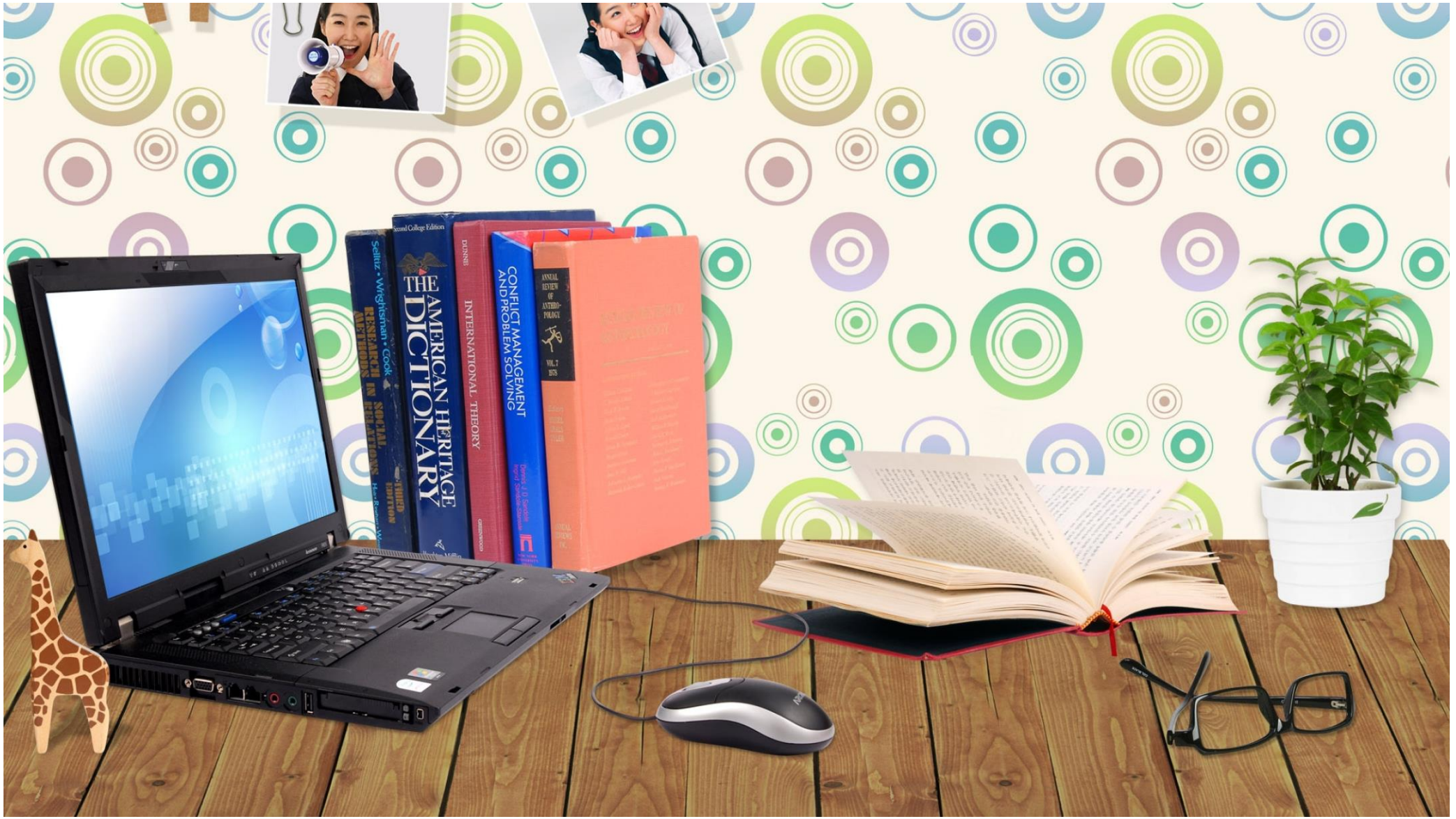
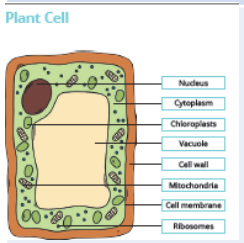
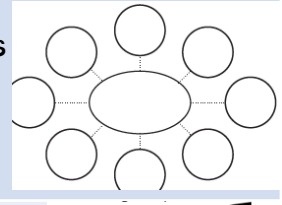


Autumn 1 Knowledge Organiser - Year 9 Name:

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.

The knowledge is evolutionary not revolutionary. Approximately half the knowledge is new and half helps you revise. Many of the activities are changing. We hope you enjoy them.

Idea	Explanation
Make some flash cards or PowerPoint slides. Make top trumps. 	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.
 Make a poster.	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!
Draw spider diagrams, or for the adventurous mind maps. 	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.
Write a song or a rap. 	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.
 Plan a lesson	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.
Write a story or comic strip. 	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.
Write a quiz. Design a game. 	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.

Sharing the Love of Reading: 11-16-year olds

The Open University

1. Can I read aloud to a friend or relative?

2. Can I hide a story or poem to be found?

3. Can I deliver a speech from a character or public figure?

4. Can I share my reading journey over the last week?

5. Can I learn about a book from someone's past?

6. Can I…

7. Can I discover what books mean to someone else?

8. Can I…

9. Can I create a paper chain of poetry?

10. Can I gain a '7-day streak' of reading?

11. Can I design my own reading den?

12. Can I recreate a scene/poem using various materials?

13. Can I read in an unusual & unexpected place?

14. Can I set up a news desk & give a report?

18. Can I make my own mini book?

15. Can I recreate a favourite book or comic cover?

16. Can I find an online video of an illustrator drawing and draw along?

17. Can I make an A-Z of authors, book titles or favourite characters?

MAYFLOWER COMMUNITY ACADEMY & NURSERY

Accelerated Reader™

To improve my Book Level:

- I will always quiz within my ZPD.
- According to my last quiz result, I should choose a book....

100%	This book was comfortable for you, perhaps try a book higher up in your ZPD range next time.
90%	This book was perfect for you. Perhaps try one or two book levels higher next time.
80%	This book was a little difficult for you. Perhaps choose one or two book levels lower next time.
70%	This book was quite challenging for you. Perhaps try a book at the lower end of your ZPD range next time.
60% or below	This book was too challenging. Perhaps try a book at the low end of your ZPD or speak to your teacher for help.

To improve my Average Percent Correct:

I will use the 5 W's to review before I quiz

I will take my time when quizzing

I will make sure my book within my ZPD range

I will make notes when reading

I will quiz as soon as I finish my book

5 W's:
What...
Who...
When...
Where...
Why....

To meet my Points Target:

Aim for 100% to earn all the points

I will fit in extra reading time:
Before bed?
On the bus?
During lunch?

I will read **fewer long** books

I will stick with a book and **finish it**

I will read several shorter books

If you are able to understand a book as you read, but struggle to remember events when you quiz, ask Miss Ling for a reading reminder sheet.

Questions, questions, questions…

Asking and answering questions (in our head and aloud) helps us to be better readers. We are constantly asking questions to encourage comprehension skills during reading and these can be broken into three clear sections; 'before', 'during' and 'after' reading.
Here are some examples you can try at home:
(You don't have to ask every question every time you read, try picking out 2-3 different questions each time you read.)

Before reading:

•Why did you select this book?
•What makes you think this book is going to be interesting?
•What do you think the book is going to be about (use the cover image, title and blurb for clues)?
•Does this book remind you of anything else you've already read or seen?

During reading:

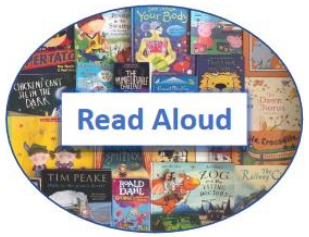
•Who/What/Where/When/Why/How questions
•Will you catch me up on the story? What's happened so far?
•What do you think will happen next? Why do you think that?
•Why do you think the character did _____?
•If you were that character, what would you have done differently in that situation?
•How do you think the character is feeling right now?
•If the book was a TV show, which actors would you cast in it?
•Where is the book set?
•What does the place look like in your head as you read? Would you want to visit there?
•Did you learn any new words or facts so far?

After reading:

•What was your favourite part of the book? Why?
•Who was your favourite character? Why?
•What was the most interesting thing you learned from the book?
•Why do you think the author wrote this book?
•Would you have ended the book differently? Did it end the way you thought it would?
•If you could change one thing in the book, what would it be?
•Do you think the book had a good title? What different titles could it have had?
•Can you retell the story in your own words?
•Does this book remind you of anything else you have read? How so?

Supporting Readers at Home

Open University research suggests there are three important ways to support readers and a love of reading.



Reading aloud to your children shows them reading is a pleasure, not a chore. Older children can also read to younger ones.
*Reading together doesn't have to be a story (recipes, news articles etc. all count too!)
*If you are not confident in reading aloud, why not listen to an audiobook together.

Making time to read alongside one another helps develop children's reading stamina and interest, Let them chose what to read and relax together (you don't need to be reading the same thing.)
* Where can you 'fit' reading in? It could be 10 minutes before tea, when they come home from school, waiting in the car, before bed etc. You may find it easier to set a regular time aside, or fit it in around your other commitments.

Children who read, and are supported as readers, develop strong reading skills and do better at school. Research also shows that reading aids relaxation and has benefits for mental health.

I wonder if…why…what…who…

Book chats encourage readers. Invite them to make connections and share their views. Join in with your views too! (Please see the next page for suggested questions you can ask about any book.)

Adapted from Open University 'Supporting Reading at Home': https://researchrichpedagogies.org/_downloads/Supporting_Readers_at_Home_Poster_.pdf
For more ideas see: https://www/researchrichpedadgogies.org

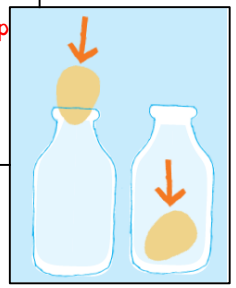
Practical Science at Home

CHANGES OF STATE
The brief: Make an egg fit into a bottle without breaking it.

The method

1. Submerge the egg in a glass of vinegar for two days: the shell will become rubbery.
2. Heat the bottle in hot water – remember to use gloves or a tea towel when handling it.
3. Rest the egg on the neck of the bottle.
4. As the air inside the bottle cools down, it will contract and suck the egg down. Top tip Try lubricating the egg with cooking oil or washing up liquid.

Now find out why this happens using your knowledge of solids, liquids and gases

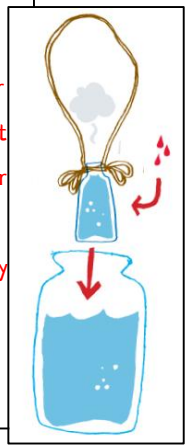


HEAT TRANSFER
The brief: Create a colourful underwater volcano.

The method

1. Cut a two foot length of string with a pair of scissors. Tie a knot around the neck of a salt shaker with one end of the string. Double-knot it to ensure the knot is secure. Repeat this process with the other end of the string, resulting in a handle to lower your shaker.
2. Empty and clean a large jar. Fill the clean jar about three quarters full with cold water.
3. Fill the salt shaker with hot water (with adult supervision) – as hot as you can get from your tap – to just below the neck. Add three to four drops of red food colouring.
4. Hold your salt shaker over the mouth of the jar by the string handle. Slowly lower the salt shaker into the jar until the shaker is completely submerged and resting upright on the bottom of the jar. Observe how the coloured water erupts from the shaker into the cold water.

Explain this using the idea of convection currents

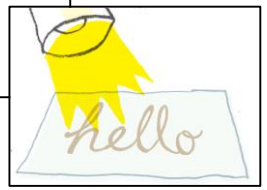


INVISIBLE INK
The brief: Write your own secret message in an invisible ink solution.

The method

1. Squeeze lemon juice into the bowl and add a few drops of water. Stir with the spoon.
2. Dip the paint brush into the juice mixture and write a message on the paper.
3. Allow the paper to dry completely. Your message should become invisible.
4. Hold the paper very close to the light bulb to heat up the message area (adult supervision required). Watch your message appear.

Why does heat uncover the message? What is a reversible reaction?

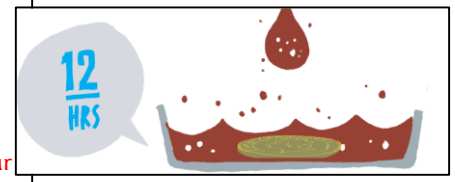


ACIDS & ALKALIS
The brief: Clean a penny using cola.

The method

1. Place the penny in the container.
2. Add enough cola so the penny is covered.
3. Leave overnight.
4. In the morning, you should find that your penny is clean.

What makes something acidic? What chemical reaction is happening to the penny?

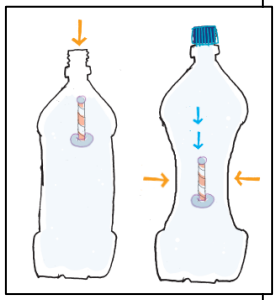


THE DENSITY DIVER
The brief: Build a Cartesian diver.

The method

1. Put a small ball of plasticine on the top of the straw to seal it.
2. Roll a sausage of plasticine and wrap it around the bottom of the straw, leaving the bottom open. This is your diver.
3. Now attempt to balance the diver so that it stays upright.
4. Place the diver vertically in the drinking glass. Add or remove weight from the base or top so that when you push it down, it just about bobs back up to the surface (and stays upright).
5. Once you are happy, place the completed diver in the two litre bottle filled to the top with water. Screw on the lid. Squeeze the bottle, and the diver will drop down to the bottom of the bottle. Release it and it floats back to the surface.

What is density? What makes something high or low density? Why might this be useful?

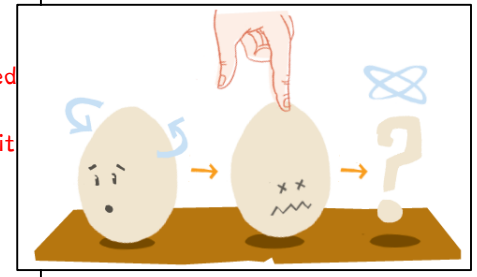


MOMENTUM
The brief: Use eggs to find out about momentum and changing direction.

The method

1. Spin each egg, one hard boiled and one fresh, on a table.
2. Leave it to spin for a few seconds then momentarily stop it by placing your finger on top.
3. Release the egg and observe what happens next.

What is happening to the inside of the egg? How do you calculate momentum?

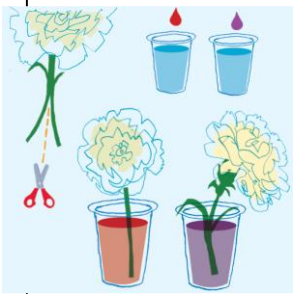


COLOURED CARNATIONS
The brief: Create multi-coloured flowers.

The method

1. Use the scissors to cut the stem of the carnation in half lengthways.
2. Take two cups and fill them with water. Add a different coloured food dye to each cup.
3. Put the split stems of the carnation into the cups and leave overnight.
4. The next morning you should find that your flower has changed colour.
5. What do you notice about the petals?

How does the food dye het to the petals? What is xylem and phloem?

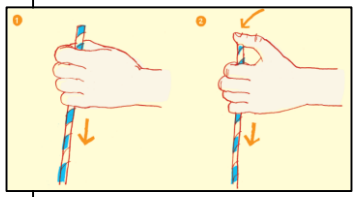


STRONG AS A DRINKING STRAW
The brief: Use a drinking straw to pierce through a raw potato.

The method

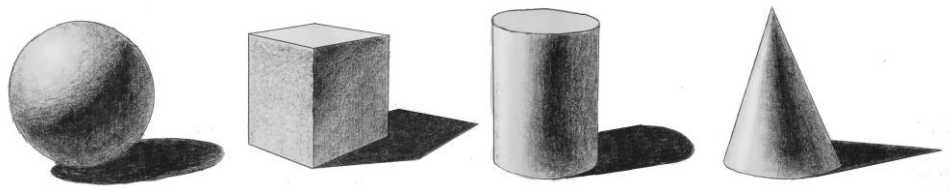
1. Hold the straw by its sides, without covering the hole at the top and try quickly stabbing the potato.
2. Repeat the experiment with a new straw but this time place your thumb over the top, covering the hole.

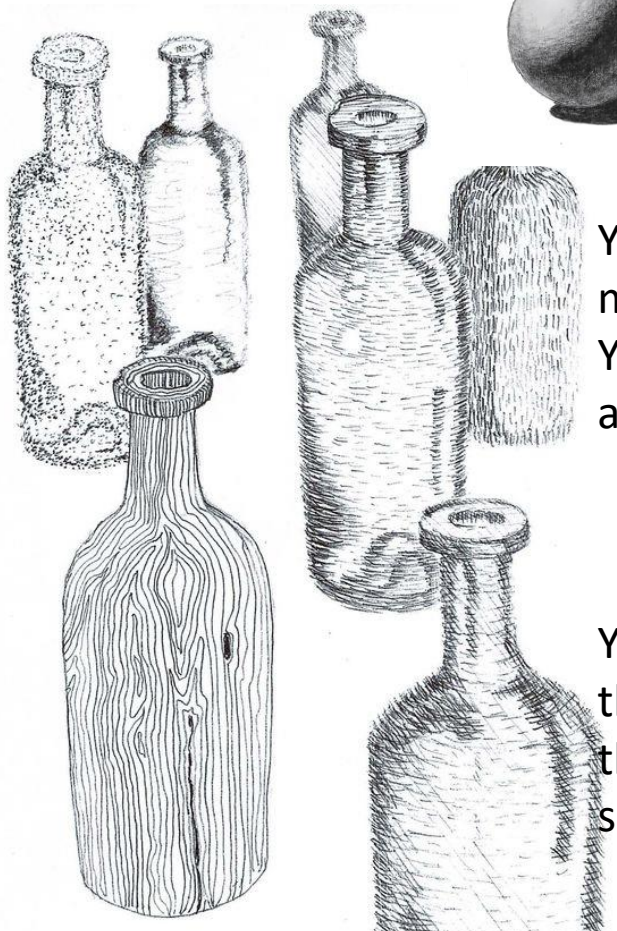
What forces are increasing or decreasing to allow this to happen?



Year 9 Art Knowledge Organiser - Autumn Term:

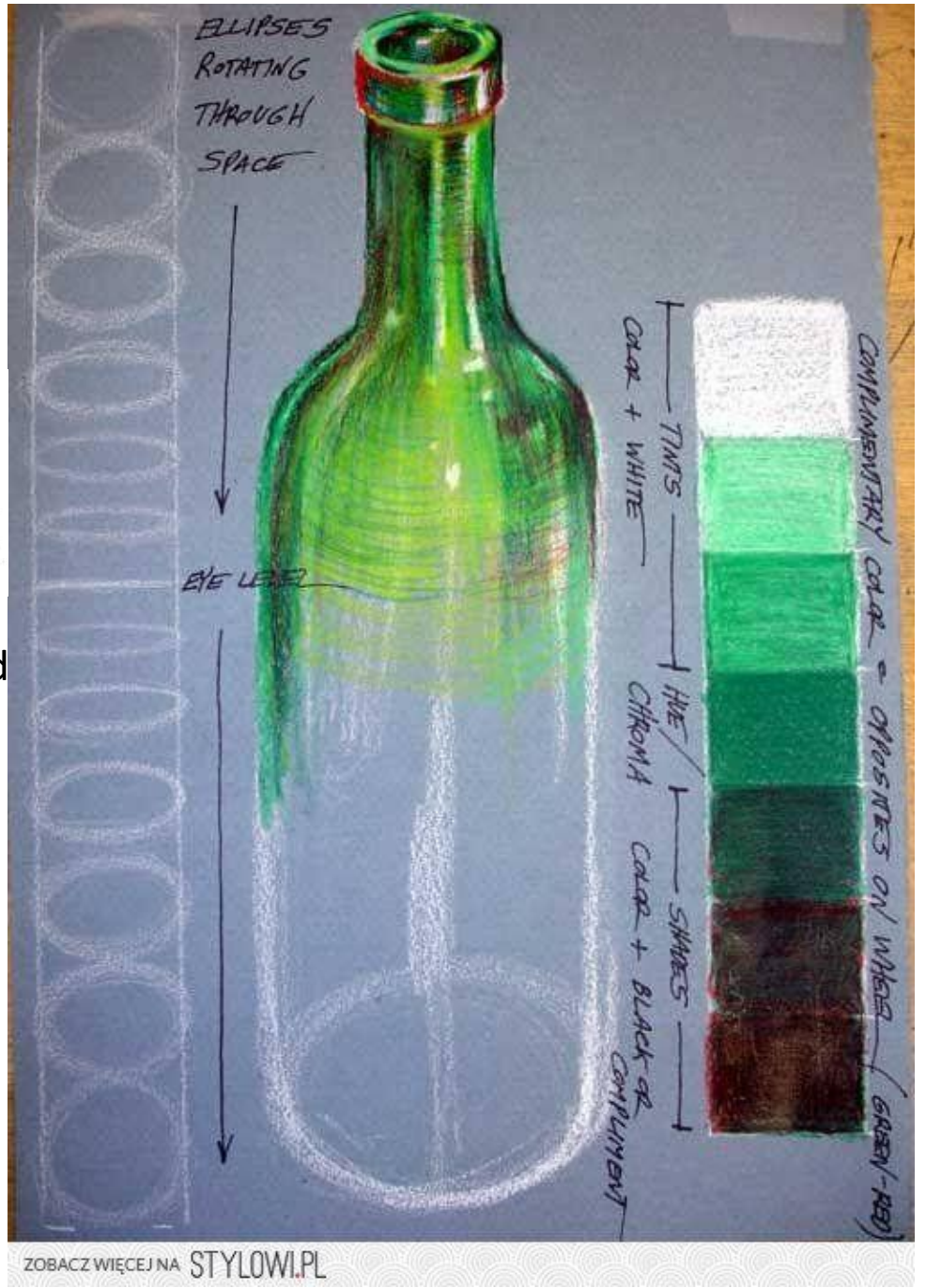
- At the start of Year 9 we do a series of lessons reminding students of the basic formal elements of Art such as **TONE**, **FORM**, **LINE**….etc… See next page for full breakdown of the art elements.
- You continue your learning on observational drawing and using tone to show 3D form. See example b[illegible]





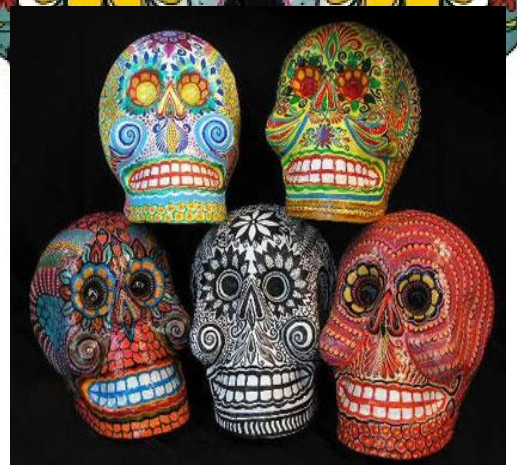
You learn new ways to make more advanced marks to create a 3D- effect.
You use new materials such as ink and learn about their properties.

You are encouraged to draw from life like in the sketch of the bottle to the right. This is the best way to improve your observation skills in Art.



Day of the Dead

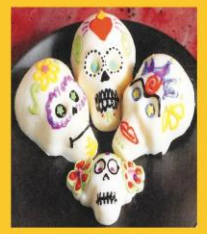
Soon after half term,
Year 9 begin studying the Mexican Festival “The Day of the Dead” learning about this tradition and the Art work that is inspired by it.
They produce their own mask design and Clay sculpture in response.



Dia de los Muertos

Day of the Dead is a Mexican holiday that celebrates and remembers the dead.

Graves are decorated with flowers and candles



food is offered as gifts

Marigold flowers are used as decoratation

People take part in parades.

In Mexico, Day of the dead is held on 2nd November, but many other countries celebrate their dead too, such as the Chinese Hungry Ghost festival and All Hallows in the UK.

You need to complete the following tasks:

1. Day of Dead research page
2. Day of Dead Mask Design
3. Colour mask

Autumn 1 half term: Year 9 Aluminium keyring

Aluminium

Light, durable and functional: these are the qualities that make aluminium one of the key engineering materials of our time. We can find aluminium in the homes we live in, in the cars we drive, in the trains and aeroplanes that take us across long distances, in the mobile phones and computers we use on a daily basis, in the shelves inside our fridges and in modern interior designs, but a mere 200 years ago very little was known about this metal. Aluminium will not rot or rust, it naturally generates a protective oxide coating, making it perfect to use as a keyring. It is soft and malleable.

Using the workshop safely

Why do you use a vice when cutting your material?
What PPE do you need when using the pillar drill?
What are the similarities of cutting metal and wood?
How did you achieve a smooth finish to your keyring?
Why is it important to achieve a smooth finish for your keyring

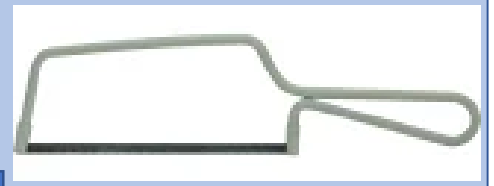
Who is your keyring for?
What considerations do you need to take into account when designing a keyring for this person?
How and when might they use it? What size and features could it have? Are there any safety considerations for a metal keyring?
Careers using this knowledge: product designer, D&T teacher

Marking, cutting, drilling, sanding and finishing aluminium

1 Put masking tape on your aluminium so you can draw the shape you want to cut for your keyring. Use a sharp pencil to draw your line and mark where you want the keyring hole to be.

2 Put your aluminium in a metal vice

3 Cut around your drawn shape with a junior hacksaw. Remember to cut just outside your drawn line so you can see the line when you file it.



4 File sharp edges with a file

5 Use a pillar drill to make a hole for your keyring

6 Use wet and dry sandpaper to smooth the edges of your keyring. Start with a coarse grit sandpaper then medium grit then finally smooth grit wet and dry.

7 Use a polisher to shine your metal keyring

Health and Safety

Micro-organisms

Micro-organisms are tiny forms of life. They can only be seen under a microscope and are sometimes called microbes.
They spoil food and make it unsafe to eat because they contaminate it with their waste products, their physical presence and the toxins they produce.

What micro-organisms can spoil food and make it unsafe to eat?

There are three groups of micro-organisms that you need to know about that spoil food and cause food poisoning. These are..

- Bacteria
- Moulds
- Yeasts

Micro organisms need 5 conditions to grow and multiply:

1. A warm temperature
2. Plenty of moisture (water)
3. Plenty of food
4. The right PH level (not too acidic or alkaline)
5. Enough time (bacteria split every 10-20 minutes)

High risk foods

- High risk food have ideal conditions for bacteria
- High risk foods are ready to eat foods that could grow harmful bacteria
- They are moist and high in protein which is food for bacteria.
- High risk foods have a short shelf life – you can't keep them for long or the bacteria might multiply to dangerous levels.

Examples of high risk foods:

Cooked meat, fish and poultry, dairy products (eggs, cheese etc.), gravies, stocks and sauces, shellfish, cooked rice.

Example exam questions:

What five conditions to bacteria need to grow and multiply? (5 marks)
What is a high risk food? (5 marks)
Name three hygiene procedures that someone must follow when serving food. (3 marks)
Name three hygiene procedures that someone must follow when preparing themselves for cooking. (3 marks).
How might bacterial cross contamination happen when making chicken nuggets? (2 mark)

Storing food safely

Cooking (75°C)	The danger zone (5°C-63°C)
• Cooking food above 75°C kills bacteria • Re-heat food properly, only once. Reheat food so 75°C for at least 3 minutes • Check the food is 75°C with a temperature probe	• Bacteria can grow and multiply quickly between 5°C to 63°C. • This is called the danger zone • The optimum temperature for bacterial growth is 37°C
Chilling (0°C – 5°C)	**Freezing (-18°C)**
• Keeping food between 0°C and 5°C slows down the growth of bacteria • This extends the shelf life of food • Chilling food doesn't change the properties much – food looks and tastes the same	• Freezing food below -18°C stops bacteria growing – they become dormant • Freezing generally extends shelf life and the nutrients aren't lost • It doesn't kill the bacteria though. They become active again once the food defrosts.

Preparing self for cooking

- Tie hair back to prevent hair and dandruff falling in food
- Take off coats and blazers
- Wear an apron to prevent bacteria transferring from our clothes to our food
- Wash hands with hot soapy water to kill bacteria

Preparing the room for cooking

- Sanitise all work surfaces
- Check equipment is clean and dry
- Tuck all stools in as they can be a trip hazard
- Put all high risk foods in the fridge to slow bacteria growth

Wash your hands after:

- Coughing
- Sneezing
- Blowing your nose
- Tying shoe laces
- Going to the toilet
- Touching hair or face
- Touching raw meat
- Touching eggs

The Eatwell guide

The Eatwell guide

The Eatwell guide is a government guide designed to show you the proportions of different foods groups you should eat over a day or more.

Tips on making healthy choices from the eatwell guide:

Fruit and vegetables: eat 5 portions of fruit and vegetables a day, this should make up 1/3 of your plate a day, fresh, frozen, canned, dried and fruit juice/smoothies all count, don't exceed 150ml of fruit juice/smoothie a day as it can cause tooth decay, try snacking on fruit over high sugar and fat foods,

Potatoes, bread, rice, pasta and other starchy carbohydrates: choose non-sugary cereals, leave the skin on potatoes, choose wholemeal options of foods such as bread, rice and pasta.

Oils and spreads: choose unsaturated fats such as vegetable oils and margarine over butter, use in small amounts.

Dairy and alternatives: choose lower fat options such as skimmed milk and low fat and salt cheese, choose low sugar yogurts and add fruit as a natural sweetener.

Beans, pulses, fish, eggs, meat and other proteins: eat more beans and pulses as they are high in fibre and fill you up for longer, cut the visible fat off meat, choose lower fat meat options, eat 2 portions of fish a week.

Water: drink 2-3 litres of water a day, choose lower sugar option drinks.

8 Guidelines for Healthy Eating

1. Base your meals on starchy carbohydrates	• This should make up 1/3 of your diet • Chose high fibre, whole grain options e.g. pasta, rice • Try to include one starchy food with each meal	5. Eat less salt – no more than 6g a day for adults	• Eating too much salt can raise blood pressure, this puts you at high risk of heart disease or a stroke • Most of the salt you eat is already in food, check the labels to help you choose low salt options
2. Eat lots of fruit and vegetables	• Try adding a banana to cereal or swap crisps for fruit • Always serve main meals with two vegetables • Beans and pulses can count as 1 of your 5 portions	6. Get active and be a healthy weight	• Regular exercise can reduce your risk of getting serious health conditions • Aim for 150 minutes of exercise a week
3. Eat more fish – including one portion of oily fish	• Fish is a source of protein and vitamins and minerals • It contains omega 3 (good for eyes, skin, brain heart) • Oily fish includes: salmon, herring, mackerel, sardines	7. Don't get thirsty	• 6-8 cups a day, 2-3 litres • Avoid sugary and fizzy drinks as they're bad for teeth • Remember fruit juice and smoothies is also high in sugar
4. Cut down on saturated fat and sugar	• All types of fat are high in energy and should be eaten in small amounts • Excess sugar can cause weight gain and tooth decay	8. Don't skip breakfast	• Kick starts you for the day • choose healthy low fat, sugar and salt and high fibre • Choose low sugar cereals and granola

Energy Needs

Energy is measured in kilocalories. We often call them calories. The more calories a food has, the more energy is gives us.

Key Words	
Energy density	The amount of energy (or calories) per gram of food.
BMR	Basal Metabolic Rate. The number of kilojoules you use to stay alive each day.
PAL	Physical Activity Level. The amount of kilojoules you use to fuel all of your physical activity.
Energy Balance	The balance between the 'energy in' and 'energy out.'
Kcal	The symbol for a kilocalorie. This is more commonly called a calorie.

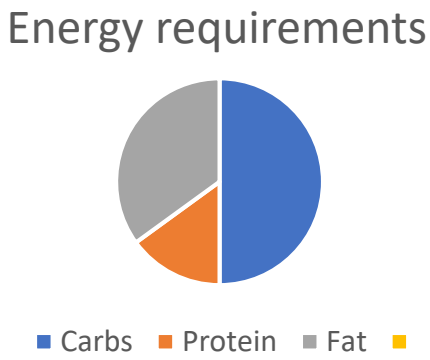
Energy density

This is the amount of energy per gram of food.

- Fat = 9 calories per gram
- Carbohydrates = 4 calories per gram
- Protein = 4 calories per gram.

This means that fat has a higher energy density than carbohydrates and protein. Fat is a very good source of energy.

Foods with a low energy density are high in water. For example, fruits and vegetables have a high water content and are therefor low in calories (energy).



Energy intake

50% - carbohydrates

35% - Fat

15% - Protein

We should get the majority of our energy from carbohydrates, then fats, then a small amount from protein. Ideally we want to use the protein for growth and repair, not energy!

Example exam questions:

What does Kcal stand for? (1 mark)
Name three sources of foods that have a high energy density. (3 marks)
Why do fruits and vegetables have a low energy density? (2 marks)
Why is it important to have equal energy input and energy output? (2 marks)
What might happen if someone's energy input is greater than their output over a long period of time? (1 mark)

Types of sports Leaders - Sports coaches, fitness instructors, local club coach, amateur coaches, PE teachers, sports teachers

Although the above people need these leadership skills in sports, many leaders and managers require these skills and qualities in all types of employment.

Leadership skills

Communication
Verbal communication – this is when the leader uses words to give instructions and feedback.
Non-verbal communication – this is when the leader gives facial expressions and bodily gestures, like pointing waving etc.
Listening – this is often overlooked but communication is a two way process and a leader must listen to their sorts people.

Knowledge

Leaders have to know lots of things about what they are teaching
How to teach the skills and tactics
Fitness requirements
Laws, rules and regulations of the sport
First aid and safeguarding

Organisation of equipment

It is important to have all the equipment that you need for your training session or it won't go the way you planned. Before a session you should make sure you have all the equipment that you need and that it is all in good working order.

Target Setting
A sports leader should have a specific goal for a session they are teaching (aims and objectives). So for example the session aim might be to improve shooting, or to improve aerobic endurance.
Aim and objectives are short term goals, but they should also have medium and long term goals which cover a number of lessons or even a whole season.

Evaluation
Leaders must be able to look at a sports performance and be able to give feedback, this means say what is good and what improvements can be made. Leaders need to be honest but also kind. They must say what the performer can do to make their work better but not dent the confidence of the sports person.

Watch this video about sport

Key words and terminologies

Communication	Appearance	Knowledge
Verbal	Resilience	Organisation
Non verbal	Enthusiasm	Confidence
Listening	Resilience	Evaluation
Motivation	Intrinsic	Extrinsic
Feedback	Target setting	Aims and objectives

Watch this video about the qualities of a sports coach

Leadership Qualities

Appearance
Make sure you are dressed appropriately for the activity and situation you will be coaching in. For example, if you are leading a session outside you need outdoor clothing so you don't get cold and wet and if you are leading gymnastics you need to be dressed differently than if you are leading a rugby session.

Gareth Southgate managing England

Gareth Southgate coaching England

Motivation
Our level of motivation will determine how much effort we put in. It is important for a sorts leaders to know what motivates their layers in their group/team.
Intrinsic motivation – A person who is motivated by taking art for its own sake. For example, they may just enjoy laying or seeing an improvement in their performance.
Extrinsic motivation – A person who is motivated by things outside of themselves, for example rewards such as money, medals.

Heather Knight – England Ladies Cricket Captain

Enthusiasm
Good leaders must be enthusiastic otherwise how can they expect their participants to be motivated, especially if it is a difficult skill or session.

Confidence
Leaders need to appear confident to their group. A leader will have more confidence if they are knowledgeable about what they are coaching and if their session is well planned.

Tracey Neville -England Netball Coach

Resilience
A good leader must be able to help their participants to develop resilience, the ability to keep going even if things are not going their way. How to not give up.

This video will tell you about different styles of leaders

A good way to improve your leadership skills could be leading the warm up activities in you PE lessons. It will help to improve your confidence by talking in front of your peers by giving instructions to them.

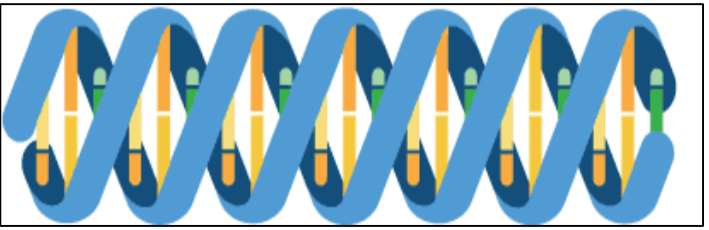
Try coming to an extra-curricular activity and helping a younger year group.

Inheritance

DNA
DNA stands for **deoxyribonucleic acid**. It is a chemical made up of two long molecules. The molecules are arranged in a spiral, like a twisted ladder. We call this the **double helix** structure.
There is DNA in the **nucleus** of every cell. DNA carries genetic information. It has all the instructions that a living organism needs to grow, reproduce and function.

Chromosomes
In a cell nucleus, DNA is organised into coiled strands called **chromosomes**.
Humans have 46 chromosomes in each cell.!Half the chromosomes are inherited from one parent and half from the other. As humans, therefore, we have **23 chromosomes** from each parent.This explains why organisms can share characteristics from both parents.

Genes
Genes are short sections of DNA. Genes carry information for particular characteristics, such as ear shape or eye colour. Different sets of genes carry information for different characteristics. There are many genes in a chromosome.



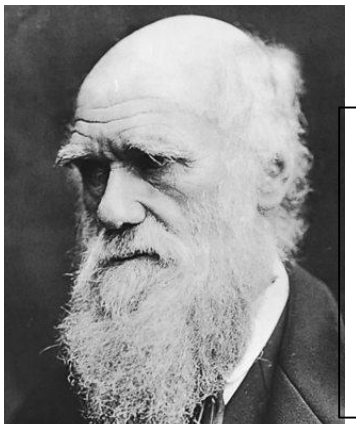
What is variation?
All people are human. They belong to the same **species**. Your friends and classmates may have different eye colour and hair colour. Some will be boys and some will be girls. Some will be tall and some will be shorter. The presence of differences between living things of the same species is called **variation**.

Inherited causes of variation
Variation in a characteristic that is a result of genetic information from the parents is called inherited variation
Here are some examples of inherited variation in humans:
eye colour, hair colour, skin colour, lobed or lobeless ears, ability to roll your tongue

Environmental variation
Variation caused by the surroundings is called **environmental variation**. Here are some other examples of features that show environmental variation:
your language
your religion
flower colour in hydrangeas (these plants produce blue flowers in acidic soil and pink flowers in alkaline soil)

Natural selection is known as 'the survival of the fittest'.
The **best adapted** organisms are able to **survive**.
The most desirable characteristics get passed down from **parents** to their **offspring**.
Scientists have used **fossils** to look at how organisms have **evolved** over time.

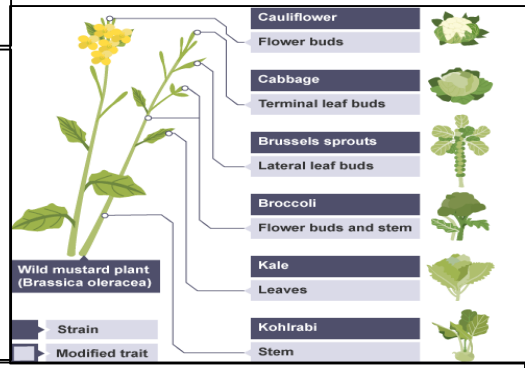
Charles Darwin was an English naturalist. He studied variation in plants and animals during a five-year voyage around the world in the 19th century.



Natural selection
These are the key points of evolution by natural selection:
•Individuals in a species show a wide range of **variation**.
•Inherited variation is due to differences in their **genes**.
•Individuals with the features that are best suited to the environment are more likely to survive and reproduce.
•The genes that allow these individuals to be successful are passed to their offspring.
•Individuals that are poorly adapted to their environment are less likely to survive and reproduce. This means that their genes are less likely to be passed to the next generation.
•Over many generations these small differences add up to the new evolution of species.

Selective breeding

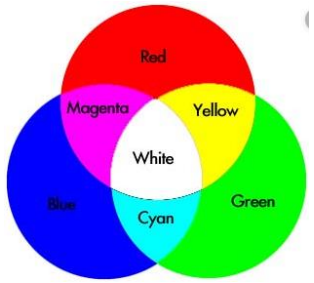
Selective breeding or artificial selection is when humans breed plants and animals for particular genetic characteristics. Humans have bred food crops from wild plants and domesticated animals for thousands of years.



For example, suppose you wanted a variety of cow that produced a lot of milk. This is what you could do:
1.select the cows in your herd that produce the most milk
2.let only these cows reproduce
3.select the offspring that produce the most milk
4.let only these individuals reproduce
5.keep repeating the process of selection and breeding until you produce a breed that consistently produces a lot of milk

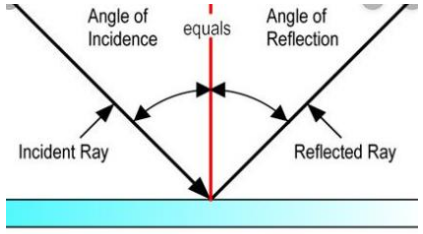
Looky Looky

Colours



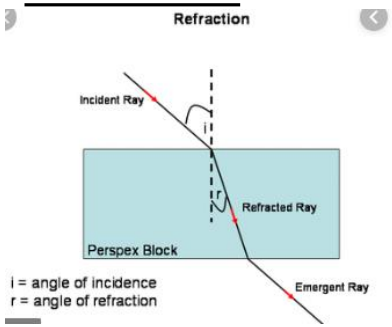
Visible light is made up of 7 colours; ROYGBIV
When we mix all the colours together we get white light
When have no colours at all, we have darkness (no light)
We can split white light into these colours using a prism and dispersion

Reflection



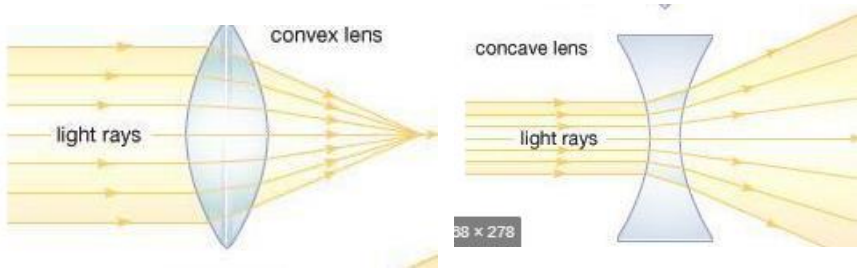
Light will reflect off of shiny, smooth surfaces
Light will not reflect off of matt or dark surfaces
The light going towards to mirror is called the incident ray
The light going away from the mirror is called the reflected ray

Refraction



Light will change speed when it enters a different medium
Glass and air are different mediums, as are air and water
The light will bend towards the normal
Upon leaving the glass block, it will travel in the same direction it did initially

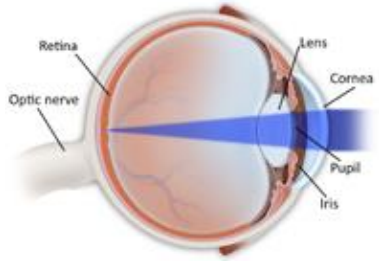
Lenses



A concave lens will cause light to diverge away from the principal axis and to sort of "spread out more" due to refraction of the light

A convex lens will cause light to converge into a focal point at which an image can be created

Human eye



Rays are refracted by the cornea, and then by the lens before focussing on the retina

The focal point has cone cells – higher acuity and colour vision

The peripheral vision is made up of cone cells which work in lower light levels

Sound

Sound travels as a longitudinal wave and spreads around a room due to vibrating particles bumping into each other
Sounds travel fastest through solids due to them being close to each other

Properties of light

Light travels at 300,000,000 m/s in a vacuum
Light travels in straight lines
Light is **transmitted** through **transparent** materials
Light is **absorbed** by **opaque** materials

Knowledge Organiser: Year 9 Autum Term Part 1 - Computer Crime & Cyber Security

Summary

Malware is a general term that describes lots of different programs that try to do something unwanted to your computer. Malware is made to stop your device from running properly and sometimes to steal your information.

Anti-malware software is designed to find and stop malware from damaging your computer or a network. To protect your computer you need to install **anti-malware** software and run regular scans.

When you are online you need to watch out for **phishing** and **spam emails** and protect your private information. **Phishing** emails are trying to trick someone into giving out information over email. **Spam emails** can contain **malware**.

Smartphones and mobile devices allow for photos, videos and your location to be shared instantly on the internet. **Be careful what you get up to in public as anyone might have a smartphone pointed at you.** Do not post photos or videos of other people online without their permission.

Key Vocabulary

Backup	A copy of important files that is kept separately in case your original files are lost or damaged.
Chat room	Accessed on the internet, users can meet to chat in real-time, messages are typed out but voice chat rooms exist too.
Copyright	A set of rights that prevents people copying and distributing a piece of work without the copyright holder's permission.
Data	Values, typically letters or numbers.
File sharing	The act of sharing files over the internet.
Firewall	An application that prevents unauthorised connections to and from the Internet.
Hack	Gaining unauthorised access to a computer.
Information	Data that has meaning, not just a number or a letter.
Licence	A legal agreement between the company who published the software and the end user covering areas such as copyright.
Malware	Malicious software created to damage or gain illegal access to computer systems.

Phishing emails are trying to trick someone into giving out information over email.

? What to look out for in a phishing email ?

- The greeting is not personalised
- Poor spelling and grammar
- Forged link
- Sense of urgency
- Request for personal information

- The sender's address is often a variation on a genuine address

Spam emails offer all kinds of things like money and prizes and can contain malware too.

Ways to reduce spam:

Use a spam filter - most email clients try to stop spam from reaching you by using a spam filter.

Do not give your email address out – if you don't trust the website or if supplying your email address is optional, don't give it to them.

Keep an eye out for tick boxes – when you sign up to a website, it might try to sign you up to its newsletter.

Malware is software that can harm devices

Typical actions of malware include deleting or modifying files.

Spyware—secretly monitors user actions, e.g. key presses, and sends information to the hacker. Some spyware can even use your webcam without your knowledge.

Viruses—spreads through normal programs and might slow down your device or change your applications and documents.

Worms— spread from device to device and copy themselves hundreds of times. A worm might copy itself onto your email account and then send a copy to all of your email contacts!

Trojan horse— pretends it will be a useful and safe program, when actually it will try to attack your device.

Adware—displays adverts while it is running; some can serve as spyware, gathering information about you from your hard drive, the web sites you visit, or your keystrokes.

Never disclose your name telephone number address or

It's wise not to share your location. Especially on websites and apps that are accessible by anyone.

Never accept someone as a 'friend' on social media simply because they claim to know another friend of yours. **Always be cautious about what you say online.**

https://www.cybersecuritychallenge.org.uk/

KEEP CALM AND GO PRACTICE

BBC Bitesize

Year 9 Knowledge organiser: Rivers

Topics covered

- ✓ Hydrological cycle
- ✓ River processes
- ✓ Upper stage features
- ✓ Middle stage features
- ✓ Lower stage features
- ✓ Flood factors
- ✓ Effects of flooding
- ✓ Managing flood risk

Key Ideas:

1. I can describe the features of a river system
2. I can describe the movement of water in a river system
3. I can explain river processes and how they create landforms
4. I can explain how flooding occurs in rivers
5. I can assess how river flooding can be managed

Skills

- ❑ To label diagrams to show river features
- ❑ To use mapping to investigate river features
- ❑ To understand different opinions and viewpoints
- ❑ To write a detailed piece of extended writing
- ❑ To draw/label a flood hydrograph
- ❑ To use ICT/MS Office to present to my class

Places and Environments

- ❖ River Wensum
- ❖ River Thames
- ❖ River Mississippi, USA
- ❖ River Nile, Egypt
- ❖ Amazon Basin
- ❖ Yangtze River

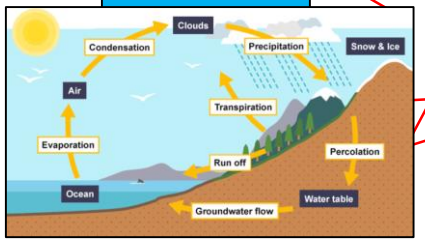
Key Terms Used in this Unit

- Water/Hydrological cycle
- Surface Run-off
- Infiltration
- Impermeable
- Gradient
- Drainage Basin
- Meanders
- Watershed
- Confluence
- Flood risk
- Deforestation
- Embankments/Levees
- Flood plain
- Dredging
- Delta
- Afforestation
- Hard engineering
- Soft engineering

Year 9 Knowledge organiser: Rivers

Career links:
Flood design engineer
Architect
News reporter
Farmer

The hydrological cycle

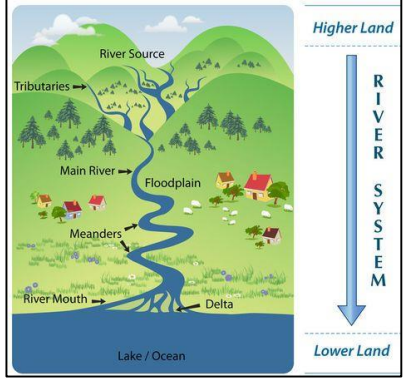


The water cycle is the journey water takes as it moves from the land to the sky and back again. It follows a cycle of evaporation, condensation and precipitation.

Can you describe the journey of a rain drop to the Ocean and back?

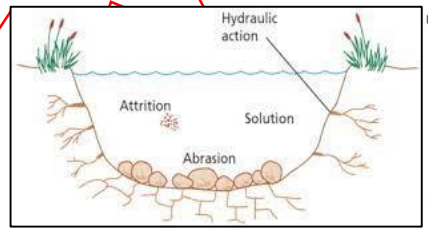
Try to write a 'definition' for each of the key words mentioned above. Which of the words are 'stores' and which are 'transfers'?

Features of a River



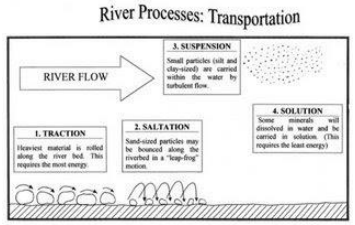
Rivers usually begin in **upland** areas, when rain falls on high ground and begins to flow **downhill**. They always flow downhill because of gravity. They then flow across the land - **meandering** - or going around objects such as hills or large rocks. They flow until they reach another body of water.
As rivers flow, they **erode** - or wear away - the land. Over a long period of time rivers create **valleys**, or **gorges** and **canyons** if the river is strong enough to erode rock. They take the **sediment** - bits of soil and rock - and carry it along with them.

CAN YOU NAME ANY FAMOUS RIVERS?
Which of the features are produced mainly by erosion?
Explain why



Definitions

- **Hydraulic Action**
  This process involves the force of water against the bed and banks.
- **Abrasion/Corrasion**
  This is the process by which the bed and banks are worn down by the river's load. The river throws these particles against the bed and banks, sometimes at high velocity.
- **Attrition**
  Material (the load) carried by the river bump into each other and so are smoothed and broken down into smaller particles.
- **Corrosion**
  This is the chemical action of river water. The acids in the water slowly dissolve the bed and the banks.

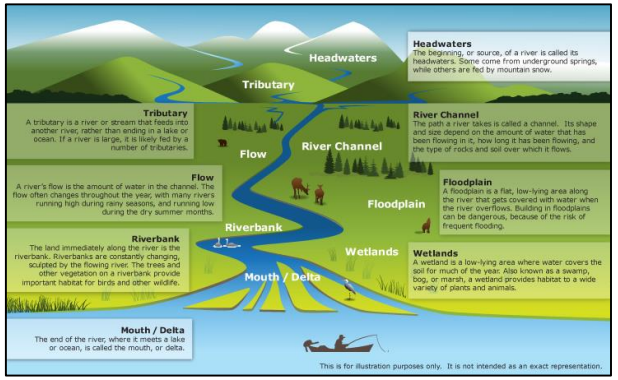


Erosion operates in 4 different ways listed above.
Transportation in 4 different ways listed to the left.
Deposition is mainly the dropping of sediment as the flow slows down.
Weathering is mainly seen in the upper stages where temperatures may freeze water causing thawing and expansion in rock cracks.

Rivers are shaped by a number of natural actions or processes.
The main river processes are Erosion, Transportation and Deposition.
Outside of the river the general process of Weathering wears down the landscape.

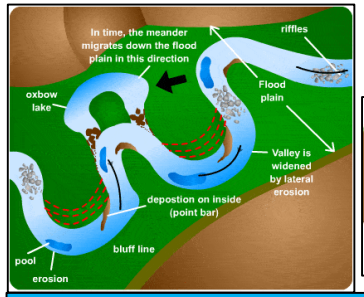
Can you use a mnemonic or a limerick to recall these processes?

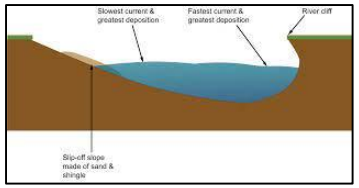
Try to summarise what each process looks like and Give it an adjective to describe HOW it works.



Can you find pictures to show these features?

CHALLENGE: Can you locate these on an OS map?

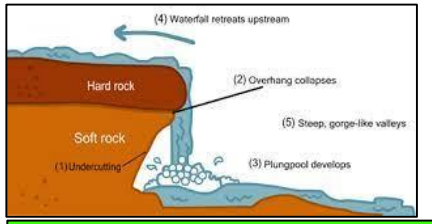




A meander is a bend in the river. Meanders usually occur in the middle or lower course, and are formed by erosion and deposition.
If the meander moves so much that the bend becomes very large, the course of the river may change. The meander may be cut off and deposition fills the section that no longer flows. This forms an **ox-bow** lake

Try to find out how the cross-section of a bend (top-right) helps to prove that there is erosion and deposition happening at the same time.

Waterfalls often form in the upper stages of a river where fast flowing water passes over different bands of rock. It **erodes soft rock more quickly than hard rock** and this may lead to the creation of a waterfall. The soft rock erodes more quickly, undercutting the hard rock



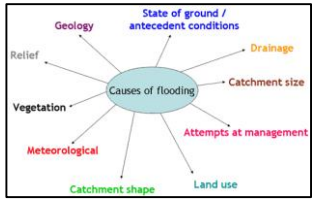
Can you draw a comic strip to show how the waterfall Is created over time?

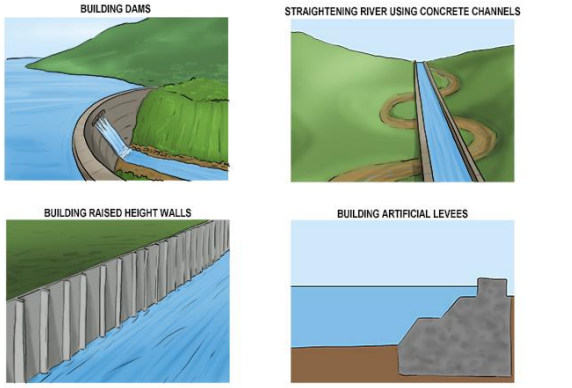
Try to use the key words you learned in the 'processes' And label or annotate your pictures.

Flooding is what happens when too much water enters a river. Although this is undoubtedly due to heavy rain, humans can add to the problems by managing landscapes in ways that constrict or try to contain water.

Can you use a mnemonic or a limerick to recall these processes?

Try to summarise what each process looks like and Give it an adjective to describe HOW it works.





There are 2 main ways to manage flooding: HARD engineering (large man-made structures) and SOFT engineering (natural approaches)

Why are these flood defences not used in all rivers that may flood?

German

Module 1: Ich liebe Ferien! (I love holidays!)

Here is the vocabulary you will need for Stimmt 2, Module 1.
Remember to listen to the German by copying and pasting the blue codes next to the speaker icons here. The full address is: https://www.activeteachonline.com/view

Früher und heute • Then and today	
Die Stadt ist/war ...	*The town is/was ...*
alt/modern	*old/modern*
klein/groß	*small/big*
schön/industriell	*beautiful/industrial*
historisch/touristisch	*historic/touristy*
laut/ruhig	*noisy/quiet*
Die Stadt hat/hatte ...	*The town has/had ...*
Es gibt/gab ...	*There is/was ...*
einen Strand	*a beach*
einen Marktplatz	*a town square*
einen Olympiapark	*an Olympic park*
einen Hafen	*a harbour*
eine Arena	*an arena*
eine Skatehalle	*a skate hall*
ein Einkaufszentrum	*a shopping centre*
ein Stadion	*a stadium*

vS9GME3o

In this Module you will learn how to:

- compare places in the past and now
- talk about what you did on holiday
- talk about how you travelled
- talk about the weather
- talk about holidays
- talk about problems on holiday

www.textivate.com
Username: openacademy
Password: surname123
Go to 'my resourses' to find your work.

Keep practising your German vocabulary on www.quizlet.com
• *Either*:
click on this link: https://quizlet.com/_8ievl8?x=1qqt&i=25q2il
• *Or*:
use your class link to go directly to your Quizlet class.

German

Was hast du gemacht?
• What did you do?

Ich habe viele Sachen gemacht.	*I did a lot of things.*
Ich habe/Wir haben ...	*I/We ...*
Musik gehört.	*listened to music.*
Volleyball gespielt.	*played volleyball.*
einen Bootsausflug gemacht.	*did a boat trip.*
viele Souvenirs gekauft.	*bought lots of souvenirs.*
viel Fisch gegessen.	*ate lots of fish.*
die Kirche gesehen.	*saw the church.*
ein Buch gelesen.	*read a book.*
Ich bin zu Hause geblieben.	*I stayed at home.*

swsCWRjP

Wohin bist du gefahren?
• Where did you travel to?

Ich bin ... gefahren.	*I travelled ...*
nach Deutschland	*to Germany*
nach Wien	*to Vienna*

n1lsGCzo

Wie bist du gefahren?
• How did you travel?

Ich bin ... gefahren.	*I travelled ...*
mit dem Auto	*by car*
mit dem Reisebus	*by coach*
mit dem Schiff	*by boat*
Ich bin geflogen.	*I flew.*
Ich bin zu Fuß gegangen.	*I walked.*

5IS5rvQ0

VEUcyfzI

Wo hast du gewohnt?
• Where did you stay?

Ich habe ... gewohnt.	*I stayed ...*
in einem Hotel	*in a hotel*
in einem Ferienhaus	*in a holiday house*
in einem Wohnwagen	*in a caravan*
in einer Jugendherberge	*in a youth hostel*
auf einem Campingplatz	*on a campsite*
bei Freunden	*with friends*

8CjrAPVZ

Mit wem bist du gefahren?
• Who did you travel with?

Ich bin ... gefahren.	*I travelled ...*
mit meiner Familie	*with my family*
mit Freunden	*with friends*

German

Was hast du noch gemacht?
• What else did you do?

Ich bin ... gegangen.	*I went ...*
an den Strand	*to the beach*
in die Stadt	*into town*
windsurfen	*windsurfing*
kitesurfen	*kite surfing*
schwimmen	*swimming*
Ich bin ... gefahren.	*I went ...*
Wakeboard	*wakeboarding*
Snowboard	*snowboarding*
Ski	*skiing*
Banane	*banana boating*
Ich habe Snowtubing gemacht.	*I went snowtubing.*
Ich habe Eistennis gespielt.	*I played ice tennis.*

swsCWRjP

Wie ist/war das Wetter?
• How is/was the weather?

Es ist/war ...	*It is/was ...*
sonnig	*sunny*
kalt	*cold*
heiß	*hot*
wolkig	*cloudy*
windig	*windy*
neblig	*foggy*
Es regnet.	*It is raining./It rains.*
Es schneit.	*It is snowing./It snows.*
Es donnert und blitzt.	*There is thunder and lightning.*

7TNSg1fL

Oft benutzte Wörter
• High-frequency words

nur	*only*
dort	*there*
zu	*too*
nicht	*not*
gar nicht	*not at all*
sehr	*very*
ungefähr	*approximately*
viel	*a lot*
viele	*lots, many*

nbPzaz9A

Wann war das? • When was that?

in den Ferien	*in the holidays*
im Sommer/Winter	*in summer/winter*
letzten Sommer/Winter	*last summer/winter*
heute	*today*
gestern	*yesterday*
früher	*then, previously*

Strategie 1

Partnerarbeit

Two heads are often better than one when it comes to learning vocabulary. Working with someone else helps you to concentrate for longer and makes learning fun. Here are some activities to try with a partner:

- Play word association. Your partner says a word from Chapter 1 and you say a word that is related to it in some way. Be prepared to justify your thinking!
  - ● *Winter*
  - ■ *Es schneit.*
- Play hangman or pictionary with the words from these ***Wörter*** pages.
- Beginnings and endings. Your partner says a word and your next word must start with the final letter of his/her word. Make the longest words you can!
  - ● *war*
  - ■ *ruhig*
- Syllables. Say the first syllable of a word with two or more syllables. Your partner has to finish the word. Make the longest chain of words you can!
  - ● *win ...*
  - ■ *... dig*
- Tandem testing. Take a section of words from these ***Wörter*** pages and test your partner. Begin by testing German into English and then say the English and ask for the German.

Look at page 132 to remind yourself of the five ***Strategien*** you learned in *Stimmt! 1*.

Read the Strategy Box for ideas on learning German vocabulary.

F8C6R2wT

Strategien

Strategie 1

How do you know if you really know a word? Ask yourself:

1 Do I know what it means when I see it?
2 Can I pronounce it?
3 Can I spell it correctly?
4 Can I use it in a sentence?

Look, Say, Cover, Write, Check

Use these five steps to learn the meaning, pronunciation and spelling of new words.

1 Look carefully at the word. Close your eyes and try to picture the word in your mind. This uses your visual memory.
2 Say the word out loud to yourself. This uses your auditory memory.
3 Cover the word – say it and 'see' the word in your mind.
4 Write the word out from memory.
5 Check your word against the original. Did you get it right? Combining seeing, listening and doing strategies makes memorising more effective.

Extra: If you find these steps easy, try to create sentences with the new words you learn.

Strategie 2

Cognates

You can use your knowledge of English to help you work out the meanings of German words. Cognates are words that look the same or similar in German and English, and they often mean the same too (but not always!). However, watch out for pronunciation because they usually sound slightly different. Here are some examples of cognates and near-cognates: *Hotel, Arena, Tourismus.*

Compound words

Long words can be difficult to remember, but they are usually made up of shorter ones, so it helps to break down these compound words into more manageable chunks – for example: *Liebes/komödie* (love/comedy = romantic comedy).

Strategie 3

Oft benutzte Wörter

High-frequency words, for example *gern, sehr, wenig*, are words that come up again and again, no matter what you are talking about. All of the *Wörter* pages have a list of these words, but there are many more.

Strategie 4

Memory room

To help you remember vocabulary, try associating it with places in a room, such as your bedroom. In your mind, place the words you want to remember in different parts of the room. For example, to learn breakfast items, you might put *Eier* by your computer, *Milch* on top of the wardrobe, etc. Then you look round the room and say *Eier* when you get to the computer and so on.

Mnemonics

If the spelling of a particular word just doesn't seem to stick, you could invent a mnemonic – a rhyme or saying that sticks easily in your mind. For example:

Snow
Can
Hurt
Noses
Even
If
Tiny

Strategie 5

Using your key phonics words

You learned the key sounds of German in *Stimmt! 1* (see page 133). One good strategy for remembering new words is to group them together with others with the same sound-spelling pattern. For example:

***J**ugendherberge* ➜ ***J**o-**J**o*
*W**o**hn**w**agen* ➜ ***W**ild**w**assersport*

Look back at the *Wörter* pages and add to your lists.

German key sounds

Sieh dir das Video auf ActiveTeach an. Hör zu und mach mit. (1–16)
Watch the video on ActiveTeach. Listen and join in.

Click on the links below to revise the sounds

ejJebkAW

NsDIUwgJ

Year 9 History: Democracy, dictatorships and the causes of the Second World War

Key words	
Democracy	A political system in which the public can vote in free elections and have freedom expression and religion
Dictatorship	A political system in which one Party or person rules the country, with no elections or freedom of expression
Cause	An event that leads to another event
Consequence	An event or an impact that happens as a result of a cause
Diversity	Differences between people, places or events
Second World War	A war that took place on several continents between 1939 and 1945
Nazi Party	Shortened name for the National Socialist German Workers Party, a far-right Party who ruled Germany between 1933 and 1945, led by Adolf Hitler
Soviet Union	Also known as the USSR, a collection of communist countries in eastern Europe, including Russia
Communism	A political system in which everything is shared equally among people and everyone has equal rights

Terms of the Treaty of Versailles	Detail
Blame	**Germany had to accept full responsibility for starting the war, even though they hadn't!**
Reparations	**Germany had to pay £6.6 billion to repair the damage of the war**
Army	**The German army was reduced to 100,000 men, no submarines, no airforce and only 6 ships. The Rhineland was also de-militarised**
Territories	**Germany gave up many areas of land, such as Alsace-Lorraine, the Sudetenland and the Polish corridor**

After the First World War, the leaders of Britain, France and the USA forced Germany to sign the **Treaty of Versailles.** The terms of this Treaty can be remembered using the word BRAT (see above)

As a result of the Reparations payments, the German economy collapsed and led to **hyperinflation in 1923.** This meant that they value of money decreased rapidly.

Although Germany recovered after 1923, the **Wall Street Crash** in 1929 led to further economic collapse in Germany. Many people turned to extreme political Parties like the Nazis and the Communists.

1919: Treaty of Versailles

1920: League of Nations formed

1923: Hyperinflation

1929: Wall Street Crash

1933: Adolf Hitler becomes Chancellor of Germany

1938: Germany marches into Austria; Munich Agreement signed

1939: Nazi-Soviet pact formed, Germany invades Czechoslovakia and Poland, WWII begins

The actions of Adolf Hitler

When Hitler became dictator of Germany in 1933, he began on his plans to rebuild Germany as a military power. He rebuilt the German army and then used it to march into Austria, invade Czechoslovakia and eventually Poland in September 1939.

The Treaty of Versailles

Although it was meant to prevent war, the harsh terms of the Treaty of Versailles actually led to a lot of anger in Germany, which helped Parties like the Nazi Party gain support. Hitler promised to end the Treaty of Versailles and take back German territories. This is exactly what he did!

What were the causes of WWII?

The Nazi-Soviet Pact

Despite being enemies, Nazi Germany and the Soviet Union made an agreement in August 1939 that neither would attack each other, at least for now. They also agreed to divide up Poland between them.

Appeasement and the Munich Agreement

In an attempt to avoid another war, British Prime Minister Neville Chamberlain made an agreement with Germany in September 1938 that Britain and Germany would not go to war with each other. The agreement also allowed Germany to take back territories in Czechoslovakia without Britain interfering.

The failure of the League of Nations

The League of Nations, set up at the end of the First World War, was to keep the peace between nations by solving issues by negotiation rather than war. They also wanted **disarmament** to occur around the world. However, the League did not enforce its ideas.

Vocabulary to learn

Savagery
Dictatorship
Civilisation
Democracy
Rationalism
Incarnation
Predicament
Tension
Aggression
Idealise

Lord of the Flies explores the dark side of humanity, the savagery that underlies even the most civilized human beings.

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

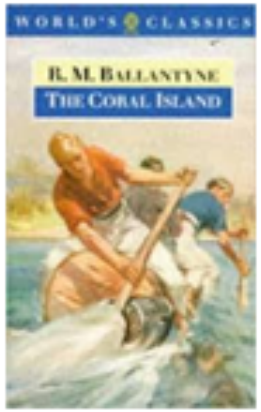
Evaluate

- 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*

You might also like:



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

Literary devices and word class

- Metaphor – a literal comparison – *she was a monster*
- Personification – human qualities – *the grass danced in the wind*
- Simile – as/like/as if – *he was like a man possessed*
- Onomatopoeia – the sound words – *bang, pop, sizzle*
- Alliteration – same starting sounds - *really rather raucous*
- Lists – to emphasise many reasons
- Verbs – doing words
- Adjectives – describing words
- Nouns – objects or abstract things e.g. love
- Adverbs – describe doing words e.g. wrote **neatly**
- connotations of words – associations – night-time = mystery

Why study English?
https://www.prospects.ac.uk/careers-advice/what-can-i-do-with-my-degree/english

Vocabulary to learn

Pathetic fallacy
Genre
Gothic
Gothicism
Adaptation
Protagonist
Connotation
Unnatural
Imagery
Suspense
Tension
Ominous
Atmosphere
Foreboding

Structure analysis checklist:

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Level 4: simple vocabulary Bad Good Light Happy
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Suggested Reading

Literary devices and word class

- Metaphor – a literal comparison – *she was a monster*
- Personification – human qualities – *the grass danced in the wind*
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YEAR 9 – REASONING WITH ALGEBRA...

Straight Line Graphs

@whisto_maths

What do I need to be able to do?

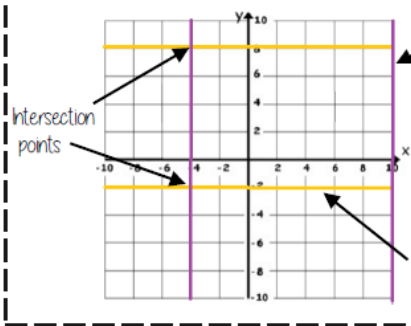
By the end of this unit you should be able to:

- Compare gradients
- Compare intercepts
- Understand and use y= mx + c
- Find the equation of a line from a graph
- Interpret gradient and intercepts of real-life graphs

Keywords

Gradient: the steepness of a line
Intercept: where two lines cross. The y-intercept: where the line meets the y-axis.
Parallel: two lines that never meet with the same gradient.
Co-ordinate: a set of values that show an exact position on a graph.
Linear: linear graphs (straight line) – linear common difference by addition/ subtraction
Asymptote: a straight line that a graph will never meet.
Reciprocal: a pair of numbers that multiply together to give 1.
Perpendicular: two lines that meet at a right angle.

Lines parallel to the axes (R)



All the points on this line have a x coordinate of 10

'a' can be ANY positive or negative value including 0

Lines parallel to the **y axis** take the form **x = a** and are **vertical**

Lines parallel to the **x axis** take the form **y = a** and are **horizontal**

All the points on this line have a y coordinate of -2

e.g (3, -2) (7, -2) (-2, -2) all lay on this line because the y coordinate is -2

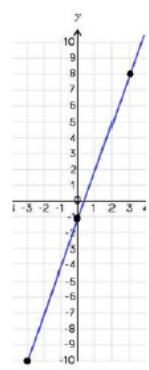
Plotting y = mx + c graphs (R)

$y = 3x - 1$ → 3 x the x coordinate then – 1

x	-3	0	3
y	-10	-1	8

Draw a table to display this information

This represents a coordinate pair (-3, -10)



You only need two points to form a straight line

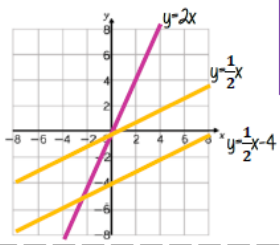
Plotting more points helps you decide if your calculations are correct (if they do make a straight line)

Remember to join the points to make a line

Compare Gradients

$y = mx + c$

The coefficient of x (the number in front of x) tells us the gradient of the line



The greater the gradient – the steeper the line

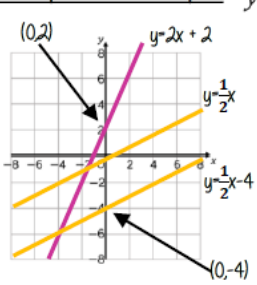
Parallel lines have the same gradient

Positive gradients

Negative gradients

Compare Intercepts

$y = mx + c$ ← The value of c is the point at which the line crosses the y-axis. Y intercept



The coordinate of a y intercept will always be (0,c)

Lines with the same y-intercept cross in the same place

y = mx + c

The coefficient of x (the number in front of x) tells us the gradient of the line

$y = mx + c$ ← The value of c is the point at which the line crosses the y-axis. Y intercept

y and x are coordinates

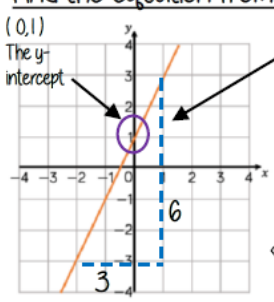
The equation of a line can be rearranged: E.g

$y = c + mx$

$c = y - mx$

Identify which coefficient you are identifying or comparing

Find the equation from a graph



$y = 2x + 1$

The direction of the line indicates a positive gradient

Positive gradients

Negative gradients

Real life graphs

A plumber charges a £25 callout fee, and then £12.50 for every hour. Complete the table of values to show the cost of hiring the plumber.

Time (h)	0	1	2	3	8
Cost (£)	£25				£125

The y-intercept shows the minimum charge. The gradient represents the price per mile

In real life graphs like this values will always be positive because they measure distances or objects which cannot be negative.

Direct Proportion graphs

To represent direct proportion the graph must start at the origin

When you have 0 pens this has 0 cost. The gradient shows the price per pen

A box of pens costs £2.30
Complete the table of values to show the cost of buying boxes of pens.

Boxes	0	1	2	3	8
Cost (£)		£2.30			

YEAR 9 – REASONING WITH ALGEBRA...

Forming and Solving Equations

@whisto_maths

What do I need to be able to do?

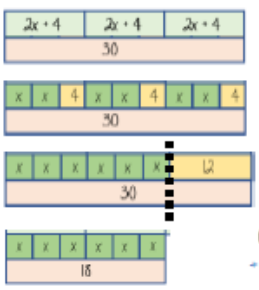
By the end of this unit you should be able to:

- Solve inequalities with negative numbers
- Solve equations with unknowns on both sides
- Solve inequalities with unknowns on both sides
- Substitute into formulae and equations
- Rearrange formulae

Keywords

Inequality: an inequality compares who values showing if one is greater than, less than or equal to another
Variable: a quantity that may change within the context of the problem
Rearrange: Change the order
Inverse operation: the operation that reverses the action
Substitute: replace a variable with a numerical value
Solve: find a numerical value that satisfies an equation

Solve equations with brackets (R)



$3(2x + 4) = 30$

Expand the brackets

$6x + 12 = 30$

$-12 \quad -12$

$6x = 18$

$\div 6 \quad \div 6$

$x = 3$

Form and solve inequalities (R)

Two more than treble my number is greater than 11

Find the possible range of values

$3x + 2 > 11$

Solve

$x \leftarrow -3 \leftarrow -2 \leftarrow 11$

$x > 3$

Inequalities with negatives

Method 1 Make x positive first

$2 - 3x > 17$

$+3x \quad +3x$

$2 > 17 + 3x$

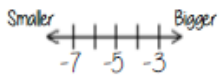
$-17 \quad -17$

$-15 > 3x$

$\div 3 \quad \div 3$

$-5 > x$

x is true for any value smaller than -5



CHECK IT!
$2 - 3(-6) = 20$
TRUE/ CORRECT

Method 2 Keep the negative x

$2 - 3x > 17$

$-2 \quad -2$

$-3x > 15$

$\div -3 \quad \div -3$

$x > -5$

x is true for any value bigger than -5

This cannot be true...

$x < -5$

When you multiply or divide x by a negative you need to reverse the inequality

Equations with unknown on both sides

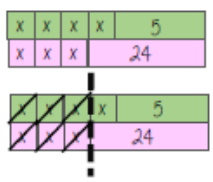
$4x + 5 = 3x + 24$

$-3x \quad -3x$

$x + 5 = 24$

$-5 \quad -5$

$x = 19$



Inequalities with unknown on both sides

Solving inequalities has the same method as equations

$5(x + 4) < 3(x + 2)$

$5x + 20 < 3x + 6$

$2x + 20 < 6$

$2x < -14$

$x < -7$

Check it!

$5(-8 + 4) < 3(-8 + 2)$

$5(-4) < 3(-6)$

$-20 < -18$

-20 IS smaller than -18

Formulae and Equations

Formulae – all expressed in symbols

Substitute in values

Equations – include numbers and can be solved

Rearranging Formulae (one step)

$x = y + z$

Rearrange to make y the subject

$y = x - z$

$y \xrightarrow{+z} x$

$y \xleftarrow{-z} x$

Using inverse operations or fact families will guide you through rearranging formulae

Rearranging can also be checked by substitution

Language of rearranging....

Make XXX the subject

Change the subject

Rearrange

Rearranging Formulae (two step)

In an equation (find x)

$4x - 3 = 9$

$+3 \quad +3$

$4x = 12$

$\div 4 \quad \div 4$

$x = 3$

In a formula (make x the subject)

$xy - s = a$

$+s \quad +s$

$xy = a + s$

$\div y \quad \div y$

$x = \frac{a + s}{y}$

The steps are the same for solving and rearranging

Rearranging is often needed when using $y = mx + c$

e.g. Find the gradient of the line $2y - 4x = 9$

Make y the subject first $y = \frac{4x + 9}{2}$

Gradient $= \frac{4}{2} = 2$

YEAR 10 – DEVELOPING ALGEBRA...

Representing solutions of equations and inequalities

@whisto_maths

What do I need to be able to do?

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

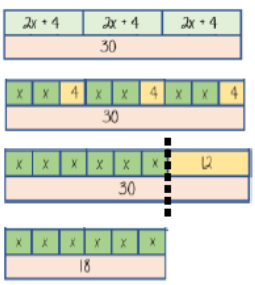
- Form and solve equations and inequalities
- Represent and interpret solutions on a number line as inequalities
- Draw straight line graphs and find solutions to equations
- Form and solve equations and inequalities with unknowns on both sides

Keywords

Solution: a value we can put in place of a variable that makes the equation true
Variable: a symbol for a number we don't know yet
Equation: an equation says that two things are equal – it will have an equals sign =
Expression: numbers, symbols and operators grouped together to show the value of something
Identity: An equation where both sides have variables that cause the same answer includes ≡
Linear: an equation or function that is the equation of a straight line
Intersection: the point that two lines meet
Inequality: an inequality compares two values showing if one is greater than, less than or equal to another.

Solve equations (R)

$3(2x + 4) = 30$



$3(2x + 4) = 30$ — Expand the brackets

$6x + 12 = 30$

$-12 \quad -12$

Substitute to check your answer. This could be negative or a fraction or decimal

$6x = 18$

$\div 6 \quad \div 6$

$x = 3$

Form and solve inequalities (R)

Two more than treble my number is greater than 11

Form

$x \rightarrow \times 3 \rightarrow +2 \rightarrow 11$

$3x + 2 > 11$

Solve

$x \leftarrow -3 \leftarrow -2 \leftarrow 11$

$x > 3$

Solutions on a number line

$x < 1$ $\quad x \leq 1$

Both represent values less than 1

Includes the value 1

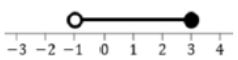
$x > 1$ $\quad x \geq 1$

Both represent values more than 1

Includes the value 1

- Includes the value it sits above
- Does NOT include the value it sits above

Values less than or equal to 3 but also more than -1



$-1 < x \leq 3$

This includes the integer values 0,1,2,3

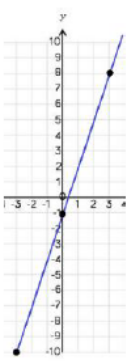
Plotting straight line graphs (R)

$y = 3x - 1$ → 3 x the x coordinate then – 1

x	-3	0	3
y	-10	-1	8

Draw a table to display this information

This represents a coordinate pair (-3, -10)



You only need two points to form a straight line

Plotting more points helps you decide if your calculations are correct (if they do make a straight line)

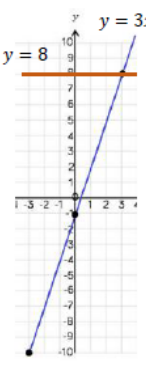
Remember to join the points to make a line

Find solutions graphically

For linear equations there is only one point the graph meets the x value

$x = 2$
$y = 4$

These two lines will cross at (2,4) because they are just x= and y= they are parallel to axes and meet in one place



$3x - 1 = 8$

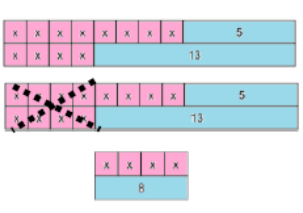
Remember equation of a line format is y = mx + c

The solution is the point the two lines meet

(3,8)

Equations: unknown on both sides (R)

$8x + 5 = 4x + 13$



$8x + 5 = 4x + 13$

$-4x \quad -4x$

$4x + 5 = 13$

$-5 \quad -5$

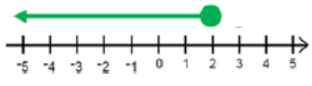
$4x = 8$

$\div 4 \quad \div 4$

$x = 2$

Inequalities: unknown on both sides

$8x + 5 \leq 4x + 13$ → $x \leq 2$



Any value 2 or less will satisfy this inequality

Year 9 RS: What is religion– a useful category or an outdated concept.

Key words	
Atheist	a person who believes in the existence of a god or gods, specifically of a creator who intervenes in the universe.
Agnostic	a person who believes that nothing is known or can be known of the existence or nature of God.
Theist	a person who believes in the existence of a god or gods, specifically of a creator who intervenes in the universe.
Secular	not connected with religious or spiritual matters.
Orthodox	following or conforming to the traditional or generally accepted rules or beliefs of a religion, philosophy, or practice.

Religion in the 19th century

Throughout the Victorian age, religion was a dominant force in the lives of many. However, there was a growing seam of doubt.

The Protestant church of England was very powerful

- The parson dominated the village. Until 1836 he received a tithe from villagers.
- Social life for ordinary people revolved around choir and Sunday School outings.
- Many employers insisted that their employees go to church.
- Most people were members of the Anglican or Presbyterian Church, although there were some Catholics and increasing numbers of Non-conformists for example, Quakers and Methodists.

Religion has had a significant impact on lives of people in the UK, with many changes to the Church over the years. British society has more recently become more liberal, secular and materialistic.

Religion in the 20th and 21st centuries

The number of regular Christian worshipers began to decline in Britain in the 20th century.

British society became more liberal, secular and materialistic:

- many people did not believe in God
- many people – particularly amongst the immigrant communities – believed in religions other than Christianity
- for many people, religion was increasingly irrelevant to their way of life
- Christianity struggled to come to terms with modern social developments, including the ordination of women, contraception and abortion:
- In the 1960s some Christians denied the miracles and said 'God is Dead'.
- At the same time, 'born again' Christians preached the need to believe the Bible literally. In the 1950s and 1960s the American preacher Billy Graham ran a number of large 'Crusades' in Britain and 'Pentecostal' Christianity became popular after the 1970s.
- Muslim faith was also changing, as some young Muslims became 'radicalised', choosing to reject, sometimes violently, a western way of life which they perceived as evil and against the teachings of the Qur'an. Instead, some Muslims wanted to bring a Muslim way of life and 'Sharia' law into Britain.

Until 1829, anybody holding public office had to make a public oath denying Catholic doctrines, which meant that Catholics could not be civil servants, Justices of the Peace or judges.

Religion still had a great influence over people's lives

- After 1738, when John Wesley founded the Methodist Church, there were many other enthusiastic 'revivals' in the 19th century when communities 'revived' religious fervour.
- Religion inspired reformers such as William Wilberforce and Dr Barnardo.
- After 1833, 'High Churchmen' restored the churches, decorated them with flowers and candles, and held services with lots of colourful ritual.
- On Census Day, 30 March 1851, 7 million people – that's 40 per cent of the population – went to church.
- In 1865, William Booth formed the Salvation Army, and set up hostels and a scheme to help the unemployed. By 1900, the Salvation Army had served 27 million meals and lodged 11 million homeless people.
- By 1900, a tenth of adults had 'signed the pledge' to abstain from alcohol.
- By 1900, there were more than 60,000 missionaries from Britain working overseas.
- The Victorian era is famous for being prim and proper, even though there was a seedy 'underworld' of prostitution, drugs and crime.

- Issues such as forced marriage and whether British Muslim women should wear the niqab, which is the cloth that covers the face, became issues of debate within their faith community and in society in general.

Religion in 21st-century Britain

In the 2011 Census, 37.5 million people – that's 59.5 per cent of the population – gave their religion as 'Christian'. But there were also:

- No religion: 16.2 million
- Refused to say: 4.5 million
- Islam: 2.7 million
- Hindu: 835,934
- Sikh: 432,429
- Jewish: 269,568
- 176,632 people declared themselves 'Jedi', the religion that features in the Star Wars films. Many people did this as a form of protest at having to answer the question, or as a joke.

In the 16th and 17th centuries, Britain broke free from the Roman Catholic Church. There was a period of religious conflict. Penal laws were passed that restricted what Catholics and other Non-conformists could do and the Act of Settlement (1701) made it law that the monarch had to be a Protestant.

The Victorians were generally very religious people and often appear to be very prim and proper. There were religious meetings called 'revivals' and religion inspired many of the great 19th century social reformers such as William Wilberforce and Dr Barnardo. British Protestant missionaries travelled all over the world.

At the same time, however, there were developments in science, such as Darwinism; politics, such as Marxism and theology. By the 20th century, religion had declined in importance for many people – although there have been significant political events related to religion over the last century. Britain was a fiercely Protestant country from the Reformation until the early 20th century. Many British historians have tended to portray the medieval Catholic Church as corrupt and wicked and to suggest that 'the Reformation' was the beginning of Britain's greatness.

World Music

Samba Music

- Originates from Brazil and is often played at carnivals and festivals
- Can have up to 2000 people in a band, all playing percussion instruments whilst marching to stay in time
- Uses polyrhythms and a fast tempo

Country & Western Music

- Often referred to as Country and Western Music, it relies heavily on guitars and drums
- Often patriotic, religious and deals with adult content
- Repetitive and easy chords but with strong melodies and lyrics

Gamelan Music

- The most recognisable feature of Chinese music is the use of the pentatonic scale, which uses all the black keys on a western keyboard.
- It usually uses flutes, stringed instruments, cymbals and gongs
- The music is soothing, played at a rubato tempo and is meant to reflect nature

Bhangra Music

- Bhangra is a fusion of traditional Indian Raga music and British influences.
- It developed in the underground party scene of Indian and Pakistani immgrants who had moved to the UK in the 1970/80's
- It uses music technology and traditional singing styles and raga scales

Modern British Music

- Famous British artists and bands include The Beatles, Oasis, Rolling Stones, Queen, Elton John and Coldplay
- Grunge, grime, dubstep, punk, soft rock are all subgenres of British music
- Often have eccentric personalities and unique singing styles

Reggae Music

- Originates from Jamaica in the 1960's
- Uses syncopation (off-beat) and a rock-steady tempo
- Bob Marley was the King of Reggae music and made it famous worldwide
- Uses instruments such as drums, guitars, keyboards and trumpets