


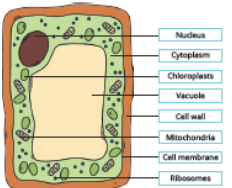
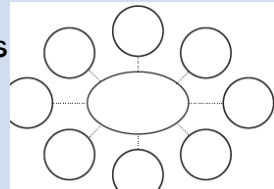




1



Just reading through your books or a knowledge organiser is not always an effective way to revise. Instead, you should do something with the information. Choose an example of the revision methods on the pages or see if you can come up with another method.

You will chose your options in class with Mr Ward on the days following Parents' evening 56<sup>th</sup> April.

Subject	Page Number	Subject	Page Number
Food	3	German	25
DT	8	History	28
PE	9	English	30
Science	11	Maths	35
Computer Science	17	RE	41
Geography	18	Music	43
Art	20	Drama	46

Idea	Explanation
<p>Make some flash cards or PowerPoint slides. Make top trumps.</p> 	<p>Write down key words, quotation, questions or equations on one side of a card. On the other side, write the definition or answer. Use them to test yourself.</p>
<p>Plant Cell</p>  <p>Make a poster.</p>	<p>Turn your notes into posters with lots of colour and illustrations. Summarising the key information in a different way is an effective way of learning and your brain will remember the colours more easily. Do the title last!</p>
<p>Draw spider diagrams, or for the adventurous mind maps.</p> 	<p>Write the topic/keyword in the centre of your page. Add everything you know in subtopics. Then explore each subtopic in turn adding more ideas. Colour/pictures help you recall.</p>
<p>Write a song or a rap.</p> 	<p>Are there songs that stick your head. Change the lyrics to the information you want to learn. If you record and listen back it will be a more fun way of revising.</p>
<p>Plan a lesson</p> 	<p>If you teach something to someone else the chance of recalling it is really high. This has been found to be the most effective way of learning something for the long term.</p>
<p>Write a story or comic strip.</p> 	<p>Take the keywords or facts that you need to learn and turn them into a story or a cartoon. The sillier the story the more likely you are to remember it.</p>
<p>Write a quiz. Design a game.</p> 	<p>Playing is how we learn as young children and it is a very powerful way of learning throughout life. If we enjoy the game it helps us remember.</p>

## Nutrients

Macro nutrients – needed in large quantities in the diet. The three macro nutrients are: PROTEIN, CARBOHYDRATES, FAT

Micro nutrients – needed in small quantities in the diet. The two micro nutrients are: VITAMINS, MINERALS

## Protein

Proteins are made up of amino acids, often referred to as the 'building blocks' of the body. Non-essential amino acids can be made by the body, however, essential amino acids can't be made by the body and we must get from the food we eat.

High biological Value (HBV) proteins contain all the essential amino acids we need and generally come from animal sources. Low biological value (LBV) proteins are missing one or more essential amino acids and generally come from plant sources.

### Food sources

HBV - beef, pork, lamb, poultry (chicken, turkey, duck), fish, cheese, butter, milk

LBV – beans, chickpeas, lentils, peas, nuts, seeds, found in smaller amounts in some vegetables such as spinach and broccoli.

### Function

Needed for growth from childhood to adulthood and the growth of nails, hair and muscle mass, repair of muscles, tissues and organs after illness or injury and to make enzymes for digestion and antibodies to stop us getting ill.

Types: High biological Value (HBV) and Low biological Value (LBV)

## Carbohydrates

There are two types of carbohydrates, complex and simple. They are also known as starchy (complex) and sugary (simple).

### Food sources

Starchy – bread, rice, pasta, potatoes, bagels, oats, flour, cereal and some vegetables.

Simple – fruit, some vegetables, chocolate, sweets, biscuits, cakes

### Function

Starchy/complex carbohydrates are digested slowly meaning blood sugar levels gradually increase providing a slow, steady release of energy. (long term energy).

Sugary/simple carbohydrates are digested slowly and provide short term energy

Types: Starchy, sugary and fibrous

### Example exam questions:

What are the two types of fat? (2 marks)

Explain the difference between a HBV and LBV protein (6 marks)

What percentage of our daily energy should come from fats? (1 mark)

What are the main differences between saturated and unsaturated fats? (6 marks)

How can one make healthy choices when choosing complex carbohydrates? (2 marks)

## Fat

There are two types of fat, saturated and non saturated.

Saturated fats are classed as 'unhealthy fats', they are solid at room temperature and are generally animal based.

Unsaturated fats are classed as 'healthier fats' and are liquid or soft at room temperature and come from plant based sources.

### Food sources

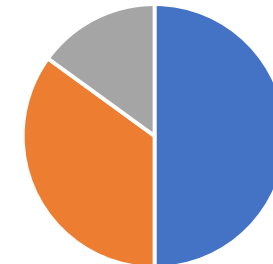
Animal – beef, chicken skin, processed meat (sausages, salami, pepperoni), bacon, butter, cheese, full fat milk

Plant – vegetable oils (sunflower, olive, rapeseed), avocado, nuts, seeds

### Function

Keeps us warm (provides insulation), secondary source of energy, protects vital organs and bones.

Energy



■ Carbohydrates ■ Fat ■ Protein ■

### Energy intake

50% - carbohydrates

35% - Fat

15% - Protein

# Factors that Affect Food Choice

When planning a meal for an event, we need to consider what factors will affect peoples food choice. After all, you want people to come and buy your food!

Nutritional Value

Some people prefer to eat healthier food, some prefer to treat themselves to something! Are you going to offer a range of dishes to try and suit everyone?

- How healthy is your dish?
- Does it contain any vegetables?
- Is it high in protein, suitable for someone into fitness?
- Is it low calorie, suitable for someone on a low-calorie diet?
- Or low in fat, salt and sugar?



Special Diets

Is your dish suitable for someone with a special dietary requirement?

Sometimes this can be used as a marketing tool as well.

- Vegetarian (no meat, or fish)
- Vegan (no meat, fish, eggs, dairy)
- Lactose Intolerance (no dairy)
- Coeliac (no gluten, found in wheat)
- Allergies and Intolerances



Appearance

They say you eat with your eyes! The more appealing your dish is, the more people are going to want to buy it.

Sometimes food trucks have examples of there dishes ready made as advertising, to hopefully encourage people to buy there food.

- How colourful is your dish?
- How will it be served?
- Will you put a garnish on?

## Factors that affect food choice



Cost

Food can be expensive! Consider how much your dish will cost and, therefor, how much you will need to sell it for.

Prioritise ingredients – which can you spend less on and not affect the overall finished dish?

Cuisine! For this task you are required to look at different cuisines and experiment with making a range of different dishes.

- Europe – classic British (pies, fish and chips)
- Indian Cuisine – Easy to add vegetables, can be eaten with a fork and can be made in advance. (Curries, breads, tandoori style chicken, onion bhaajis, samosas etc).
- Mexican – always popular as its easy to eat and packed full of flavour (Tacos, burritos, enchiladas, fajitas).
- American – possibly the most popular of them all? (burgers, chicken strips, chips, donuts, apple pie, pizza).
- Italian cuisine – Pizzas are quick and cheap to make and you can add a range of different toppings to suit different dietary needs. (Pasta, pizza, risotto, arancini).

# Build your own Kebab

## Ingredient choices:

### Protein

Chicken

Beef

Lamb

Pork

Haloumi

Tofu

### Carbohydrates

Pasta

Couscous

Rice

Bulgar Wheat

Quinoa

### Vegetables (pick 3)

Mushrooms

Cherry Tomatoes

Onion

Courgette

Pepper

Marinade of your choice (we will also provide a range of marinades).

## Equipment

Chopping board, knife, baking tray, baking paper, saucepan.

## Skills

Developing and adapting a recipe, chopping, roasting, seasoning, boiling.

## Method

1. Preparing the protein and the vegetables and marinating. These will be put onto skewers and roasted and served with your choice of carbohydrate.

You are welcome to adapt this recipe. You can also prepare a salad of your choice or bring in ingredients to add to your carbohydrate side. Be creative!

# Homemade chips and curry sauce

## Ingredients

1 onion  
1 garlic clove  
2.5cm ginger  
1 teaspoon soy sauce  
100 - 200ml coconut milk  
300ml water  
1 tsp turmeric  
2 tbsp curry powder  
1 tbsp plain flour  
1 stock cubes  
1-2 large potatoes  
Olive oil  
Salt and pepper

## Equipment

Chopping board  
Knife  
Frying pan  
Wooden spoon  
Sieve  
Baking tray

## Method

1. Prepare your vegetables: Cut your potato, skin on into wedges or fries, finely dice the onion, mince the garlic and ginger.
2. Put the potato wedges/fries onto a baking tray lined with baking paper. Drizzle with oil, salt and pepper and roast for 30 minutes, turning once.
3. Fry your onion, garlic and ginger in 1 tbsp oil for 5 minutes.
4. Add the curry powder, turmeric and cook for a few more minutes.
5. Add the flour and mix. Add your stock cube and slowly add the water, constantly stirring. Then slowly add the coconut milk, constantly stirring.
6. Add 1tsp sugar and soy sauce, mix thoroughly.
7. Sieve your sauce before serving with your wedges/chips.

# Pizzas

## Ingredient

200g strong white bread flour,  
plus extra for dusting

50g ground semolina (or extra  
flour)

1 tsp salt

1 tsp dried yeast

1 tbsp oil

100-125ml warm water

Toppings of your choice

Grated cheese

Tomato passata

Cook garlic, add  
the tomato passata  
and season with  
salt, pepper and  
herbs for a  
flavoursome  
tomato base.

## Equipment

Knife, chopping board, wooden  
spoon, bowl, jug, grater, rolling  
pin, cookie cutter

**Skills:** Rich yeast dough,  
kneading, baking, grating,  
shaping,

1. Pre-heat the oven to 200°C Weigh flour and add to a bowl, add yeast and salt and oil
2. Create a well in the middle of the flour and add the oil, then gradually add the warm water and mix **(make sure not to add all at once or the dough will be too wet)**
3. When smooth, work the dough on the worktop until elastic and smooth, set aside to rise while preparing the filling (if you have plenty time, leave your dough in a warm place to prove for around an hour).
4. Wash, peel, slice your vegetables, grate the cheese.
5. If using any meat – prepare that too.
6. When all is prepared, roll out the dough thinly on a baking tray covered with baking paper.
7. Add the tomato sauce, toppings and cheese.
8. Bake until crispy (10-15min)

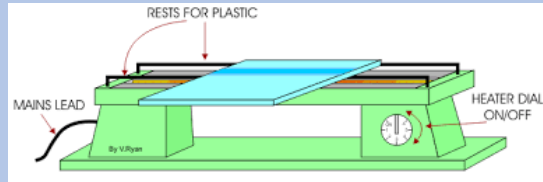


## 3D CAD - Computer Aided Design



### Plastic forming

You will be forming plastic in the workshop to make a phone holder. It will be made from one piece of acrylic. You will be using the line bender or strip heater to bend/form your acrylic.



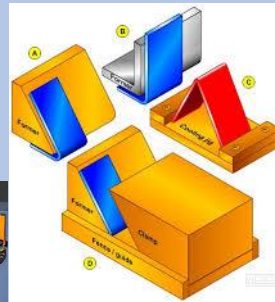
You will need a jig to bend your acrylic into a specific shape. Once your acrylic has been softened you will bend your acrylic around your chosen jig. What PPE do you think you will need when doing this process?

<https://www.youtube.com/watch?v=-s1d4xy6uiw> – watch this video which shows you how to make a phone holder with acrylic and using a line bender.

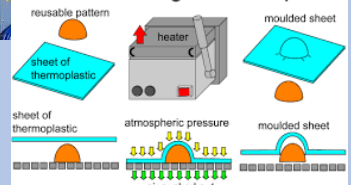
Another way of forming/shaping plastic in the workshop is with a vacuum former. We will show how this works.

<https://www.youtube.com/watch?v=cbV8Wbvmjpg> – watch this video to learn how vacuum forming works.

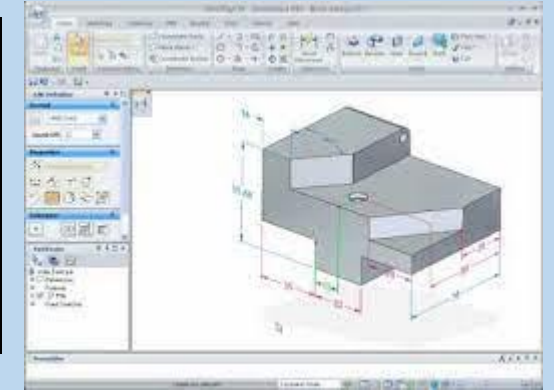
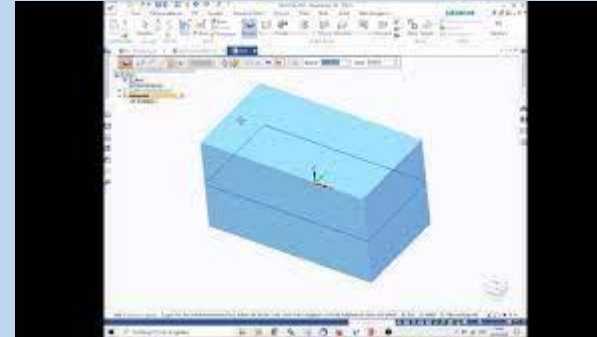
These products have been made with a vacuum former or line bender. Have a look at plastic products at home and see if any have been vacuum formed or produced or a line bender.



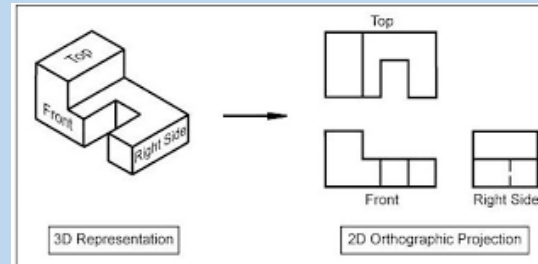
Vacuum Forming of thermoplastic



CAD is the use of computers to enable users to perform certain functions in the design process. Siemens Solid Edge 3D is the programme we use in the Academy for 3D CAD.



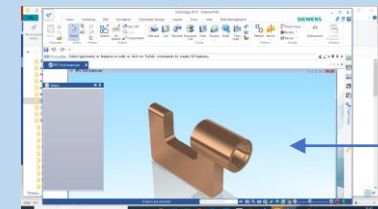
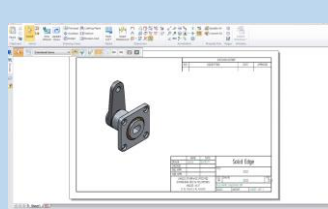
Designers use 3D CAD to develop their ideas and to communicate them to stakeholders. They would need to present their final design in isometric and orthographic projections. Both projects are important to provide clarity to others.



3D Solid Edge allows you to draw your product in 3D isometric and it will also project this as an orthographic drawing. This information is crucial for communicating details to a third party.

<https://www.youtube.com/watch?v=JZ-6AfadSQI>

Watch this video for a Solid Edge tutorial.

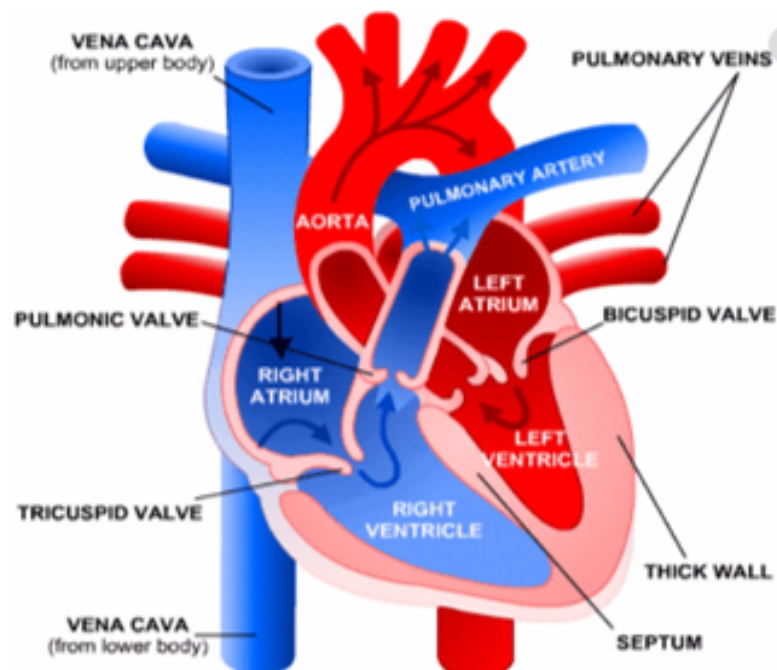


Solid Edge allows you to render (add colour and texture) to a product. This shows what your product would look like.

**Career paths** for those interested in CAD/CAM: Architect, Graphic designer, illustrator, textile designer, fashion designer, engineer, furniture designer, product designer.



### The Cardiovascular System



BBC Bitesize revision and test



How your heart works



### Functions of the Cardiovascular System

There are 4 main functions of this system. Circulation and transport, protection, clotting and temperature regulation. Complete the paragraph below and add the missing terminology.

Circulates	Transports	Oxygen
Protecting	Platelets	37°C
		Infections

The blood ..... and ..... carbon dioxide away from the vital organs and muscles. Red blood cells transport ..... to the vital organs and muscles. The blood helps to maintain the body's temperature to a constant .....

White blood cells are essential in ..... the body and keeping it healthy. White blood cells help fight ..... by producing antibodies that destroy harmful micro-organisms in the body.

Finally, the cardiovascular system can help prevent the body from losing blood during an injury. Specialised blood cells, called ..... form a clot and seal the damaged area.

The blood is made up of Red Blood Cells, White Blood Cells, Platelets and Plasma

This QR code will provide you with lots of new information, challenges and ideas to help keep your heart healthy. Have a go at the 10-minute exercises and read up on the ways you can support your cardiovascular system.

Have a go at this word search to help learn key terminology for the cardiovascular system.



## Cardiovascular system

W A H M U S C L E J O L L G X  
G T Y C Z V F H F B R B V E M  
I R P A H C T R A N S P O R T  
E I E R C Y A L H M M B P O A  
C U R D C W P R B K E L L P G  
P M T I V A P S D G O O A J Y  
L X R O M E O H X I Q O T S Z  
A R O V P Q N G B F A D E Q T  
S C P A B I L T D M J C L O L  
M E H S H M B R R W M Y E X H  
A L Y C A G I Q S I T F T Y E  
K L X U Z V I S L T C Q S G A  
U S D L D E B Z X M M L J E R  
B M R A R M I B N S Y O E N T  
M H I R D M H E A R T R A T E

To improve your cardiovascular system, you should consider different methods of training.



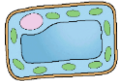


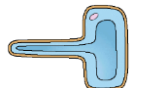
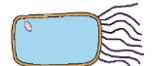
1. Continuous training – Working at a steady pace for at least 30 minutes
2. Fartlek training – 'Speed training' where you change the speed of exercise
3. Interval training – Varying the intensity and time of exercise with periods of rest in between.

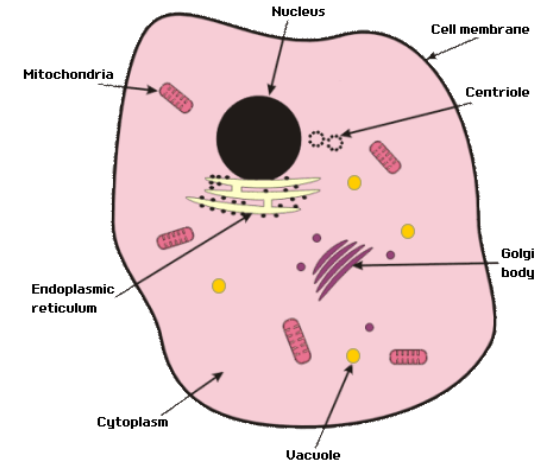
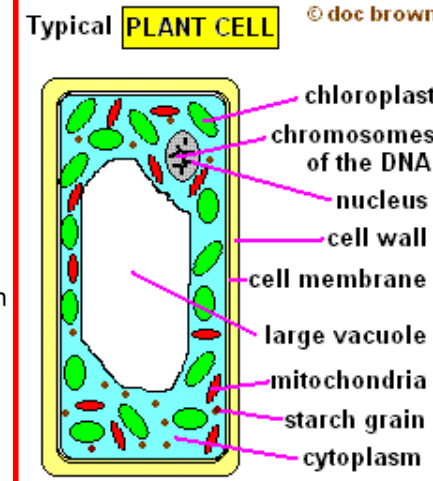
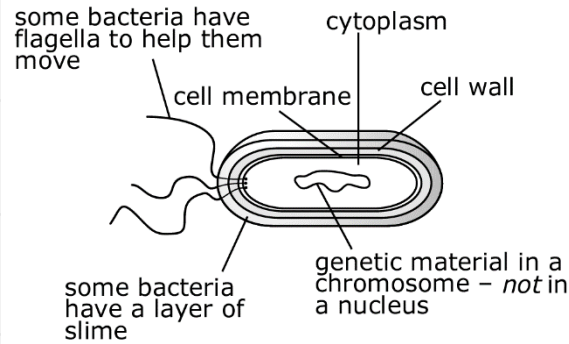
### Careers in Sport include:

- Personal Trainer
- Medical Assistant
- Physical Therapy Assistant
- Sports Massage Therapist
- Sports and Fitness Nutritionist
- Strength and Conditioning Coach
- Sports Analytics / Sports Statisticians



Cardiovascular	Hypertrophy	Platelets	Ventricle
Transport	Muscle	Plasma	Heart rate
Cardiac	Atrium	Oxygen	Heart
Blood	Cells		

	<b><u>Sperm Cell</u></b> Found in the testes Its job is to carry genetic information and fertilise the egg
	<b><u>Egg Cell</u></b> Found in the ovaries Its job is to carry genetic information
	<b><u>Palisade Cell</u></b> Found on the surface of leaves Its job is photosynthesis
	<b><u>Red blood Cell</u></b> Found in the blood Its job is to carry oxygen around the body
	<b><u>Nerve Cell</u></b> Found all over the body Its job is to carry electrical signals to our brain
	<b><u>Root hair cell</u></b> Found in the roots of plants Its job is to absorb water and minerals
	<b><u>Ciliated Epithelium</u></b> Found in our throat/airways Its job is to sweep mucus and dirt back up our throat



## Converting units

Unit	How many millimetres
Millimetre [mm]	1mm
Micrometre [µm]	0.001mm
Nanometre [nm]	0.000001mm

x1000

x1000

/1000

/1000

To convert from a **smaller** unit **to a bigger** unit you have to **divide**.

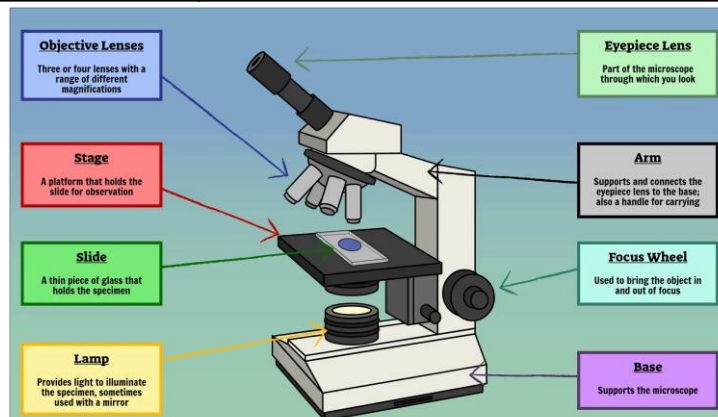
**Example**

Convert 5 micrometres to millimetres.  
 $5/1000 = 0.005\text{mm}$

To convert from a **bigger** unit **to a smaller** unit you have to **multiply**.

**Example**

Convert 32 millimetre to micrometres.  
 $32 \times 1000 = 32000\mu\text{m}$



Total  
magnification



Objective  
lens  
magnification

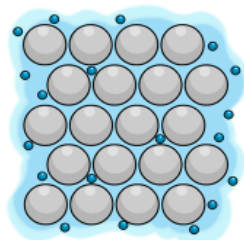


Eyepiece lens  
magnification



## How do metals conduct heat?

Metals are good conductors of heat. The outer electrons of metal atoms are not attached to any particular atom. They are free to move between the atoms.



↑  
heat

When a metal is heated, the free electrons gain kinetic energy. This means that the free electrons move faster and transfer the energy through the metal.

This makes heat transfer in metals very efficient.

Insulators do not have free electrons and so they do not conduct heat as well as metals.

## Infra-red Radiation

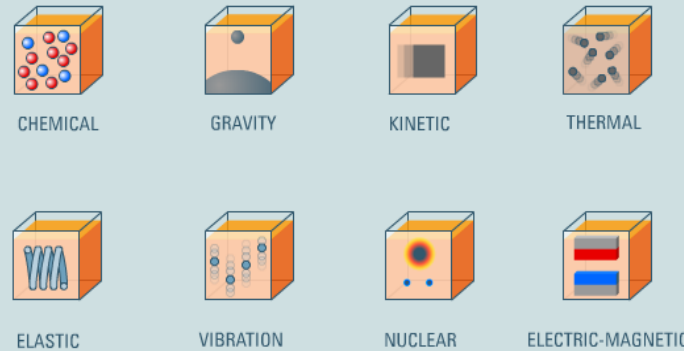
Heat can move by travelling as **infrared waves**.

These are electromagnetic waves, like light waves, but with a longer wavelength.



This means that infrared waves act like light waves:

- They can travel through a vacuum.
- They travel at 300,000,000 m/s.
- They can be reflected.
- They cannot travel through opaque materials.



## What is an energy store?

Places where an amount of energy can be measured.

The amount of energy can also be calculated (using the appropriate equation / formula).

A store can 'hold' the energy or it can be filled or it can be emptied.

8 different stores have been identified

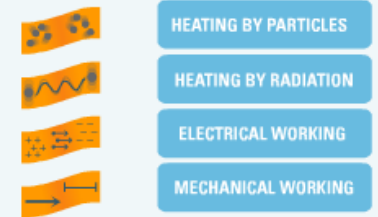
## What is an energy pathway?

A 'route' along which energy can be transferred or a method by which energy is exchanged between stores.

Emptying or filling stores – but **NOT** a store itself.

Can measure the rate of transfer – how much energy every second = Power (in watts)

4 pathways have been identified



## Heat can travel by Convection

A hot fluid expands, so is less dense, so rises. Cold fluid takes its place. A convection current can be formed.

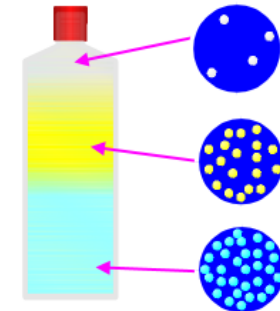


## Convection and density

To understand how heat can be transferred by **convection**, the idea of **density** is important.

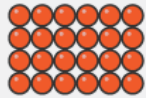


If water, oil and air are mixed up, they will settle out in order of density – which one will rise to the top?

The air is least dense and rises to the top, the water is the most dense and sinks to the bottom – **it depends on how far apart the particles are**.

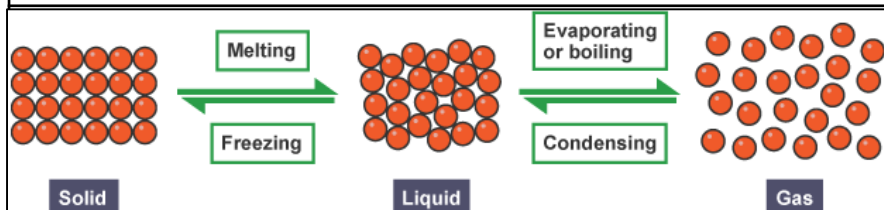


# PARTICLES

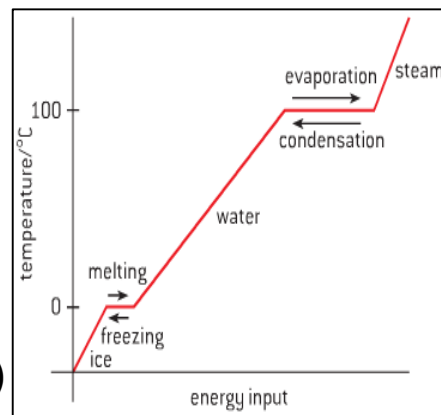
**Key knowledge – Particle theory, states of matter, changes of state, diffusion, density**

State	Solid	Liquid	Gas
Diagram			
Arrangement of particles	Regular arrangement	Randomly arranged	Randomly arranged
Movement of particles	Vibrate about a fixed position	Move around each other	Move quickly in all directions
Closeness of particles	Very close	Close	Far apart

The particles should be the same in all 3 diagrams.



As a substance is heated it gains energy. When the particles gain enough energy they overcome the forces between them. Whilst a change of state is happening the temperature of the substance does not change. (flat line on graph)



## Density

1 kg of a gas has a larger volume than 1 kg of a solid. There is empty space between particles in a gas, but in a solid, they are tightly packed together.

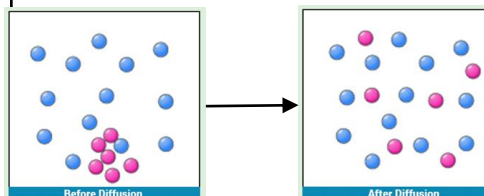
$$\text{Density} = \text{Mass} / \text{Volume}$$

... so the density of the gas is much smaller than the density of the solid.

## Diffusion

Particles in a liquid or a gas spread out from an area of high concentration to an area of low concentration until the concentrations are equal.

The higher the concentration gradient the faster the net diffusion. The higher the temperature the faster the net diffusion. If the particles that are spreading are water molecules we call this process osmosis.



## How Science works

### Risk Assessment

Hazard	Risk	Level of risk	Control measure
What could cause harm? e.g. electricity	What harm could it cause? e.g. electrical shock, burns to the skin	How likely is it to happen and how bad would it be? Low, medium or high risk?	What safety precautions will be taken? e.g. wear safety goggles, ensure all wires and equipment is tested, fused, earthed and insulated. Do not use near water.

**The independent variable – The one factor that can be changed in an investigation**

**The dependent variable – The one thing that needs to be measured in an investigation**

**Control variable – all the factors that need to be kept the same to ensure the investigation is fair**

# FORCES

A force can be a **push** or a **pull**, for example when you open a door you can either push it or pull it. You can not see forces, you can only see what they do.

When a force is applied to an object it can lead to a change in the objects

**Speed**

**Direction of movement**

**Shape (think about a rubber band)**

Forces can also be divided into 2 types, contact forces and non contact forces.

**Contact forces** for example friction, are caused when two objects are in contact.

Other forces for example gravity, are **non contact forces**. The two objects do not need to be in contact for the force to occur.

The unit of force is the **Newton (N)**, this is named after Sir Isaac Newton, who came up with many theories including those to do with gravity and the three laws of motion. We measure force using a piece of equipment called a Newton metre.

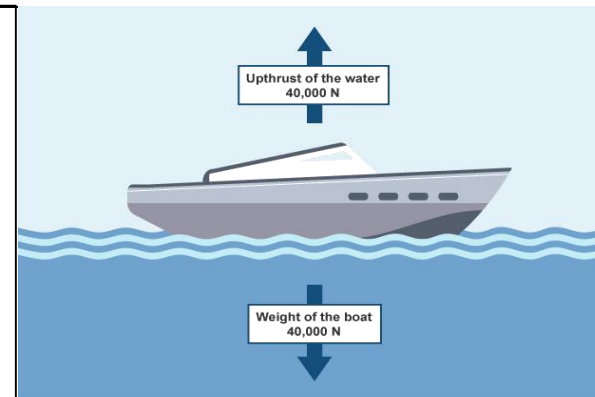
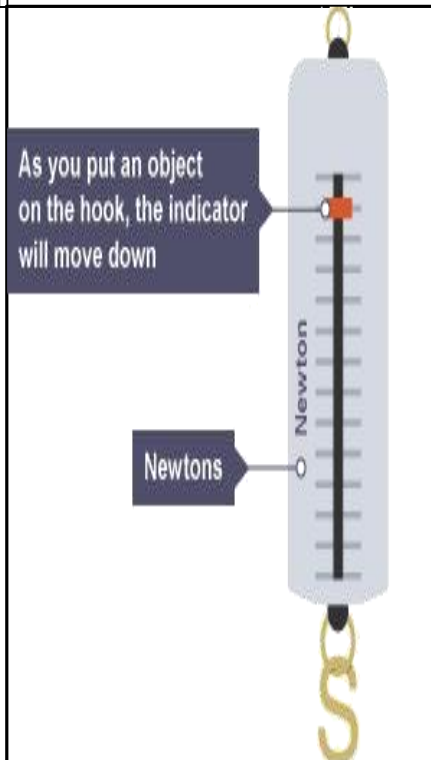
## Balanced forces

When two forces acting on an object are equal in size but act in opposite directions, we say that they are **balanced forces**.

If the forces on an object are balanced (or if there are no forces acting on it), this is what happens:

- a stationary object stays still
- a moving object continues to move at the same speed and in the same direction

Remember that an object can be moving, even if there are no forces acting on it.



## Force Diagrams

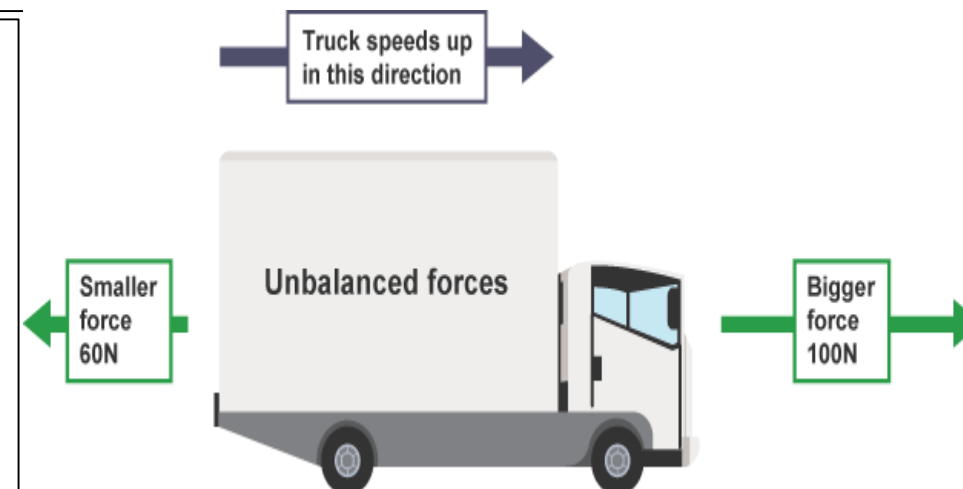
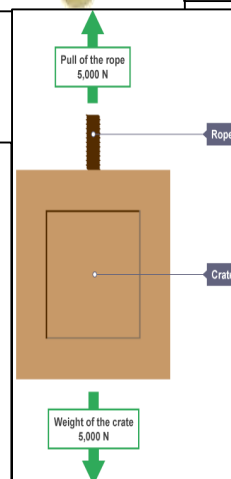
To show the forces acting on a body we use a free body force diagram. A **free body force diagram** shows all of the forces that are acting on the body. It has arrows that show the direction the force acts, the larger the arrow, the larger the force. A free body force diagram should always have labelled arrows.

## Unbalanced forces

When two forces acting on an object are not equal in size, we say that they are unbalanced forces. The overall force acting on the object is called the **resultant force**. If the forces are balanced, the resultant force is zero.

If the forces on an object are unbalanced, this is what happens:

- a stationary object starts to move in the direction of the resultant force
  - a moving object changes speed and/or direction in the direction of the resultant force
- In the example below, the resultant force is the difference between the two forces:  
 $100 - 60 = 40 \text{ N}$  (to the right)





The rate of a reaction is 'the time taken for a product to form, or reactants to be used up'

**Rate = amount of product produced (reactants used up) / time taken**

Factors that can affect the rate of a chemical reaction are:-

- Temperature
- Concentration
- Surface Area
- Pressure
- Catalysts

They usually do this by increasing the number of successful collisions between particles.



Mass is neither created nor destroyed in chemical reactions. In other words, the mass of any one element at the beginning of a reaction will equal the mass of that element at the end of the reaction.

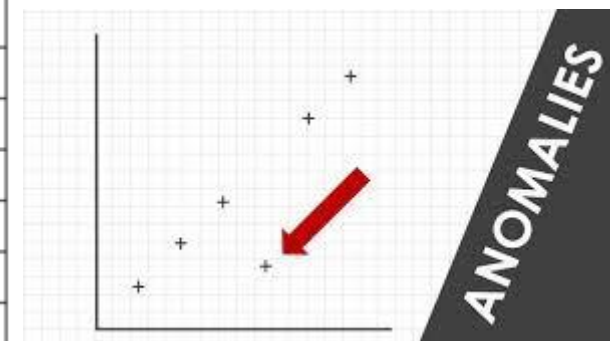
This image is not to be copied or re-used.

**State symbols** tell you what state a chemical is in:-

- (l) = Liquid
- (s) = solid
- (g) = gas
- (aq) = aqueous (solute dissolved in water)

An **Anomalous result** is one which does not fit the pattern

Independent Variable (Unit)	Dependent Variable (Unit)
0.0	0.0
1.0	0.5
2.0	1.9
3.0	1.7
4.0	2.5
5.0	3.1



## INDEPENDENT VARIABLE

The only thing that changes in an experiment – Left column of the results table

## DEPENDENT VARIABLE

The thing that you measure in an experiment – Right column of the periodic table

## CONTROL VARIABLE

The things you keep the same each time you do the experiment

### Physical Hazards



Explosives    Flammable Liquids    Oxidizing Liquids    Compressed Gases    Corrosive to Metals

### Health Hazards



Acute Toxicity    Skin Corrosion    Skin Irritation    CMR<sup>1</sup>, STOT<sup>2</sup>, Aspiration Hazard

### Env. Hazards



Hazardous to the Aquatic Environment

## Herbivores

These consumers eat producers.  
This means plants and possibly bacteria.

## Carnivores

These consumers eat other consumers.  
They eat animals.

## Omnivores

These consumers eat other consumers and producers. They eat animals and plants. Most humans are omnivores.

### WHAT HAPPENS TO ENERGY ONCE IT IS IN A FOOD CHAIN?

Energy passes out of each organism (including plants) in a food chain or web in a number of ways:

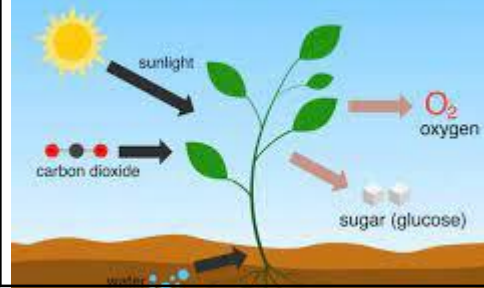
It is released as heat energy during respiration.

It is used for life processes (eg movement)

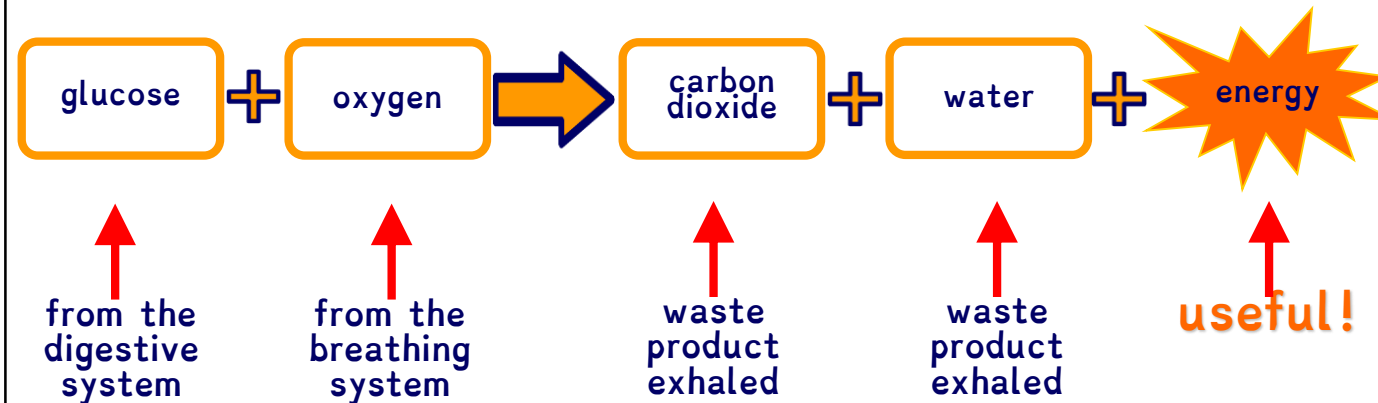
It is egested in faeces or remains in dead organisms which are passed to decomposers

The amount of available energy to each level of a food chain / web decreases as you go up the chain / web

### PHOTOSYNTHESIS

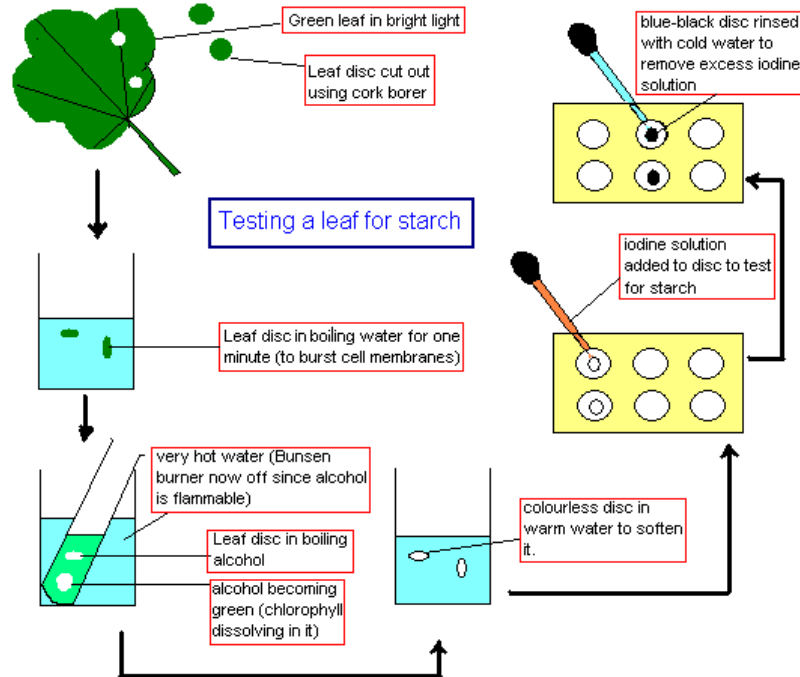


**Respiration** is the process that the body uses to release energy from digested food (glucose):



This type of respiration is called **aerobic** respiration because energy is released **with oxygen**.

How do the glucose and oxygen needed for aerobic respiration get to the all the body's cells?



## Summary

A network is created when more than one device is connected together.

A network can be a small collection of computers connected within a building (e.g. a school, business or home) or it can be a wide collection of computers connected around the world.

The main purpose of networking is to share data between computers.

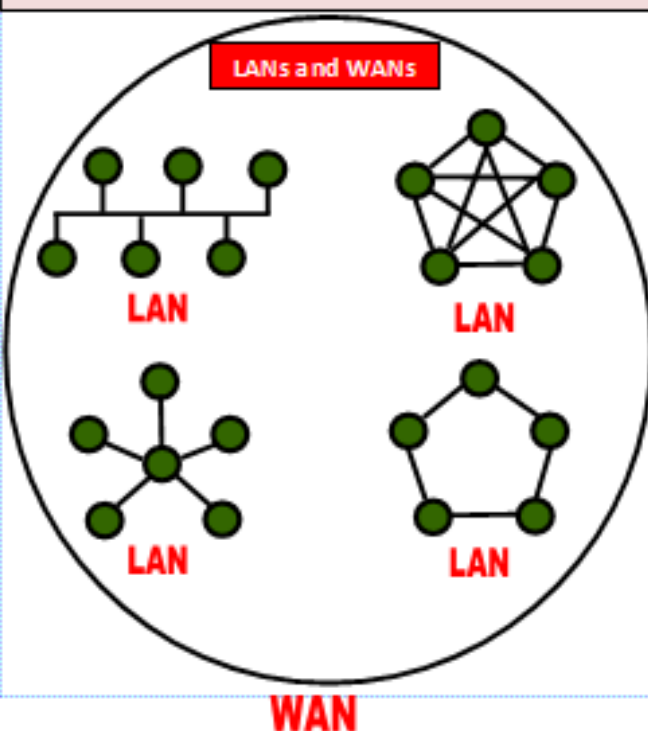
A file has to be broken up into small chunks of data known as **data packets** in order to be transmitted over a network. The data is then re-built once it reaches the destination computer.

Protocols are used to control how data is transmitted across networks. They are a set of rules for how messages are turned into data packets and sent across networks.

Bandwidth measures the amount of data that can transfer through a communications channel over a given period of time.

Careers include Cloud Computing Engineer, Computer Network Specialist, Information Security Specialist, Computer Support Specialist, Software/Application Developer, Games Designer and Web Developer

A school network is usually a **LAN**. LANs are often connected to WANs, for example a school network could be connected to the internet. **WANs** can be connected together using the internet, leased lines or satellite links.



## Advantages of networks

- ◆ Sharing devices such as printers saves money.
- ◆ Site (software) licences are likely to be cheaper than buying several standalone licences.
- ◆ Files can easily be shared between users.
- ◆ Network users can communicate by email and instant messenger.
- ◆ Security is good - users cannot see other users' files unlike on stand-alone machines.

## Disadvantages of networks

- ◆ Purchasing the network cabling and file servers can be expensive.
- ◆ Managing a large network is complicated, requires training and a network manager usually needs to be employed.
- ◆ If the file server breaks down the files on the file server become inaccessible. Email might still work if it is on a separate server. The computers can still be used but are isolated.
- ◆ Viruses can spread to other computers throughout a computer network.
- ◆ There is a danger of hacking, particularly with wide area networks. Security procedures are needed to prevent such abuse, e.g. a firewall.

## Key Vocabulary

<b>File server</b>	A networked <b>computer</b> that provides shared storage, it can be accessed by workstations on the same network.
<b>Input device</b>	Input devices, like a keyboard, allow us to put raw data in a computer which it processes to produce outputs.
<b>LAN</b>	Local <b>Area Network</b> covers a small area such as one site or building, e.g. a school or a college.
<b>Licence</b>	A legal agreement between the company who published the software and the end user covering areas such as copyright.
<b>Network</b>	A network is a number of computers linked together to allow the sharing of resources.
<b>Output device</b>	A device used to output data or information from a computer, e.g. a monitor or printer.
<b>Server</b>	A computer that holds data to be shared with other computers. A web server stores and shares websites.
<b>WAN</b>	<b>Wide Area Network</b> covers a large geographical area. Most WANs are made from several LANs connected together.
<b>Workstation</b>	A computer connected to a network.



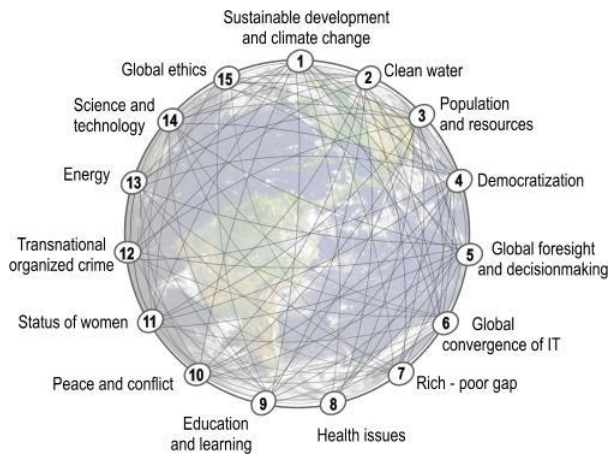
The internet is a global **network** of computers. All computer devices (including PCs, laptops, games consoles and smartphones) that are connected to the internet form part of this network. Added together, there are billions of computers connected to the internet, all able to communicate with each other.

<https://bbc.in/37yD3x>





# Year 9 Knowledge organiser: Global challenges



## Topics covered

- ✓ Types of challenges
- ✓ Population and resources
- ✓ Poverty and Wealth inequality
- ✓ Settlements and environmental quality
- ✓ Resource exploitation and environment
- ✓ Ecosystems and biodiversity
- ✓ Global Warming and Climate Change

## Key Ideas:

1. I can describe global scale challenges
2. I can describe how human populations are un-equal
3. I can describe how human activities are damaging the environment
4. I can explain why opinions vary on solving global challenges
5. I can discuss ideas for a sustainable future

## Skills

- ❑ To research using ICT
- ❑ To interpret a variety of graphs/infographics
- ❑ To use mapping to investigate deforestation and urbanisation
- ❑ To understand different opinions and viewpoints
- ❑ To write a detailed piece of extended writing
- ❑ To use ICT/MS Office to present to my class

## Places and Environments

- ❖ Amazon rainforest
- ❖ Antarctica and Arctic
- ❖ India
- ❖ China
- ❖ Germany
- ❖ Tuvalu
- ❖ Maldives

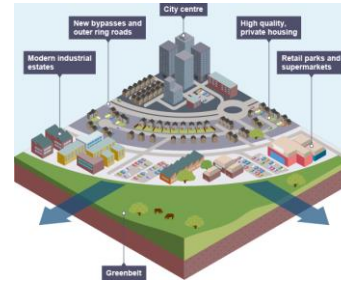
## Key Terms Used in this Unit

- Over-population
- Resource Consumption
- Water access
- Electrification
- Literacy
- Environmental Hazards
- Freedom
- Standard of Living
- Greenhouse gases
- Disease
- Global warming
- Climate Change
- Biodegradable plastics
- Pollution
- Deforestation
- Biodiversity
- Sustainability
- Transport
- Conservation



Population and Resources - Global population rises to 8 billion  
This places added pressures on our resources.

Which resources do humans need?



Cities in developed countries

Here we struggle to find enough space within cities for new housing. House prices have become extremely expensive.

New housing is spreading into the green fields that surround our towns and cities. This places added pressures to our natural systems.

Compare old and new maps of Norwich - how has the city changed over time?



Food and water resources

We continue to throw away large quantities of food resources while food banks and global food poverty continues.

What factors affect prices on the shelves?



Ocean pollution

Large areas of the Pacific Ocean have formed islands of floating waste. This is a global problem.

How could this affect wildlife and humans?

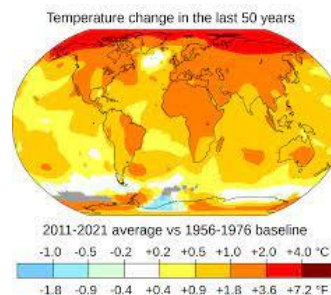
Climate Change

Possibly the greatest challenge facing mankind today.

As global climate changes it has many impacts. Can you name areas of the world that are at risk from:

- Rising sea levels
- Forest fires
- Reduced food production
- Extreme weather
- Species extinctions

CHALLENGE:  
EXPLAIN how these areas are being impacted



Water Security

Issues of water quality and insufficient quantity continue to affect large areas of the world.

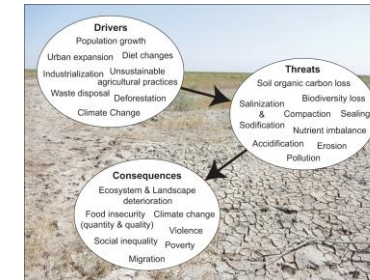
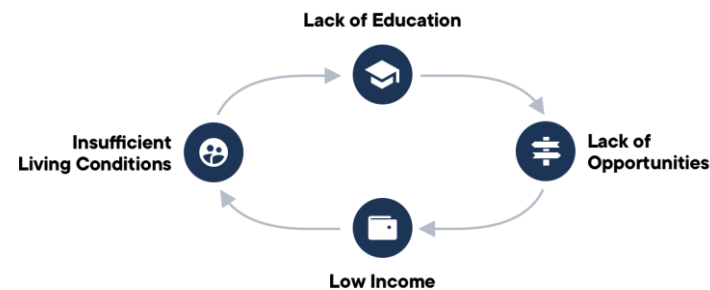
Many areas lack adequate sanitation.

How does this affect peoples everyday lives?



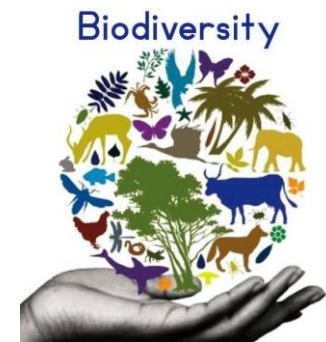
Poverty Cycle

Why is learning and education so valued in the developing countries?



Species loss

We live in times when species loss is increasing. Why?



Soils - the forgotten resource!

Wars have been fought over soil! And yet modern farming methods continue to degrade the soil. Ancient farming methods are being revived along with natural plant based soil improvements but is it too late?

Energy production

Using fossil fuels is no longer cheap and renewable energy prices have fallen this means that western economies are transitioning, however large parts of the world are dependent on oil and gas still.

It is a global challenge to reduce fossil fuel use and emissions of CO2 - but why is this so difficult?



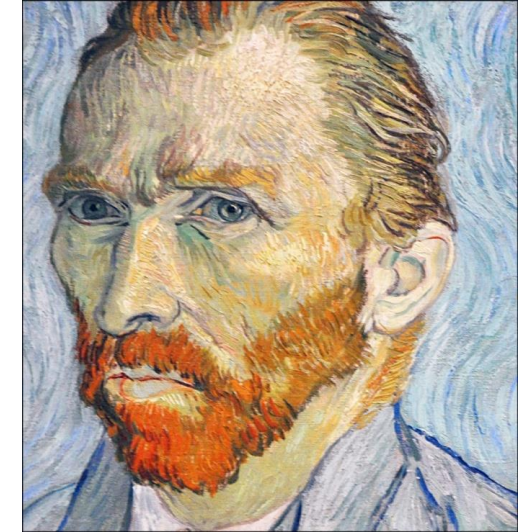
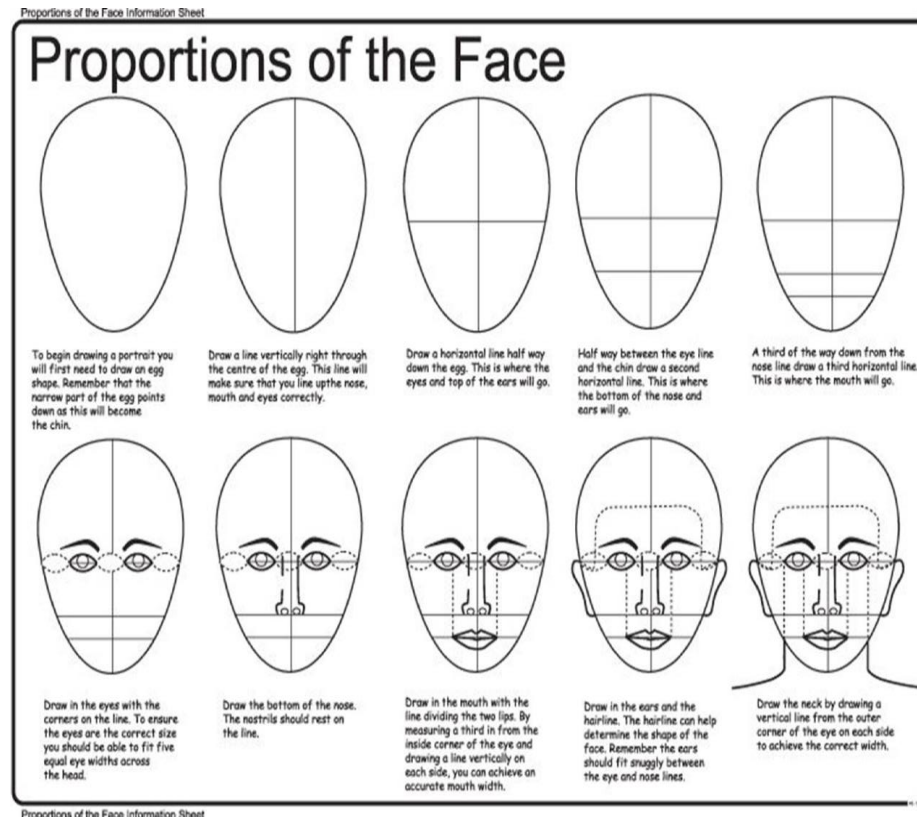


## Overview:

To create a self-portrait that has both realistic and stylised elements.

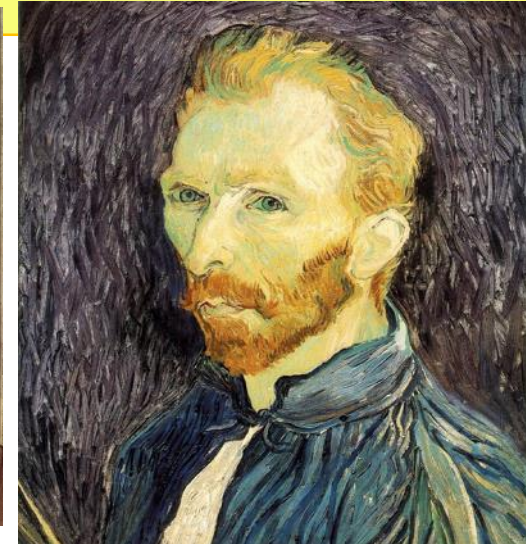
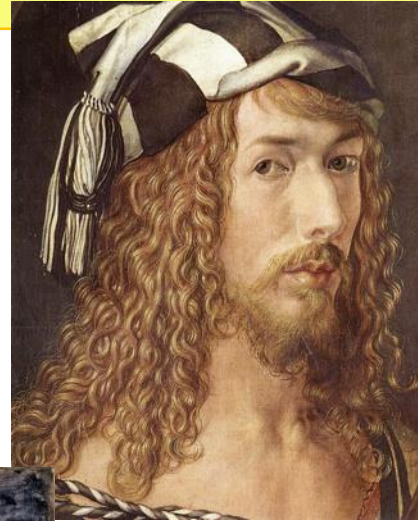
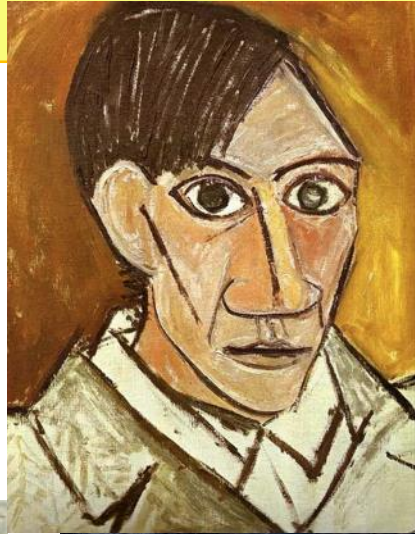
To demonstrate the portraiture and mixed media skills you have learned so far this year in Art.

This diagram shows the rough proportions of the human face. You will learn about this and how to draw facial features like the Eyes below:





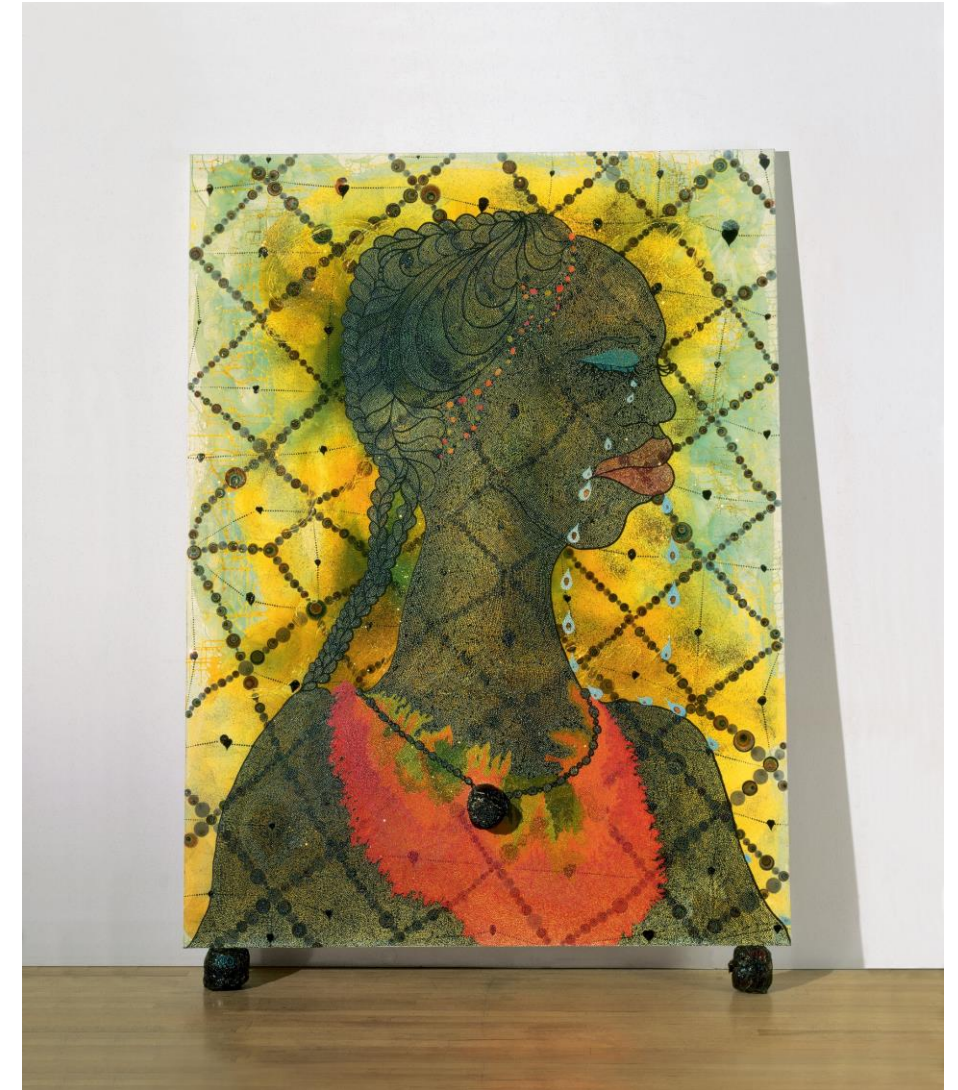
# PORTRAITS self or not? Year 9







**PORTRAITS CAN BE REALISTIC.... Or  
..... ABSTRACT**

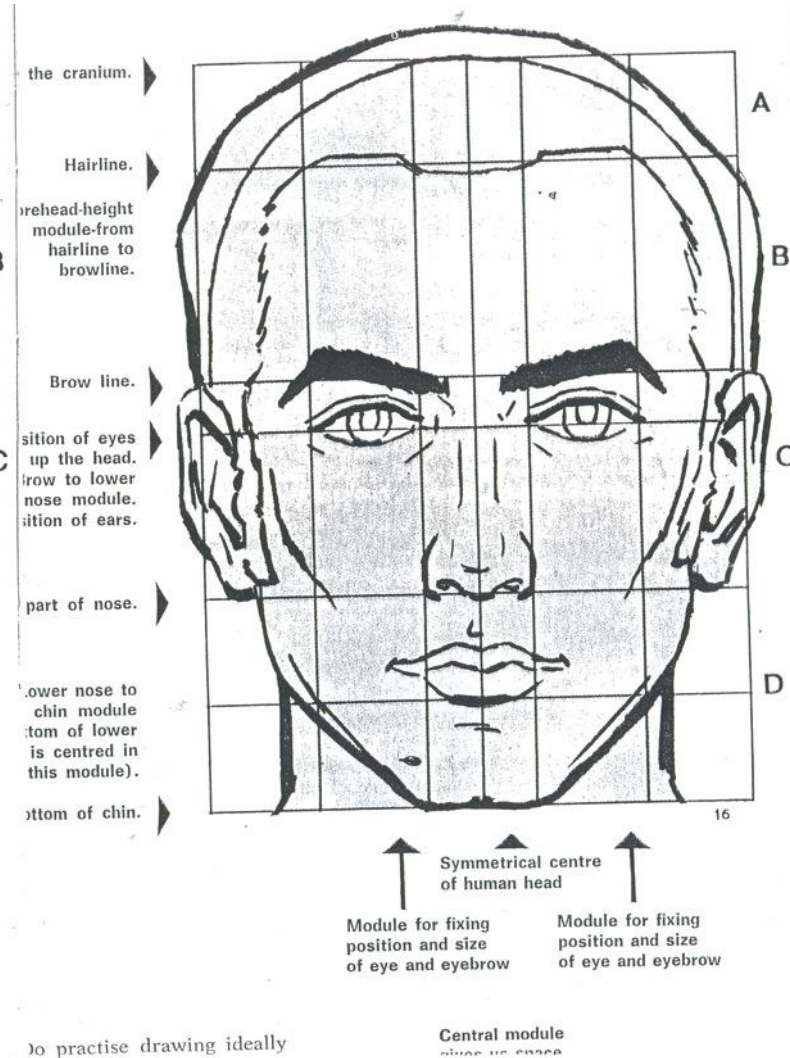
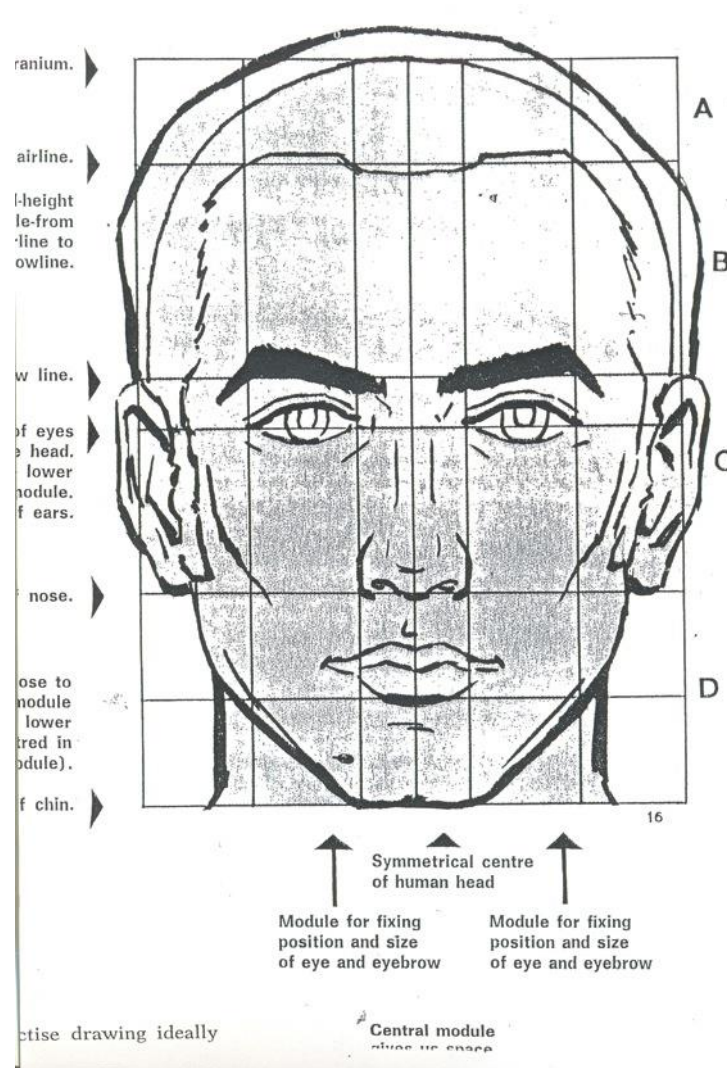


Chris Ofili

"No Woman, no cry"



# How do you draw the human face?







## Module 4: Klassenreisen machen Spaß! (School

Here is the vocabulary you will need for Stimmt 2, Module 4. trips are fun!)

Remember, you can hear the German pronunciation by clicking on the **Soundfile** links on the electronic version of this KO.

### In der Jugendherberge

#### • In the youth hostel

die Hausordnung	<i>rules of the house</i>
Man muss vor 22:00 Uhr ins Bett gehen.	<i>You have to go to bed before ten o'clock.</i>
Man muss das Bett machen.	<i>You have to make the bed.</i>
Man muss das Zimmer sauber halten.	<i>You have to keep the room clean.</i>
Man muss vor acht Uhr aufstehen.	<i>You have to get up before eight o'clock.</i>
Man muss abwaschen.	<i>You have to wash up.</i>
Man darf nicht rauchen.	<i>You must not smoke.</i>
Man darf nicht im Zimmer essen.	<i>You must not eat in the room.</i>
Man darf keine laute Musik hören.	<i>You are not allowed to listen to loud music.</i>

In this Module you will learn how to:

- talk about typical breakfasts
- discuss typical German food
- understand and use recipes
- talk about healthy lifestyles
- understand and respond to longer texts
- describe and compare dinner parties

[www.textivate.com](http://www.textivate.com)

Username: openacademy

Password: surname800

Go to 'my resources' to find your work.



[Soundfile](#)



[Soundfile](#)

### Der Tagesablauf • Daily routine

Ich stehe auf.	<i>I get up.</i>
Ich wasche mich.	<i>I get washed.</i>
Ich dusche mich.	<i>I have a shower.</i>
Ich ziehe mich an.	<i>I get dressed.</i>
Ich frühstücke.	<i>I have breakfast.</i>
Ich gehe aus.	<i>I go out.</i>
Ich komme zurück.	<i>I come back.</i>
Ich esse zu Abend.	<i>I have dinner/the evening meal.</i>
Ich gehe ins Bett.	<i>I go to bed.</i>

### Um wie viel Uhr? • At what time?

um ... Uhr	<i>at ... o'clock</i>
um fünf/zehn/zwanzig nach ...	<i>at five/ten/twenty past ...</i>
um fünfundzwanzig vor ...	<i>at twenty-five to ...</i>
um Viertel nach ...	<i>at quarter past ...</i>
um Viertel vor ...	<i>at quarter to ...</i>
um halb acht	<i>at half past seven</i>



[Soundfile](#)



[Soundfile](#)

### Wie komme ich zum/zur ...?

#### • How do I get to the ...?

Geh/Geht/Gehen Sie ...!	<i>Go ...!</i>
(nach) links	<i>(to the) left</i>
(nach) rechts	<i>(to the) right</i>
geradeaus	<i>straight on</i>
Nimm/Nimmt/Nehmen Sie ...!	<i>Take ...!</i>
die erste Straße links	<i>the first street on the left</i>
die zweite Straße rechts	<i>the second street on the right</i>
Geh an der Ampel links!	<i>Go left at the lights.</i>
Geh an der Kreuzung rechts!	<i>Go right at the crossroads.</i>
der Bahnhof	<i>station</i>
der Park	<i>park</i>
die Bushaltestelle	<i>bus stop</i>
die Kirche	<i>church</i>
das Schwimmbad	<i>swimming pool</i>
das Hallenbad	<i>indoor swimming pool</i>
das Museum	<i>museum</i>
der Markt	<i>market(place)</i>
der Lehrer	<i>teacher (male)</i>
die Lehrerin	<i>teacher (female)</i>
das Souvenirgeschäft	<i>souvenir shop</i>
die Imbissstube	<i>snack bar</i>
das Eiscafé	<i>ice cream parlour</i>
vor dem/der ...	<i>in front of the ...</i>
Entschuldigung/Bitte, ...	<i>Excuse me, ...</i>
Danke (sehr/schön)./ Vielen Dank.	<i>Thank you very much.</i>
Bitte (sehr/schön).	<i>You're welcome./</i>
Nichts zu danken.	<i>Don't mention it.</i>



### Auf einem Fest • At a festival

der Umzug(–e)	procession, parade
der Festwagen(–)	float (in a parade)
die Band(s)	band, group
das Kostüm(e)	costume, outfit
der Hut(–e)	hat
die Fahne(n)	flag
die Kirmes(sen)	funfair
das Fahrgeschäft(e)	ride (at funfair)
der Imbiss(e)	snack
bunt	colourful
traditionell	traditional
der Trick(s)	trick
das Handy(s)	mobile phone
die Haare (pl)	hair
die Schuhe (pl)	shoes

Read the Strategy Box to improve your accent.



[Soundfile](#)



[Soundfile](#)



### Oft benutzte Wörter

#### • High-frequency words

zu (zum/zur)	to (to the)
vor	before, in front of
groß	big
lang	long
laut	loud
lecker	tasty
schön	nice, beautiful
toll	great
Das macht Spaß.	That's fun.
Das hat Spaß gemacht.	That was fun.

### Strategie 4

#### Improving your pronunciation

By now, you should have a good idea of how German words are pronounced, but it is always good to practise. The vowels often cause problems, especially when there are two together. Link the words to the key phonics you learned in *Stimmt! 1* and say them out loud.

**au** – *sauber* as in *Haus*

**ei** – *Klassenreise* as in *Eis*

**ie** – *Viertel* as in *Biene*

**eu** – *Kreuzung* as in *Freund*

But note that **Museum** is a foreign word (from Latin) and the **e** and **u** are pronounced separately (like 'moo-zay-um').

Sometimes it's hard to recognise that a word is actually made up of two or more words joined together. Each part of the word is said separately. For example, by themselves **gerade** means 'straight' and **aus** means 'out'. Join them together and you have **gerade|aus** (straight on) – written as one word, but sounded as two. Similarly, there's a triple **s** in **Imbiss|stube** – the double **s** belongs to **Imbiss** and the other **s** belongs to **stube** – so it is said as two words.

You will recognise some parts of compound words, but with some new words you'll just have to listen carefully and imitate the pronunciation.

Key words	
<b>Tsar</b>	Monarch or emperor of Russia
<b>Autocracy</b>	A political system where the country is ruled by one monarch who holds all political power
<b>Revolution</b>	A sudden and significant change to the political system in a country, usually involving the overthrow of the previous government or ruler
<b>Bolshevik</b>	Name of the Russian Communist Party who take control of Russia in 1917
<b>Lenin</b>	Leader of the Bolsheviks until his death in 1924
<b>1905 Revolution</b>	Russia's first Revolution in which the Tsar's power is threatened but survives with some minor changes
<b>February Revolution</b>	Takes place in 1917 and sees the overthrow of the Tsar and his replacement with the 'Provisional Government'
<b>October Revolution</b>	Takes place in 1917, led by the Bolsheviks, and sees the overthrow of the Provisional Government
<b>Jack the Ripper</b>	Nickname given to a serial killer who killed at least five prostitutes in Whitechapel in 1888
<b>Whitechapel</b>	The very poor area of London in which 'Jack the Ripper' carried out his murders.

## Russia in 1905

By 1905, the vast majority of Russia was still a backward country mostly based on farming. Peasants worked hard and were often vulnerable to famine and disease. However, they were very religious and very loyal to the Tsar of Russia.

In 1905 Russia had its first Revolution. Although the protesters mostly did not wish to overthrow the Tsar they did demand some changes. This had 3 main causes:

- Ongoing poverty and inequality in Russia, and as inflation, hunger and taxation increased the peasants began to protest
- The Russian army/navy were humiliated by the Japanese in the Russo-Japanese war, so people were angry and some blamed the Tsar
- Bloody Sunday was a protest in the capital city of St. Petersburg where the Tsar ordered his troops to shoot the protesters

Despite a large amount of opposition in 1905, Tsar Nicholas II was able to survive and introduce only very limited changes.

However, in 1917 there were two revolutions in Russia that changed the country forever. On the right are some of the key features of both.

February 1917 Revolution	October 1917 Revolution
Caused by the Tsar's failure to end the war despite its effects on the Russian people.	Caused by the Provisional Government's failure to end the war, despite promising they would.
Caused by increasing demands for democracy in Russia by many different political groups.	Caused by the actions of the Communists who wanted Russia to become a Communist country.
Caused by ongoing poverty and suffering in Russia.	Caused by ongoing poverty and suffering in Russia.
Led to the creation of a Provisional Government who planned to bring in free elections	Led to the replacement of the Provisional Government with a Communist government
Although they imprisoned much of their opposition, the Government eventually lost control and the Bolsheviks took power	Once in power, the Bolsheviks fought the Russian Civil War against those who wanted the Tsar to return. They won and remained in power.

### 'Jack the Ripper'

In Whitechapel in 1888 the murders of five prostitutes were strongly suspected to be the work of a single person. Although the murderer was never caught, he was given the name 'Jack the Ripper'.

The murders took place in the area of Whitechapel, London. It was possible for the killer to escape partly because the crime rate in Whitechapel was so high.

Prostitutes were often victims of violent crime; they were alone with men, spent a lot of time out at night and many had no family able to protect them.

#### The victims

1. Mary Ann Nichols— 31st August 1888

Mary was found dead in the middle of the street. She had had her throat cut and her belly sliced open.

2. Annie Chapman— 8th September 1888

Annie Chapman was found in a yard, again with her throat cut and her belly sliced open. The fact that many people were close by suggests the killer was silent. Elizabeth Long reported seeing Annie talking to a foreign gentleman with a shabby genteel appearance.

3. Elizabeth Stride— 30th September 1888

Elizabeth Stride was found dead in a pub back yard. Her throat had been cut however the killer had been disturbed before he could mutilate her body. This seemed to anger him and he went in search of another victim.

4. Catherine Eddowes— 30th September 1888

Later that same night Catherine Eddowes was murdered in Mitre Square. The killer was clearly frustrated by his earlier failure as the cuts were deeper and more frantic than the others.

5. Mary Jane Kelly— 9th November 1888

This was the most gruesome of the murders. Mary Kelly invited the murderer back to her home where the murder took place. Jack the Ripper spent hours mutilating her body. This was the most gruesome murder by far.

#### Why wasn't the killer caught?

It is likely that, had he been around today, Jack the Ripper would have been caught. However there were several reasons why he was able to get away with it.

Some of these have to do with the failures of the Police at the time:

- The police ignored and sometimes destroyed key evidence, such as writing on Catherine Eddowes' wall (a crime scene)
- The two police forces involved did not communicate well with each other
- The police offered no reward for information
- Much of the evidence the police used came from unreliable witnesses

However, there were also factors outside of Police control:

- Whitechapel was like a maze which made it easy for criminals to hide and escape
- The press were very critical of the police and mocked even some of their sensible tactics
- Many fake letters were sent to the police, claiming to be from the killer.



**Vocabulary to learn**

Identify  
Explain  
Evaluate  
Extent  
Statement  
Perspective  
Writer's craft  
Descriptive  
Discursive  
Non-fiction  
Fiction  
Article  
Report  
Speech  
Letter  
Formal  
Informal  
Protest  
Rebellion  
Segregation  
Prejudice

Links to news sights for vocab and form revision

<https://www.bbc.co.uk/news>

<https://www.independent.co.uk/>

**Structure analysis checklist:**

- Zoom in/out
- Repetition of an image/idea
- Links and connections between paragraphs
- Shifts:
  - inside to outside (and vice versa)
  - focus
  - time
  - topic
  - setting/place
  - mood/atmosphere
  - description to dialogue (and vice versa)

**Language analysis checklist:**

- Link to task
- Relevant quote
- Meaning of quote
- Method named
- Effects explained
- Word zoomed in on
- Meaning of word
- Implied meanings
- Aim higher: layers of meaning

**Evaluate**

- The impressions you have of the text in relation to a statement
- The methods the writer has used to create these impressions
- How the particular **methods** create these impressions

**Methods**

- **Linguistic devices** – *simile, metaphor, personification, repetition, rhetorical question etc.*
- **Word choices** – *nouns, adjectives, verbs, adverbs etc.*
- **Sentence forms** – *fragment, simple, compound, complex*

**Checklist:**

1. Capitals
2. Full stop .
3. Exclamation !
4. Question ?
5. Comma ,
6. Apostrophe '
7. Ellipsis ...
8. Semi colon ;
9. Colon :

**Descriptor from GCSE assessment criteria**

Level 4: simple vocabulary  
Bad Good Light Happy

Level 5: effective vocabulary  
Negative Positive Bright Jolly

Level 6: sophisticated vocabulary  
Awful Fantastic Brilliant Ecstatic

Levels 7-9: ambitious vocabulary  
Immoral Virtuous Dazzling Elated

**Persuasive techniques**

- Rhetorical questions – poses a question that begs to be agreed with
- Lists – a number of things broken up with commas or semi-colons
- Using 3 – using 3 reasons makes it sound like there could be even more
- Hyperbole - exaggeration
- Alliteration – same sounds close together (catchy/memorable)
- Repetition – makes it memorable
- Personal pronouns – you, I, we (speaks to the person reading/listening)
- Direct address – as above
- Imperatives – commanding words e.g. must, will.
- Emotive language – tugs on the readers'/audiences' heartstrings
- Incentives – reasons why that benefit the reader/audience
- Anecdote – personal stories
- Metaphor – comparison to create an image for the reader/audience

## Tasks

- **What, who, why and when:** What do you think the article on the next page (source A) is describing? Who are the subjects of the article? Why has it been written? When do you think it was written?
- Using Source A, write to explain how the article links to the theme of protest? Look at language and structure as well as the content of the article.
- Imagine you are living at the time the article was written. Write a response to Source A, explaining your views on the institution and the treatment of its patients.
- **What, who, why and when:** What do you think the speech on the subsequent (next) page (Source B) is describing? Who are the subjects of the speech? Why has it been written? When do you think it was written?
- How does Source B compare to Source A? Does the writer/speaker have a different purpose for their writing? Consider the structure. Is their intended audience the same as Source A? Are there similarities in the content? Write to explain. Aim higher by using quotes to support your impressions and comparisons.
- Write your own speech in protest of something that you feel is unjust. This could be the representation of people of colour in film or the inclusion of the LGBTQ+ community in modern literature. You can choose whatever topic you feel strongly about, but you must include your feelings of injustice in relation to it. Use the persuasive techniques box on the first page to create a strong impact and affect your audience.

## Source A:

Female hysteria was once a common medical diagnosis for women. It is no longer recognized by medical authorities as a medical disorder. Salpetriere was a hospital which in the C19th held female hysteric patients. This is an account of a visit to that hospital.

The Parisian asylums are old buildings, constructed at a period when very different ideas were entertained of the architectural necessities of such establishments: secondly, that they possess a very insufficient acreage. These disadvantages, it is only fair to bear in mind, in judging their condition; their influence is felt beyond their direct effects, for they act indirectly by discouraging the attempts of the medical officers to carry out an effective system of treatment. No one regrets more, I am sure, than do many of these physicians, that they are thus cramped by the character of the buildings and grounds devoted to their patients... Making every allowance, however, I candidly confess that I was disappointed in the Paris asylums; and I think any reader of the works of Esquirol, Georget, Scipio, Pinel, &c., would be led to form a much higher estimate of the system of treatment pursued by the French than is actually the case...

Only one opinion prevailed among the Parisian doctors on the Non-Restraint System; they all regarded "Restraint" as necessary and beneficial. The well-known and excellent Dr. Falret, in conducting me over his division of the Salpêtrière, spoke in decided terms...

I found a very considerable number restrained by the camisole at Salpêtrière, Bicêtre, and Charenton. Some of these were also confined by straps, to a chair...

In Dr. Falret's division at the Salpêtrière I was much interested in the day room for the tranquil, in which were seated a large number of women engaged in sewing, and looking very clean, well dressed, and comfortable. On one occasion they sung, and recited many poetical pieces committed to memory for the purpose – Dr. Falret present and encouraging them by signs of approbation. Several tunes were also played on the piano. This was a highly interesting exhibition, and reflected credit on Dr. Falret who introduced these exercises.



Source B:

**Ed Milliband Speaking to the Royal College of Psychiatrists**

It is excellent to be here with you today at the Royal College of Psychiatrists.

I spoke a few weeks ago in Manchester about the future of our country.

About the huge challenges Britain faces, as we attempt to rebuild our economy and create a stronger society.

A country where everybody has a stake, where prosperity is fairly shared and where we protect and improve the institutions that bind us together.

I called this approach “One Nation”.

One Nation means nobody is left out, or written off.

Because it is wrong.

And we can't succeed as a country if that's what we do.

And today I want to talk about one of the most serious challenges our country faces.

One that writes people off in just that way.

Affecting:

North and south.

Rich and poor.

Old and young.

Those who work and those who can't.

Disabled and non-disabled people.

A problem that can strike anyone.

It blights millions of lives.

And undermines the welfare of our nation.

And it is also a challenge that affects our competitiveness as a country.

That places a huge strain on our public services.

And that costs our economy tens of billions of pounds a year.

From the people living with schizophrenia and bipolar disorder to those fighting bouts of depression and panic attacks.

Now, you would think a widespread and important challenge like this would be something we that it would be top of the political agenda.

That every leading politician would be obliged to address to it.

That we would be falling over each other, as we do, to prove that we had a solution.

But that doesn't tend to happen.

For far too long leading politicians from all parties, including my own, have maintained an almost complete silence about mental health.

Only in emergencies and at the extreme end of conditions do we tend to talk about the issue.

Now there will be some people who say that mental health is the kind of subject we can talk about in the good times, but not when the economy is such a priority.

In my view, that is the opposite of the truth.

Because mental health is an economic challenge holding back prosperity.

Because however hard the economic challenges, we cannot forget about people's quality of life.

And, finally, if we want a politics that talks directly to the challenges that British people face in their everyday lives, we cannot allow the silence to continue.

Taboo

And it's not just politics that is too silent.

It is a taboo running across our society which infects both our culture and our politics.

It is a taboo which not only blights the lives of millions but also puts severe strain on the funding of our NHS and threatens Britain's ability to pay our way in the world.

It is a taboo which must be broken if we are to rebuild Britain as One Nation.

Mental health is subject we all, whoever we are, still instinctively avoid.

At home, in the workplace and in our communities, it tends to be brushed under the carpet.

Teachers and our parents are unlikely to talk to us about mental illness when we are young.

And we all fear the unknown.

Today in 2012, far too many people in this country still feel as if they have to pretend they have something else wrong with them when they are struggling with depression.

People can be scared to tell their boss.

Intimidated by the culture that still surrounds mental illness.

Scared into silence.

## What do I need to be able to do?

By the end of this unit you should be able to:

- Recognise enlargement and similarity
- Enlarge a shape by a positive SF
- Enlarge a shape from a point
- Enlarge a shape by a fractional SF
- Work out missing sides and angles in a pair of similar shapes.

## Keywords

**Similar Shapes:** shapes of different sizes that have corresponding sides in equal proportion and identical corresponding angles.

**Scale Factor:** the multiple describing how much a shape has been enlarged

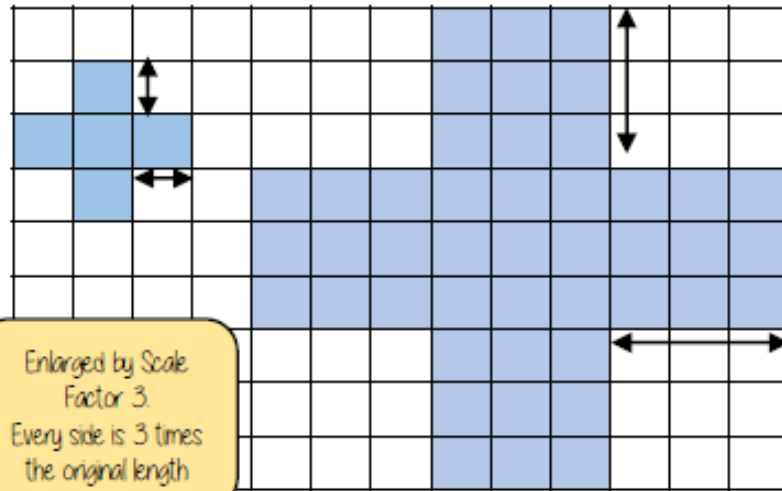
**Enlarge:** to change the size of a shape (enlargement is not always making a shape bigger)

**Corresponding:** objects (or sides) that appear in the same place in two similar situations.

**Image:** the picture or visual representation of the shape

## Enlarge by a positive scale factor

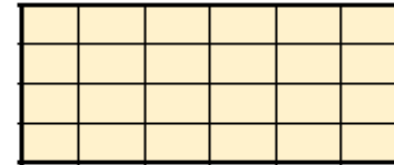
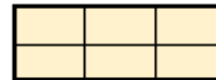
With a scale factor larger than 1 it makes the shape bigger



## Recognise enlargement & similarity

Shapes are similar if all pairs of corresponding sides are in the same ratio

These shapes are similar because all sides are increased by the same ratio



Enlargements are similar shapes with a ratio other than 1

Similar  
Shapes



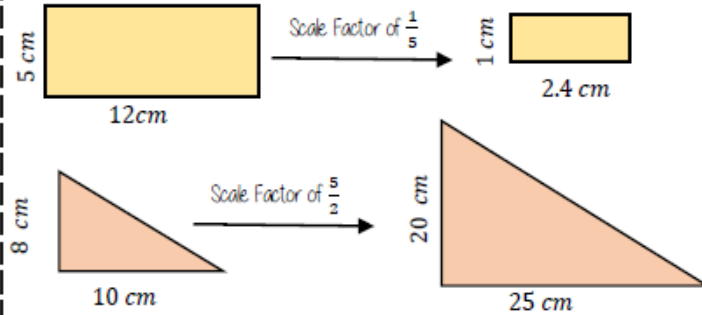
Enlargement  
(No Centre)





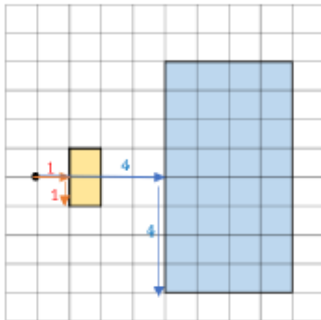
### Positive fractional scale factor

With a scale factor between 0 and 1 it makes the shape smaller



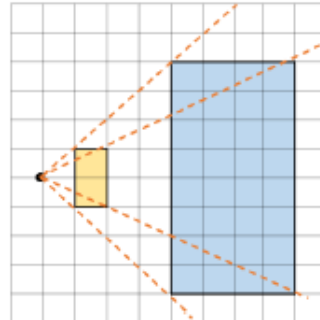
### Enlarge a shape from a point

Scaled distances method



Scale the distance between the point of enlargement and each corresponding vertices

Rays method

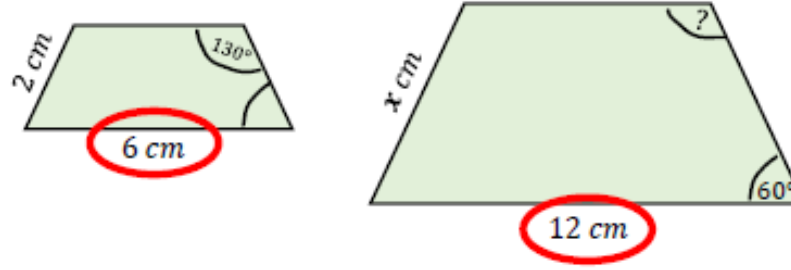


Multiply the distance from the centre of corresponding vertices by the scale factor along the ray

### Calculations in similar shapes

Don't forget that properties of shapes don't change with enlargements or in similar shapes

The two trapezium are similar find the missing side and angle



Corresponding sides identify the scale factor

$$\frac{12}{6} = 2$$

Scale Factor = 2

Calculate the missing side

Length (corresponding side)  $\times$  scale factor

$$2\text{ cm} \times 2$$

$$x = 4\text{ cm}$$

Enlargement does not change angle size

Calculate the missing angle

Corresponding angles remain the same  
 $130^\circ$

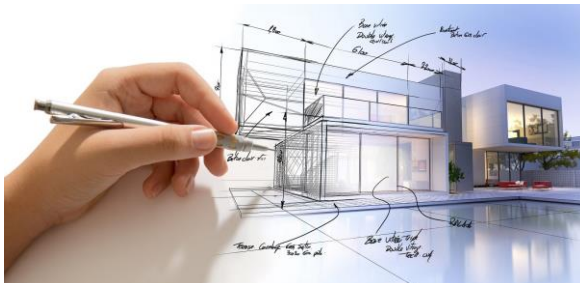
Fractional Scale Factor



Enlargement (with a centre)



Calculations in Similar Shapes



A job that relies on geometry:

An Architect

Architects design buildings and other structures.

Buildings must be not only attractive, but also safe and functional. Architects may be involved in all phases of development, from the first discussion with the client through to construction. Architects sometimes specialize in the design of one type of building, such as hospitals or homes.

# YEAR 9 — REASONING WITH GEOMETRY... Solving ratio & proportion problems

## What do I need to be able to do?

By the end of this unit you should be able to:

- Solve problems with direct proportion
- Use conversion graphs
- Solve problems with inverse proportion
- Solve ratio problems
- Solve 'best buy' problems

## Keywords

**Proportion:** a comparison between two numbers

**Ratio:** a ratio shows the relative size of two variables

**Direct proportion:** as one variable is multiplied by a scale factor the other variable is multiplied by the same scale factor.

**Inverse proportion:** as one variable is multiplied by a scale factor the other is divided by the same scale factor.

## Direct Proportion

As one variable changes the other changes at the same rate.



4 cans of pop = £2.40

$\times 0.5$  4 cans of pop = £2.40  
 $\times 0.5$  2 cans of pop = £1.20

This multiplier is the same  
In the same way that this  
would be for ratio

This is a multiplicative change

$\times 3$  4 cans of pop = £2.40  
 $\times 3$  12 cans of pop = £7.20

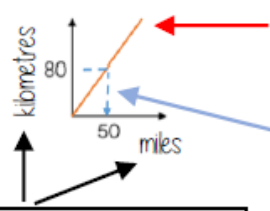
Sometimes this is easiest  
if you work out how much  
one unit is worth first  
e.g. 1 can of pop = £0.60

R

## Conversion Graphs

Compare two variables

R



This is always a straight line because as one variable increases so does the other at the same rate.

To make conversions between units you need to find the point to compare — then find the associated point by using your graph.  
Using a ruler helps for accuracy  
Showing your conversion lines help as a "check" for solutions

Labelling of both axes  
is vital

Recipes



Proportion  
Problems



Conversion  
Graphs



Currency  
Conversions



## Inverse Proportion

As one variable is multiplied by a scale factor the other is divided by the same scale factor

Examples of inversely proportional relationships

Time taken to fill a pool and the number of taps running

Time taken to paint a room and the number of workers

T is inversely proportional to G. When T=2 then G=20

T	1	2	8
G	40	20	5

$\div 2$  (from 1 to 2)  
 $\times 4$  (from 2 to 8)  
 $\times 2$  (from 40 to 20)  
 $\div 4$  (from 20 to 5)

## Best Buys

Have a directly proportional relationship

To calculate best buys you need to be able to compare the cost of one unit or units of equal amounts



Shop A

4 cans for £1.20

$$\downarrow \quad \text{£1.20} \div 4$$

1 can is £0.30  
Or 30p

Shop B

3 cans for 93p

$$\downarrow \quad \text{£0.93} \div 3$$

1 can is £0.31  
Or 31p

Cost per item

Shop A is the best value as it is 1p cheaper per can of pop



Shop A

4 cans for £1.20

$$\downarrow \quad 4 \div \text{£1.20}$$

£1 buys 3.333 cans of pop

Shop B

3 cans for 93p

$$\downarrow \quad 3 \div \text{£0.93}$$

£1 buys 3.23 cans of pop

Cost per pound

Shop A is still shown as being the best value but pay attention to the unit you are calculating, per item or per pound

Best value is the most product for the lowest price per unit

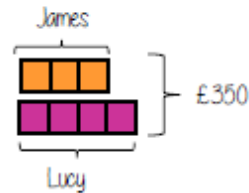
## Sharing a whole into a given ratio

James and Lucy share £350 in the ratio 3:4. Work out how much each person gets

Model the Question

James: Lucy

3:4



Find the value of one part

Whole: £350

7 parts to share between (3 James, 4 Lucy)

$$\text{£350} \div 7 = \text{£50}$$

□ = one part = £50

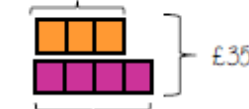
Put back into the question

James: Lucy

3:4

£150:£200

$$\text{James} = 3 \times \text{£50} = \text{£150}$$



$$\text{Lucy} = 4 \times \text{£50} = \text{£200}$$

## Finding a value given 1:n (or n:1)

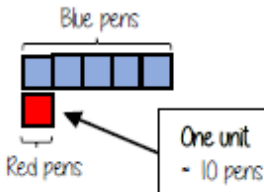
Inside a box are blue and red pens in the ratio 5:1. If there are 10 red pens how many blue pens are there?

Model the Question

Blue: Red

5:1

□ = one part = 10 pens



Put back into the question

Blue: Red

5:1

50:10

$$\text{Blue pens} = 5 \times 10 = 50 \text{ pens}$$



$$\text{Red pens} = 1 \times 10 = 10 \text{ pens}$$

There are 50 Blue Pens

A job that relies on geometry:

A Chef

## Chef Responsibilities Include

- Ensuring that all food is of excellent quality and served in a timely manner.
- Planning the menu, keeping in mind budget, and availability of seasonal ingredients.
- Coordinating kitchen staff, and assisting them as required.
- Training staff to prepare and cook all the menu items.
- Taking stock of ingredients and equipment, and placing orders to replenish stock.

Inverse Proportion



Best Buys



Sharing in a ratio



Ratio in the form 1:n





# YEAR 9 — REASONING WITH GEOMETRY...

## Rates

### What do I need to be able to do?

By the end of this unit you should be able to:

- Solve speed, distance, time questions
- Use distance time graphs
- Solve density, mass, volume problems
- Solve flow problems
- Use flow graphs
- Interpret rates of change and their units

### Keywords

Convert: change

Mass: a measure of how much matter is in an object. Commonly measured by weight.

Origin: the coordinate (0, 0)

Volume: the amount of 3D space a shape takes up

Substitute: putting numbers where letters are — replacing numbers into a formula

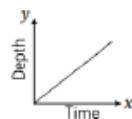
### Flow problems & graphs



This will fill at a constant rate, then as the space decreases it will speed up and the neck of the bottle fill at a faster constant speed



The cylinder will fill at a constant speed



Units are important.  
Ensure any volume  
calculations are the same unit  
as the rate of flow

### Rates of change & units

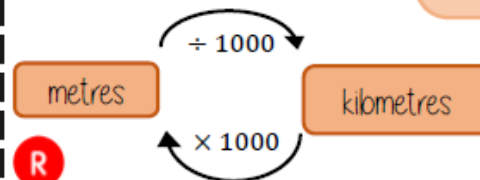
Common rates of change relationships

Revisit your conversions between units of length and capacity

Speed: miles per hour

Exchange rates: euros per pounds

Density: mass per volume



Converting  
Units



Converting  
Area



Converting  
Volume



Rate of  
Change

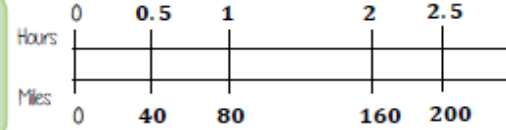


## Speed, Distance, Time

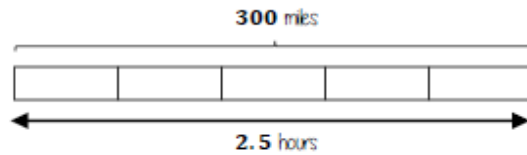
'per' for every  
e.g. 80 miles per hour (mph)  
Travel 80 miles every hour

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

You can use a  
double number  
line to help you  
calculate distance



e.g. A boat travels at a constant speed for 2.5 hours.  
It travels 300 miles.



Bar models  
can help to  
calculate mph

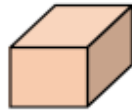
Each part is half  
an hour  
Each part is 60  
miles

## Density, Mass, Volume

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

$$\text{volume} = \frac{\text{mass}}{\text{density}}$$

$$\text{mass} = \text{volume} \times \text{density}$$



volume of prism = Area of cross section  $\times$  Depth

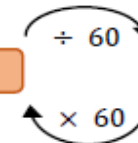


## Speed, Distance, Time

Before calculations – make sure you are  
working in the same units as the speed

Learn or learn how to  
rearrange the formula for  
speed, distance and time

Substitute in the variables given



$$\text{time} = \frac{\text{distance}}{\text{speed}}$$

$$\text{distance} = \text{speed} \times \text{time}$$

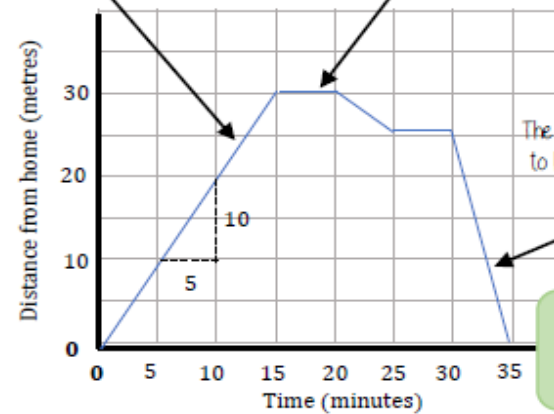
## Distance – Time graphs

The steeper a gradient the faster  
the speed

$$\frac{10}{5} = 2 \text{ metres per min}$$

$$\text{Gradient} = \text{speed}$$

Horizontal lines represent staying still



The distance coming closer  
to home shows the return  
journey

Units are  
important.  
Meters per minute

Speed Distance  
Time



Density Mass  
Volume



Distance Time  
Graphs



Gradient



A job that relies on  
this area of maths

**Mechanical  
Engineer**

Mechanical engineering is a branch of engineering that applies the principles of Mechanics and Materials science for analysis, design, manufacturing, and maintenance of mechanical systems. It involves the production and usage of heat and mechanical power for the design, production, and operation of machines and tools. They can vary from building a rocket ship all the way down to a modern car. It is one of the oldest and broadest engineering disciplines.

## Year 9 RS: Is it ever right to fight?

Key words	
Peace	A state of mutual harmony between people and countries.
Ahimsa	The principle of non-injury to all living things.
Just War Theory	This is a war that is fought in a fair and noble way.
Jihad	A struggle or fight against the enemies of Islam.
Greater Jihad	A struggle with oneself to be a good Muslim
Lesser Jihad	A struggle with oneself and the rest of the world.
War	A state of conflict and tension between countries.
Pacifism	Not believing in violence.

‘A kind word with forgiveness is better than charity followed by injury’ *Surah, Qur’an 2:263*

‘If anyone does evil or wrongs his own soul, but afterwards seeks God’s forgiveness, he will find God often forgiving, Most Merciful.’

*Surah , Qur’an 4:110*

‘Be forgiving and control yourself in the face of provocation; give justice to the person who was unfair and unjust to you; give to the one who did not help you when you were in need, and keep fellowship with the one who did not care about you.’ *Hadith*

### Christian Teachings on War and Peace.

In the Old Testament in the Bible God commanded the Israelites to fight against nations that had sinned against Him. These were called ‘holy wars’ because they were against nations who had blasphemed about the Israelite God ‘Yahweh’.

In the Bible a shepherd boy David killed a giant called Goliath with a small slingshot. Goliath had publicly provoked the Israelites and defied God’s name, and David stepped forward to challenge him. This ended the battle and showed God’s power, might and glory to the rest of the nation. Sometimes, fighting can be the lesser of two evils, to defeat evil and encourage peace. In the New Testament Jesus believed in peace and love, he did not encourage people to fight or wage war on each other. War encourages people to be selfish and inflict physical and mental suffering on each other. War leads to a breakdown of trust and love between humans and it brings nothing but misery for everyone involved. Jesus was a pacifist (he believed in peace) and said whoever uses violence to get what they want will have violence done against them. He told Christians they must: “Love your neighbour as yourself.” This means loving and showing forgiveness when someone does something wrong rather than seeking revenge. The Bible seems to give two messages about war. In the Old Testament God was instructing his people to attack and kill their enemies and quote, “An eye for an eye and a tooth for a tooth.”



Muslim Teachings on War and Peace.

The Arabic word for struggle is jihad. All Muslims have a daily struggle or Jihad to make society perfectly Muslim. This includes struggling with yourself and your desires and not fighting. This is the greater jihad.

The lesser jihad is the struggle with forces outside yourself by means of war.

Muslims call wars fought in the name of Allah a Jihad or Holy War.

What are the rules/limits for Muslims?

It must be a last resort – all non-violent methods to solve the problem must have been tried. It must be authorised and led by a Muslim authority. It must be fought in such a way as to cause the minimum amount of suffering.

Innocent civilians (especially the old, the young, and women) must not be attacked.

It must be ended as soon as the enemy lays down their arms.

This shows that God encouraged revenge for things that were done against someone's wishes. However, in the New Testament Jesus said he had come to bring peace and no good could ever come from violence. Jesus also said, "Those who live by the sword shall die by the sword." Patience, forgiveness and love were the only ways to deal with violence and war. This is the point of view most Christians try to follow.

Some Christians, however, feel there are certain conditions that can lead to war being acceptable. Violence can be used to uphold peace and freedom and resist attack. Violence must promote good or avoid evil and those who are to be attacked must deserve it. This is called a "Just War". Peace and justice must always be restored once a war has happened. Many Christians serve in the armed forces, and believe that Jesus' teachings on peace apply to society, and not world conflict. They are called combatants – they believe it is better to fight against evil and make the world a better place. Some Christians believe war is right, although they are not willing to fight in combat. These people (non-combatants) would rather help out in practical ways e.g. working as a medic or driving trucks. There are some Christians called, "Quakers", who believe all violence is against God's wishes. They are also called Pacifists, or conscientious objectors. They refuse to fight in the army and say the Spirit of Jesus could never move people to fighting a war because the teachings of Christ are about love.



# Year 9 Spring Term Knowledge Organiser

Chord = 2 or more notes played at the same time

Semitone = the shortest distance between 2 notes

Tone = equal to 2 semitones

Major tonality = happy, brighter sounding music based on a specific set of notes in a scale





Minor tonality = sad, darker sounding music based on a specific set of notes in a scale

**MAJOR CHORDS**

<b>C Major</b>  C E G	<b>C# Major</b>  C# E G#
<b>D Major</b>  D F# A	<b>D# Major</b>  D# F# A#
<b>E Major</b>  E G# B	<b>F Major</b>  F A C
<b>F# Major</b>  F# A# C#	<b>G Major</b>  G B D
<b>A# Major</b>  A# C# E	<b>A Major</b>  A C# E
<b>B# Major</b>  B# D# F#	<b>B Major</b>  B D# F#

[www.piano-keyboard-guide.com](http://www.piano-keyboard-guide.com)

**MINOR CHORDS**

<b>C Minor</b>  C Eb G	<b>C# Minor</b>  C# E G#
<b>D Minor</b>  D F A	<b>D# Minor</b>  D# F# A#
<b>E Minor</b>  E G B	<b>F Minor</b>  F Ab C
<b>F# Minor</b>  F# Ab C#	<b>G Minor</b>  G Bb D
<b>A# Minor</b>  A# C# E	<b>A Minor</b>  A C E
<b>B# Minor</b>  B# D# F#	<b>B Minor</b>  B D F#

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## WORKING THEM OUT!!!

### Key Signatures with Sharps (#)

To work out what the key is for Key Signatures with Sharps (#) in them, look at the last Sharp and move a semitone up!



C# = one step up = D

The Key is D Major



C# or D#  
D# or E#  
F# or G#  
G# or A#  
A# or B#

C or B#  
D  
E  
F or E#  
G  
A  
B or C#

AQA

## WORKING THEM OUT!!!

### Key Signatures with Flats (b)

To work out what the key is for Key Signatures with Flats (b) in them, look at the "second to last flat!" This will be the key!



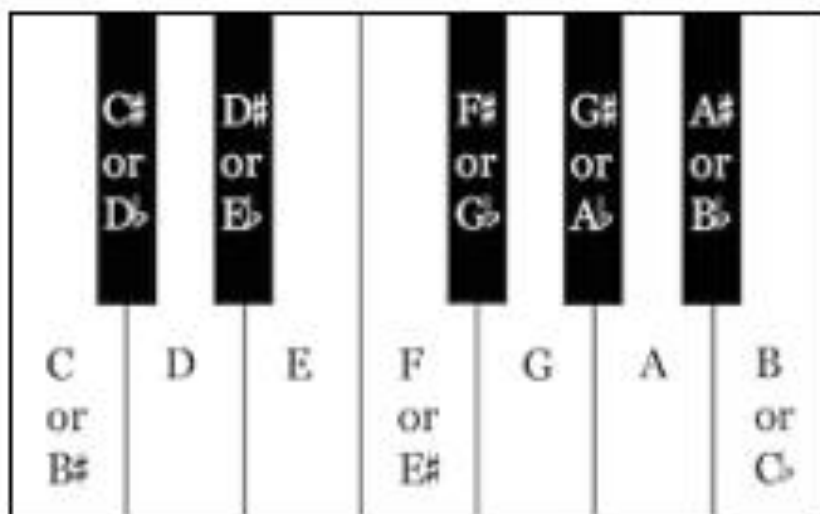
Eb

The Key is Eb Major



C D E F G A B

C D E F G A



C# or D#  
D# or E#  
F# or G#  
G# or A#  
A# or B#

C or B#  
D  
E  
F or E#  
G  
A  
B or C#

AQA

## MINOR KEY SIGNATURE



- This key is Eb Major
- To find the Relative Minor key, count 3 semitones down
- The relative Minor key is C Minor














C# or D#  
D# or E#  
F# or G#  
G# or A#  
A# or B#

C or B#  
D  
E  
F or E#  
G  
A  
B or C#



Using your knowledge of key signatures, tonalities and semitones/tones, see if you can work out the names of these key signatures – watch out for sharps and flats, major or minor!

		____ Major ____ Minor
		____ Major ____ Minor
		____ Major ____ Minor
		____ Major ____ Minor
		____ Major ____ Minor
		____ Major ____ Minor
		____ Major ____ Minor



# Year 9 Knowledge Organiser

## Job Roles



The performing Arts Industry is made up of many different job roles who all must work together collaboratively to make sure that each production is a success.

A **sound designer** is responsible for designing the use of sound within a production, e.g. sound effects or music, working with the director to create and develop sound that enhances a production. They will also advise the director on whether the production requires microphones and other technical equipment.

The **director** is responsible for the overall creative vision of the show. They have to bring the different elements of the production together to produce the final production. They have meetings with the design team at various stages during a production. They will also direct the performers and help them develop their characters in rehearsals ahead of the final performance.

A **set designer** is responsible for designing the set, working closely with the director and the design team to create the world of the show. They may begin by providing the director with a concept, before moving on to the technical drawing stage. Once the design is complete, the set is constructed and completed by various departments that specialise in materials such as metal, wood and paint.

A **costume designer** is responsible for designing the costume, hair and make-up for a production, working closely with the design team to ensure that the costumes match the style of the show. They will often create designs ahead of the production being cast and can then make changes once they have met the performers. The costume designer works closely with the costume department, who are responsible for making the outfits and wigs

**Going the extra mile activities.**  
**Here are some great ideas to do with family to avoid boredom that go above and beyond during the next half term.**

The Arts	IT	DT	English and Drama	Humanities	PE	Maths	Science
Create a Christmas play for you and your friends to work on over the internet. Make it hilarious.	Write a pseudocode/Python program that prints the times table for any number entered by the user. You will need two variables 1 will be typed in by the user.	Research what different kinds of materials roofers use. Why do we often have slate tiles on our roof? What is the point of gutters?	Watch one of the briefings by the government. What makes a good information giving speech? How is it being delivered? Make your own.	Create a detailed plan to make the world more economically equal when we are all back to normal. Share it with anyone you can get to listen.	Invent a new sport.	Explain what a square root is to someone really not mathematical.	Use equipment in your home to get salt out of salty water. How could we get water from salt water?
Develop an observational humour stand up show. Watch how comedians tell a story. Think about their delivery and how they make it look like they have just had that thought. Try it.	How can the school improve the student and staff use of Office 365? Create a 1 page summary of the improvements you made.	Design a meme about increasing social interactions during social isolation. Make it funny and informative.	Devise a political protest speech outlining your objection to something political e.g. children's suffrage or the tyranny of schooling.	In 1917 Russia had a great revolution. What would a great revolution look like in 2027? What would be the similarities and differences if Year 9 were in charge?	Create a set of rules.	Where can we find the Fibonacci sequence in nature? Do some research!	Find out how the brain remembers things.
Watch a performance by an artist you love – many are on Instagram or YouTube. Evaluate the difference between a live performance and a studio edit.	Design a new computer game. What would be the features? How would it work?	Create a village. Any media. Make sure the village has a wide range of housing.	Think about the points that agree and disagree with the following statement:  There should be no democracy. We should have an overlord who makes all the decisions.	Why are we fascinated by crime? What makes Jack the Ripper such an interesting topic? Find out why if you can!	Get family members to play.	Pick any number. If that number is even, divide it by 2. If it is odd multiply it by 3 and add 1. Repeat the process. Every time you end up with 1. Why?	Over the past 20 years there has been tremendous research done on the origin of homo sapiens and other human species. Find out about it because your parents never learned it at school!
Make a playlist that means something to you. Share it with friends and explain why it matters to you.	Think about how we can avoid mental health problems and remain connected online. Explain it to your family and make a plan.	Invent a new sauce for chips or burgers. Test it. How could you bring it to market?	Think about a film you have watched recently. Imagine you had control of the story from half way through. How would you develop it?	How can we be greener as a society using technology? Create an infomercial advertising a product.	Send it to the organisers of the Quarantine Olympics to include it in the next games!	What is the shortest journey that goes to all these places in any order. York, Ipswich, London, Bristol, Leeds, Norwich, Oxford?	Sir Isaac Newton and Paul Dirac are two eminent British scientists. What did they do?