

# KO — YEAR 8 — FOOD SAFETY

## 4C's OF FOOD SAFETY



CLEANING, CROSS  
CONTAMINATION, COOKING AND CHILLING.

Moisture

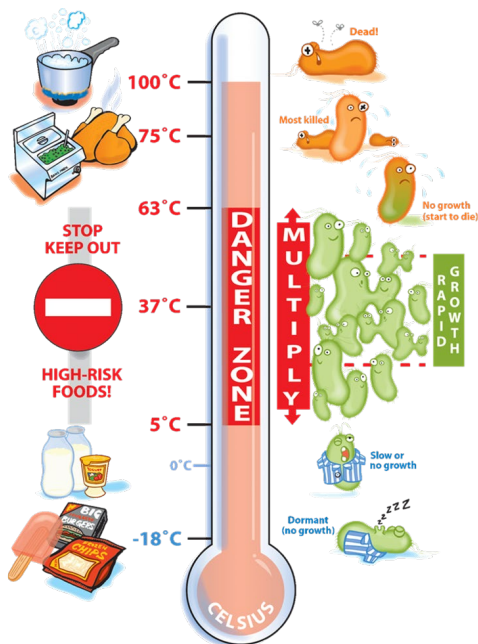
Warmth

Time

Food

Binary fission a single cell, divides into two identical daughter cells. Bacteria need four things to multiply.

## Critical Temperatures



## Critical temperatures

Fridge **0-5**

Freezer **-18- -21C**

Danger zone between **5-63**

**Danger zone is where bacteria is most active!!**



## NON VISIBLE SIGNS

- Headache
- Weakness
- Feeling cold/shivery
- Stomach ache
- Nausea
- Loss of appetite
- Aching muscles

## VISIBLE SIGNS

- Diarrhoea
- High temperature
- Being sick (vomiting)
- Dizziness



## Remember!!

When washing your hands you use hot soapy water.  
Wash your hands for 20 seconds and rinse  
Use paper towel to dry hands and throw away once used

## How to wash your hands properly



**RAW MEAT**

**RAW FISH**

**COOKED MEATS**

**SALADS & FRUITS**

**VEGETABLES**

**DAIRY PRODUCTS**

The importance of using colour coded equipment when preparing food is to prevent cross contamination..

**Cross contamination** is when bacteria transfers from one area to another

## HACCP

When handling food we follow a procedure called HACCP. This is used to ensure all food produced is handle with care and reduces the risk of **cross contamination**

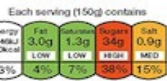


| Stage in the kitchen  | Action  |
|-----------------------|---|
| Delivery              | <ul style="list-style-type: none"> <li>- Check the temperature of the delivery van</li> <li>- Make sure ingredients have been stored correctly</li> </ul>   |
| Preparation           | <ul style="list-style-type: none"> <li>- Store food in the correct temperature such as in a fridge at 0-5C</li> <li>- Make sure appropriate equipment is used. For example a <b>red chopping</b> board is for raw meat</li> </ul> |
| Cooking and serving   | <ul style="list-style-type: none"> <li>- Make sure food is cooked the whole way through using a temperature probe to record temperatures</li> </ul>   |
| Holding and reheating | <ul style="list-style-type: none"> <li>- Do not reheat certain foods such as those that contain chicken</li> <li>- Only serve food when ready to be served.</li> </ul>  |

# KO — YEAR 8 — Food Health and Nutrition

## Eatwell Guide

Check the label on packaged foods



Choose foods lower in fat, salt and sugars

Use the Eatwell Guide to help you get a balance of healthier and more sustainable food. It shows how much of what you eat overall should come from each food group.



## Dietary guidelines

Health experts and the Government have worked together and produced a set of Dietary Guidelines and an Eatwell Guide to help people make informed choices when they are deciding what to eat. These are shown below. You will see that there are also guidelines about your lifestyle choices as well as what you eat.

1. Base your meals on starchy foods.
2. Eat lots of fruit and vegetables.
3. Eat more fish – including a portion of oily fish each week.
4. Cut down on saturated fat and sugar.
5. Eat less salt – no more than 6g a day (1 level teaspoon) for adults.
6. Get active and be a healthy weight.
7. Don't get thirsty – drink plenty of water.
8. Don't skip breakfast.

## Check how much fat, sugar and salt is in your food



Remember that the amount you eat of a particular food affects how much sugars, fat, saturates and salt you will get from it.

## Food Shopping Card

|                        | Sugars             | Fat                | Saturates           | Salt                  |
|------------------------|--------------------|--------------------|---------------------|-----------------------|
| What is HIGH per100g   | Over 15g           | Over 20g           | Over 5g             | Over 1.5g             |
| What is MEDIUM per100g | Between 5g and 15g | Between 3g and 20g | Between 1.5g and 5g | Between 0.3g and 1.5g |
| What is LOW per100g    | 5g and below       | 3g and below       | 1.5g and below      | 0.3g and below        |

## Macronutrients and micronutrients

There are 5 main groups of nutrients. These 5 groups can be divided into 2 groups

**Macronutrients** which are needed by the body in large amounts.

**Micronutrients** which are needed by the body in small amounts.

### What are Nutrients?

Nutrients are the building blocks that make up food and have specific and important roles to play in the body. Some nutrients provide energy while others are essential for growth and maintenance of the body.

| Macro Nutrient | Role in the body   | Food Example  |
|----------------|--|---|
| Carbohydrate   | The main source of energy for the body.  | Bread, rice, pasta, potatoes                        |
| Protein        | Provides the body with growth and repair.  | Meat, poultry, beans, eggs, lentils, tofu, fish     |
| Fat            | Provides the body with insulation and a small amount protects vital organs. Provides essential fatty acids for the body. | Butter, oil, cheese, cream, nuts, oily fish, crisps |

| Vitamin | Role in the body   | Food examples  |
|---------|--|--|
| A       | Helps to keep the eyes healthy and strengthen the immune system.           | Dark green leafy vegetables, carrots, liver                  |
| B       | Helps to release the energy from the food we eat.                          | Bread, milk, cereals, fish, meat                             |
| C       | Help with skin healing and healthy skin. Help with the absorption of Iron. | Fresh fruit, broccoli, tomatoes                              |
| D       | Important for absorbing calcium and help with healthy bone structure       | Oily fish, eggs, butter, Sunshine                            |
| Mineral | Role in the body   | Food Examples  |
| Calcium | Important for strong teeth and bones. It also helps with blood clotting.   | Milk, yoghurt, soya, dark green leafy vegetables             |
| Iron    | Needed for red blood cells which help to transport oxygen around the body. | Nuts, whole grains, dark green leafy vegetables, meat, liver |

### Fibre:

Fibre also known as non-soluble polysaccharide (NSP) is not absorbed by the body. As fibre passes through your body it collects all the rubbish and waste until it finally is expelled as faeces. It absorbs water and bulks up the waste making it soft.

### Deficiency

Lack of fibre can cause constipation and diverticular disease.

### Excess intake

Bloating, abdominal pain, flatulence, diarrhoea.



### Water:

Water is vital to life. 70% of the human body is water. It is not a nutrient. Most drinks including milk are made of water. It helps to digest and absorb nutrients, remove waste from the body, control our body temperature, concentrate and lubricate our joints.

### Deficiency

A lack of water can result in dehydration.

### Excess intake

In rare cases, drinking an extreme amount in a short time can be dangerous. It can cause the level of salt, or sodium, in your blood to drop too low. That's a condition called hyponatremia. It's very serious, and can be fatal. You may hear it called water intoxication.



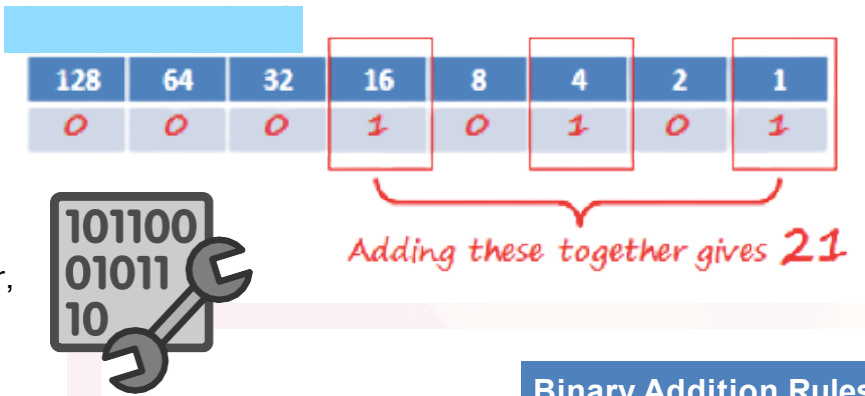




Binary Conversion

Writing the column values out above your binary number is always a good place to start. Only add the column value where the binary number is 1.

To convert from denary to binary start with the highest placeholder and compare it to your number, if your number is bigger than the first value, then place a 1 in the column. Subtract the value and continue the process using the remainder

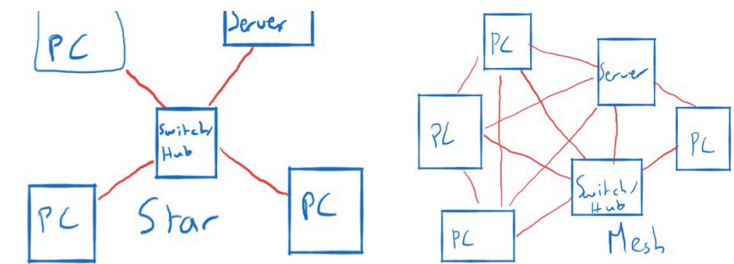


Network topologies

A network topology describes the way that a LAN is connected.

**Star** - Most common network layout. A central device controls sending packets between devices.

**Mesh** - Nodes may be connected via a series of paths, and multiple routes exist, such as the internet. A mesh may be partially or fully connected.



Data Representation

**Text**, like everything on a computer is represented by numbers. Each character is given a number value. This is called a character set. ASCII uses 8 bits which allows for 256 characters to be represented.

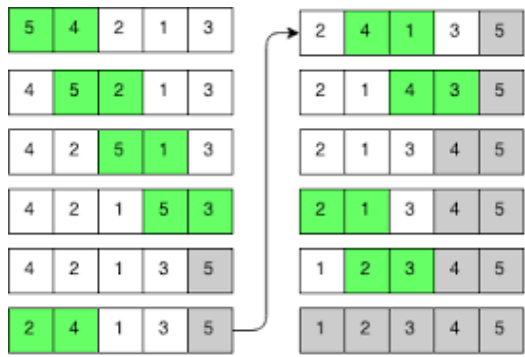
The word 'Computing' uses the **denary** codes:  
111 109 112 117 116 105 110 103

Obviously the computer would recognise these in **Binary** as:  
01000011 01101111 01101101 01110000 01110101 01110100  
01101001 01101110 01100111

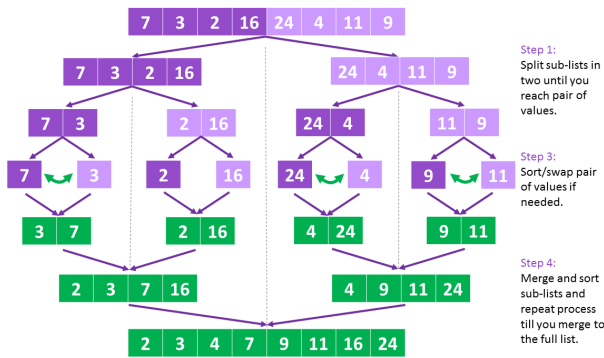
If you want to use accents in European languages or larger alphabets such as Chinese Mandarin then more characters are needed. **Unicode** is much larger than ASCII and can represent thousands more characters across many different languages, it can even represent emojis!

Sorting Algorithms

**Bubble Sorts**, compare pairs of values, swapping them as they go if they are not in order, the next pair of values are compared moving one position each time.



VS

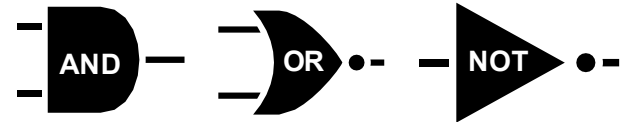


A **Merge Sort**, is a case of divide and conquer. First of all, the items of data in a list are divided in half until each item is in a **SUBLIST** of one item, (this is the **DIVIDE** stage). The algorithm will then merge each sublist, after comparing and sorting them as appropriate. -When all of the data has been merged back into a single list it will be in the correct order (the **CONQUER** stage)

Year 8 - Computing - Intermediate Computer Systems - Knowledge Organiser

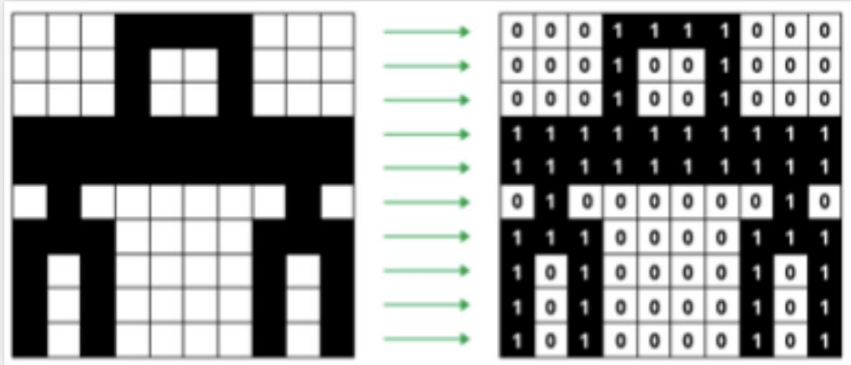
Logic Gates

Computers are made up of circuits containing millions of switches. As electrical switches have two possible values (ON or OFF), these values can be represented using binary values 1 or 0. A truth table shows all of the different combinations for each gate. these gates can also be joined together to create a logic circuit.

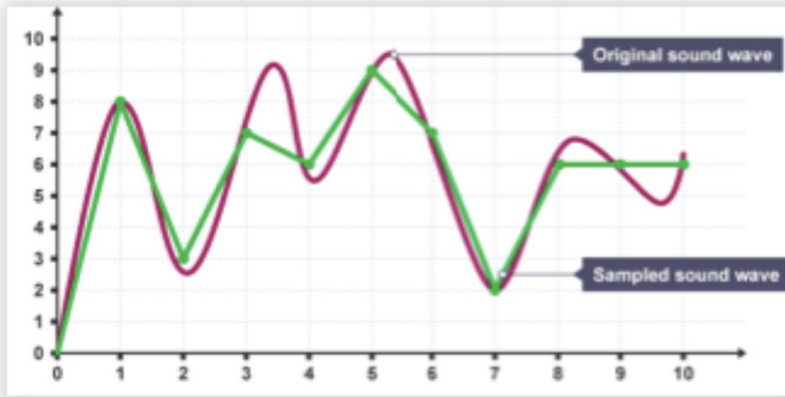


| A | B | Q |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 1 |


**BITMAP images** are made up of an invisible grid and each pixel is assigned a colour from a number value. Pixel is short for picture element. The black squares are represented as 1's and the white squares are represented as 0s. The number of pixels we use is known as the **resolution**.




**Sound** exists as waves, however, as computers only understand binary values this needs to be converted. Digital sound isn't as smooth as a real sound wave. Digital sound is broken down into thousands of samples per second - each of these samples is then stored as binary data.



# Keyboard Shortcuts

**Ctrl** + **C** = Copy 

**Ctrl** + **B** = Bold

**Ctrl** + **V** = Paste 

**Ctrl** + **I** = Italic

**Ctrl** + **X** = Cut 

**Ctrl** + **U** = Underline

**Ctrl** + **A** = Select All

**Ctrl** + **S** = Save

**Ctrl** + **Z** = Undo

 +  + **S** =  
Snipping Tool

**Ctrl** + **Y** = Redo

**F5** = Refresh

**F7** = Spelling &  
Grammar check

**F11** = Fullscreen Mode



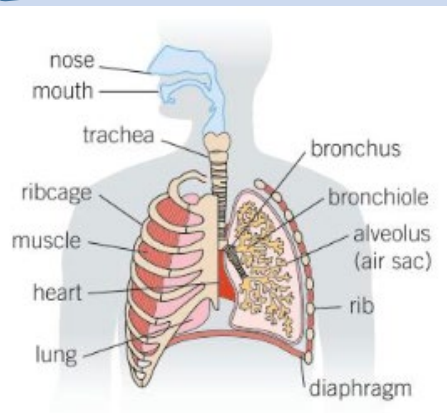
## Key Words!

# Knowledge Organiser - Year 8 - Cellular Respiration

## Gas Exchange

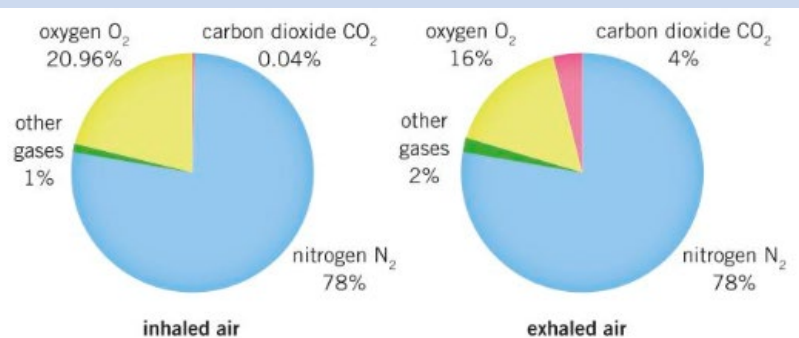
**Breathing (ventilation):** The movement of air in (inhaling) and out (exhaling) of the lungs.  
**Trachea (windpipe):** Carries air from the mouth and nose to the lungs.  
**Bronchi:** Two tubes which carry air to the lungs.  
**Bronchioles:** Small tubes in the lung.  
**Alveoli:** Small air sacs found at the end of each bronchiole.  
**Ribs:** Bones which surround the lungs to form the ribcage.  
**Diaphragm:** A sheet of muscle found underneath the lungs.  
**Lung volume:** Measure of the amount of air breathed in or out  
**Respiration:** A chemical reaction which occurs inside all cells to release ENERGY from food substances such as GLUCOSE.  
**Circulatory system:** Transports substances around the body.  
**Respiratory system:** Replaces oxygen and removes carbon dioxide from blood.

## Respiratory System



Air enters your body through your mouth and nose.  
 ↓  
 Air moves down the **trachea** (windpipe) – a large tube.  
 ↓  
 Air moves down a **bronchus** – a smaller tube.  
 ↓  
 Air moves through a **bronchiole** – a tiny tube.  
 ↓  
 Air moves into an **alveolus** – an air sac.  
 ↓  
 Oxygen then diffuses into the blood.

When we breathe in we inhale to take in oxygen. The oxygen is used in **respiration** to transfer energy. When we breathe out we exhale carbon dioxide and water, the waste products of **respiration**.

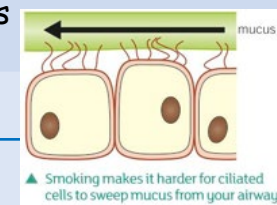
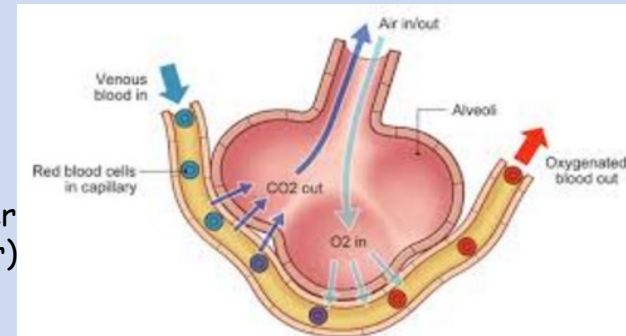


Inhaled air contains more oxygen compared to air breathed out. Air we breathe out contains more carbon dioxide than air breathed in.

During gas exchange **oxygen** passes into the **blood** from the **alveoli** and **carbon dioxide** (a waste product of respiration) passes from the **blood** into the **alveoli** to be exhaled. Gas exchange occurs by the process of **diffusion**.

To maximise the efficiency of gas exchange, the alveoli have several adaptations.

1. Large surface area.
2. The membranes of the alveolus and capillaries are only one cell thick (shorter diffusion distance, gases diffuse quicker)
3. They are moist, encouraging gas molecules to easily dissolve.
4. Good blood supply (maintains concentration gradient)



## Factors that affect gas exchange

### Smoking

- Causes cancer
- Damages the cilia so they can't remove mucus properly, (increased infections)
- Chemicals break down and reduce the number of alveoli (reduces surface area- **emphysema**)

|                 |   |
|-----------------|---|
| Tar             | contains chemicals which cause cancer.                            |
| Nicotine        | Stimulant drug which makes the heart beat faster, also addictive. |
| Carbon Monoxide | reduces the amount of oxygen the red blood cells can carry        |

### Asthma

- narrows the small airways (bronchioles) that carry air in and out of the lungs.
- airways can become inflamed, swollen and constricted (or narrowed) and excess mucus is produced

## Respiration

Respiration is not breathing. That is called . Respiration is a chemical reaction which occurs in every one of the cells in the human body. It releases energy stored in glucose and without it, these cells would die.

Glucose and oxygen are taken in and converted to carbon dioxide, water and energy. This energy is important for growth, movement and keeping warm.

Your circulatory system is made up of three parts: the heart, blood vessels and the blood itself.



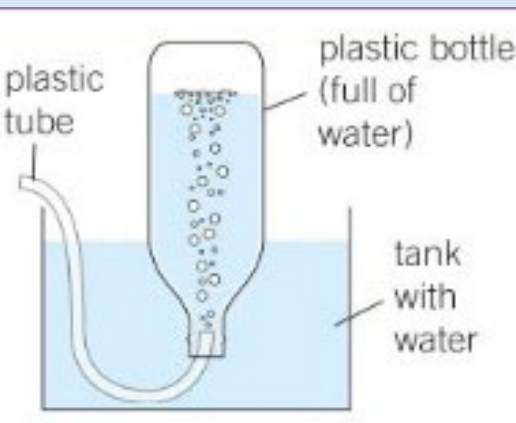
## Circulatory System

Your heart keeps all the blood in your circulatory system flowing. The blood travels through a network of blood vessels to everywhere in your body. It carries useful materials like oxygen, water and nutrients and removes waste products like carbon dioxide.

## Lung Volume

Breathing and respiration are NOT the same! Breathing is a **MECHANICAL** process while respiration is **CHEMICAL**.

Lung Volume can be measured by blowing into an inverted measuring cylinder/bottle. The volume of water displaced is equal to how much air your lungs can hold.

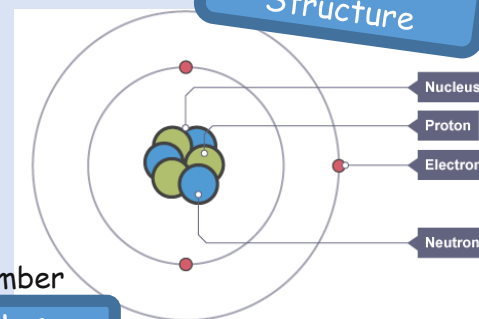




## Key Words!

# Knowledge Organiser - Year 8 - Atoms and the Periodic Table

## Atomic Structure

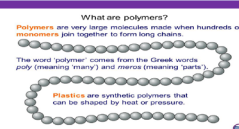


Protons and electrons have electrical charges that are equal and opposite. An atom is neutral because it always contains the same number of protons and electrons.  
Remember: **Proton Positive Neutron Neutral**

Atomic number = number of protons in nucleus  
Mass number = number of protons + neutrons in nucleus  
Number of neutrons in nucleus = mass number - atomic number

## Polymers, Ceramics and Composites

Natural polymers like wool and cotton are made by plants and animals. Polymers do not occur naturally. They are formed during chemical reactions.



Ceramics are made from soft substances, which when heated become hard and brittle. Ceramics have many uses which can be linked to their properties. Some uses are clearly visible, such as coffee mugs, but other uses are less visible, such as in car engines.

## Metals and non-metals

Metal = left Non-metal = right

**Metals:** Shiny, good conductors of electricity and heat, malleable and ductile, and usually solid at room temperature.

**Non-metals:** Dull, poor conductors of electricity and heat, brittle and usually solid or gaseous at room temperature.

## Elements, mixtures, compounds.

The atoms of some elements do not join together, but instead they stay as separate atoms. Helium is like this. The atoms of other elements, such as hydrogen and oxygen, join together to make **molecules**.

A **compound** is a substance that contains atoms of two or more different elements chemically joined together. For example, water is a compound of hydrogen and oxygen.

This is a common examination question. You must be able to recognise diagrams of a element, mixture and compound.

## The halogens

These are group 7 elements. They all have 7 electrons in the outer shell. A more reactive halogen will displace a less reactive halogen.

### Properties of the Halogens

|    | Colour     | State  |
|----|------------|--------|
| F  | Yellow     | Gas    |
| Cl | Green      | Gas    |
| Br | Orange     | Liquid |
| I  | Grey/black | Solid  |
| At | Black      | Solid  |

↑ INCREASING MOLECULAR SIZE  
↑ INCREASING DENSITY  
↓ DECREASING REACTIVITY

**Periodic table:** Shows all the elements arranged in rows and columns.  
**Physical properties:** Features of a substance that can be observed without changing the substance itself.  
**Chemical properties:** Features of the way a substance reacts with other substances.  
**Groups:** Columns of the periodic table.  
**Periods:** Rows of the periodic table.  
**Elements:** What all substances are made of, and which contain only one type of atom.  
**Atom:** The smallest particle of an element that can exist.  
**Molecules:** Two to thousands of atoms joined.  
**Compound:** Pure substances made up of two or more elements strongly joined.  
**Chemical formula:** Shows the elements present in a compound and their relative proportions.  
**Polymer:** A molecule made of thousands of smaller molecules in a repeating pattern.

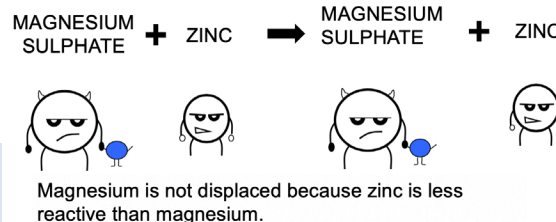
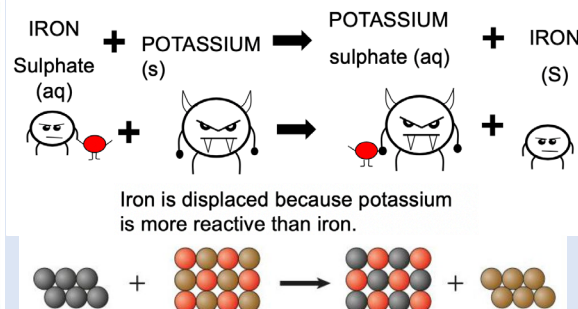
The horizontal rows are called periods. The vertical columns are called groups.

Group 1: Alkali metals  
Group 7: The Halogens  
Group 0: Nobel Gases  
Middle Section: Transition elements

## Periodic table

**Reactivity:** The tendency of a substance to undergo a chemical reaction.  
**Reactivity series:** A list of metals in order of how vigorously they react.  
**Displace:** A more reactive metal displaces (or pushes out) a less reactive metal from its compound.  
**Displacement:** A reaction where a more reactive metal takes the place of a less reactive metal in a compound.

## Displacement



## Reactivity series

reactive  
potassium  
sodium  
lithium  
calcium  
magnesium  
aluminium  
zinc  
iron  
lead  
copper  
silver  
gold  
unreactive

**Chemical properties** When added to water all group 1 metals produce hydrogen gas. The reactions also produce an alkaline solution so universal indicator turns purple. As you move down the group the reactions become more vigorous.

**Physical properties** The melting points decrease as you move down the group. They all have one electron in their outer shell. They are shiny but react quickly with oxygen in the air to tarnish. They are soft metals and can be easily cut with a knife.

## Group 1



**Chemical formula** Chemical symbols and formulae are used to represent elements and compounds. Some simple chemical formula that you need to know:

Carbon dioxide  
CO<sub>2</sub>

Sulphate  
SO<sub>4</sub>

Water  
H<sub>2</sub>O

Sodium  
chloride  
NaCl

Nitrate  
NO<sub>3</sub>

## Chemical Formula

## Key Words!

# Knowledge Organiser - Year 8 - Science - Energy and Reactions

## Thermal Decomposition



Some chemical reactions need energy to start them off. This energy can be in the form of heat, light or electricity. When you use energy to split up compounds they are **decomposed**. Some compounds break down when heated, forming two or more products from one reactant. This type of reaction is called **thermal decomposition**. For example, copper carbonate breaks down easily when it is heated:

**copper carbonate** → **copper oxide** + **carbon dioxide**

$$\text{CuCO}_3 \rightarrow \text{CuO} + \text{CO}_2$$

### Complete Combustion:

Hydrocarbon fuels are made from the elements carbon and hydrogen. When hydrocarbons burn they use oxygen and form carbon dioxide and water, and release heat energy. We can show the reaction using a word equation.

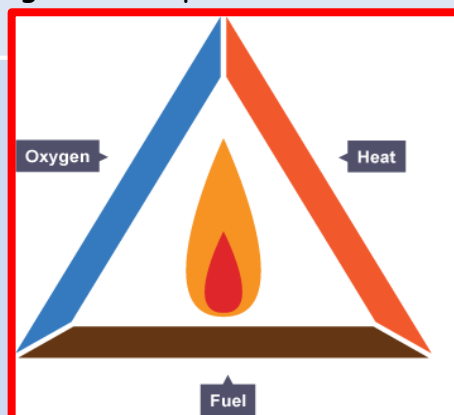


If there is plenty of air, **complete combustion** happens: the hydrogen atoms combine with oxygen to make water vapour, H<sub>2</sub>O the carbon atoms combine with oxygen to make carbon dioxide, CO<sub>2</sub> the maximum amount of energy is released

### Incomplete Combustion:

If there is not enough oxygen available, carbon monoxide or even soot is produced during **incomplete combustion**.

## Combustion



If one of the sides of the fire triangle is removed, a fire will not start, and a fire that is already burning will go out. Fire-fighting relies on this principle. The fire will go out when the fuel runs out, but it is often unsafe to leave a fire that long

Heat: A source of heat is required in order for ignition to occur, and different materials have different 'flash points'

Fuels: A fire cannot begin if there is no material to burn. Homes and businesses are full of flammable materials, such as paper, oil, wood and fabrics.

To sustain the combustion reaction, oxygen is needed, as it reacts with the burning fuel to release heat and CO<sub>2</sub>. Earth's atmosphere consists of 21% oxygen, so there is plenty available to trigger a fire if the other two components are present.

## Endothermic Reactions

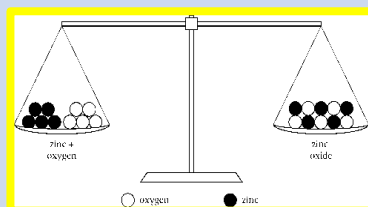
**Endothermic reactions take in energy from the surroundings.** The energy is usually transferred as heat energy, causing the reaction mixture and its surroundings to get colder. The temperature decrease can also be detected using a thermometer. Some examples of endothermic reactions are:

Thermal decomposition  
Cooking an egg

**FUN FACT!**  
Endothermic reactions can be used for everyday purposes. For example, certain sports injury cold packs use endothermic

## Law of Conservation of Mass

In a chemical reaction, the mass of the reactants is always the same as the mass of the products. This is because atoms are not created or destroyed in chemical reactions; they are just rearranged into different compounds.



## Exothermic Reactions

Exothermic reactions **transfer energy to the surroundings**. The energy is usually transferred as heat energy, causing the reaction mixture and its surroundings to become hotter. The energy level decreases in an exothermic reaction. This is because energy is given out to the surroundings.

Some examples of exothermic reactions are:

Making an ice cube. Rusting of iron.  
Snow forming in clouds. Burning of sugar.  
Burning of a candle.

## Further Reading



|                                      |   |
|--------------------------------------|---|
| Fire Triangle                        | <a href="https://www.youtube.com/watch?v=URlmys6XGGk">https://www.youtube.com/watch?v=URlmys6XGGk</a> |
| Physical and Chemical Changes        | <a href="https://www.youtube.com/watch?v=x49BtB5dOwg">https://www.youtube.com/watch?v=x49BtB5dOwg</a> |
| Combustion                           | <a href="https://www.youtube.com/watch?v=cRnpKjHpFyg">https://www.youtube.com/watch?v=cRnpKjHpFyg</a> |
| Decomposition                        | <a href="https://www.youtube.com/watch?v=o9ArhzjrQNY">https://www.youtube.com/watch?v=o9ArhzjrQNY</a> |
| Endothermic and Exothermic Reactions | <a href="https://www.youtube.com/watch?v=eJXL0lrbtqE">https://www.youtube.com/watch?v=eJXL0lrbtqE</a> |



# Knowledge Organiser - Year 8 - Human Organ Systems and Health

## Key Words

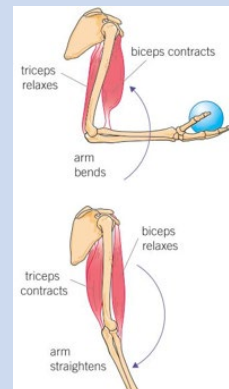
**Joints:** Places where bones meet.  
**Bone marrow:** The site of blood production. Found in the centre of bones.  
**Ligaments:** Connect bones in joints.  
**Tendons:** Connect muscles to bones.  
**Cartilage:** Smooth tissue found at the end of bones, which reduces friction between them.  
**Antagonistic muscle pair:** Muscles working in unison to create movement.  
**Musculoskeletal System:** The muscles and skeleton of the body working together to bring about movement.  
**Immune system:** Protects the body against infections.  
**Reproductive system:** Produces sperm and eggs, and is where the foetus develops.  
**Digestive system:** Breaks down and then absorbs food molecules.

## Muscles

### Antagonistic Muscles

For example the biceps on the front of the upper arm and the triceps on the back of the upper arm:

- to raise the forearm, the biceps contracts and the triceps relaxes
- to lower the forearm again, the triceps contracts and the biceps relaxes



## Balanced Diet

| Nutrient               | Function   | Sources                      |
|------------------------|--|------------------------------|
| Carbohydrate           | Main source of energy.   | Pasta, bread, rice, cereal   |
| Protein                | Growth and repair  | Fish, meat and eggs          |
| Lipids (fats and oils) | A source of energy and insulation  | Butter, cooking oil and nuts |
| Fibre                  | Parts of plants that cannot be digested, which helps the body eliminate waste. | Fruit, veg, wholegrains      |
| Vitamins and Minerals  | General health   | Fruit, veg, milk and fish    |
| Water                  | Needed in all cells and body fluids  | water, fruit, veg, milk      |

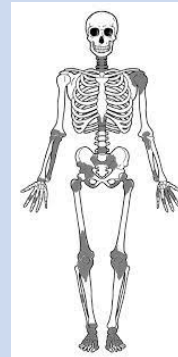
## Unbalanced Diet

The amount of energy you need depends on: Age, gender, body size, how active you are

**Malnourished** is used to describe people who do not have a balanced diet: they don't consume the right amount of nutrients. This can be TOO MUCH (obesity) or TOO LITTLE (starvation). It could lead to a deficiency disease.

- Iron deficiency causes **anaemia**.
- Vitamin A deficiency can result in **blindness**.
- Vitamin C deficiency causes **scurvy**.
- Protein deficiency can cause **kwashiorkor**

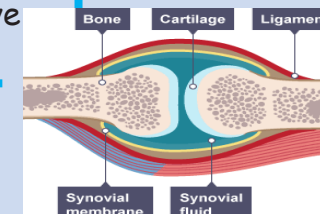
## The skeleton



The skeleton has four main functions:

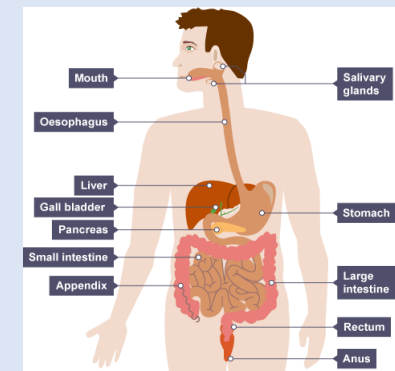
- to support the body
- to protect some of the vital organs of the body
- to help the body move
- to make blood cells

Bones are linked together by joints which allow us to move. The human skeleton has joints called **synovial joints**.



Hinge Joints (Elbow)  
 Ball and Socket Joints (Hip)  
 Gliding Joints (Fingers)  
 Pivot Joints (Neck)  
 Fixed Joint (Skull)

## Digestive System



Digestion happens in the **digestive system**, which begins at the mouth and ends at the anus.

**Stomach:** A sac where food is mixed with acidic juices to start the digestion of protein and kill microorganisms.

**Small intestine:** Upper part of the intestine where digestion is completed and nutrients are absorbed by the blood.

**Large intestine:** Lower part of the intestine from which water is absorbed and where faeces are formed.

## Bacteria and Enzymes

**Enzymes:** Substances that speed up the chemical reactions of digestion.

**Gut bacteria:** Microorganisms that naturally live in the intestine and help food break down.

Enzymes are special **proteins** that can **break down** large **insoluble** food molecules into smaller **soluble** molecules.

The digestive system contains many bacteria and about half of the dry weight of faeces consists of bacteria. Bacteria in the digestive system are important. They reduce the chance of harmful bacteria multiplying and causing disease. They produce some vitamins that humans need, such as vitamins B and K

## Drugs

**Drugs** are chemical substances that affect the way your body works.

**Medicinal:** Cure illness or relieve symptoms (paracetamol, antibiotics).

**Recreational (legal):** Drugs that are taken for pleasure (caffeine, alcohol, tobacco.)

**Recreational (illegal):** Drugs that can cause long term damage tend to be **addictive**.

**Alcohol** is a depressant. It is found in beer, wines and spirits.

Depressants can cause:

- Lowered inhibitions
- Slowed thinking and activity
- A distorted view of the world
- Some depressants cause loss of memory and concentration, as well as an increased risk of mental health issues.

Alcohol is a legal depressant for people over 18, and it is found in drinks such as beer and wine

## Key Words!

# Knowledge Organiser - Year 8 - Energy Changes and Systems

**Work:** The transfer of energy when a force moves an object, in joules.

**Lever:** A type of machine which is a rigid bar that pivots about a point.

**Input force:** The force you apply to a machine.

**Output force:** The force that is applied to the object moved by the machine.

**Displacement:** The distance an object moves from its original position.

**Deformation:** When an elastic object is stretched or squashed, which requires work.

**Thermal conductor:** Material that allows heat to move quickly through it.

**Thermal insulator:** Material that only allows heat to travel slowly through it.

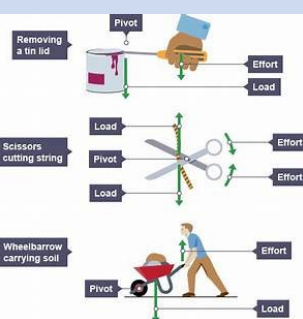
**Temperature:** A measure of the motion and energy of the particles.

**Thermal energy:** The quantity of energy stored in a substance due to the vibration of its particles.

**Conduction:** Transfer of thermal energy by the vibration of particles.

**Convection:** Transfer of thermal energy when particles in a heated fluid rise.

**Radiation:** Transfer of thermal energy as a wave.



**Simple machines give a bigger force but with a smaller movement**

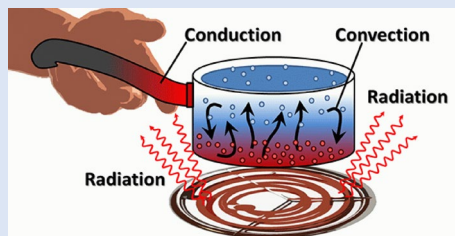
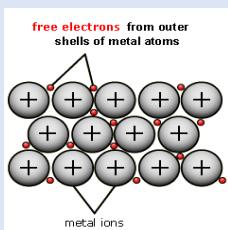
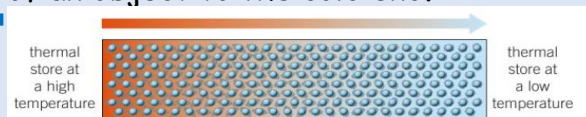
The wheelbarrow is a simple machine with the load near the pivot (the wheel) and the effort on the handles far from the pivot. When you lift the wheelbarrow, the handles move through a bigger distance than the load does.

## Simple Machines

If you multiply the force by the distance travelled, you get the same value for the effort and for the load.

## Conduction

Heat energy can move through a substance by **conduction**. Metals are good conductors of heat but non-metals and gases are usually poor conductors of heat. Poor conductors of heat are called insulators. Heat energy is conducted from the hot end of an object to the cold end.



Metals are made of atoms which have free electrons, free electrons can move throughout the whole metal. If they are heated the free electrons move quickly transferring the heat energy quickly through the metal.

## Radiation

Heat can be transferred by **infrared** radiation. Unlike **conduction** and **convection** - which need particles - infrared radiation is a type of **electromagnetic radiation** that involves waves.

Because no particles are involved, radiation can even work through the **vacuum** of space. This is why we can still feel the heat of the Sun even though it is 150 million kilometres from the Earth.

| Surface                            | Absorption | Emission |
|------------------------------------|------------|----------|
| Dull, matt or rough, dark coloured | Good       | Good     |
| Shiny, light coloured              | Poor       | Poor     |

When a **force** causes a body to move, work is being done on the object by the force. Work is the measure of energy transfer when a force ( $F$ ) moves an object through a distance ( $d$ ). It can be calculated using the following formula:

$$\text{Work done (J)} = \text{force (N)} \times \text{distance moved (m)}$$

So when work is done, **energy** has been transferred from one energy store to another, and so:

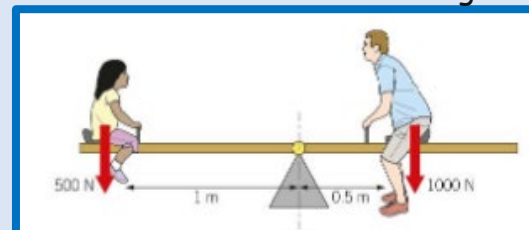
$$\text{energy transferred} = \text{work done}$$

## Work done



A **moment** is the turning effect of a force. Forces that create a moment act around a point called the **pivot**. The pivot is the point around which the object can rotate or turn. On a seesaw the pivot is the point in the middle.

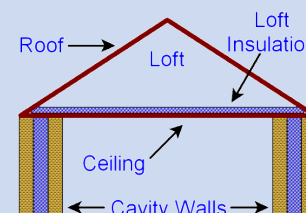
When you push open a door, you apply a force to the edge of the door furthest from the hinges. This force has a turning effect on the door - a **moment** which causes the door to rotate around the hinges - the **pivot** - and the door opens.



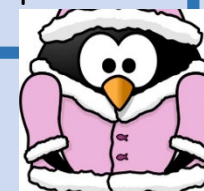
## Moments

Force  $\times$  distance right ( $1000\text{N} \times 0.5\text{m} = 500\text{Nm}$ )  
 Force  $\times$  distance left ( $500\text{N} \times 1\text{m} = 500\text{Nm}$ )  
 The forces are equal, so the see-saw is balanced

Insulators are materials that do not allow thermal energy to be easily passed through. They are inefficient at transferring heat energy. These are typically non-metals. The particles vibrate **more** when they are heated. They bump into the particle next to them passing on the kinetic energy. This is done slowly.



Houses can be adapted to include insulation features which reduces energy wastage and therefore cost.

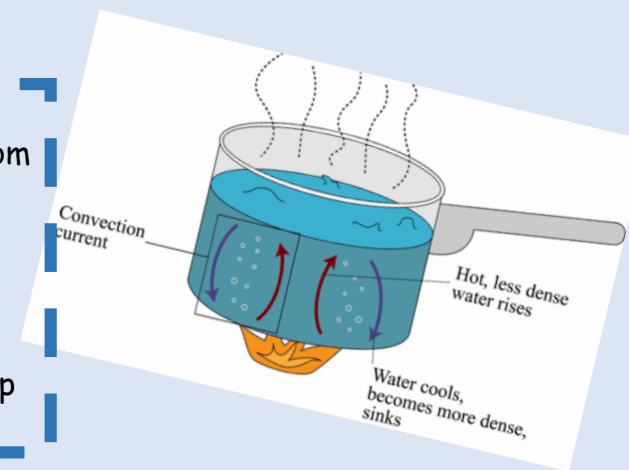


## Insulation

## Convection

When you heat soup in a pan it all heats up, not just the layer in contact with the bottom of the saucepan.

- Soup at the bottom gets hotter so particles move faster.
- Hotter particles move further apart, becoming less dense.
- Hotter soup rises and cooler, denser soup sinks.





# Year 8 Geological World (Vol)



Make sure you know the 'bare bones' of this unit.



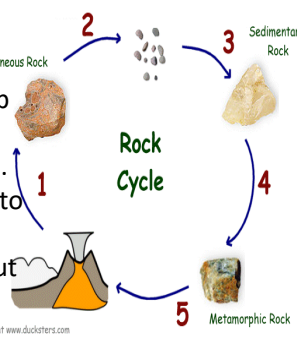
## Keywords:

- Rock cycle**- The cycle of how rocks change in the Earth's crust.
- Pangaea**: Name for when all the Earth's land formed one 'supercontinent' 200 million years ago.
- Tectonic hazards** – e.g., earthquakes / volcanoes.
- Plate margin** – where two of the Earth's plates meet, tectonic hazards happen here.
- Destructive plate margin**- where the Earth's crust is destroyed.
- Constructive plate margin**- where new crust is created.
- Volcanic eruption** – hot magma erupts from the ground
- Short term responses** (immediate) – helping straight away.
- Long term responses** – later responses to help in the future.
- Super Volcanoes** - a volcanic eruption which releases more than 1,000 cubic kilometers of material

## The Rock Cycle

1. Magma erupts, cools and creates **igneous rock**.
2. **Weathering** (rain and cold temperatures break up rocks) / **erosion** (water from rivers and seas breaking up rocks) break the rock into tiny pieces.
3. The broken-down rocks are squashed into layers to make **sedimentary rocks**.
4. These rocks are buried deep in the ground and put under high pressure and heat to create **metamorphic rocks**.

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## Geological Time

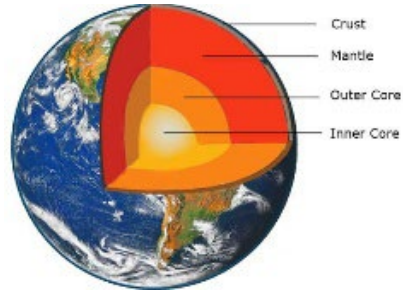
Earth was created 4.5 billion years ago.

Over the past 4.5 billion years, geologists (people who study the earth) have identified a series of time periods which describe and show a major event from that time.

**Period** – These are smaller periods of time (BUT they still show millions of years!)

**Era** – This groups together a set of periods of time. They usually end with a major event.

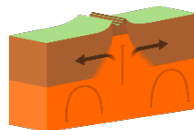
## Structure of the Earth and Convection Currents



Earth has four different layers:

- **Inner core- solid**
- **Outer core-liquid**
- **Mantle- hot liquid magma**
- **Crust- solid rock layer**

## Plate Margins



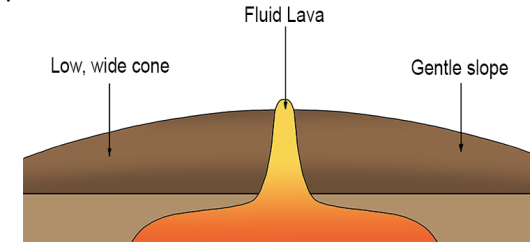
**Constructive margin** – two plates move apart and cracks form in the crust. Magma rises, erupts and cools which creates new land.



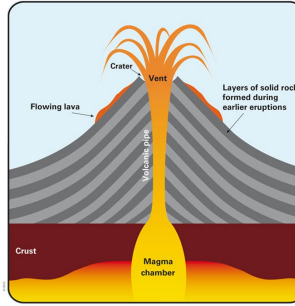
**Destructive margin** – oceanic and continental plates towards each other, the heavier oceanic plate sinks in the mantle. This movement creates earthquakes. Because of the heat in the mantle the crust melts to make magma which will erupt from a volcano.

## Types of Volcanoes

**Shield Volcano** – forms at a constructive plate margin. Low gentle rounded shape.



**Composite Volcano** – forms at a constructive plate margin. Cone shaped.



## HIC Volcanic Eruption - Iceland 2010

**Primary Effects** – Homes/roads were damaged, the ash cloud spread around Europe causing 100,000 flights to be cancelled.

**Secondary Effects** – flooding happened when a glacier melted, fresh fruit and vegetables were wasted as they could not be transported

**Short term response** – 700 locals evacuated, the Red Cross provided food to locals where their farms were destroyed

**Long term response** - rebuilt riverbanks even higher than before to reduce flooding, they have improved monitoring systems

## LIC Volcanic Eruption – Mt. Nyiragongo DRC 2002

**Primary Effects** – 250 people died, 450,000 people were displaced or evacuated

**Secondary Effects** – Several earthquakes took place in the days after the eruption. Between 3,000 to 8,000 people crossed the border to find safety in Rwanda.

**Short term response** – authorities built temporary shelters.

**Long term response** – communities and schools now have evacuation drills to prepare for future eruptions

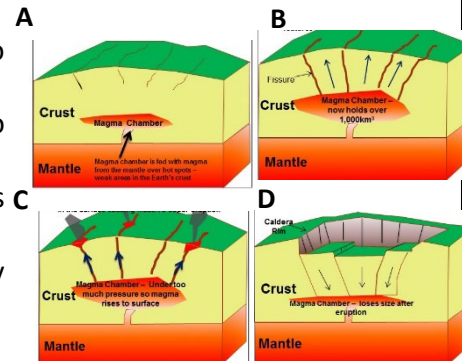
## Super Volcanoes

**A.** A magma chamber fills due to magma building from the hotspot.

**B.** The magma pushes up the land to create a dome.

**C.** Gas and ash erupt through cracks in the crust.

**D.** The land collapses into the empty magma chamber to create a caldera.



# Haka

## Key Vocabulary

Call and Response

Facial Expression

Formation

Strength

Unison

Culture

## Historical Context

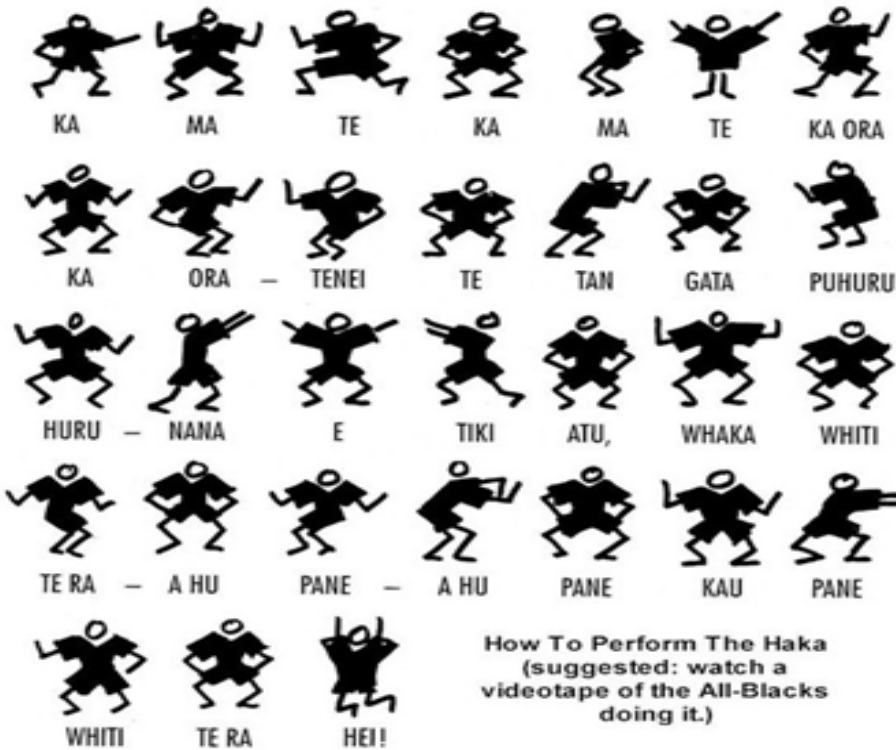
The haka is a traditional war cry, dance, or challenge from the Māori people of New Zealand. It is a posture dance performed by a group, with vigorous movements and stamping of the feet with rhythmically shouted accompaniment. The words of a haka often poetically describe ancestors and events in the tribe's history.

War haka were originally performed by warriors before a battle, proclaiming their strength and prowess in order to intimidate the opposition, but haka are also performed for various reasons: for welcoming distinguished guests, or to acknowledge great achievements, occasions or funerals.

The New Zealand sports teams' practice of performing a haka before their international matches has made the haka more widely known around the world. This tradition began with the 1888–89 New Zealand Native football team tour and has been carried on by the New Zealand rugby team since 1905.

Other countries have adopted their own version of the haka which they perform before matches. Can you find some of these?

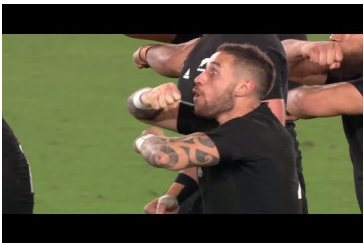
# Technical Skills



Actions include violent foot-stamping, tongue protrusions and rhythmic body slapping to accompany a loud chant.

A variety of shapes are used.

There are many videos of the Haka available to watch online



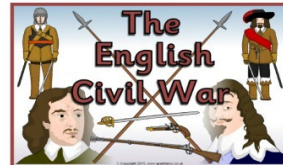
## Lesson Overview

- |   |                                   |
|---|-----------------------------------|
| 1. Key features of Cultural Dance and basic history | 2. Copy and repeat Haka 1         |
| 3. Copy and repeat Haka 2                           | 4. Create own version of the Haka |
| 5. Performance of the 3 dances for assessment       | 6. Evaluation of Performances     |



| <u>Key Vocabulary</u>        | <u>Definitions</u>  |
|------------------------------|---|
| <b>Monarch</b>               | The king or queen.  |
| <b>Treason</b>               | The crime of <b>betraying</b> one's king or country   |
| <b>Civil War</b>             | A war between groups of people in the <b>same country</b> .   |
| <b>Roundheads</b>            | <b>Parliamentarian</b> soldiers in the English Civil War. Led by <b>Oliver Cromwell</b> .           |
| <b>Cavaliers</b>             | <b>Royalist</b> soldiers in the English Civil War. Led by <b>Prince Rupert</b> .                    |
| <b>Divine Right of Kings</b> | The idea that a monarch has a <b>God-given right</b> to rule, and their power cannot be challenged. |
| <b>Parliament</b>            | The group of <b>lawmakers</b> in the <b>government</b> . Led by the Prime Minister.                 |
| <b>Republic</b>              | Country with no king or queen.  |
| <b>Puritan</b>               | A <b>very strict Protestant</b> who believes in purifying the Church of England.                    |
| <b>Interregnum</b>           | Where England was ruled without a King by Oliver Cromwell.  |
| <b>Tyranny</b>               | Cruel, harsh, unfair government by someone with unlimited power.                                    |

# Year 8: The English Civil War



## The Gunpowder Plot (5<sup>th</sup> Nov 1605)

Many English Catholics were upset when James I became King (1603) as he did nothing to help them worship more freely. A group of **12 Catholics**, led by **Robert Catesby**, plotted to **blow up the Houses of Parliament** & King James I. **36 barrels of gunpowder** were placed in the cellar beneath Parliament. **Guy Fawkes** was caught before he lit the fuse. The plotters were found guilty of **treason** & were **hung, drawn & quartered**.

## King Charles I (1625-49)

Charles upset Protestants by marrying **Henrietta Maria**, a French **Catholic**. His adviser **Archbishop William Laud** made changes to the Church, which Puritans believed seemed like a return to Catholic ways. Charles **quarrelled with Parliament** lots over **religion & money e.g. Ship Money Tax**, & ruled without parliament from 1629-40 (The '**11 Years Tyranny**' or '**Personal Rule**'). Charles believed strongly in the **divine right of kings**. In 1642, the struggle between king & Parliament led to **civil war**!



## The Commonwealth (1649-1660)

After Charles's execution England became a **republic**. Parliament ruled at first, but in 1653 **Oliver Cromwell** closed Parliament & ruled as **Lord Protector**. Under the **Protectorate** England was ran by **11 Major-Generals**. The **Puritans** became powerful. Churches had to be plain, & dancing, theatre, pubs, gambling, maypoles and even Christmas were banned.



## The English Civil Wars (1642-49)

**Roundheads vs. Cavaliers**. Most big towns, & the south-east, supported Parliament. Wales, the north & west of the country supported Charles. The war was very bloody, with around **250,000 deaths**.

### Key battles

1642: Battle of **Edgehill** (indecisive)

1644: Battle of **Marston Moor** (Parliament won)

1645: Battle of **Naseby** (Parliament won)

### Armies

•**Pikemen** carried long, wooden spears called pikes.

•**Musketeers** fired heavy guns called muskets.

•**The cavalry** were mounted on horses & had swords & pistols

•**Cromwell** set up the **New Model Army** in 1645. This was a well trained, **professional** army. It's Commander was **General Fairfax**.



## Execution of King Charles I (30<sup>th</sup> January 1649)

Charles was put on **trial for treason**. 59 judges, including Cromwell, signed his **death warrant**. He was executed in **Whitehall** as a '**Tyrant, Traitor, Murderer and public enemy**'.




## King Charles II (1660-1685)

He returned from Holland in 1660 to claim the throne in the **restoration of the monarchy**. He is known as the '**merry monarch**' as he spent most of his time enjoying himself!



## The Glorious Revolution - (1688)

This replaced the reigning king, James II, with the joint monarchy of his protestant daughter Mary and her Dutch husband, William of Orange. The event ultimately changed how England was governed, giving Parliament more power over the monarchy and planting seeds for the beginnings of a political democracy.

|         |                |           |          |              |        |                     |   |            |                               |          |                     |      |
|---------|----------------|-----------|----------|--------------|--------|---------------------|---|------------|-------------------------------|----------|---------------------|------|
| 1603    | 1605           | 1625      | 1642     | 1644         | 1645   | 1649                |   | 1660       | 1665-66                       | 1685     | 1689                | 1702 |
| James I | Gunpowder Plot | Charles I | Edgehill | Marston Moor | Naseby | Charles I execution |  | Charles II | Great Plague & Fire of London | James II | Glorious Revolution | Anne |

|  |  |   |  |
|--|--|---|--|
| <div> <div> Year 8 French Sentence Builder Sports, hobbies and frequency </div> </div> | Je joue [I play]<br>il joue [he plays]<br>Elle joue [she plays]<br>Nous jouons [we play] | souvent<br>[often]<br>tout le temps<br>[all the time]<br>rarement<br>[rarely]<br>tousjours<br>[always]<br>tous les jours<br>[every day]<br>régulièrement<br>[regularly]<br>de temps en temps<br>[from time to time] | au basket<br>[basketball]<br>au foot<br>[football]<br>au rugby<br>[rugby]<br>au tennis de table<br>[table tennis]<br>aux jeux vidéo<br>[video games] |
|  | Je fais [I do]<br>il fait [he does]<br>Elle fait [she does]<br>Nous faisons [we do]      | du patin à glace<br>[ice skating]<br>du vélo<br>[cycling]<br>de l'équitation<br>[horse riding]<br>de la musculation<br>[weightlifting]<br>de la natation<br>[swimming]<br>des promenades<br>[walking]               |  |

|  |   |  |  |
|--|---|--|--|
| <div> <div> Year 8 French Sentence Builder Sports, hobbies and verb + infinitive </div> </div> | j'adore<br>[I love]<br>j'aime beaucoup<br>[I like ... a lot]<br>je n'aime pas<br>[I don't like]<br>je préfère<br>[I prefer]<br>je déteste<br>[I hate] | au basket<br>[basketball]<br>au foot<br>[football]<br>au rugby<br>[rugby]<br>aux jeux vidéo<br>[video games]                                       | au basket<br>[basketball]<br>au foot<br>[football]<br>au rugby<br>[rugby]<br>aux jeux vidéo<br>[video games]   |
|  | je vais<br>[I am going]<br>il va<br>[he is going]<br>elle va<br>[she is going]<br>nous allons<br>[we are going]                                       | jouer<br>[to play]<br><br>faire<br>[to do]<br>[to 'go']  | du vélo<br>[cycling]<br>de l'équitation<br>[horse riding]<br>de la musculation<br>[weightlifting]<br>de la natation<br>[swimming]<br>des promenades<br>[walking] |
|  |   | écouter de la musique [to listen to music]<br>regarder un film [to watch a film]<br>lire un livre [to read]<br>promener le chien [to walk the dog] |  |



|   |                              |                                |  |               |   |                                     |  |
|---|------------------------------|--------------------------------|--|---------------|---|-------------------------------------|--|
| L'an dernier<br>[last year]<br><br>L'été dernier<br>[last summer] | je suis allé<br>[I went]     | en France<br>[to France]       | avec ma famille<br>[with my family]<br><br>avec mes parents<br>[with my parents]<br><br>avec mes amis<br>[with my friends] | où<br>[where] | Year 8 Sentence Builder<br>Past holidays: countries and accommodation |                                     |  |
|   |                              | en Italie<br>[to Italy]        |  |               | je suis resté<br>[I stayed]   | dans une caravane<br>[in a caravan] |  |
|   |                              | en Écosse<br>[to Scotland]     |  |               |   | dans une tente<br>[in a tent]       |  |
|   |                              | en Espagne<br>[to Spain]       |  |               |   |                                     |  |
|   |                              | en Turquie<br>[to Turkey]      |  |               |   |                                     |  |
|   | elle est allée<br>[she went] | en Allemagne<br>[to Germany]   |  |               |   | elle est restée<br>[she stayed]     |  |
|   | il est allé<br>[he went]     | nous sommes allés<br>[we went] |  |               | au Portugal<br>[to Portugal]  | il est resté<br>[he stayed]         |  |
|   |                              |                                |  |               | au pays de Galles<br>[to Wales]                                       | nous sommes restés<br>[we stayed]   |  |
|   |                              |                                |  |               | au Mexique<br>[to Mexico]   | dans un hôtel<br>[in a hotel]       |  |
|   |                              |                                |  |               | aux États-Unis<br>[to the USA]  | dans un gîte<br>[in a cottage]      |  |

Year 8 Sentence Builder

Past holidays: countries and accommodation

# Y9 Subject Knowledge Organiser

## Football – Rules, Player Positions, Pitch Dimensions & Skills

### Rules

- ☐ A senior football match consists of two 45-minute halves and must have a 15-minute break in the middle.
- ☐ A team can start with a maximum of 11 players, of which one is the designated goalkeeper.
- ☐ To continue a match, a team must have a minimum of 7 players on the field.
- ☐ A team is able to make substitutions at any time of the match and are able to make a maximum of three changes.
- ☐ A competitive game must be officiated by a referee and two assistant referees, also known as linesmen.
- ☐ The whole ball must cross the goal line for it to constitute a goal.
- ☐ A referee may award a foul if they believe an unfair act is committed by a player. A foul contravenes the laws of the game and can be given for a range of offences (for example, kicking the player, pushing, handball etc).
- ☐ Fouls are punished by the award of a free kick (direct or indirect, depending on the offence) or penalty kick to the opposing team if it is committed in the penalty box.
- ☐ In cases of foul play, a referee can penalise players with either a yellow or red card. A yellow card gives a player a warning about their conduct and a red card requires them to leave the pitch.
- ☐ In the event that a player receives two yellow cards, the referee will automatically show a red card.
- ☐ A throw-in is awarded to a team if the opposition kicks the ball over the side-lines.
- ☐ A corner kick is awarded to a team if the opposition kicks the ball over the goal line and either side of the goal posts.
- ☐ A player is deemed offside if they are in front of the last defender when a teammate passes the ball through to them.

### Control

Good control of the football is an essential skill to maintain possession of the ball from the opposition and, if done accurately, gives the player more time to make the correct next decision.

- ☐ Keep your eye on the ball at all times.
- ☐ On contact with the ball, withdraw the foot slightly to take the momentum out of the ball (this is known as "cushioning").
- ☐ Aim to contact the middle of the ball to ensure that it stays close to the ground and does not bounce up.
- ☐ Once under control, move the ball out of your feet to allow the next decision to be made.

### Block tackle

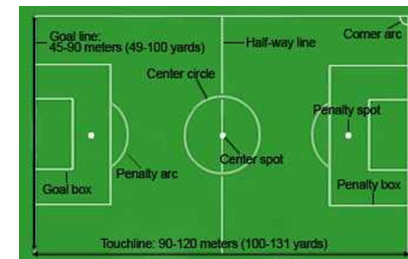
The block tackle is an essential skill for winning the ball back in football. It is mainly used when confronting an opponent head on and it is important to complete it with good timing and technique to prevent injury or fouls.

- ☐ Close down your opponent quickly but do not rush uncontrolled at them.
- ☐ Try to reduce any space around you and monitor for passing options.
- ☐ Stay on the balls of your feet, arms slightly out to jockey your opponent.
- ☐ Keep your eye on the ball and wait for a clear view of the ball.
- ☐ When you can see most of the ball, transfer your weight from your back to front foot and move the inside of your foot towards the ball.
- ☐ Maintain a strong body position.

### Player Positions



### Pitch Dimensions



### Throw-in

The throw-in is the legal way to restart the game if the ball has gone out of play from either of the side-lines.

- ☐ Hold the ball with both hands and ensure that the thumbs are behind the ball and fingers are spread.
- ☐ Hold the ball behind the head with relaxed arms and elbows bent.
- ☐ Keep your feet shoulder-width apart.
- ☐ Face your target.
- ☐ Lean back with both feet in contact with the ground.
- ☐ Slightly bend your knees and arch your head, neck, shoulders and trunk.
- ☐ When ready, propel yourself forward and release the ball just as it passes your head.
- ☐ Once the ball is released, bring your strongest leg forward and out in front of you for balance.

### Long pass

A long pass is an attacking skill that allows players to switch the direction of the attack very quickly to create space, find a teammate or to catch out the opposition.

- ☐ Move parallel to the ball and place your non-kicking foot to the side of the ball.
- ☐ Keep your eye on the ball until you have it under your control.
- ☐ Look up to see where is the best place to pass the ball.
- ☐ On selection of your pass, maintain a strong body position.
- ☐ Explosively bring your kicking foot through and strike the ball with laces of your football boot.
- ☐ Aim to hit the middle of the ball to ensure it stays close to the ground or the lower half of the ball if you want to lift it over opposition players.
- ☐ Keep looking at your target.
- ☐ Follow your kicking leg through towards the intended target and your body over the ball.
- ☐ The speed of the kicking leg will direct how hard you kick the ball.



# Y9 Subject Knowledge Organiser

## Netball – Rules, Officials, Scoring, Player Positions

### Rules

- ❑ Players are not allowed to travel with the ball.
- ❑ A team can have up to 12 players but only seven are allowed to play on court.
- ❑ Defending players are unable to snatch or hit the ball out of another player's hands.
- ❑ A defending player is only allowed to stand beside the player with the ball until it has left their hands.
- ❑ A defending player must stand three feet away from the person with the ball.
- ❑ An attacking player is unable to hold the ball for more than three seconds.
- ❑ Players must remain within their designated zones.
- ❑ The team retaining possession after the ball goes out of play have three seconds at the side-line to get the ball back into play.

### Officials

During a competitive game of netball there are two umpires and up to two scorekeepers and timekeepers officiating.

A scoresheet is completed for each quarter as shown. This also determines which teams centre pass it is.

### NETBALL SCORESHEET



GRADE: \_\_\_\_\_ DATE: \_\_\_\_\_

UMPIRES: \_\_\_\_\_

HOME TEAM: \_\_\_\_\_ VISITING TEAM: \_\_\_\_\_

HOME TEAM SCORE: \_\_\_\_\_ VISITING TEAM SCORE: \_\_\_\_\_

First Quarter

|    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |

Second Quarter

|    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |

Third Quarter

|    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |

Fourth Quarter

|    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |

### Player Positions



- GS → Goal shooter
- GA → Goal attack
- WA → Wing attack
- C → Centre
- WD → Wing defence
- GD → Goal defence
- GK → Goal keeper

### Scoring

In a game of netball there are two clear ways to score points:

1. In open play, if a shot is successfully scored from inside the goal circle, the team gains one point.
2. If the team is awarded an obstruction or contact penalty then they will receive a penalty shot at the net. A successful shot will be awarded with one point.

### Netball Shooting

1. Stand in a balanced position facing the goal
2. Ball held high above head (away from defenders arms)
3. Ball sits on one hand (fingers) with other hand supporting
4. Bend your knees and elbows keeping your hands high and focus on the goal. Keep your shoulder still
5. Extend knees and elbows and flick the ball off your fingers - push the ball high to allow it to fall into the net
6. End the shot with arms high and hands following the ball



### Team Information

**Goal Shooter (GS)**-To score goals and to work in and around the circle with the GA.

**Goal Attack (GA)**-To feed and work with GS and to score goals.

**Wing Attack (WA)**-To feed the circle players giving them shooting opportunities.

**Centre (C)** - To take the centre pass and to link the defence and the attack.

**Wing Defence (WD)**-To look for interceptions and prevent the WA from feeding the ball to the GS and GA.

**Goal Defence (GD)**-To win the ball and stop the GA from scoring.

**Goal Keeper (GK)**-To work with the GD and to prevent the GA/GS from scoring.

### Key Vocabulary

**Passing**- sending the ball

**Receiving**- catching the ball

**Footwork**- how you land when in control of the ball (see footwork rule)

**Dodging**- a way to change direction quickly

**Defending**- preventing the other team from gaining possession of the ball and scoring

**Attacking**- making an attempt to score

**Marking**- a way to prevent your opponent from receiving or passing the ball or shooting

**Shoot**- attempt to score a goal

**Offside**- Moving into an area where you're not permitted (see offside rule)

**Interception**- preventing a pass between players

**Throw in**- a free pass taken off court

**Centre Pass**- taken to start or restart the game

**Free Pass**- awarded when there is an infringement of the rules by a player

**Penalty Pass**- as above, when two players are involved

**Goal Third & Centre Third**- areas of the court

# Y9 Subject Knowledge Organiser

## Basketball – Rules, Scoring, Officials, Court Dimensions & Player Positions

### Rules

- ☐ A basketball team can have a maximum of five players on the court.
- ☐ Player substitutions can be made at any time and there is no restriction on the number of substitutions made.
- ☐ A ball can travel through dribbling or passing.
- ☐ A player is no longer able to dribble with the ball once the player puts two hands on the ball. At this point, a player must either pass or shoot.
- ☐ If a team wins possession back in their own half, they have ten seconds to get it into their opponent's end or a foul will be called.
- ☐ An attacking team has 24 seconds from gaining possession of the ball to shoot
- ☐ After the shot is taken, the clock is restarted for another 24 seconds.
- ☐ After a team scores a basket, the ball is returned back to the opposition to start again.
- ☐ All fouls that are committed throughout a game are to be accumulated and when a certain number is reached, the umpire will award a free throw.
- ☐ Depending on where a technical foul is committed, the umpire may award a number of free throws a player will receive.
- ☐ Violations can be awarded by the officials in basketball for player handling errors. These include travelling, double dribble, goal-tending and back court violation.

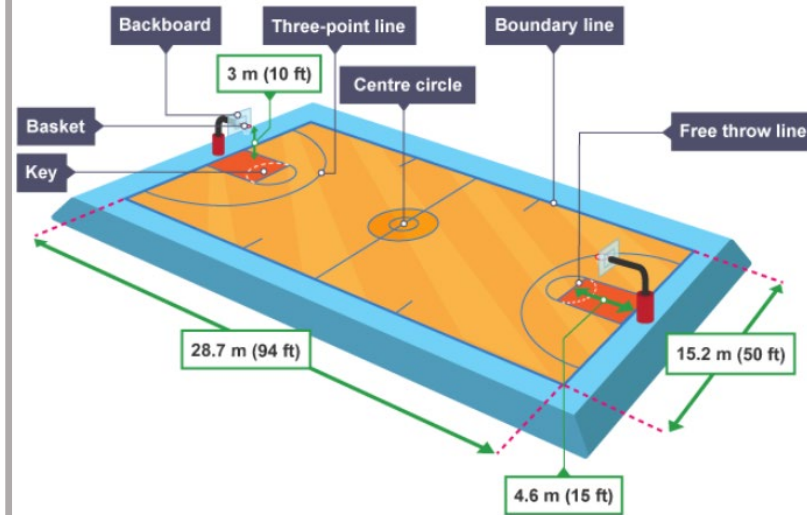
### Scoring

In a game of basketball there are three clear ways to score points. If a shot is successfully scored from outside of the three-point line, three points are awarded. If a shot is successfully scored from inside of the three-point line, two points are awarded. If a team is awarded a technical foul then they will receive between one and three free shots. Each shot scored will be awarded with one point.

### Officials

During a competitive game of basketball there are two referees, a scorekeeper, timekeeper and a shot clock operator. To ensure that everybody is aware of a decision made, the referees perform a series of hand and arm signals.

### Court Dimensions



### Player Positions





# Y9 Subject Knowledge Organiser

## Table Tennis – Rules, Scoring, Officials & Table Dimensions

### Rules

- ❑ To start a point, the server must stand at the back of the table and can serve either forehand or backhand. The ball must be thrown up either equal to or above the height of the net before striking the ball and the ball must be thrown from an open palm to stop finger spin.
- ❑ If the ball hits the net on a serve but continues over the other side then a 'let' is played.
- ❑ Players are allowed to hit the ball around the side of the net.
- ❑ The ball must bounce on a player's side of the table before playing their shot.
- ❑ During play, competitors are not allowed to touch the table with their non-bat hand. If they do, the point is conceded.
- ❑ Players must swap ends at the end of a game, and in the final match players will switch ends after five points.

### Scoring

A competitive game of table tennis is played to the best of five or seven games. The first player to get to 11 points in a game is the winner. However, if a game is tied at 10-10, a player must win a game by two clear points. You do not lose service if you lose a point - each player must serve for two points in a row before handing the service over to their opponent.

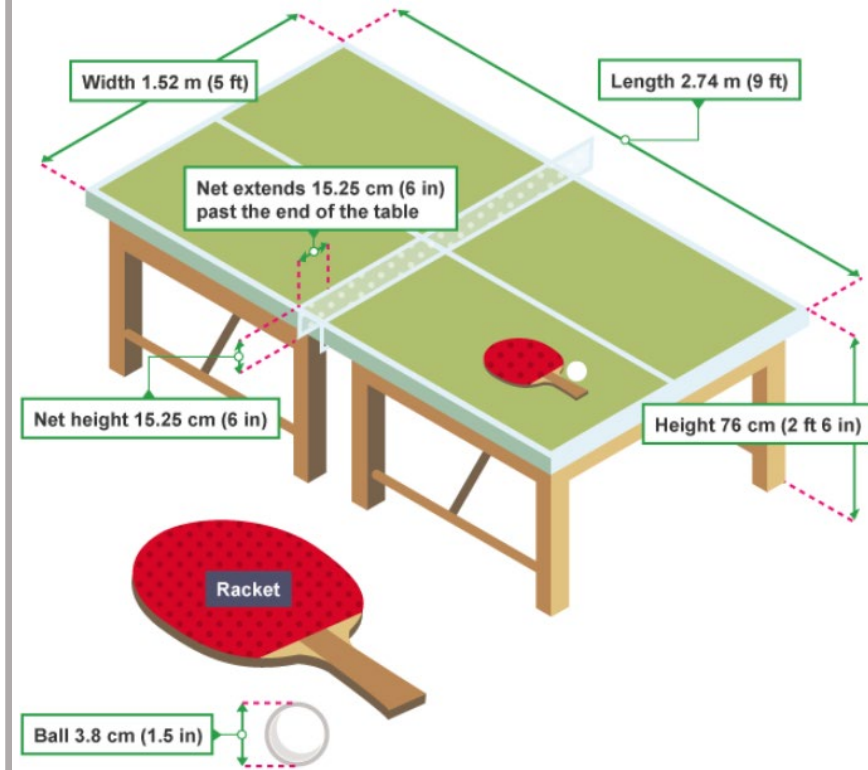
### Officials

For every table tennis competition, a referee is appointed with a deputy who can act on their behalf. The referee is required to be present at the venue throughout a tournament and is required to uphold the rules. During a table tennis match, an umpire is appointed to decide on the result of each point or rally. The umpire is required to use their judgement when applying the laws and regulations of the ITTF. Where the umpire is officiating alone, their decision is final and they should be seated about 2–3 metres from the side of the table and in line with the net.

### Table Dimensions

A competitive table tennis table should measure 2.74 m (9 ft) long, 1.525 m (5 ft) wide and be 76 cm (2 ft 6 in) high. The surface of a table tennis table must be the same dark colour across the court and be of a matt appearance.

The net is 15.25 cm (6 in) high and extends 15.25 cm (6 in) past the end of the table. A competitive table tennis ball should bounce 23 cm high when dropped from a height of 30 cm. In all competitions, the playing area for a full size table should be 8 m long by 4 m wide. This is essential to safely allow the players to chase around the table after well-placed shots.



# Y9 Subject Knowledge Organiser

## Trampolining

### Trampolining Skills Checklist

These are the skills you will develop in your lessons, working towards the more advanced skills.

| Basic Jumps                                |  | Basic landings and combinations                   |  | Basic Twists                             |  |
|--|--|---|--|--|--|
| Checking/stopping                          |  | Seat drop   |  | Seat drop, half twist to feet            |  |
| Good controlled straight bouncing          |  | Front drop  |  | Half twist to seat drop                  |  |
| Tuck jump                                  |  | Back drop   |  |  |  |
| Pike jump                                  |  | Seat drop to front drop                           |  |  |  |
| Straddle jump                              |  | Front drop to seat drop                           |  |  |  |
| Half twist jump                            |  | Seat drop half twist to seat drop - (swivel hips) |  |  |  |
| Advanced twists                            |  | Combinations (twisting and rotating)              |  | Basic somersaults                        |  |
| Cat twist                                  |  | Front drop, half twist to feet                    |  | Back drop to front drop                  |  |
| Back drop, ½ twist to back drop – (cradle) |  | Half twist to front drop                          |  | Hands and Knees forward turnover to back |  |
| Half turntable                             |  | Back drop, half twist to feet                     |  | Three quarter somersault to feet         |  |
| Full turntable                             |  | Half twist to back drop                           |  | Back pullover                            |  |
| One and a half twist jump                  |  |   |  | Front drop to back drop                  |  |
|  |  |   |  | Front/Back somersault to feet            |  |

### Scoring

A final trampoline mark is based on a difficulty and execution score.

A difficulty score begins at 0.0 and goes up continuously with every difficult skill performed.

An execution score is different and begins at a score of 10.0, and is then deducted by judges for errors in performance.

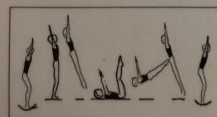
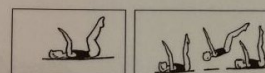
In a competition, a participant will receive five execution scores with the highest and lowest marks thrown out. The three middle scores are then added to the two judges' difficulty score and a total final mark is given.

|     |     |     |     |     |
|-----|-----|-----|-----|-----|
| 0.3 |     | 0.2 |     | 0.3 |
| 0.2 | 0.1 | 0.0 | 0.1 | 0.2 |
| 0.3 |     | 0.2 |     | 0.3 |

Points can be deducted for landing outside of the central area, as shown in the diagram.

### BACK LANDING

| PROGRESSIONS                                     | Achieved |
|--|----------|
| 1. Back bouncing.                                |          |
| 2. Seat to back landing                          |          |
| 3. Flat back landing position.                   |          |
| 4. Flat back (support and mat).                  |          |
| 5. Back landing position.                        |          |
| 6. Back landing push and go (mat and support).   |          |
| 7. Back landing push and go (no mat or support). |          |
| 8. Back landing return to feet.                  |          |
| 9. 3 low bounces arms up to back to feet.        |          |



#### TEACHING POINTS

- Take off for flat back and then pike into the landing.
- Vision – focus on the end frame on the ascent and roof on landing.
- To return to feet – kick upwards and forwards.

#### COMMON ERRORS AND CORRECTIONS

- Under rotation – push hips forward.
- Over rotation – lift upper body.
- Rise to feet – kick over bar.

### Example 10 bounce routine

1. Full twist
2. Straddle
3. Seat landing
4. ½ twist to seat
5. ½ twist to feet
6. Pike jump
7. Back landing
8. ½ twist to feet
9. Tuck jump
10. ½ twist

### MOST IMPORTANT COMPONENTS OF FITNESS

**Power** – to jump high.

**Balance** – to be able to keep your body positioned correctly.

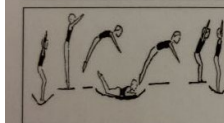
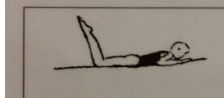
**Strength** – to hold your body weight or that of others.

**Flexibility** – to put your body into the correct position.

**Co-ordination** – to be able to complete skills at the correct time.

### FRONT LANDING

| PROGRESSIONS   | Achieved |
|--|----------|
| 1. Correct landing position on the bed.              |          |
| 2. Static hands and knees bouncing.                  |          |
| 3. Hands and knees to front with mat.                |          |
| 4. Hands and knees to front no mat.                  |          |
| 5. Hands and knees to front back to hands and knees. |          |
| 6. Crouching to front with mat.                      |          |
| 7. Crouching to front without mat.                   |          |
| 8. Crouching to front to feet.                       |          |
| 9. Standing front to feet with mat.                  |          |
| 10. Standing front to feet without mat.              |          |



#### TEACHING POINTS

- Push feet back so centre of mass remains over cross.
- Vision – focus on end bed.
- Land with whole forearm in contact with the bed.
- Arms, stomach and thighs land at the same time.
- Push with hands to return to feet.

#### COMMON ERRORS AND CORRECTIONS

- Landing knees first – Insufficient forward rotation so need to push feet and hips back more.
- Diving forwards (chest first) – over rotation so must lift upper body.
- Travel – keep tummy on cross.
- Twisted body – look at end bed on take off.



# Y8 Art: STILL LIFE

## Key Figures

|   |  |
|---|--|
| <b>Paul Cezanne</b><br> | Paul Cézanne (1839-1906) was a French artist and Post-Impressionist painter. He was one of the most influential artists in the history of modern painting and has inspired generations of artists.                     |
| <b>Kate Malone</b><br>  | Kate Olivia Malone MBE (1959 - ) is a British ceramic artist known for her large sculptural vessels and rich, bright glazes. Malone is a judge, along with Keith Brymer Jones, on BBC2's The Great Pottery Throw Down. |
| <b>Still Life</b><br>   | A still life is a work of art depicting mostly inanimate subject matter, typically commonplace objects which are either natural or human-made.   |
| <b>Ceramics</b><br>    | Ceramic art is art made from ceramic materials, including clay. It may take varied forms, including artistic pottery, including tableware, tiles, figurines and other sculpture.                                       |

## Key Terms

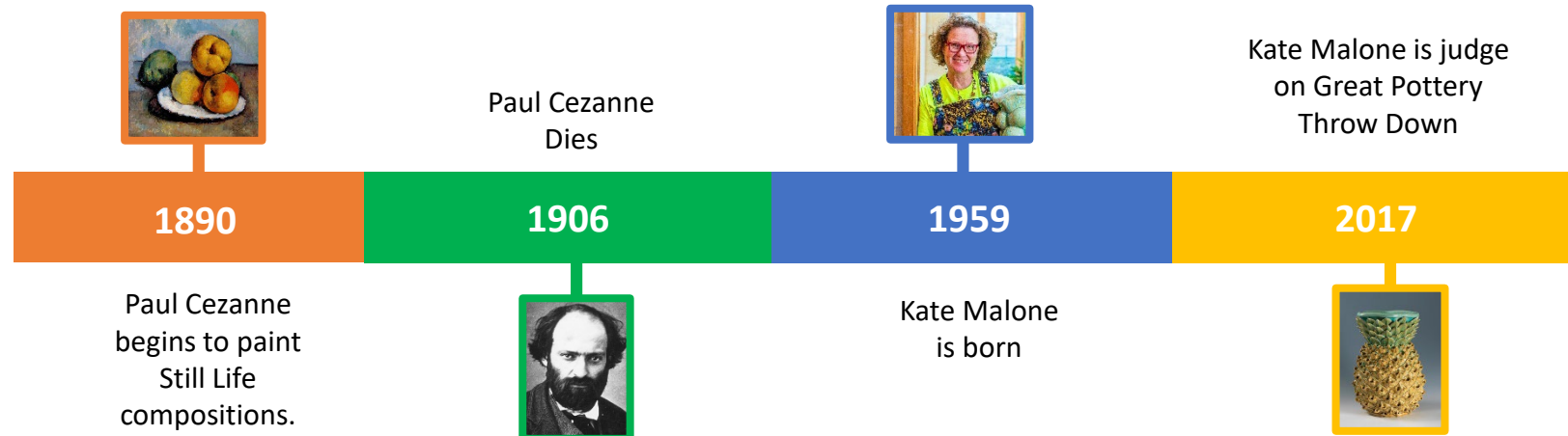
|                   |  |
|-------------------|--|
| Background        | The part of a picture, scene, or design that forms a setting for the main figures or objects, or appears furthest from the viewer.         |
| Ceramic           | The art or technology of making objects of clay and similar materials treated by firing.   |
| Colour            | What the eye sees when light is separated.   |
| Complementary     | Complementary colours are opposite each other in the colour wheel.   |
| Composition       | Composition is the way in which different elements of an artwork are combined or arranged.   |
| Foreground        | The part of a view that is nearest to the observer, especially in a picture or photograph.   |
| Form              | An element in art where an object appears to have three-dimensions.  |
| Hyperrealism      | Hyperrealism is a genre of painting and sculpture resembling a high-resolution photograph.   |
| Line              | A line is a mark made in art. A line has a width and a length. A line can be straight, curved, continuous, dashed or broken.               |
| Primary Colour    | Primary colours are Red, Yellow and Blue. Primary colours cannot be created by mixing other colours together.                              |
| Proportion        | Proportion is a principle of art that describes the size, location or amount of one element to another (or to the whole) in a work.        |
| Ratio             | The relationship between the size, number, or amount of two or more things.  |
| Score             | Process used to roughen up clay surfaces before attaching together,  |
| Slip              | Clay mixed with water. Acts as a glue when attaching two pieces of clay together.  |
| Secondary Colour  | Secondary colours are Orange, Purple and Green. A secondary colour is made by mixing two primary colours together.                         |
| Shade             | A shade is the mixture of a colour with black, which reduces lightness.  |
| Still Life        | The term "still life" describes a work of art that shows inanimate objects from the natural or man-made world, such as fruit, flowers etc. |
| Tertiary Colour   | A tertiary colour is made by mixing a primary colour together with a secondary colour.   |
| Three-Dimensional | A three-dimensional picture, image, or film looks as though it is deep or solid rather than flat.  |
| Tone              | A tone is produced either by the mixture of a colour with gray, or by both tinting and shading.  |



SMSC Creative thinkers, Cultural, Reflective learners

## Timeline

Knowledge links:  
History  
Maths  
English



Types of job:

We all have dreams and goals of the kinds of career we'd like to have.

- There are many things that can influence the careers available for us to follow:
- These can include INTERNAL FACTORS, like our qualifications, abilities and talents.
- They can also include EXTERNAL FACTORS like the economy, the jobs available, and the area in which you want to live and work.

It's important to think about the kind of job you would like to do and the career you'd like to have. This will help you decide which subjects you'd like to study at school and beyond!

Applying for jobs:

You need to show why you're interested in the role and demonstrate your skills, work experience and knowledge.

For example if you were applying for a teacher role:

I want to apply for this role as I would love to make a difference to the lives of students. I believe I am a caring individual who would help and support students.  
I worked part-time at Greggs. Whilst working here I gained many skills such as good communication and patience. I had to speak to customers, deal with complaints and ensure all customers were pleased with the service and food.

Skills and qualities:

There are two key things which will help you get a job:

- Your skills.
- Your qualities.

Skills – having learnt knowledge, abilities or attitudes that will help you be successful in a particular job role.  
*For example, a teacher might need knowledge of their subject, the ability to plan lessons and mark books and the attitude of being determined not to give up on the young people they're teaching.*

Qualities – personality traits and things about you. *For example, being trustworthy, hard working and working well with others are traits that will benefit you in any job!*

KEY WORDS:

|            |  |
|------------|--|
| Career     | The jobs you work in over the course of your life.                                 |
| Employment | Being paid by someone to do work for them, or running a business of your own.      |
| Skills     | Things you have learnt which help you do a job well.                               |
| Qualities  | Aspects of your personality and who you are.                                       |
| Employer   | Someone who hires other people to work for them.                                   |
| Employee   | Someone who earns their money by working for another person.                       |
| Interview  | A meeting between you and an employer to find out if you are suitable for the job. |
| Savings    | A portion of your earnings that you set aside.                                     |
| Mortgage   | A loan used to buy a house.  |
| Pension    | The money you'll use to live on when you retire.                                   |

Changes to work:

Over the next few decades there will be many changes to the kind of jobs which are available. This is due to:

Technological changes e.g. internet, social media, email  
Gender roles breaking down – women workforce  
Less offices – working from home, remote learning  
New skills needed – resilience, problem solving, communication  
Alternative working patterns – part time, flexitime

Interviews:

An interview is a meeting between you and an employer (person who can give other people jobs) to find out whether you are suitable for that job.  
Employers interview potential employees because they want to get a sense of someone's personality and how they will interest with other people face-to-face, as well as to ask them any questions they may have.

In an interview, you should:

- Be confident, focus on the positives about yourself and your experiences, be polite and respectful, tell the truth and dress smartly

In an interview you should not:

- Be rude or arrogant, dress casually, be on your phone, fidget or be late.

Why is saving important?

- It gives you a better future
- It gives you financial security
- You avoid debt

Wages and salaries :

are two different ways of paying workers to carry out a job. In general, wages refer to hourly pay and salaries refer to annual pay. Wages are paid based on the amount of hours worked and then multiplied by an hourly rate of pay. Salaries are based on an annual amount that is then paid monthly. Most workers are also entitled to holiday pay

# Isometric Drawing

## Internal Line

Makes product look hollow

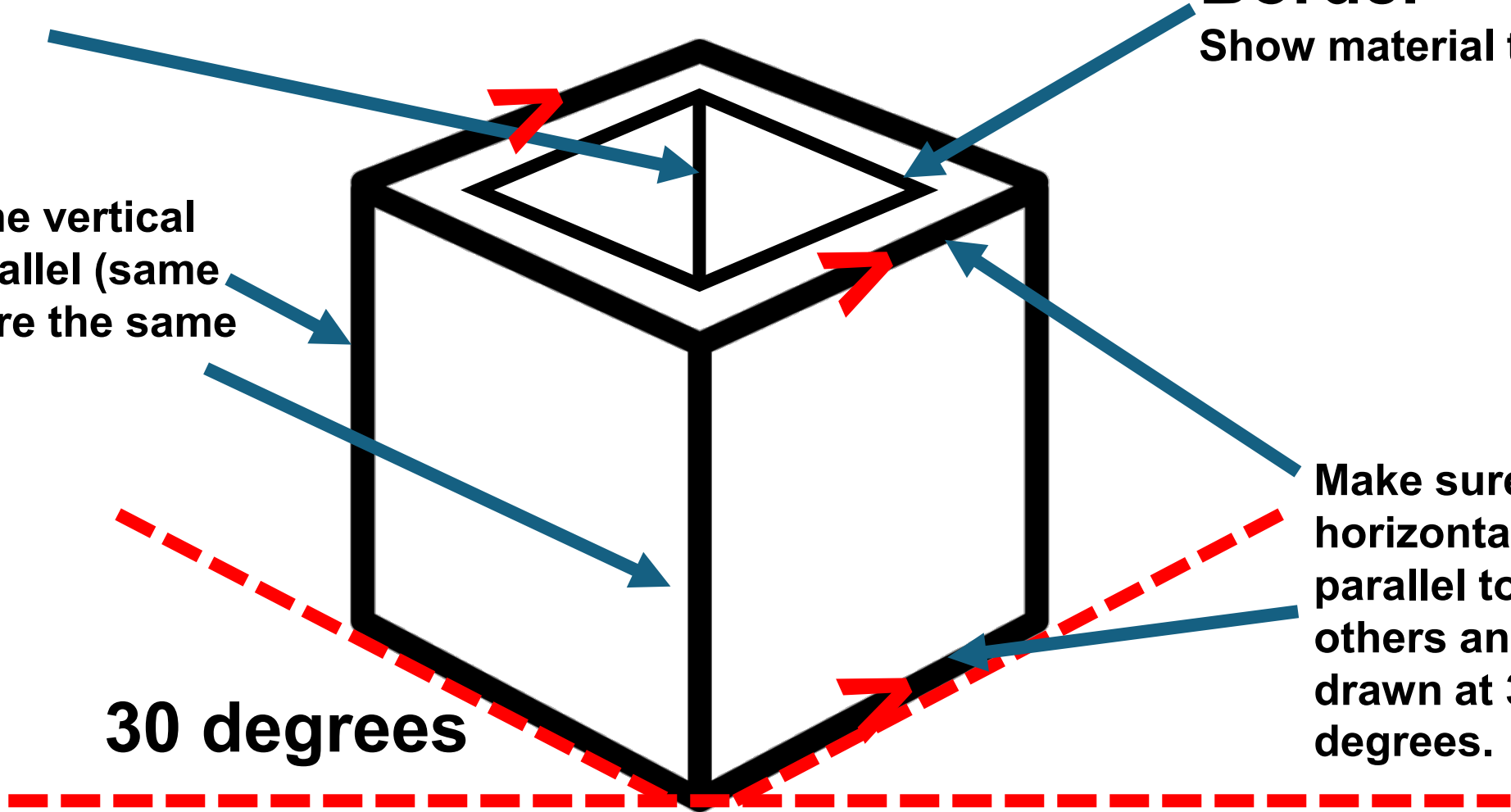
## Border

Show material thickness

Make sure the vertical lines are parallel (same angle) and are the same length.

Make sure horizontal lines are parallel to the others and are drawn at 30 degrees.

30 degrees





# ACCESSFM

## Labels and Annotations

- Labels = facts
- Annotations = explanations

We use **ACCESS FM** to help us write a **specification** - a list of requirements for a design - and to help us **analyse and describe** an already existing product.

## ACCESS FM - Helpsheet

|          |        |                    |
|----------|--------|--------------------|
| <b>A</b> | is for | <b>Aesthetics</b>  |
| <b>C</b> | is for | <b>Cost</b>        |
| <b>C</b> | is for | <b>Customer</b>    |
| <b>E</b> | is for | <b>Environment</b> |
| <b>S</b> | is for | <b>Size</b>        |
| <b>S</b> | is for | <b>Safety</b>      |
| <b>F</b> | is for | <b>Function</b>    |
| <b>M</b> | is for | <b>Material</b>    |



**Aesthetics** means **what does the product look like?**  
What is the: Colour? Shape? Texture? Pattern? Appearance? Feel? Weight? Style?



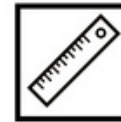
**Cost** means **how much does the product cost to buy?**  
How much does it: Cost to buy? Cost to make?  
How much do the different materials cost? Is it good value?



**Customer** means **who will buy or use your product?**  
Who will buy your product? Who will use your product?  
What is their: Age? Gender?  
What are their: Likes? Dislikes? Needs? Preferences?



**Environment** means **will the product affect the environment?**  
Is the product: Recyclable? Reuseable? Repairable? Sustainable?  
Environmentally friendly? Bad for the environment?  
**6R's of Design:** Recycle / Reuse / Repair / Rethink / Reduce / Refuse



**Size** means **how big or small is the product?**  
What is the size of the product in millimeters (mm)? Is this the same size as similar products? Is it comfortable to use? Does it fit?  
Would it be improved if it was bigger or smaller?



**Safety** means **how safe is the product when it is used?**  
Will it be safe for the customer to use? Could they hurt themselves?  
What's the correct and safest way to use the product? What are the risks?



**Function** means **how does the product work?**  
What is the products job and role? What is it needed for? How well does it work? How could it be improved? Why is it used this way?

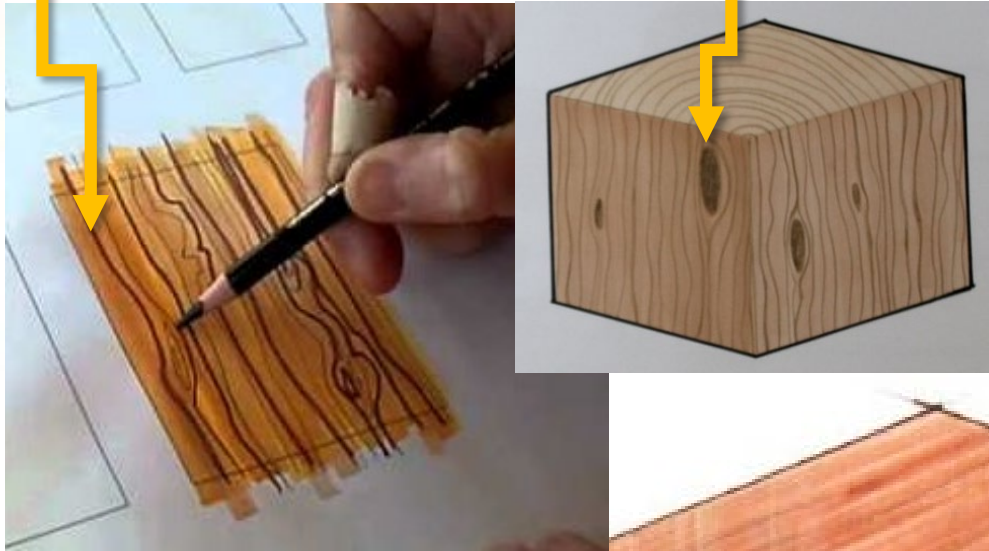


**Material** means **what is the product made out of?**  
What materials is the product made from? Why were these materials used? Would a different material be better? How was the product made? What manufacturing techniques were used?

# Rendering Wood

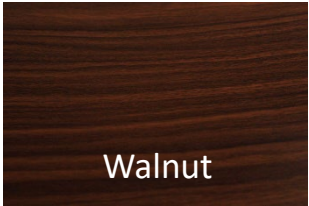
## Useful tips

1. Shade background lightly and evenly using yellow, orange and light brown
2. Use a darker brown to add the pattern of the wood
3. Use slightly wavy lines to add texture
4. Add occasional knot patterns – darker ovals



## Learning Objectives

- Students to **define** 'rendering' and 'texture'
- Students to **describe** and **compare** textures of different materials
- Students to successfully **render** different materials to a **high standard**



| Keywords  |  |
|-----------|--|
| Lesson    |  |
| Rendered  | Adding colour, shade and texture to drawings to make them more realistic |
| Texture   | The feel, appearance or consistency of a surface                         |
| Highlight | Light area   |
| Contrast  | Difference between light and dark  |
|           |  |
| Material  | Wood   |
| Grain     | Pattern of wood  |
| Knot      | Dark circle in wood.   |
| Varnished | Shine added to wood  |



## Information Station

## Must

- Pencil must be sharp
- Shade with the side so that shading is even
- Hold the pencil near the end so not to press so hard
- Use the tip of the pencil to shade near the edges and to add detail



# Rendering Metal

## Useful tips

1. Shade background lightly and evenly using a pencil
2. Slightly darken the outside edges
3. Add highlights using the corner of a rubber
4. Add some light streaks using the tip of a pencil at an angle

## Learning Objectives

- Students to **define** 'rendering' and 'texture'
- Students to **describe** and **compare** textures of different materials
- Students to successfully **render** different materials to a **high standard**



| Keywords  |  |
|-----------|--|
| Lesson    |  |
| Rendered  | Adding colour, shade and texture to drawings to make them more realistic |
| Texture   | The feel, appearance or consistency of a surface                         |
| Highlight | Light area   |
| Contrast  | Difference between light and dark  |
|           |  |
| Material  | Metal  |
| Lustre    | Shine  |
| Dull      | Lacks shine  |
| Oxidised  | Rusty  |

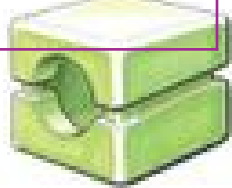
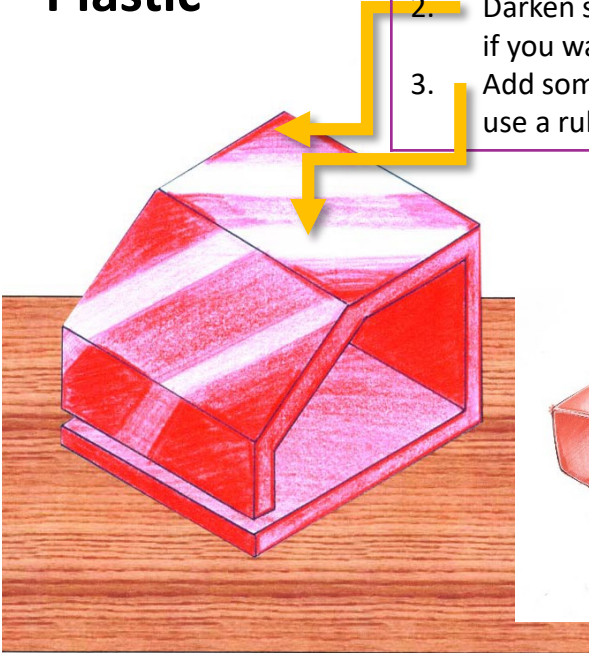
| Must  |  |
|---|--|
| <ul style="list-style-type: none"><li>• Pencil must be sharp</li><li>• Shade with the side so that shading is even</li><li>• Hold the pencil near the end so not to press so hard</li><li>• Use the tip of the pencil to shade near the edges and to add detail</li></ul> |  |



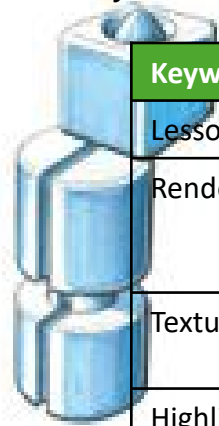
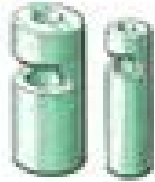
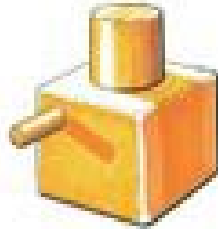
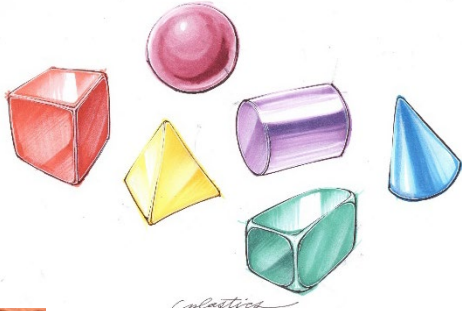
# Rendering Plastic

## Useful tips

1. Shade background lightly and evenly
2. Darken some areas using straight lines. You can use a ruler if you want.
3. Add some highlights using the corner of a rubber. You can use a ruler if you want.



Nylon plastic



Acrylic plastic

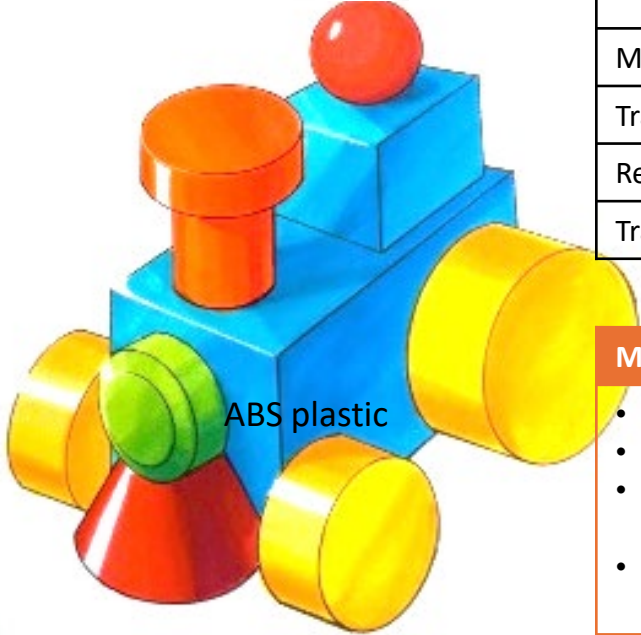


## Information Station

## Learning Objectives

- Students to **define** 'rendering' and 'texture'
- Students to **describe** and **compare** textures of different materials
- Students to successfully **render** different materials to a **high standard**

| Keywords    |  |
|-------------|--|
| Lesson      |  |
| Rendered    | Adding colour, shade and texture to drawings to make them more realistic |
| Texture     | The feel, appearance or consistency of a surface                         |
| Highlight   | Light area   |
| Contrast    | Difference between light and dark  |
|             |  |
| Material    | Plastic  |
| Translucent | Nearly see though  |
| Reflective  | Light bounces from material  |
| Transparent | See through  |



ABS plastic

Must

- Pencil must be sharp
- Shade with the side so that shading is even
- Hold the pencil near the end so not to press so hard
- Use the tip of the pencil to shade near the edges and to add detail



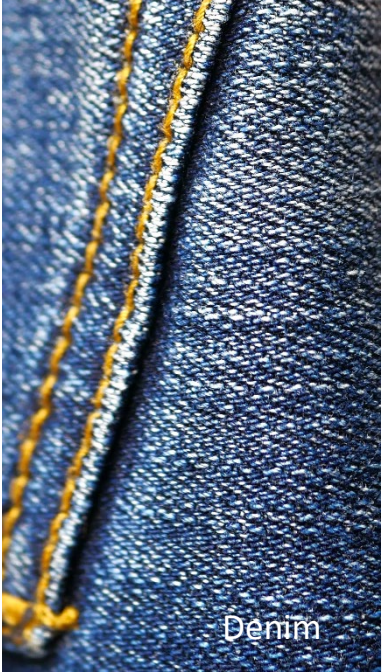
# Rendering Fabric

## Useful tips

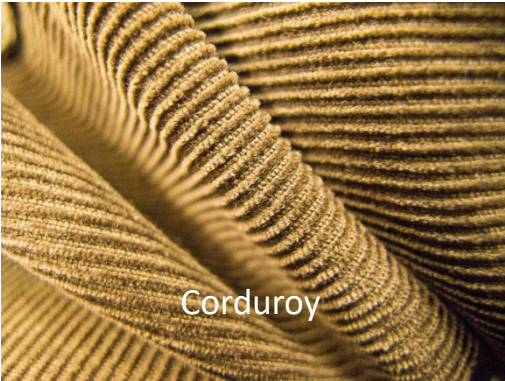
1. Shade background lightly and evenly
2. Sharpen coloured pencil
3. Use the tip to add repeated marks
4. Change the darkness of your lines by pressing harder or softer
5. Use thick and thin lines

## Learning Objectives

- Students to **define** 'rendering' and 'texture'
- Students to **describe** and **compare** textures of different materials
- Students to successfully **render** different materials to a **high standard**



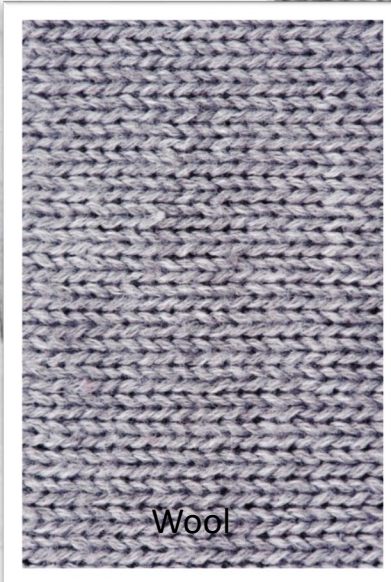
Denim



Corduroy



Hessian



Wool



| Keywords  |  |
|-----------|--|
| Lesson    |  |
| Rendered  | Adding colour, shade and texture to drawings to make them more realistic |
| Texture   | The feel, appearance or consistency of a surface                         |
| Highlight | Light area   |
| Contrast  | Difference between light and dark  |
|           |  |
| Material  | Fabric   |
| Weft      | Horizontal lines   |
| Warp      | Vertical lines   |
| Woven     | Fabric texture/pattern   |

## Must

- Pencil must be sharp
- Shade with the side so that shading is even
- Hold the pencil near the end so not to press so hard
- Use the tip of the pencil to shade near the edges and to add detail



# Rendering Glass

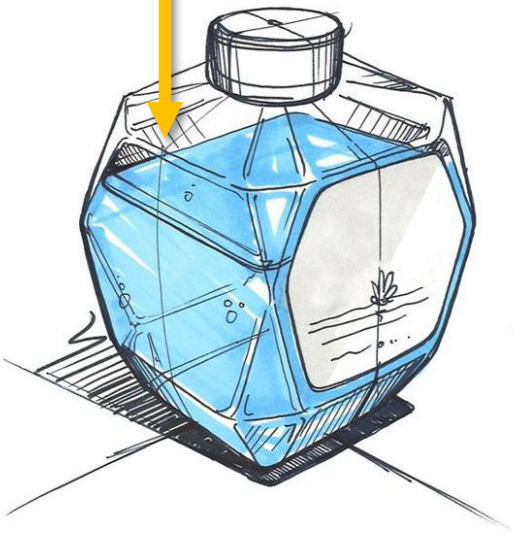
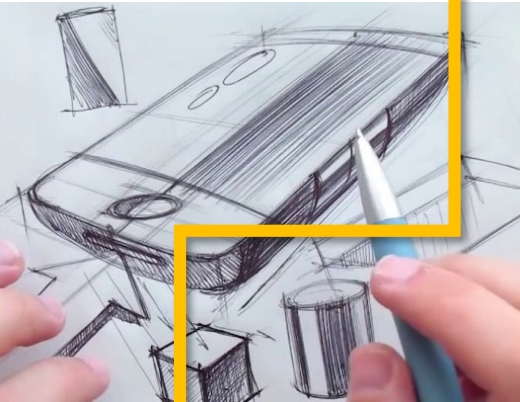
## Useful tips

1. Shade background lightly using either a light blue or grey
2. Add high lights using a rubber
3. Add darker thin lines near the highlight
4. Highlights should be different in size

## Learning Objectives

- Students to **define** 'rendering' and 'texture'
- Students to **describe** and **compare** textures of different materials
- Students to successfully **render** different materials to a **high standard**

| Keywords  |  |
|-----------|--|
| Lesson    |  |
| Rendered  | Adding colour, shade and texture to drawings to make them more realistic |
| Texture   | The feel, appearance or consistency of a surface                         |
| Highlight | Light area   |
| Contrast  | Difference between light and dark  |
|           |  |
| Material  | Glass  |
| Tinted    | Lightly coloured glass   |
| Frosted   | Non see through glass  |
| Opacity   | How see through the glass is   |



Information Station

## Must

- Pencil must be sharp
- Shade with the side so that shading is even
- Hold the pencil near the end so not to press so hard
- Use the tip of the pencil to shade near the edges and to add detail



# Year 8 Topic 1 Number and Calculations Student Knowledge Organiser

## Key words and definitions

Odd numbers– a number ending in 1, 3, 5, 7 or 9, can **not** be divided by 2

Even numbers – a number ending in 2, 4, 6, 8 or 0, **can** be divided by 2

Factors – numbers which divide into another number with no remainder

Multiples – answers to multiplications of the number

Prime numbers – a number that has exactly 2 factors: 1 and itself

Square numbers– multiply by itself, e.g.  $2 \times 2 = 4$  written as  $2^2$

Cube numbers – multiply by itself 3 times e.g.  $2 \times 2 \times 2 = 8$  written as  $2^3$

## Multiplication and division

$$\begin{array}{r} 124 \\ \times 26 \\ \hline 744 \\ 2480 \\ \hline 3224 \end{array}$$

So  $1.24 \times 0.26 = 0.3224$

$$\begin{array}{r} 288 \\ 15 \overline{) 4320} \\ \underline{30} \phantom{0} \\ 132 \phantom{0} \\ \underline{120} \phantom{0} \\ 120 \phantom{0} \\ \underline{120} \\ 0 \end{array}$$

Answer: 28.8

## Addition and subtraction

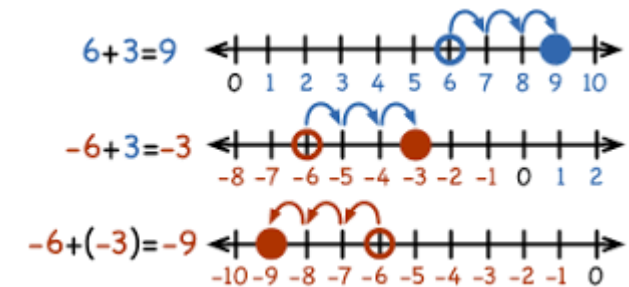
Line up the decimal points

$$\begin{array}{r} 1.234 \\ + 4.1 \\ \hline 5.334 \end{array}$$

$$\begin{array}{r} 21.40 \\ - 27.59 \\ \hline 3.81 \end{array} \rightarrow \text{Borrow as usual}$$

Line up the decimal points

## Negative numbers - directed



### Adding/Subtracting

$$\begin{array}{l} 5 + -7 = 5 - 7 = -2 \\ -5 - 8 = -13 \\ 5 - -2 = 5 + 2 = 7 \end{array}$$

### Multiplying

$$\begin{array}{l} 5 \times -2 = -10 \\ -3 \times 7 = -21 \\ -6 \times -2 = 12 \end{array}$$

### Dividing

$$\begin{array}{l} -30 \div 2 = -15 \\ 20 \div -2 = -10 \\ -6 \div -2 = 2 \end{array}$$

## Sparx Maths Skills Links

Addition and Subtraction M928, M347, M106, M429, M152

Multiplication and division M462, M187, M354, M803, M262, M263

Order of operations M521

Negative numbers M527, M106, M288, M521

# Year 8 Topic 2 Area and Volume Student Knowledge Organiser

## Key words and definitions

Area – the area of a 2D shapes is the amount of space inside it

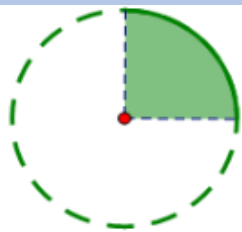
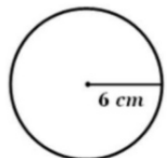
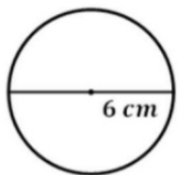
Perimeter – the perimeter is the total distance around the outside of a shape

Circumference – the distance around the outside of a circle

Surface area – sum of the areas of all the faces in a 3D shape

Volume – the amount of 3D space occupied by an object

## Area and Circumference



$$C = \pi d$$

$$= 3.142 \times 6 \text{ cm}$$

$$= 18.85 \text{ cm}$$

$$A = \pi r^2$$

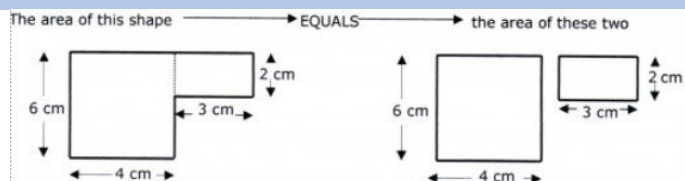
$$= 3.142 \times 6^2$$

$$= 3.142 \times 36$$

$$= 113.11 \text{ cm}^2$$

$$\text{Area} = \frac{90}{360} \pi r^2 = \frac{1}{4} \pi r^2$$

## Compound area



$$\text{The area of this shape} = (6 \times 4) + (2 \times 3)$$

$$= 24 + 6$$

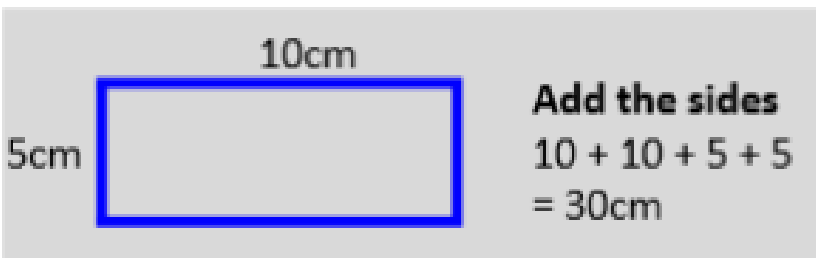
$$= 30 \text{ cm}^2$$



## Area

|   |  |
|---|--|
| <p><b>SQUARE</b></p> <p><math>A = \text{Length}^2</math></p>                                  |  |
| <p><b>RECTANGLE</b></p> <p><math>A = \text{Length} \times \text{width}</math></p>             |  |
| <p><b>TRIANGLE</b></p> <p><math>A = \frac{1}{2} \text{Base} \times \text{height}^*</math></p> |  |
| <p><b>TRAPEIZUM</b></p> <p><math>A = \frac{1}{2} (a + b) \times \text{height}^*</math></p>    |  |
| <p><b>PARALLELOGRAM</b></p> <p><math>A = \text{Base} \times \text{height}^*</math></p>        |  |

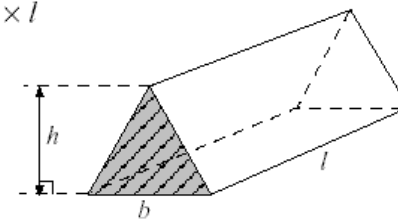
## Perimeter



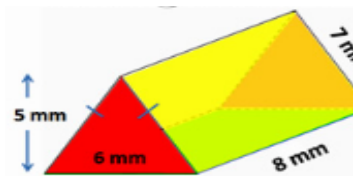
## Volume of a prism

Volume of triangular prism = area of cross-section  $\times$  length

$$= \frac{1}{2} \times b \times h \times l$$



## Surface area of a triangular prism



The "Total Surface Area" =

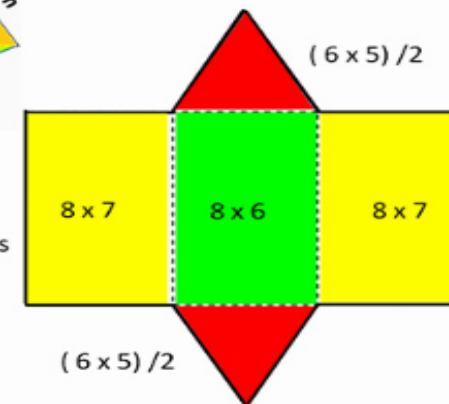
$$2 \times (6 \times 5) / 2 : \text{Two Reds}$$

$$+ 2 \times (8 \times 7) : \text{Two Yellows}$$

$$+ 1 \times (8 \times 6) : \text{One Green}$$

$$= 2 \times 15 + 2 \times 56 + 1 \times 48$$

$$= 190 \text{ mm}^2 \checkmark$$



## Sparx Maths Links

|              |  |
|--------------|--|
| Area         | M900, M390, M635, M269, M291, M610, M996 |
| Perimeter    | M920, M635, M690, M635                   |
| Circles      | M169, M231                               |
| Volume       | M765                                     |
| Surface area | M534                                     |

# Year 8 Topic 3 Expressions Student Knowledge Organiser

## Key words and definitions

Expression – numbers, symbols and operators grouped together

Term – number or variable or numbers and variables multiplied together

Equation – a mathematical statement that shows two things are equal

Expand – multiply to remove brackets

Factorise – the reverse of expanding, taking out a common factors

Substitution – putting numbers in place of letters

Simplify – collect like terms

## Simplifying expressions

$$t + t + t = 3t$$

add powers

$$a^1 \times a^1 = a^2$$

subtract powers

$$a^{10} \div a^3 = a^7$$

$$t \times t \times t = t^3$$

### Simplifying

$$3e + 6r - e + 5t$$
$$2e + 11t$$

If there is **no sign** in front of the term,  
it is **POSITIVE**

## Substitution

Evaluate  $3a - 2b$ , for  $a = 10$  and  $b = 4$

$$3a - 2b \quad (a = 10 \quad b = 4)$$

$$= 3(10) - 2(4)$$

$$= 30 - 8$$

$$= 22 \quad \checkmark$$

## Expand a single bracket

### Expanding single brackets

$$3(x + 2)$$
$$3x + 6$$

## Expand a double bracket

### Expanding double brackets

$$(x + 3)(x + 4)$$

$$x^2 + 4x + 3x + 12$$

$$x^2 + 7x + 12$$

## Factorising

$$4x + 16$$

4 is a factor of both 4 and 16.

$$4(x + 4)$$

## Factorising a quadratic

$$x^2 + 5x + 4$$

1. Find factors of 4 which sum (add) to 5
2. They are  $4 \times 1 = 4$  and  $4 + 1 = 5$
3. Result is:  $(x + 4)(x + 1)$

## Writing expressions

5 less than a number  $k$   $k - 5$

a number  $x$  divided by 11  $\frac{x}{11}$

4 times the sum of  $n$  and 5  $4(n + 5)$

## Sparx Maths Links

Simplifying M795, M531, M949, M813, M568

Substitution M417, M327, M208

Expanding M237, M792, M690

Factorising M100, M908



# Year 8 Topic 4 Fractions, decimals and percentages Student Knowledge Organiser

## Key words and definitions

Fraction – represents part(s) of a whole

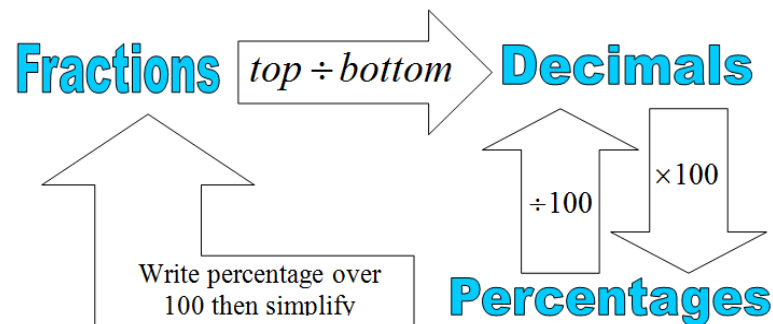
Percentage – how many parts per hundred

Equivalent – equal in value

Improper – a fraction where the numerator (top number) is larger than the denominator (bottom number)

## Fraction, decimal and percentage equivalence

| Fractions     | Decimals | Percentages |
|---------------|----------|-------------|
| $\frac{1}{5}$ | 0.2      | 20%         |
| $\frac{3}{4}$ | 0.75     | 75%         |
| $\frac{1}{8}$ | 0.125    | 12.5%       |
| $\frac{1}{2}$ | 0.5      | 50%         |



## Calculations with fractions

**Add**  $\frac{1}{2} + \frac{1}{3} = \frac{1 \times 3}{2 \times 3} + \frac{1 \times 2}{3 \times 2} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$

**Subtract**  $\frac{7}{8} - \frac{1}{3} = \frac{7 \times 3}{8 \times 3} - \frac{1 \times 8}{3 \times 8} = \frac{21}{24} - \frac{8}{24} = \frac{13}{24}$

**Multiply**  $\frac{3}{4} \times \frac{1}{3} = \frac{3}{12} = \frac{1}{4}$

**Divide (KFC)**  $\frac{1}{2} \div \frac{1}{3} = \frac{1}{2} \times \frac{3}{1} = \frac{3}{2} = 1\frac{1}{2}$

$\frac{14}{3}$  How many 'whole' 3's fit into 14?  $4\frac{2}{3}$

$7\frac{2}{5}$   $(5 \times 7) + 2 = \frac{37}{5}$

## Finding a fraction of an amount

**multiply by the numerator  
and  
divide by the denominator**

For example,

$$\begin{aligned} \frac{2}{3} \text{ of 18 litres} &= 18 \text{ litres} \div 3 \times 2 \\ &= 6 \text{ litres} \times 2 \\ &= 12 \text{ litres} \end{aligned}$$

## Finding a percentages

**15% of £200**

**% of an amount**

$$10\% = 20$$

$$5\% = 10$$

**Answer: £30**

**Increase by a %**

**Increase £200 by 15%**

$$15\% \text{ of } 200 = 30$$

Add it on or use the multiplier(1.2)

$$(200 \times 1.2)$$

**Answer: £230**

**Decrease by a %**

**Decrease £200 by 15%**

$$15\% \text{ of } 200 = 30$$

Subtract it or use the multiplier(0.85)

$$(200 \times 0.85)$$

**Answer: £170**

## Standard Form

1) 4733

$$4.733 \times 10^3$$

1) 0.00765

$$7.65 \times 10^{-3}$$

4) 0.00000081

$$8.1 \times 10^{-7}$$

5) 7277.66

$$7.27766 \times 10^3$$

## Sparx Maths Skills Links

Fraction, decimal, percentages M958, M264, M922, M264

Equivalent fractions M410, M335, M671, M939

4 operations with fractions M835, M931, M157, M197, M110, M265, M110

Fraction of an amount M695, M684

Improper fractions/mixed numbers M601

Percentage of an amount 84, 85, 86, 87, 88, 89

# Year 8 Topic 5 Probability Student Knowledge Organiser

## Key words and definitions

Probability – the likelihood of an event happening

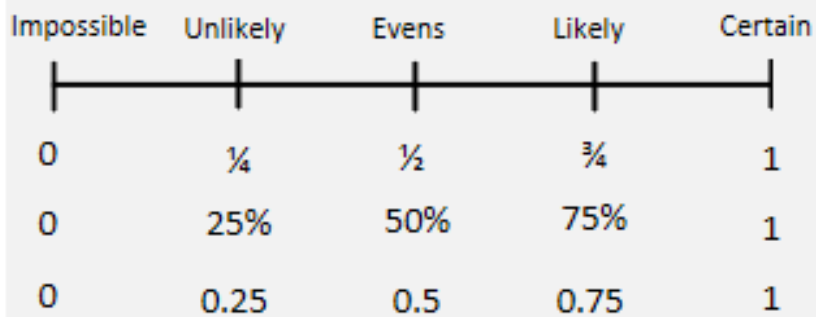
Mutually exclusive events – events which may not occur at the same time.

Exhaustive - Events are exhaustive if they include all possible outcomes

Sample space diagram - shows all the possible outcomes. It is used to find theoretical probability.

Outcome – A possible result of an experiment or trial.

## Probability Scale



$$\text{Probability} = \frac{\text{number of successful outcomes}}{\text{total number of possible outcomes}}$$

## Probability of an event not happening

$$P(\text{not } A) = 1 - P(A)$$

**Ex:** The probability of NOT tossing a  of a die.

$$P(A) = \frac{1}{6} \text{ (Probability of Event A)}$$

$$\text{therefore } P(\text{not } A) = 1 - P(A) = 1 - \frac{1}{6} = \frac{5}{6}$$

## Sample space diagrams

Represent the results from **adding** two 6-sided dice in a sample space diagram.

- a) The probability of getting a total of 7?  $\frac{6}{36}$
- b) The probability of getting a total of a 1?  $\frac{0}{36}$
- c) The probability of getting a total of a 10?  $\frac{30}{36}$

|            |   | First die |   |   |    |    |    |
|------------|---|-----------|---|---|----|----|----|
| Second die |   | 1         | 2 | 3 | 4  | 5  | 6  |
|            | 1 | 2         | 3 | 4 | 5  | 6  | 7  |
|            | 2 | 3         | 4 | 5 | 6  | 7  | 8  |
|            | 3 | 4         | 5 | 6 | 7  | 8  | 9  |
|            | 4 | 5         | 6 | 7 | 8  | 9  | 10 |
|            | 5 | 6         | 7 | 8 | 9  | 10 | 11 |
|            | 6 | 7         | 8 | 9 | 10 | 11 | 12 |

## Relative Frequency

$$\text{Relative Frequency} = \frac{\text{number of 'successful' trials}}{\text{total number of trials}}$$

| Item  | Frequency | Relative frequency |
|-------|-----------|--------------------|
| 1     | 4         | 4/20 (or 20%)      |
| 2     | 5         | 5/20 (or 25%)      |
| 3     | 5         | 5/20 (or 25%)      |
| 4     | 2         | 2/20 (or 10%)      |
| 5     | 4         | 4/20 (or 20%)      |
| Total | 20        |                    |

## Experimental Probability

$$\text{Estimated/Experimental Probability} = \frac{\text{frequency of event}}{\text{total frequency}}$$

**Predicted** number of outcomes = probability x number of trials

## Sparx Maths Links

|                                       |            |
|---------------------------------------|------------|
| Probability scale                     | M655       |
| Theoretical probability               | M941, M938 |
| Probability of an event not happening | M755       |
| Relative frequency                    | M332       |
| Experimental probability              | M206, M332 |
| Sample space diagram                  | M718       |