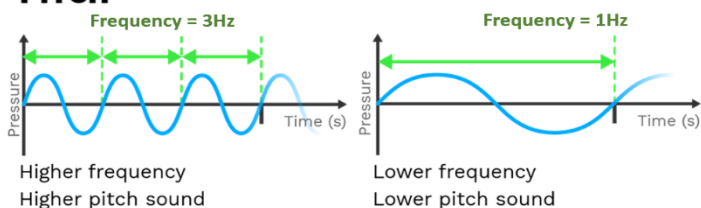
Objects reflect the colour they appear

white light coming in

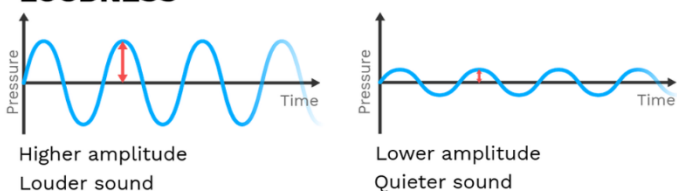


Key Vocabulary	Definition
Photosynthesis	The process that allows plants to make their own food. The raw materials are water and carbon dioxide, and using light energy captured by a green pigment chlorophyll, glucose [sugar] and oxygen are produced.
Density	Density is a measure how much mass takes up how much space [volume]. Items with a density of less than 1g/cm ³ will float in water. Densities of more than 1g/cm ³ will sink in water. Density [g/cm³] = Mass [g] ÷ Volume [cm³] .
Boiling Point	Temperature at which a material changes from liquid to gas. Energy is used to change particle arrangement.
Melting point	Temperature at which a material changes from solid to liquid. Energy is used to change particle arrangement.
Absorb	Soak up. Soft materials absorb sound to protect out ear. Coloured objects absorbs all colours that are not reflected.
Dispersion	The refraction (and reflection) of white light into the spectrum [7 colours] that occurs inside a prism.
Transverse Waves	Energy waves that travels at 90° to the angle of movement. Light is an example - it does not require particles to travel.
Longitudinal Waves	Energy waves that travels in forward compression pulses. Sound is an example - it does needs particles to transmit the energy.
Ultrasound	Sound waves with a frequency above which humans can detect. Used for scanning pregnant females and cleaning delicate materials. Also used by bats for echolocating prey.
Auditory Range	The frequencies that your ear can detect. It varies in different animals. Loudness is measured in decibels .

PITCH



LOUDNESS



The sound vibrations in the air make the **eardrum** vibrate, and these vibrations are passed through the **three small bones (called ossicles)** to a spiral structure called the **cochlea**.

Electrical signals are created in the curved **cochlea** by vibrating hairs and are passed to the brain through the **auditory nerve**, and our brain interprets these signals as sound.