

Name and Tutor group:



Year 7 Knowledge Organiser

Term 4

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CORSHAM CHARACTER

INTELLECTUAL VALUES

The pursuit of truth,
knowledge and
understanding.

Be reflective. Be curious. Be
open-minded. Be creative.



PERFORMANCE VALUES

Maximum effort, maximum
focus.

Be resilient. Always Persevere.
Contribute to Teamwork.
Be ambitious.



DREAM BELIEVE ACHIEVE

	Look, Cover, Write, Check	Definitions to key words	Flashcards	pictures
Stage 1	Look at & study an area of your knowledge <u>organiser</u>. 	Write down the key words & definitions 	Write key words, dates/formulae, equations/quotes on one side & answers on the other 	Draw pictures/diagrams/cartoon strips 
Stage 2	Cover up your knowledge <u>organiser</u> and write everything you remember 	Cover up the definitions. How many can you remember? Repeat. 	Include pictures or diagrams if it helps. Read through them. 	Label your pictures/diagrams/cartoon strips 
Stage 3	Check. Correct mistakes in green and add anything you missed. Repeat 	Check. Correct mistakes in green pen. Which ones do you find hard to remember? 	Test yourself and get someone to test you. 	Explain out loud to yourself or family/friend what your images show 
	<u>Self quizzing</u>	<u>Mindmaps</u>	Paired retrieval	Speak, Cover, Write, Check
Stage 1	Use your knowledge <u>organiser</u> to create quiz questions. 	Create a <u>mindmap</u> of everything you can remember from your knowledge <u>organiser</u> 	Give a family member/friend the knowledge <u>organiser</u> to hold 	Read out loud the information from the knowledge <u>organiser</u> several times. 
Stage 2	Write down the answers to your quiz 	Check your knowledge <u>organiser</u> & use a green pen to make any corrections. 	Get them to test you using the knowledge <u>organiser</u> 	Cover up your knowledge <u>organiser</u> and write everything you remember 
Stage 3	Keep self-quizzing until you get all the answers correct 	Add additional information to your <u>mindmap</u> or make connections to other knowledge 	Write down your answers to their questions 	Check. Correct mistakes in green and add anything you missed. 

Choose any of the following activities to complete your homework



LEARNINGSIENTISTS.ORG

LEARN TO STUDY USING ...

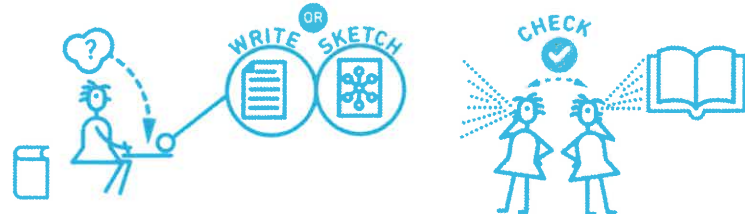
Retrieval Practice

PRACTICE BRINGING INFORMATION TO MIND



HOW TO DO IT

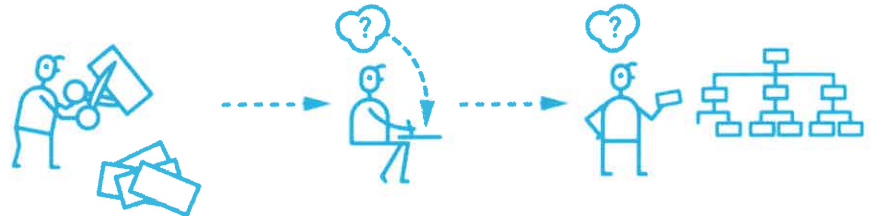
Put away your class materials, and write or sketch everything you know. Be as thorough as possible. Then, check your class materials for accuracy and important points you missed.



Take as many practice tests as you can get your hands on. If you don't have ready-made tests, try making your own and trading with a friend who has done the same.



You can also make flashcards. Just make sure you practice recalling the information on them, and go beyond definitions by thinking of links between ideas.



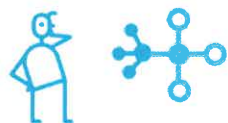
HOLD ON!



Retrieval practice works best when you go back to check your class materials for accuracy afterward.



Retrieval is hard! If you're struggling, identify the things you've missed from your class materials, and work your way up to recalling it on your own with the class materials closed.

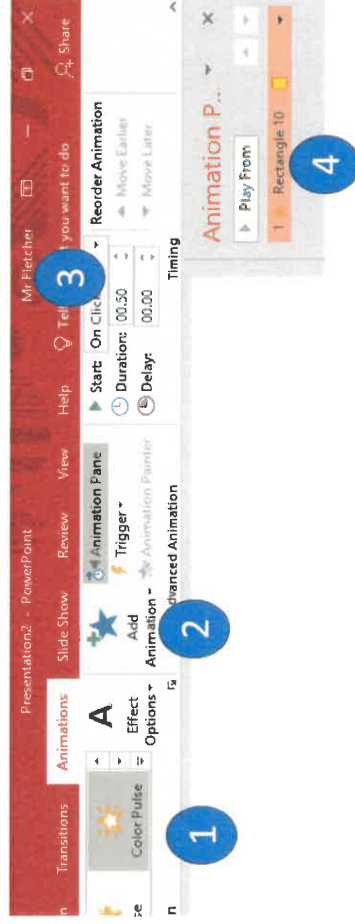


Don't only recall words and definitions. Make sure to recall main ideas, how things are related or different from one another, and new examples.

RESEARCH

[Read more about](#) Roediger, H. L., Putnam, A. L., & Smith, M. A. (2011). Ten benefits of testing and their [retrieval practice](#)

applications to educational practice. In J. Mestre & B. Ross (Eds.), *Psychology of learning and motivation: Cognition in education*, (pp. 1-36). Oxford: Elsevier. [as a study strategy](#)



Animation in powerpoint

1. Use these to quickly add just one animation to a shape. They won't let you add more than one.
2. This button lets you add any animation to a shape. You can add more than one. Green means entrance effects, yellow is emphasis, red means exit effects and dotted lines are for movement
3. Choose when to start the animation
4. Shows all the animations on the slide in the order they will happen

Key vocabulary

Animation

Visual effects used on objects such as text boxes or pictures. They allow these objects to be brought on and off the slide in a certain way

Media

Images, videos or sounds which can be added to a presentation

Stock image

Existing photos and images which are available and free to use

Presentation

A visual way of displaying information to an audience that is clear and engaging. It can contain text, images and videos

Text box

A box in which text can be inputted and formatted

Audio

Any type of sound, such as music or voiceover

Design Templates

A variety of ready-made templates with custom formatting (font, colour scheme etc.) which gives a certain look and feel

Text formatting When you change the format of text on a page, including the font, the size and whether it is bold, underlined or in italics

Presentation Program A computer program, such as PowerPoint, which is used to create a presentation

Transition

The interesting effect used when one slide moves onto the next

Slide

A single page within a presentation

WordArt

A way to treat text as a graphic so that you can add special effects to text

Slideshow

A collection of pages arranged in sequence that contains text and images to present to an audience. Often referred to as a PowerPoint presentation

Font

A set of type which shows words and numbers in a particular style and size

Flashback- show the audience a past event or moment.



Year 7 Police Enquiry- Term 4



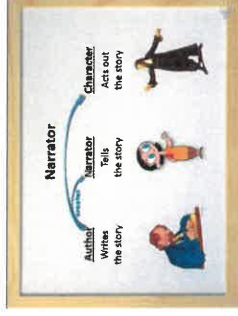
Performance techniques



Cross-cutting: Two or more scenes staged in the same space at the same time.



Narration/narrator: to speak directly to the audience to give specific and helpful information about the plot, a character, a location etc.



Hot-seating: Where questions are directed to a character, who must respond in role to give details on an event, experience, thoughts/feelings etc.

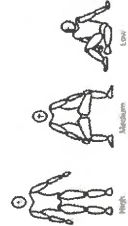


Performance

Skills.  Vocal

- **Pitch-** how low or high your voice is
- **Pace-** the speed at which you talk at
- **Pause-** stopping between words/sentences. 
- **Emphasis-** a change in the use of voice to highlight an important word.
- **Volume-** the (how loud or quiet you speak )
- **Tone-** suggests a mood or emotion that a character is feeling e.g happy or sad

Physical

- **Facial expression-** using your face to show how a character is feeling
- **Gesture/Hand-** an action to communicate a character's thoughts to replace words (EXAMPLE: waving hand) 
- **Levels-** used to show a character's power or status in a scene. 
- **Proxemics-** the use of space/distance between characters. 



Stimulus- A starting point to create drama



Year 7 Food - Knowledge Organiser

Key Skills

Breadmaking

Kneading – This works the dough to develop the **gluten** in the flour.

Gluten – The protein in flour that gives baked goods their structure and texture.

When making the dough the dry ingredients are combined with the wet ingredients. Warm water is added to activate the yeast which is a natural raising agent.

Fermentation - Yeast feeds on the sugar contained with the dough, producing carbon dioxide and alcohol, in a process called fermentation. During bread making, the dough is left in a warm place. The warmth causes fermentation to take place

Function of ingredients in bread – Strong plain flour, water, salt, yeast, sugar, oil.

Key Practical Skills

- **Chopping and Knife Skills** – fruit salad, layered salad
- **Rubbing in method** – shortbread, scones and quiche
- **Creaming method** – fairy cakes
- **Melting method** – flapjacks
- **Pastry Making and Rolling** – Quiche, tomato tart
- **Bread making** – Bread Rolls, Focaccia, Chelsea buns.

Health and Safety Rules in our Kitchen

- Wash hands thoroughly with soap and hot water
- Tie hair back
- Put on a clean apron
- Blazer and jumper off and roll up sleeves
- Bags under the table and chairs pushed under
- Sensible behaviour
- Listen to instructions
- No running in the kitchen
- Do not cough or sneeze onto food
- Use the correct colour chopping board
- Clear up spills immediately
- Do not mix raw and cooked food on the same board
- Follow the washing up routine

Personal Skills

- Confidence
- Organisation
- Teamwork
- Time management



Food Hygiene

- **Food Poisoning:** illness caused from eating contaminated food.
- **Bacteria:** Microscopic living organisms – some are good and some are bad!
- **High risk foods:** Foods that are high in protein and high in moisture. These foods need to be cooked and stored correctly to avoid harm



Knife Skills



Bridge Hold



Claw Hold

Vegetable cuts



Conduction

Energy is transferred by direct contact



Convection

Energy is transferred by the mass motion of molecules



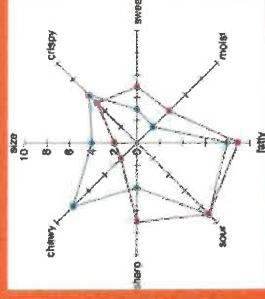
Radiation

Energy is transferred by electromagnetic radiation



Sensory Analysis

Using technical descriptive words to evaluate food products. Using our senses - taste, texture, aroma and appearance. We record this information onto a star (sensory) profile.



We use this to compare the sensory profile of a shop bought and home made product.

Keywords

- Hygiene
- Safety
- Fermentation
- Sensory
- Analysis
- Healthy
- Bacteria
- Evaluate
- Kneading
- Consumer
- Gluten

Washing Up Routine

RINSE



STACK



WASH



DRAIN

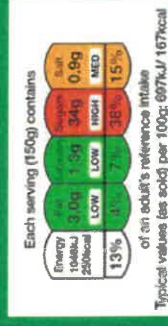


DRY



Healthy eating

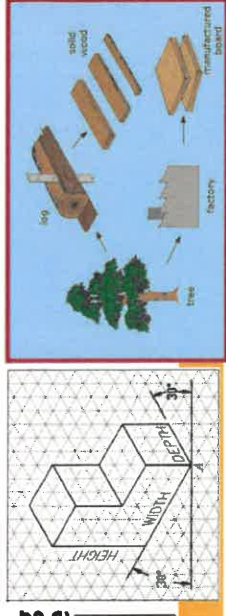
The Eatwell guide shows how much of what we eat in total should come from each of the five food groups.



The Traffic light system shows us if a product is high, medium or low in fat, saturated fat, sugar, fibre and energy so we can make an informed choice

KS3 YEAR 7 D&T RESISTANT MATERIALS

Isometric Drawing 2 point perspective



Tools and Equipment

Measuring and marking

Steel rule		An accurate tool for measuring and marking out
Try square		A tool used to check right angles on wood or plastic
Template		A template is a tool used to mark out shapes repeatedly

Shaping and finishing

Metal file		Used to shape or smooth wood, metal or plastic
Glass paper		An abrasive paper used to smooth the surface or edges of wood
Disc sander		A machine used to smooth the edges of materials

Softwood

Softwoods come from coniferous trees which are evergreen, needle-leaved, cone-bearing trees, such as cedar, fir and pine.

Hardwood

Hardwoods come from broadleaved, deciduous trees, such as oak, maple and beech.

Hardwoods	Softwoods
 Beech Oak Ash Teak	 Pine Spruce Cedar Fir

Manufactured board

Manufactured boards are timber sheets which are produced by gluing wood layers or wood fibres together. Manufactured boards often made use of waste wood materials. Ply, MDF or chipboard.



Keywords

Bench hook
Bookend
Coping saw
Hardwood
Softwood
Joint
Tenon saw
Reciprocating saw
Vice
Abrasive
Template
Specification
Research
Design
Practical task
Evaluation
Timber cycle



Cutting

Tenon saw		A hand saw with a stiff back used to cut straight lines in wood – back saw action
Coping saw		A hand saw used to cut complex shapes in wood and plastic
Scroll saw		A machine saw used to cut complex shapes in wood and plastic
Bench hook		Held against the front edge of a bench or table to support work
Pillar drill		A machine used to make holes in materials
Laser cutter		CAM: Laser cutting is the use of a high-powered laser to cut, etch and engrave your material

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

ACCESS FM - Helpsheet

A is for Aesthetics		Aesthetics means what does the product look like? What is the Colour? Shape? Texture? Appearance? Feel? Weight? Size?
C is for Cost		Cost means how much does the product cost to buy? How much does it cost to make? How much does it cost to transport? What is a good value?
C is for Customer		Customer means who will buy or use your product? What are their needs? What do they want? What are their likes? What are their dislikes? What are their dislikes? What are their dislikes?
E is for Environment		Environment means what the product effect the environment? Environmentally friendly? What is the product made of? What is the product made of? What is the product made of?
S is for Size		Size means how big or small is the product? How big or small is the product? How big or small is the product? How big or small is the product?
S is for Safety		Safety means how does the product use? What is the product use? What is the product use? What is the product use?
F is for Function		Function means what is the product made of? What is the product made of? What is the product made of?
M is for Material		Material means what is the product made of? What is the product made of? What is the product made of?

Health and Safety in DT:

- Listen to your teacher's instructions
- Always wear an apron
- Long hair should be tied back
- Don't use equipment you are not trained on
- Always stand up during practical lessons
- When using machines, always wear safety glasses
- Only use the stop button in an emergency
- Work quietly and be sensible and careful at all times

What is good design?

- Clear ideas
- Annotations
- Measurements
- Content
- Presentation
- Balance

Maths in DT:

- Multiplication
- Divide
- Add / Subtract
- Measurement conversion
- Ratios
- Percentages
- Surface area

Traditional wood joints:

- Butt Joint
- Lap / Rebate Joint
- Finger Joint
- Dovetail Joint
- Mitre Joint

KS3 YEAR 7

DT TEXTILES

Tools and Equipment	
Measuring and marking	
Measuring Tape	Fabric tape measure used to measure
Tailor's chalk	A temporary mark on fabric
Template / Pattern	A template / pattern is a tool used to mark out shapes repeatedly

Constructing	
Sewing needle	Helps to sew fabric together
Embroidery needle	A needle with a larger eye to accommodate embroidery thread
Sewing machine	Machine sews fabric together
Pins	A temporary method to hold fabric in place
Tacking stitch	A temporary stitch to hold fabric together

Fibres to Fabric

Fibres – short (staple) or long (filament) threads used to make yarn.

Yarn - Yarn is a **length of fibres**.

Continuous length of fibres which are interlocked, used to produce fabrics, as well as in crocheting, knitting, embroidery and ropemaking.

Fabric – cloth made up of woven/knitted/bonded fibres/yarn

Fibre Categories:

Natural Fibres

- Plant based natural fibres:
- Cotton
- Linen
- Flax
- Coir (coconut)

Animal based natural fibres:

- Wool
- Angora
- Silk

Man-made Fibres

- Polyester
- Acrylic
- Nylon

Fabric Construction:

- Woven
- Knitted
- Bonded

Keywords

Resilience
Design
Product analysis
Research
Evaluation
Stitch
Scissors
Sewing machine
Fibres
Yarn
Fabric
Customer
Environment
Function
Material
Seam allowance
Invisible stitch
Embroidery
Applique
UCD

Cutting	
Fabric shears	Scissors used for cutting fabric
Thread scissors	Scissors used for cutting thread
Stitch ripper	Used for removing sewn stitches from fabric
Pinking shears	Creates a zig zag cut edge for decoration to prevent fraying

Surface Decoration

Applique	Sewing one piece of fabric on top of another piece of fabric
Embroidery	A decorative stitch
Beads	A small decorative object which can be sewing onto fabric
Buttons	A type of fastener

Types of Seams:

- Plain
- French
- Flat felled
- Bound
- Lapped

Maths in DT:

- Multiplication
- Divide
- Add / Subtract
- Measurement conversion
- Ratios
- Percentages
- Surface area

What is good design?

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Health and Safety in DT:

- Listen to your teacher's instructions
- Always wear an apron
- Long hair should be tied back
- Don't use equipment you are not trained on
- Work quietly and be sensible and careful at all times

A is for **Aesthetics**

C is for **Cost**

C is for **Customer**

E is for **Environment**

S is for **Size**

S is for **Safety**

F is for **Function**

M is for **Material**

Y7 ENGLISH – PROSE STUDY

Narrative Voice

A story has to be 'told' to the reader and a 'narrator' is needed to do this. A narrator's voice can be first, second or third person. Here is a quick summary:

- **First person** uses 'I' or 'we' to tell the story. In this case, the narrator is a character and you will read about events from their point of view. You are more likely to be able to relate to and sympathise with their feelings because of this.
- **Second person** uses 'you'. It is not often used in fiction texts and it's rare to find a story written entirely from this perspective (try writing a piece in the second person to see how difficult it is). However, some fiction texts, such as gamebooks (choose your own adventure) use this perspective.
- **Third person** uses 'he', 'she', 'it' or 'they'. The narrator of the story will usually be the writer. Some texts will give many different characters' viewpoints, but others will focus on one character, the hero or heroine, and the reader will usually relate to and sympathise with them more than others.

What is explicit and implicit meaning?

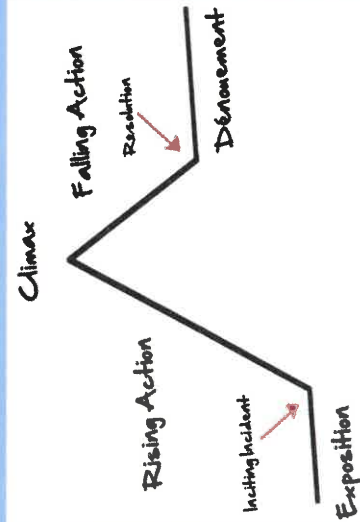
Explicit meaning describes something that is very clear and without vagueness or ambiguity.

Implicit meaning often functions as the opposite, referring to something that is understood, but not described clearly or directly, and often using implication or assumption.

Context

The context of a text is the place and time in which it was written, who it was written by, and where it was published. All of these affect the purpose and effect of the text.

Terminology	Definition
Symbolism	Use of symbols to represent ideas or qualities.
Imagery	Visually descriptive language.
Hyperbole	An exaggeration.
Allegory	Extended metaphor in which a symbolic story is told.
Onomatopoeia	A word that imitate the sound it represents.
Personification	A figure of speech in which an object is given human feelings, thoughts or attitudes.
Metaphor	A metaphor is a figure of speech that describes an object or action in a way that isn't literally true.
Simile	A comparison that uses 'like' or 'as'.



Using quotations and useful phrases

When quoting from a text, remember to:

- use quotation marks
- quote accurately
- quotes of three words or fewer can be used in the sentence you are writing - for example, when the writer talks about the 'futility of life' he means... short, well-chosen quotations are better than long ones, so that you can give more precise analysis

Remember that certain words and phrases are helpful when you're explaining an idea in some detail, especially if you are commenting on implicit meaning. The following list shows some of those phrases:

- this implies
- this suggests
- which gives the impression that
- possibly
- perhaps
- this indicates that
- this shows
- obviously

Use to **connectives** to build your analysis. Here are some examples:

- however
- therefore
- in contrast
- because
- but
- and
- furthermore
- also
- then
- at first

Les ordinateurs et les portables

• Computers and mobile phones

Qu'est-ce que tu fais ...	What do you do/are you doing ...
avec ton ordinateur?	on your computer?
avec ton portable?	on your mobile phone?
Je joue.	I play/I'm playing games.
Je surfe sur Internet.	I surf/I'm surfing the net.
Je chatte sur MSN.	I chat/I'm chatting on MSN.
Je regarde des clips vidéo.	I watch/I'm watching video clips.
Je télécharge de la musique.	I download/I'm downloading music.
J'envoie des SMS.	I text/I'm texting.
Je parle avec mes ami(e)s/ mes copains/ mes copines.	I talk/I'm talking to my friends/mates.
J'envoie des e-mails.	I send/I'm sending e-mails.

Le sport • Sport

Je joue ...	I play ...
au basket	basketball
au billard	billiards/snooker
au foot(ball)	football
au hockey	hockey
au rugby	rugby
au tennis	tennis
au tennis de table/ au ping-pong	table tennis
au volleyball	volleyball
à la pétanque/aux boules sur la Wii	boules on the Wii
Tu es sportif/sportive?	Are you sporty?
Je suis (assez) sportif/ sportive.	I'm (quite) sporty.
Je ne suis pas (très) sportif/sportive.	I'm not (very) sporty.
Mon sportif/Ma sportive préféré(e) est ...	My favourite sportsman/ sportswoman is ...

Qu'est-ce que tu fais? • What do you do?

Je fais du judo.	I do judo.
Je fais du parkour.	I do parkour.
Je fais du patin à glace.	I go ice-skating.
Je fais du roller.	I go roller-skating.
Je fais du skate.	I go skateboarding.
Je fais du vélo.	I go cycling.
Je fais de la danse.	I do dance.
Je fais de la gymnastique	I do gymnastics.
Je fais de la natation.	I go swimming.
Je fais de l'équitation.	I go horse-riding.
Je fais des promenades.	I go for walks.

Quand? • When?

en été	in summer
en hiver	in winter
quand il fait beau	when it's good weather
quand il fait chaud	when it's hot
quand il pleut	when it rains
quand il fait froid	when it's cold

La fréquence • Frequency

quelquefois	sometimes
souvent	often
tous les jours	every day
tous les soirs	every evening
tout le temps	all the time
de temps en temps	from time to time
une fois par semaine	once a week
deux fois par semaine	twice a week

Les mots essentiels • High-frequency words

sur	on
en (été)	in (summer)
quand	when
tout/toute/tous/toutes	all
par (deux fois par semaine)	per (twice a week)
d'habitude	usually
d'abord	first of all
ensuite	then/next
puis	then/next

jouer à

You use **jouer à** to talk about playing a sport or a game. **à** has a different form with masculine, feminine and plural nouns. (Most sports are masculine singular.)

singular	plural
masculine	feminine
le rugby	la pétanque
Je joue au rugby.	Tu joues à la pétanque?
	aux boules.

Qu'est-ce que tu aimes faire? • What do you like doing?

le soir/le weekend in the evenings/
at the weekends
le samedi matin/ on Saturday mornings/
après-midi/soir afternoons/evenings
J'aime ... I like ...
... retrouver mes amis ... meeting my friends
en ville. in town.
... regarder la télévision ... watching TV.
(la télé).
... jouer sur ma ... playing on my
PlayStation. PlayStation.
... écouter de la musique. ... listening to music.
... faire les magasins. ... going shopping.
... faire du sport. ... doing sport.
... jouer au football. ... playing football.
... traîner avec mes copains. ... hanging out with my
mates.
... téléphoner à mes ... phoning
copines. my mates.

Verbs – the present tense

You use the present tense in French to say what you do or what you are doing.

Most verbs in French are regular **-er** verbs (e.g. *surfer* – to surf, *jouer* – to play, *regarder* – to watch). The endings of regular **-er** verbs all follow the same pattern.

Qu'est-ce qu'ils font? • What do they do?

Il fait de la lutte. He does wrestling.
Elle fait du jogging. She goes jogging.
Elle a gagné le match. She won the match.
Il est champion régional. He's the regional
champion.
Elle s'entraîne (trois) fois She trains (three) times
par semaine. a week.
Ils font de la musculation. They do weight training.
Elles écoutent de They listen to music.
la musique.
Ils jouent au foot. They play football.
Elles regardent la télé. They watch TV.
Ils sont des clowns. They're clowns.
Elles aiment le R&B. They like R&B.

faire

faire (to do or make) is an important irregular verb.

je fais I do/make (I'm doing/making)

tu fais you do/make (singular, informal)

il/elle/on fait he/she does/makes; we do/make

nous faisons we do/make

vous faites you do/make (plural/formal)

ils/elles font they do/make

You use **faire de** to talk about some sports and other activities. **de** has a different form with masculine, feminine and plural nouns.

singular	feminine	before a vowel	plural
masculine			
le vélo	la natation	l'équitation	les promenades
Je fais du vélo.	Tu fais de la natation.	Elle fait de l'équitation.	On fait des promenades.

Saying 'they' in French

There are two words for 'they' in French: **ils** for male, **elles** for female. (For a mixture of male and female, use **ils**.) The *ils/elles* form of regular **-er** verbs ends in **-ent**. (The **-ent** ending is silent.)

Ils téléchargent de la musique. – They download music.

Elles jouent sur la PlayStation. – They play on the PlayStation.

The verbs **être** (to be) and **faire** (to do) are irregular:

ils/elles sont – they are **ils/elles font** – they do

regarder (to watch)

je regarde I watch (also, I'm watching)

tu regardes you watch (singular, informal)

il/elle/on regarde he/she watches/we watch

nous regardons we watch

vous regardez you watch (plural and formal)

ils/elles regardent they watch

Note: **envoyer** (to send) has a slight irregularity: **j'envoie, tu envoies, il/elle/on envoie**

What is population explosion?

Since 1900 the world's population growth has increased. Rapid population explosion started in the 1950s when the population grew from 2 million to 8 million in 40 years.

Causes: A high birth rate in LIDCs

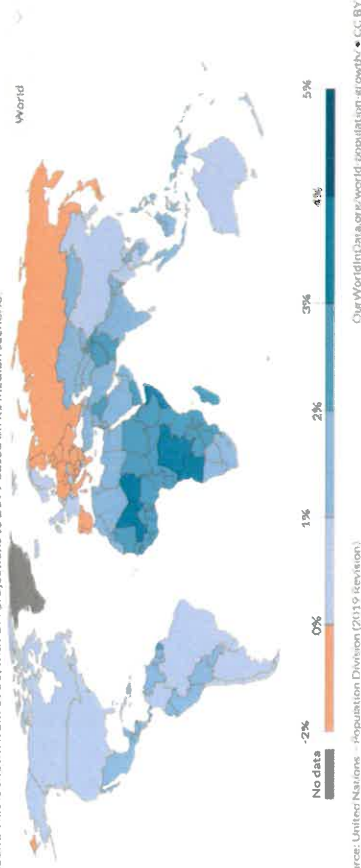
- A lack of access to contraception increases the likelihood of pregnancy.
- While the country was developing more children were needed to work on the farm.
- In LIDCs women were viewed as having the traditional role of raising children rather than starting a career
- A high infant mortality rate meant that the birth rate is higher

Causes: Lower death rates

- Increase in healthcare means fewer people die of diseases.
- Improvements in education on healthy eating means that there is less malnutrition.
- Improvements in water security mean more people drink clean water, reducing water born diseases

Natural population growth, 2020

Natural population growth is the population increase imposed by birth and death. Migration flows are not taken into account. This is shown from 1950, with UN projections to 2059 based on its median scenario.



Where is population explosion happening right now?

Population growth is occurring fastest in the continent of Africa and the region of south Asia. This is due to the higher birth rate in these areas.

Notice how population is falling in some areas of the world.

Yr7 Geog: HC problematic population explosion?

Population pyramids

A population pyramid shows the population structure of a country. The shape of it can tell us many things about the country.

If it has a **wide base** - It means the country has a higher birth rate

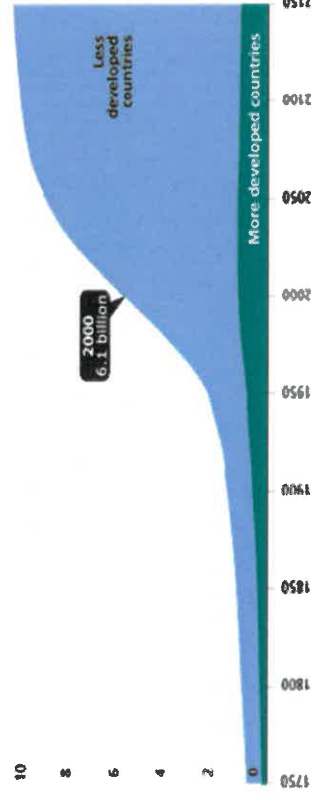
If it is **high** - it means that the life expectancy is high

If the sides are **steep** - it has a high death rate

If it is **top heavy** - there is an aging population



Population (in billions)



Consequences of population explosion

Demand for resources	More people require more food, more homes and more fuel. These all need more land which means more deforestation and impact on natural habitats
Climate change	More people require more energy, this means that we burn fossil fuels at a faster rate which increases the amount of carbon dioxide in the atmosphere. This is the driving cause of climate change.
Impact on ecosystems	More land we take over the less there is for habitats and ecosystems. Many animals are at risk of extinction.
Aging population	As medicine and quality of life increases, life expectancy increases. Consequently we have a higher % of elderly people which can cause strain on the population and government.

Yr7 Geog: How problematic is population explosion?

Issues of an aging population

An aging population occurs as people live longer due to better diet, improved medication and improved housing.

An aging population occurs when there is a high % of retired workers
The UK currently has an aging population.

Strain on NHS

Elderly patients take up a lot of NHS time and resources. More elderly people mean that waiting time at surgeries are longer and there are fewer beds available in hospitals.

Increased government spending

More elderly rely on their pension, more pensioners mean that they government have to spend more money on the state pension and less on education and hospitals. This results in higher taxes for the working population or an increase in the age at which people can retire.

Solving an aging population

Raise the retirement age

If workers work for longer it means they can contribute more tax to the government. It also means that they will have fewer retirement years so the government can spend less on pensions

Encourage elderly to live healthy and active lifestyles.

This should mean that fewer elderly people need treatment from the NHS and as a result reduce the strain on the NHS.



Ways to mitigate population explosion

There have been actual attempts to reduce birth rates in countries. China experimented with the 1 child policy where families were only allowed to have 1 child. This is no longer the rule.

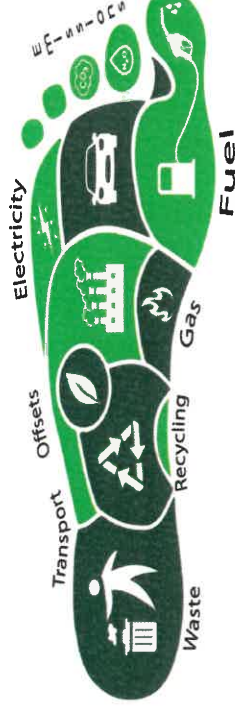
More recent strategies have included improved education on family planning and improved access to contraception to reduce birth rate-(especially in developing or poorer countries).

1 Child Policy in China

Families were only allowed to have one child in an attempt to reduce birth rate to control population growth. (fewer births = less population growth). This ended in 2013. It worked as the population growth was slowed but it did raise many human rights issues.

Education in Kerala, India

Educating women to the benefits of family planning and increasing access to contraception, plus empowering women to make decisions reduced the birth rate in Kerala. This was a successful example of reducing population growth.



Reducing our carbon footprint

Eat less beef

The beef industry is responsible for a significant amount of deforestation. Also cows are responsible for releasing methane which is also a greenhouse gas.

Reduce food waste

When we waste food, we also waste energy and water it takes to produce it. Also when food goes to landfill sites it then produces methane which is a more powerful greenhouse gas.

Recycle more

Increasing the use of recycled materials reduces carbon footprint as no energy needs to be used to make the new materials.

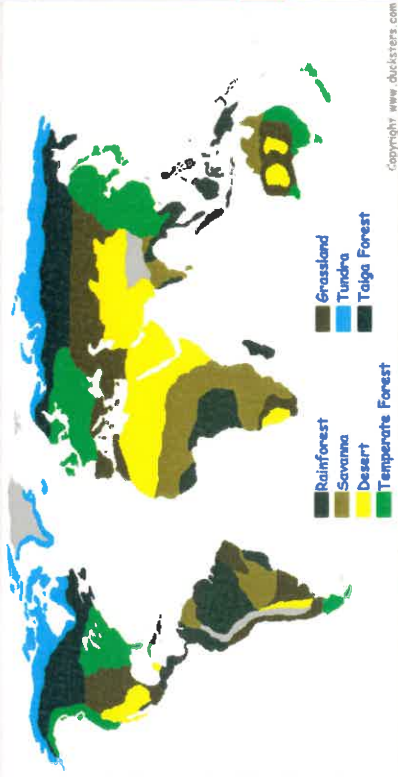
Walk more and cycle more. Drive less.

Reducing the use of fuels and fossil fuels will reduce the amount of carbon being released into the atmosphere.



What and where are Biomes?

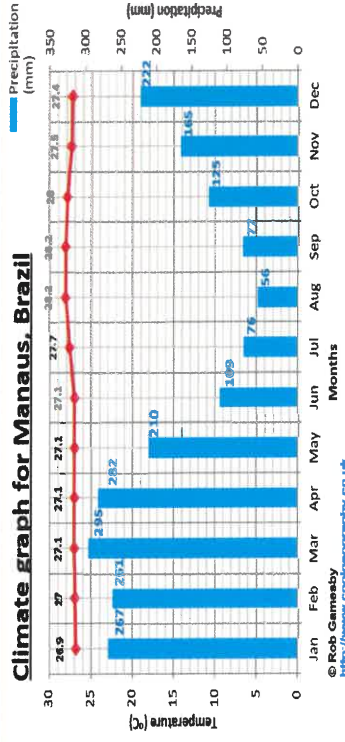
A biome is a very large ecosystem. There are many major biomes shown in the map below. The vegetation (flora) and animals (fauna) in each biome is determined by the climate of that region.



Notice how the biomes are linked to latitude. As the latitude changes away from the equator the biome also changes.

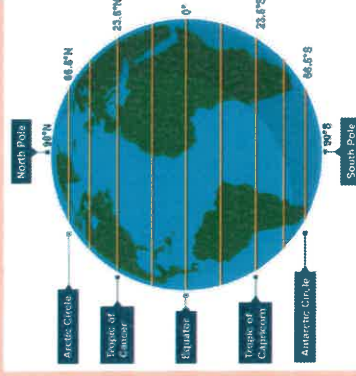
What is a climate graph?

We measure a regions climate on a climate graph. This tells us the temperature and precipitation levels each month. The rainfall is always shown as the bar graph and the temperature as a line graph.



What are lines of latitude

Lines of latitude go around the world. The equator is latitude line 0 and the north pole is latitude line 90N. The tropic of cancer is 23.5N. The higher the latitude line the further away from the equator you are and so the climate will change



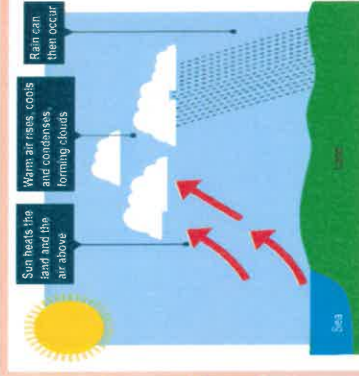
Climate and characteristics of a rainforest

- Rainforests are located between the Tropic of Cancer and the Tropic of Capricorn.
- Due to its proximity to the equator it has a high temperature.
- Due to the high temperatures all year round it creates a lot of convectional rainfall.
- The rainforest has 4 distinct layers shown in the diagram below.



Convectional rainfall in the rainforest

The solar radiation heats up the air.
This air rises as it is now less dense.
As it rises it cools, condenses to form clouds.
Therefore rainforests create at least 50% of it's own rainfall.



Year 7 Geography – How important are ecosystems?

Flora and Fauna of the Tundra

The flora and the fauna has adapted in the rainforest to suit the climate.

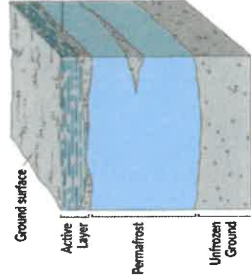
- Drip tips**
Leaves have evolved to have sharp tips to their leaves, this is that it can shed all the rainfall so it doesn't drown.
- Tree trunks and buttress roots**
Trunks are branchless to help them compete to grow tall and buttress roots help keep the tall trees grounded.
- Sloths**
Spend much of their time hanging from the branches of the canopy. They are camouflaged in the forest

Human impact on the rainforest: Deforestation		
Causes	Impacts	Management
Deforestation mostly occurs so land can be cleared for farming. The two types of farming are cattle farming for beef and Palm oil used in many foods and cosmetics.	Rainforests are important because they absorb significant amounts of carbon dioxide from the atmosphere. By removing the trees, less carbon dioxide can be absorbed and so more is kept in the atmosphere.	Reducing the demand for beef and palm oil globally will reduce the need for mass deforestation. Protection schemes can also be implemented by local governments but these have to be enforced.



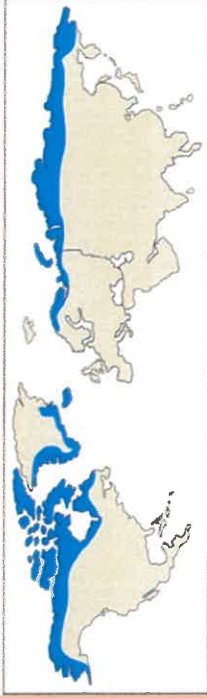
What is permafrost?

Permafrost is permanently frozen soil. (although the top section of the soil thaws in the summer so plants can grow) Most of it has been frozen for thousands of years. It contains a significant amount of carbon in the form of dead plants.



Where is the Tundra?

The tundra is a biome which is found within the Arctic circle (above 66.5N). It is the land area before the sea ice of the Arctic starts.



Flora and Fauna of the Tundra

Flora (plants) and Fauna (animals) have adapted to live in the tundra.

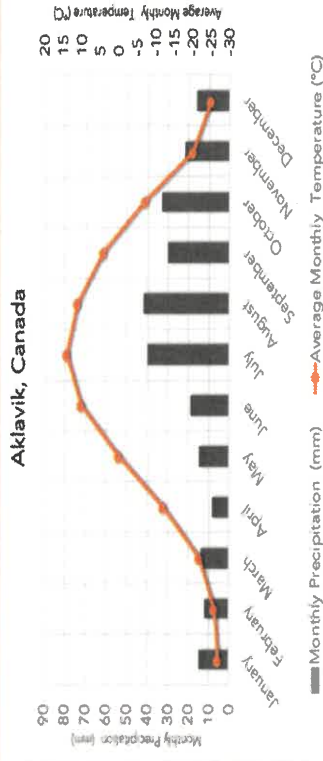
Flora	Fauna
There are thousands of species in the tundra, they are small and close to the ground. Plants include short shrubs, flowers and birch trees. They have adapted to surviving in cold conditions.	Polar bear is the main predator in the tundra, it is well camouflaged and hibernates for the winter. Caribou are "deer like" animals that migrate across the tundra.



Year 7 Geography – How important are ecosystems?

Climate and characteristics of the Tundra

Due to its latitude the temperature is below freezing for 8 months of the year. There is plenty of rainfall in the Tundra too with an average 30mm.



For 8 months of the year the tundra is covered in snow and ice and the active layer of the permafrost is frozen. For 4 months of the year the tundra thaws out. This is when the active layer thaws and flowers and other fauna can grow. The plants do not grow very high due to the limited growing time.

Human impact on the tundra: Permafrost

Causes	Impacts	Management
Human caused climate change is melting the permafrost. a) Allowing tree species to invade due to warmer climates.	More carbon is released not the atmosphere as carbon is released. This is accelerated the greenhouse effect. Buildings sink into the thawed soil (it was once solid). Much more of the tundra is covered in lakes	Governments are being asked to reduce their carbon emissions to try and control the amount of carbon. However many governments still need to burn fossil fuels to help their economy.

Enquiry: How did warfare change?

Outline: During the Medieval and early Modern periods, monarchs often had to prove themselves or defend their country through fighting battles. The tactics and weapons used in these battles changed over time for a wide range of reasons. The consequences of these battles had a long lasting impact on many people and their nations.



Battle	Date	Summary
Hastings	1066	William the Conqueror won against Harold II to become the Norman king of England.
Agincourt	1415	Henry V won against the French which strengthened his claim to the French throne.
Bosworth	1485	Henry Tudor won against Richard III to become king of England.
Armada	1588	Elizabeth I won against Philip II of Spain's armada to prevent the Spanish invasion of England.
Naseby	1645	Parliament won against Charles I's army. This was a turning point which made it more likely that Charles would lose the English Civil War.
Trafalgar	1805	Britain won against Napoleon's France in a naval battle near Spain. This slowed down Napoleon's domination of Europe.
Waterloo	1815	Britain won against Napoleon's France in a land battle. This ended Napoleon's domination of Europe.



History – Year 7 Knowledge Organiser Topic 3

Key individuals



Sir Francis Drake. He was a pirate who worked for Elizabeth. His tactics helped the English beat the Armada, especially the use of fireships.



Oliver Cromwell. Helped to command Parliament's army in the Civil War. His tactics helped them to beat the king and he then became leader of England.



Horatio Nelson. Led the English navy at Trafalgar. His tactics were crucial to British success, but he died during the battle.



The Duke of Wellington. Commanded the British and their allies at Waterloo. Was instrumental to the victory.

Historical skill focus: cause and consequence

- Why do events happen?
- How do events change people's lives?

Key vocabulary:

Armada: a large amount of ships. The Spanish Armada had 130 ships which attempted to invade England.

Broadside: when a ship fires off all its cannon at once.

Cavalry: soldiers who fight on horses.

Civil War: a war fought within one country.

Crescent formation: a shape that ships form when sailing which looks like a crescent. Its protects ships from attack.

Feigned retreat: when soldiers pretend to run away, but then turn around and fight back when the enemy is chasing them. This tactic breaks the formation of the enemy lines.

Fire ships: ships set on fire and sent into enemy lines to disrupt the formation of their ships.

Infantry: soldiers who fight on foot.

Line of battle: when ships line up to then fire broadsides on the enemy.

Longbow: English and Welsh technology which fires arrows faster and further.

Mercenaries: soldiers who are paid to fight for the highest bidder. They have no loyalty to their leader.

Navy: ships used to defend a country.

New Model Army: Parliament's new army in the Civil war which was well trained and disciplined. Became England's first standing army.

Pikemen: soldiers who carry 16ft pikes to use in battle.

Shield wall: when soldiers pack closely together behind their shields.

Standing army: a professional army which is always ready to fight.

Strategy: overall plan for how to win a battle or a war.

Tactics: different methods used during a battle to achieve the overall strategy.

Vanguard: the main part of the army.



Furthering learning

Want to find out more about the Battle of Hastings?



YEAR 7 — DIRECTED NUMBER

Operations with equations and directed numbers

@whisto_maths

What do I need to be able to do?

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

- Perform calculations that cross zero
- Add/ Subtract directed numbers
- Multiply/ Divide directed numbers
- Evaluate algebraic expressions
- Solve two-step equations
- Use order of operations with directed number

Keywords

Subtract: taking away one number from another.

Negative: a value less than zero.

Commutative: changing the order of the operations does not change the result

Product: multiply terms

Inverse: the opposite function

Square root: a square root of a number is a number when multiplied by itself gives the value (symbol $\sqrt{\quad}$)

Square: a term multiplied by itself.

Expression: a maths sentence with a minimum of two numbers and at least one math operation (no equals sign)

Perform calculations that cross zero

Number lines are useful to help you visualise the calculation crossing 0

Use the number line to guide subtraction of 6

$4 - 6 = -2$

Start at 4

Find the difference between 6 and -4

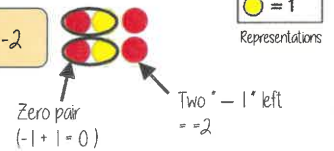
From 6 to 0
6
From 0 to -4
4
10 beads between them

$-5 + 5 = 0$ Rearrangements of the same equation

$5 - 5 = 0$

Add directed numbers

$2 + -4 = -2$



$8 + -3 = 5$



Partitioning

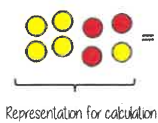
$8 + -3 = 5$

$5 + 3 + -3 = 5$

Partition the value to create a zero pair calculation

Generalisation
 $+ - =$

Subtract directed numbers



2

"Subtract" — means take away or remove

$2 - -1 = 3$



Start with the representation of 2

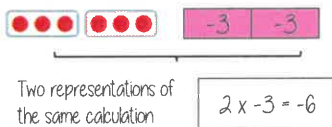
$2 - -3 = 5$



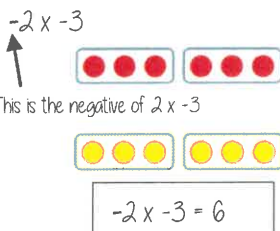
Generalisation

$- - = +$

Multiply/ Divide directed numbers



Negative, Negative calculation



The act of making counters into their negative is turning them over

Divisions are the inverse operations

Evaluate algebraic expressions



$a = 5$

$b = -4$

$a^2 = 5^2$

$a^2 = 25$

$b^2 = (-4)^2$

$b^2 = 16$

With negative numbers the brackets are important so that it performs -4×-4

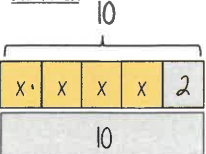
Brackets around negative substitutions helps remove calculation errors

$2a - b = 2 \times 5 - (-4) = 10 + 4 = 14$

$3b - 2a = 3(-4) - 2(5) = -12 - 10 = -22$

Two-step equations

Bar Model!

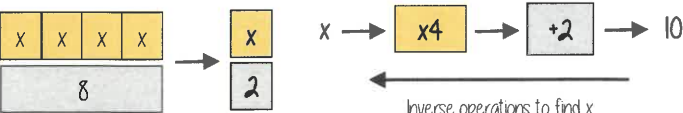


$4x + 2 = 10$

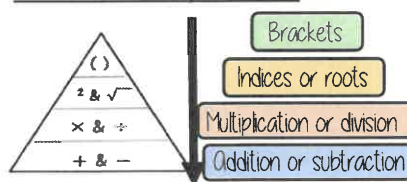
$10 - 4x = 2$

Representing the same question (use fact families)

Function machine



Use order of operations



Brackets around negative substitutions helps remove calculation errors

Remember square roots have a positive and negative value

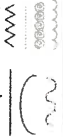
x	-5	-2	-1	0	1	2	5
-5	9	6	5	0	-5	-6	-9
-2	6	4	2	0	-2	-4	-6
-1	3	2	1	0	-1	-2	-3
0	0	0	0	0	0	0	0
1	-3	-2	-1	0	1	2	3
2	-6	-4	-2	0	2	4	6
5	-9	-6	-3	0	3	6	9

1. Rhythm	
Writing music down so players can easily read the pitch and duration of the notes they are supposed to play.	
1	 Crotchet = 1 Beat
2	 Quaver = 1/2 Beat
3	 Minim = 2 Beats
4	 Semibreve = 4 Beats
5	 Rest = Rest for 1 beat (Crotchet rest)
6	 Rest = Rest 1/2 beat (Quaver rest)

2. Staves	
1	 Staff/ Staff = The Staff is the five lines which the notes are written on. Between these five lines there are four spaces. There are two Staves (known as The Grand Staff) one above the other. They are sometimes also referred to as the Staff, depending on where you are in the world!
4	Treble Clef = A symbol that is placed on every line of music to show the notes which will be sung or played by voices and instruments that can achieve higher notes. 
5	Bass Clef = Signifies low to medium pitches being read on the staff. 

3. DR SMITH		In music we use DR SMITH to help us remember terms of music.	
1	D ynamics	How loud or quiet you play the music.	
2	R hythm	Is a pattern on sounds of different lengths and what makes music move and flow.	
3	S tructure	Gives shape and balance to music.	
4	M elody	The main tune of the piece.	
5	I nstrumentation	 A combination of instruments used to perform a piece of music. - Strings (bowed) - Woodwind - Brass - Percussion - Keyboard - Guitar - Voice	
6	T exture	Layers of sound in a piece of music.	
7	T empo	How fast or slow the music is.	
8	T onality	Major or minor scale.	
9	H armony	A multiple of pitches being played at the same time.	

<https://www.youtube.com/watch?v=bHTstUefUq0>
Practise your rhythms with this link.

3. Dynamics		Dynamics can make the listener feel different emotions. In music you would use Italian words to describe the dynamics.	
1	<i>pp</i>	Pianissimo = Very soft & very quiet	
2	<i>p</i>	Piano = Soft & Quiet	
3	<i>mp</i>	Mezzo Piano = Medium soft & quiet	
4	<i>mf</i>	Mezzo Forte = Medium loud	
5	<i>f</i>	Forte = Loud	
6	<i>ff</i>	Fortissimo – Very loud	
Key Vocabulary			
1	Pulse		he heartbeat of the rhythm/music that you hear.
2	Composition		An original piece or work of music.
3	Unison		Two or more people play or sing the same pitch or in octaves at the same time.
4	Polyrhythm		When two or more rhythms with different pulses are heard together.
5	Graphic score		Representation of music through the use of visual symbols.
6	Call and Response		The leader sings a line (the call) and is answered by a chorus (the response).
7.	Solo		An individual performance.



HINDUISM

KNOWLEDGE ORGANISER



Overview

Hinduism is one of the world's major religions. It is the **world's 3rd largest religion**, with about 1.1 billion followers. It is around 5,000 years old.

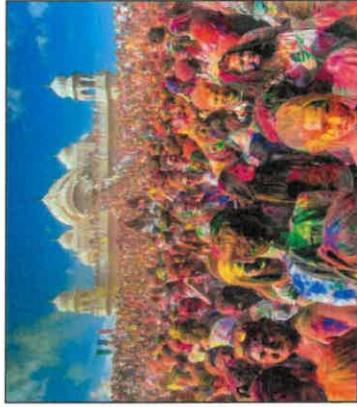
Hindus are the people who follow Hinduism. It is a very complex religion that is followed by different people in different ways.

Many gods are worshipped in Hinduism. All of these different Gods are believed to be a part of the supreme God named '**Brahman**.'

Hindus believe in **karma** and **reincarnation** – that when you die you are reborn as something else.

Hinduism does not have one holy book, but several sacred texts. **Mandirs** are Hindu worship buildings.

Image of Holi festival, celebrating the start of spring. People smear each other with colours.



Hindu Beliefs

Brahman and the Gods

-Hindus believe in one supreme God called **Brahman**. He can be found in everyone and everything, including the other Gods.

-Some of the important other Gods include '**Brahma**' (the creator), '**Shiva**' (the destroyer) and '**Vishnu**' (the protector). These three together form the '**Trimurti**' (trinity).

-Other gods include **Ganesh** (remover of obstacles), **Hanuman** (the monkey God), **Lakshmi** (the Goddess of wealth and good fortune, and **Vishnu** (the God who preserves life and stands up to evil).

Karma and Reincarnation

-Hindus believe that people are born again after they die, as another living thing (reincarnation).

-In each life the person is rewarded or punished for the things that they have said and done in their last life – this is called **karma**.

-Hindus believe that if they live a perfect life, they will be freed from birth and death to join the Gods (**Moksha**).



Festivals

-Hindus enjoy many festivals as a part of their religion. **Holi** festival marks the beginning of spring.

-**Diwali**, or the Festival of Lights, is held in the Hindu month of **Ashwin** (September of October in the western calendar). This event marks the Hindu New Year. Oil lamps are lit and floated down rivers to welcome the Goddess of Wealth. Fireworks are set off in order to ward off evil spirits.

-Hindu people also go on pilgrimages, for example to the River Ganges, which is sacred to Hindus.

Answers to Important Questions and Key Vocabulary

Where and how do Hindus worship? Why?	 	-Many Hindus worship at home in their own shrine – this could be anything from a room, an altar, or simply pictures or statues. -The Hindu building for communal worship is called a Mandir (Hindu temple). The temples are dedicated to different gods and are the focus of religious life. -At Mandirs , Hindu people often recite the names of Gods and Goddesses. They also offer water, fruit and flowers to the Gods.	Key Vocabulary
What are the Hindu holy books?		-There are many different types of holy texts in Hinduism. Perhaps the most sacred are called the Vedas . The Vedas guide people in their daily lives. They are written into the Sanskrit language.	Hindu Brahman Karma Reincarnation Brahma Shiva Vishnu Holi Devoli
Where do most Hindus live in the world?		-About 15% of the world's population are Hindus. -India has the most Hindus by far – about 1 billion Indians are Hindus – this is around 80% of all Indians. -However, Nepal has the highest proportion of Hindus – about 83% of its population are Hindus. There are also lots of Hindus in Bangladesh, Indonesia, Malaysia, Pakistan and Sri Lanka. -Most of the populous countries in the world contain a population of Hindu people.	Shiva Vishnu Holi Devoli
How many different types of Hindus are there?		-There are many, many different forms of Hinduism, as different types have developed over the thousands of years since it was founded. -There are four main forms – Vaishnavism , Shaivism , Shaktism and Smartism . These four types can be broken down many more times! -Although they have small differences, each of the different forms follows the same rough principles.	Dhoti Sari River Ganges

Top 10 Facts!

1. Hindus believe that all living things have souls.	6. Hindu women wear a long piece of clothing called a sari .
2. Because of this, very committed Hindus are vegetarians.	7. Singing and dancing is an important part of Hindu worship, as is chanting.
3. Cows are considered to be particularly sacred, as they give milk to the people.	8. Big Hindu ceremonies include marriage (vivaha) and cremation (antyeshti)
4. People clean their houses, and then decorate them, to celebrate Diwali .	9. Hindu wedding celebrations last for many days. The bride and groom wear red and gold.
5. Traditional Hindi clothes include a robe (dhoti) and shawl (chaddar) for men.	10. After death, Hindus are cremated, and their remains are scattered in a nearby river.

Hindu Timeline

2500BCE: Evidence of Indus Valley Hindus.	1500 BCE: The oldest Hindu scriptures were created.	1300 BCE: The oldest Hindu hymns were composed.	800 BCE: The sacred text of the Mahabharata begins to be composed.	600CE: Hinduism begins to grow and flourish – prayers and songs written.	950-1050CE: A 'City of Temples' is built in India at Khajuraho – 80 still stand.	c. 1600 CE: The Hindu Renaissance begins. Many modern versions of sacred texts are found, translated and used.
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R.E: SPECIAL PLACES

KNOWLEDGE ORGANISER



Overview

-Places can be extremely important to people. Most people have different places in their lives that are special to them. Different places are special to different people.

-Home is often a special place for people. It helps them to feel as though they belong and are safe.

-Many religious people, for example Christians, Jews and Muslims, have special places that mean a lot to them and their religion.

-To these people, places (and the objects and symbols in them) are often sacred.

The Sheikh Zayed Grand Mosque in Abu Dhabi, a special place for Muslims.



In Judaism

Synagogues

-Synagogues are places of worship for Jewish people. Jews use synagogues as places to meet, worship and study.

-Jews sometimes call their synagogues 'temples' or 'shuls.'

-Synagogues often have large rooms for prayers, and smaller rooms for studying.

-There are normally also offices and a large room for special events.

-The front of the synagogue faces towards Jerusalem in Israel. Jerusalem is a holy place in Judaism.



The Western Wall

-The Western Wall is a holy place of prayer and pilgrimage for Jewish people.

-It was once a part of the Second Temple of Jerusalem, but now the western wall is all that remains.

-It is about 50 metres long and about 20 metres high.

-Jews make pilgrimages (religious journeys) to the Western Wall.



Key Vocabulary

Church

Advent

Harvest

Altar

Lectern

Font

Stained-Glass Windows

Synagogue

Western Wall

Mosque

Prophet Muhammad

Allah

Dome

In Christianity

Churches

-Churches are special religious places for Christians.

-Every Sunday, Christians gather in churches to worship God and Jesus.

-Churches are places where babies are christened, people are married, and funerals are held. It is also a peaceful place, where people can come and pray to God in their own time.

-Many churches are the centre of their communities, and hold lots of activities and programmes which people are welcome to attend.

-Churches also hold special events at different times of the year, e.g. Easter/ Christmas.



Harvest Festival

-At Harvest time (in Autumn), many churches are filled with fresh produce and foods.

-At Harvest time, Christians thank God for his creation, and for the food they eat.

-Christians often donate food and money at this time of year, to those who need it more than themselves.



Advent

-Advent takes place in the lead up to Christmas (December).

-On each of the four Sundays of advent, candles are lit around an advent wreath.

-On Christmas Eve/ Christmas Day, a 5th is lit in the centre, representing Jesus.

-Many churches hold nativity plays.



In Islam

Mosques

- Muhammad lived around 1,400 years ago in Arabia. Muslims believe that he received messages from God. This is the basis for Islam.

-According to Muslim tradition, Muhammad's camel (Qaswa) chose the location of the very first mosque. Mosques are where Muslims pray to Allah (God).

-Bilal, one of Muhammad's companions, gave the very first call to prayer. The 'adhan' (call to prayer) still takes place today, and begins each time with the words 'Allahu akbar' (God is most great) repeated four times.

-Today, there are mosques all over the world. They often have domes and/or minarets (tall, slender towers). There are no pictures/ statues in

Mosques as Muslims believe that this would be offensive to Allah.

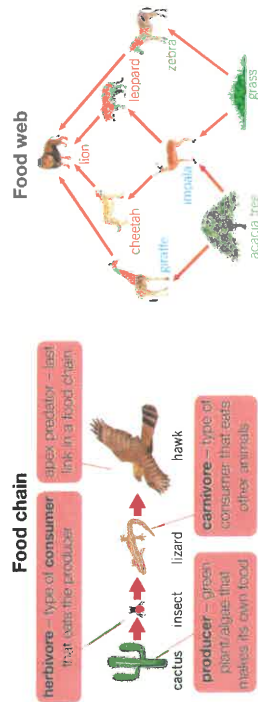


Personal Spirituality – Key Questions

What makes our homes special?	Where is my favourite place in my home?	What makes our school special? What makes our village special?	What special places have I visited?	How do I feel when I am in special places?	Are places that are special to me, special to everyone?	What do I like/ dislike about places around me?	What times and events can make places special?
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Food chains and webs

- **Food chains** show the direction in which energy flows when one organism eats another
- The direction of the arrows represent the direction in which the energy flows
- **Food webs** show how a number of different food chains are connected



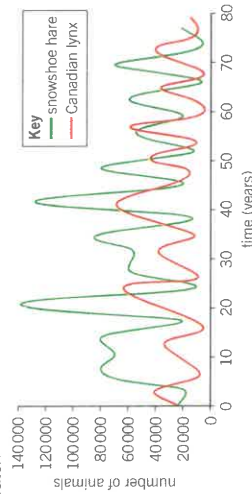
- **Producers** are the organisms which start the food chain, they convert energy from the Sun, making their own food, these are often plants
- **Prey** are organisms which are eaten by other organisms
- **Predators** are the organisms which eat the prey

Ecosystems

- All of the organisms which live in one area are known as a **population**
- An **ecosystem** is all of the organisms which are found in a particular location and the area in which they live in, both the living and non-living features
- A **community** are all of the areas in an ecosystem, the area in which the organisms live in is known as the **habitat**
- A **niche** is the specific role in which an organism has within an ecosystem, for example a panda's diet consists of 99% bamboo

Competition

- **Competition** is the process in which organisms compete with one another for resources
- Animals compete for food, water, space and mates
- Plants compete for light, water, space and minerals
- The best competitors are those who have adapted in order to best gain these resources
- As the number of a predator in a population increases the number of the prey will decrease as more are being eaten

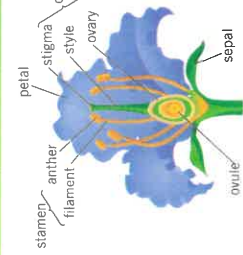


- As the number of the predator decreases the number of the prey will increase as less are being eaten
- The relationship between the predator and the prey is known as a **predator-prey relationship**

Disruption to food chains

- **Interdependence** is the way in which living organisms rely on each other to survive
- A food chain will be disrupted if one of the organisms die out
- If the producer dies out the rest of the food chain will also die out unless they have a different food source
- If the **consumer** population die out the number of organisms which they eat will increase unless they are eaten by another organism
- **Bioaccumulation** is the process by which chemicals such as pesticides and insecticides build up along a food chain

Parts of a flower



Stamen

- Male part of the flower
- The **anther** produces **pollen**
- The **filament** holds up the anther

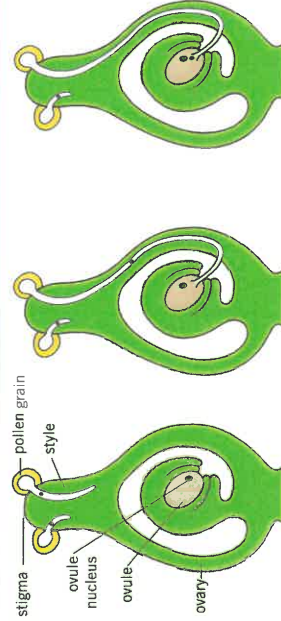
Carpel

- Female part of the flower
- The **stigma** is sticky to catch grains of pollen
- The **style** holds up the stigma
- The **ovary** contains **ovules**

Pollination and fertilisation

Pollination is the **fertilisation** of the ovule, the point at which the pollen is transferred to the ovule from the anther to the stigma, there are two types of pollination

- Cross pollination is between two different types of plant
- Self pollination happens within the same plant



The tube grows out of the pollen grain and down through the style.

The tube grows out of the pollen grain and down the tube. The pollen nucleus moves down the tube.

The pollen nucleus joins with the ovule nucleus. Fertilisation takes place and a seed will form.

Germination is
the seed needs:

Germination is the process in which the **seed** begins to grow, for this to occur the seed needs:

- Water to allow the seed to swell and grow and for the embryo to start growing
- Oxygen for that the cell can start respiring to release energy for germination
- Warmth to allow the chemical reactions to start to occur within the seed

 Key terms

Make sure you can write definitions for these key terms.

anther	bioaccumulation	carpel	community	competition	consumer	ecosystem	fertilisation	food chain	food web	germination	habitat	interdependence
	ovary	ovule	petal	predator	prey	producer	pollination	population	seed	stamen	stigma	style

P1 Chapter 3: Energy

Knowledge organiser

Energy

- **Energy** is needed to make things happen
- It is measured in **joules** or **kilojoules**
- The **law of conservation of energy** says that energy cannot be created or destroyed, only transferred
- This means that the total energy before a change is always equal to the total energy after a change

Energy can be in different energy **stores**, including:

- **Chemical** – to do with food, fuels and batteries
- **Thermal** – to do with hot objects
- **Kinetic** – to do with moving objects
- **Gravitational potential** – to do with the position in a gravitational field
- **Elastic potential** – to do with changing shape, squashing and stretching

Food and energy

- Food has energy in a chemical energy store
- Different foods contain different amounts of energy
- Different activities require different amounts of energy
- Different people need different amounts of energy depending on what they do each day

Power and energy

- **Power** is a measure of how much energy is transferred per second
- Power is measured in **watts (W)**
- Each appliance has it's own power rating to tell us how quickly it uses energy
- We can calculate power with the equation:

$$\text{power (W)} = \frac{\text{energy (J)}}{\text{time (s)}}$$

Non-renewable energy

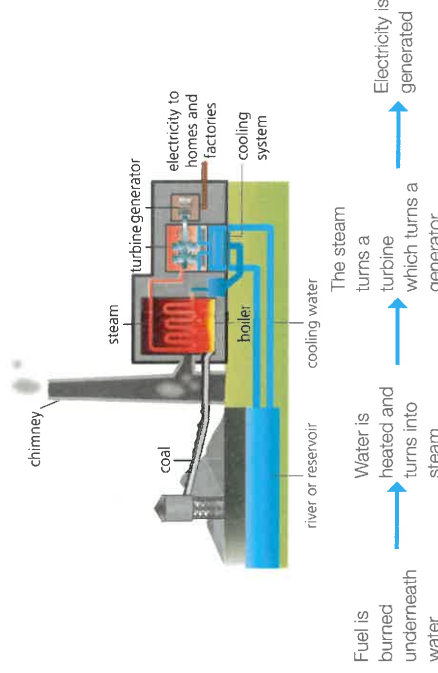
- **Non-renewable** energy cannot be replaced within your lifetime
- **Non-renewable energy resources** include coal, oil, natural gas and nuclear resources
- Coal, oil and natural gas are also known as **fossil fuels**, they release carbon dioxide when burned which contributes to global warming

Renewable energy

- **Renewable** energy can be replaced within your lifetime
- Renewable energy resources include wind, tidal, wave, biomass, solar, hydroelectric and geothermal
- Renewable energy resources do not produce much carbon dioxide, meaning that they have a smaller effect on global warming

Power stations

Thermal power stations burn coal, oil and natural gas, which are all non-renewable energy resources



Dissipation of energy

- We say that energy is **dissipated** when it is transferred to a nonuseful store, it cannot be used for what it was intended for
- Energy can be wasted through friction, heating up components or heating the surroundings
- **Efficiency** is a measure of how much of the energy has been used in a useful way, we can calculate this with the equation:

$$\text{efficiency (\%)} = \frac{\text{useful energy output}}{\text{energy input}} \times 100$$

Key terms

Make sure you can write definitions for these key terms.

chemical dissipated efficiency elastic potential energy energy resources fossil fuels gravitational potential joules kinetic kilojoules
law of conservation of energy non-renewable power renewable thermal watts

Chemical reactions

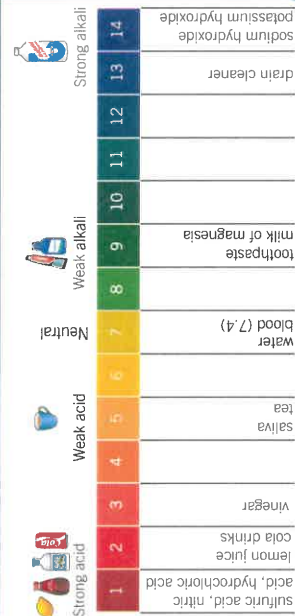
- A **chemical** reaction is a change in which atoms are rearranged to make new substances
- A **reversible** reaction is one where the products can react to get back the substances which you started with, most chemical reactions are not reversible
- You can look for signs that a chemical reaction has taken place such as flames, smells, heat change, a loud bang or gentle fizz

Acids and alkalis

- Acids and alkalis** are the chemical opposites of one another
- Both acids and alkalis can be **corrosive and irritants**

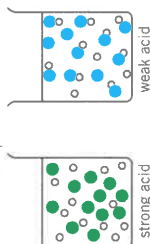
To see whether a substance is an acid or an alkali, we can use an **indicator**. Indicators show how acidic or how alkaline a solution is by showing its position on the **pH scale**, one example of this is **universal indicator**

- If the solution has a pH value of 1–6 it is **acidic**
- If the solution has a pH value of 8–14 it is **alkaline**
- If the solution has a pH value of 7 it is known as **neutral**



Acid strength

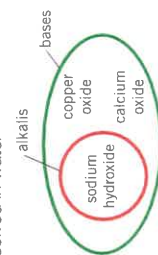
- The strength of an acid depends on how much of the acid has broken apart when it has dissolved in water
- Hydrogen chloride dissolves in water to form hydrochloric acid, this is a **strong acid** as all of the particles split up
- A **weak acid** will have particles that do not all split up



- The **concentration** of the acid is the amount of acid which has dissolved in 1 litre of water
- The more concentrated the acid, the lower the pH

Neutralisation

- Neutralisation** reactions are any reaction in which acids react with a **base** to cancel out the effect of the acid
- These reactions form a neutral solution with a pH of seven
- A **base** is any substance which neutralises an acid
- An alkali is a base which has been dissolved in water



Salts

- Salts** are substances which are formed when an acid reacts with a metal or metal compound
- Different acids form different types of salts:
 - Hydrochloric acids form chloride
 - Sulphuric acids form sulphates
 - Nitric acids form nitrates

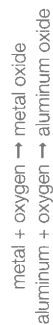
Metal reactions

When a metal reacts with an acid it will produce a salt and hydrogen gas, the fizzing that you see is the hydrogen gas being given off

metal + acid → salt + hydrogen

magnesium + hydrochloric acid → magnesium chloride + hydrogen

When a metal reacts with oxygen a metal **oxide** is formed, this process is known as **oxidation**

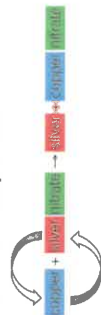


- When a metal reacts with water it forms a metal **hydroxide** and hydrogen gas.
- The alkali (group 1) metals react most vigorously, giving off a brightly coloured flame

metal + water → metal hydroxide + hydrogen

sodium + water → sodium hydroxide + hydrogen

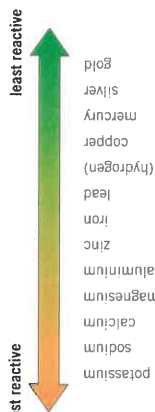
When a more reactive metal reacts with a compound containing a less reactive metal, it can take its place, this is known as a **displacement** reaction



- If the metal on its own is higher in the **reactivity series** than the metal in the compound a reaction will take place
- If the metal on its own is lower in the reactivity series than the metal in the compound, a reaction will not take place

The reactivity series

- The **reactivity series** describes how reactive different metals are compared to one another
- The higher the metal is in the reactivity series the more reactive it will be this means that it will react much more vigorously



Key terms

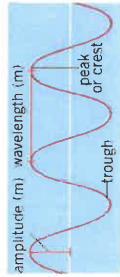
Make sure you can write definitions for these key terms.

acid acidic alkali alkaline base chemical chemical reaction concentration concentrated corrosive displacement hydroxide indicator irritant neutral

neutralisation oxide oxidation pH scale reversible reactivity reactivity series salt strong acid universal indicator weak acid

Properties of waves

- A **wave** is an **oscillation** or **vibration** which transfers energy from one place to another
- Amplitude** – the distance from the middle to the top of bottom of the wave
- Wavelength** – the distance between a point on the wave to the same point on the next wave
- Trough** – The bottom of the wave
- Peak** – The top of the wave
- Frequency** – How many waves pass a fixed point per second, measured in Hertz (Hz)



There are two main types of waves:

Transverse waves, e.g. light

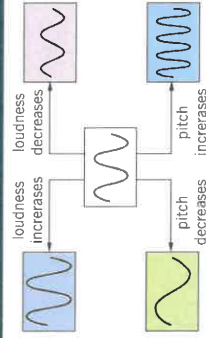
- Travel at 90° direction of energy transfer
- Do not need a medium to travel through

Longitudinal waves, e.g. sound

- Travel in the direction of energy transfer
- Need a medium to travel through

Sound waves

- Sound waves are caused by the vibration of particles, sound travels quicker in a solid than a gas as the particles are closer together
- Oscilloscopes** display sound waves on a screen
- Humans can hear between 20–20000 **hertz** (Hz), but other animals have different ranges of hearing
- Sound waves above 20000 Hz are known as **ultrasound**, these sound waves are too high pitched for humans to hear

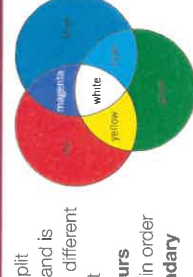


Hearing

- The **pinna** directs sound along the **auditory canal** to the **eardrum** which will vibrate
- The vibration from the ear drum moves onto the ossicles which amplifies the sound
- This passes the sound to the cochlea where tiny hairs detect the vibrations and passes this along to the **auditory nerve** as electrical signals for our brain

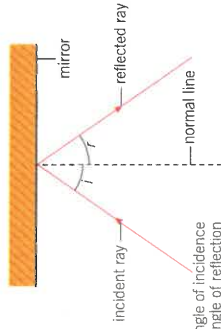
Colour

- Light can be split using a prism and is made up from different colours of light
- Primary colours** can be mixed in order to form **secondary colours**
- Objects appear a certain colour as they absorb all other colours of light, but reflect the colour of light which they appear



Reflection

- The **law of reflection** states that the **angle of incidence** will be equal to the **angle of reflection**

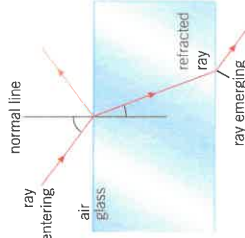


- For light reflecting off a smooth surface will form an image is called **specular reflection**
- Reflection off of a rough surface will not form an image and is known as **diffuse scattering**



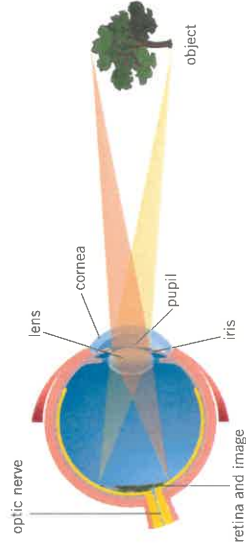
Refraction

- Refraction** occurs when a wave passes between two different substances
- This happens as the wave will travel at different speeds in the different materials
- When the wave passes into a more dense material from a less dense material it will bend towards the **normal**, e.g. air into glass
- When the wave passes into a less dense material from a more dense material it bends away from the normal e.g. glass to air



Light and the eye

- Light entering your eye is refracted by the **lens**, focusing it on the retina and creating an inverted image
- Photoreceptors** detect the light hitting your retina and send an electrical impulse to your brain
- If the light is not focussed on the retina or the eye, people cannot see properly
- Long sighted people have the light focus behind the eye, short sighted people have the light focus in front of the retina.
- Lenses can be used to refract the light in a way in which it will focus on the retina.



Key terms

Make sure you can write definitions for these key terms.

amplitude angle of incidence angle of reflection auditory canal auditory nerve diffuse scattering eardrum frequency hertz law of reflection lens longitudinal normal oscillation oscilloscope peak photoreceptors primary colour refraction secondary colour specular reflection transverse trough ultrasound wave wavelength