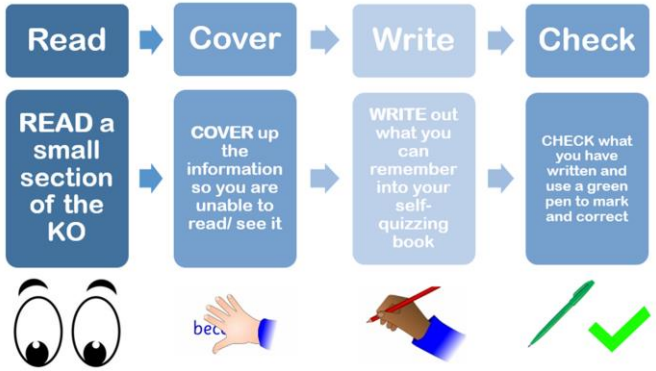
Year 8
Knowledge Organiser: Cycle 1

Name: _____

Tutor group: _____



Article 29:
Education must develop every child's personality, talents and abilities to the full. ***UNCRC***

Your Knowledge Organiser

- Knowledge Organisers contain critical knowledge you must know. This will help you recap, revisit and revise what you have learnt in lessons in order to remember this knowledge for the long-term.

- You must have this book for every lesson – it is part of your equipment.

Using Your Knowledge Organiser for Revision

- Students remember 50% more when they test themselves after learning.
- You can use your book to help **memorisation**.
- **Read** a section of your Knowledge Organiser.
- **Cover** it up.
- **Write** out what you've remembered.
- **Check** the Knowledge Organiser to see if you're right.
- **Repeat** this process.
- Do this **every day** to help commit the information to your **long-term memory**.

How to Use the Book for Self-Quizzing

Read	Cover	Write	Check
READ a small section of the KO	COVER up the information so you are unable to read/ see it	WRITE out what you can remember into your self-quizzing book	CHECK what you have written and use a green pen to mark and correct

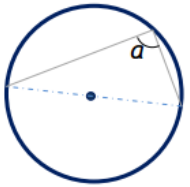
Using your Knowledge Organiser for Revision

Research shows that students remember 50% more when they test themselves after learning something.

You can use your 100% book to create **flashcards**.

These should be:

- **double-sided**
- **a question on one side, the answer on other**
- **a keyword on one side, a definition or image on the other**
- **used for self-testing.**

Circles	**Circles**
1. What is the size of angle a? 2. State the rule. 	1. What do you know about the angles *x* and *y*? 2. State the rule. 

Q1 What is **emulsion**? Oil, water, droplet, shake, immiscible, bond, mixture.	**Q2** What is **one similarity** between an **alkene** and an **unsaturated** fat?
Q3 What is the name for the **test** for **unsaturated fat** or **alkene**? Describe what you would **see**.	**Q4** Describe two ways that **saturated** fat and **unsaturated fat** (oil) are **different**.
Q5 What is **the advantage** of cooking food in **oil**? **Explain** your answer.	**Q6** **Describe** what an **emulsifier** molecule does.
Q7 Name the **two parts** of an **emulsifier** molecule.	**Q8** What is the difference between a **monounsaturated** fat and **polyunsaturated** fat? **Mono** = one **Poly** = many

Feedback

Your teachers will give you feedback about your learning and progress in many different ways. These will include:

- Verbal feedback about something you are working on in the lesson (practical or written work).
- Verbal feedback through asking questions.
- Guided independent self-assessment.
- Guided peer assessment.
- Instant/quick written comments or identification of SPAG errors on your work as you complete it.
- Written feedback on your work and setting R4 or extension questions for you to complete.
- Knowledge quizzing/short tests that give you a score (i.e. 15/20).
- Longer tests that may also give a score (i.e. in %) as well as feedback about the content you need to re-learn/refresh.

You will be expected to respond to feedback in the following ways:

- ✓ Correcting all SPAG errors and copying out spellings as directed by your teacher.
- ✓ Answering R4 questions and completing extension questions/tasks in green pen.
- ✓ Giving peer feedback when it is expected by the teacher, using the format provided.
- ✓ Setting yourself targets when required, to ensure that you keep developing your knowledge and skills.
- ✓ Focusing on the areas of knowledge that you need to learn and quizzing yourself on these for homework.
- ✓ Showing that you take pride in your work by presenting it neatly.
- ✓ Always asking for help if you don't understand the work or what to do.

The Literacy Mat

Connectives

Adding Ideas
Furthermore, in addition, similarly, also, and, too.

Showing Difference
But, however, on the other hand, although, whereas, alternatively, arguably.

Evaluating
Consequently, surprisingly, significantly, interestingly, unexpectedly.

Listing
Firstly, secondly, last, then, next, finally.

Common Mistakes

Correct Capital Letters
To start EVERY sentence.
For 'I' (as in 'I went').
For ALL names.
Film/book names.
NeVeR To be uSed RanDomLy!

Would HAVE' vs 'Would OF'
NEVER use '**of**' after a modal verb:

'Would have' **NOT '**would of'
'Could have' **NOT '**could of'
'May have' **NOT '**may of'
'Should have' **NOT '**should of'
'Might have' **NOT '**might of'

Great Big Nevers!
Gonna - going to
Ain't - am not
We/they was - we were
Gotta - have got to
Innit - isn't it
Gotten - got
Coz/cause - because

Homophones
To/too - I went to school (towards). I ate too much (more than enough). I am happy too (also).
Their/there/they're - They're (they are) over there (that place) reading their (belonging to them) books.
Your/you're - Your work is great (belonging to you). You're awesome (you are).

Correct Sentences

Simple Sentence - must contain a verb and a subject.

subject — verb
Matt was very cold today.

subject — verb
I always eat breakfast in the morning

Compound Sentence - two **simple sentences** joined by a **connective**.

connective
I tried to speak slowly **but I was far too excited.**

connective
Dan is very organised and he always helps others.

Complex Sentence - contains a **simple sentence** and one or more '**subordinate clauses**' (extra information!).

subordinate clause — comma
When he handed in the homework, the teacher knew he had worked hard on it.

comma — comma
She told a joke, **which was hilarious**, to her friends.
subordinate clause

Proof Reading

Follow this checklist when proof-reading or editing your work, especially assessments!

1. Check your presentation: Underline your date, title and any subtitles. Check that your work is laid out in paragraphs.
2. Skim read: Make sure capital letters and full stops are 100% accurate.
3. Skim read again: Check that your complex sentences have accurate commas.
4. Skim read again: Check the spelling of words you are not sure about (neighbour/dictionary/teacher/literacy mat).
5. Read a final time but carefully: Do **ALL** of your sentences make sense? Is there a better, clearer way of explaining/describing something?

Apostrophe Rules

1. Contractions
The apostrophe is put in the place of missing/omitted letters:
I will becomes I'll / should not becomes shouldn't etc.

2. Possession
If something belongs to someone, we put an apostrophe, then an 'S':
Toby's football / The dog's collar / The door's handle.
But if the name already ends in an 'S', you just put an apostrophe:
Chris' guitar / Jess' book / Mr Jones' classroom.

3. Plural Possession
If something belongs to a group, we just put an apostrophe at the end.
The class' whiteboard / The boys' shoes.

4. It's vs Its
'It's' should ONLY have an apostrophe if it is being shortened from 'it is'.
NEVER for possession: Its legs were long and hairy.

Never use an apostrophe for plurals! Carrot's / Ball's / CD's

The Literacy Mat: Common Spellings

accommodation	daughter	improvise	performance	soldier
actually	decide/decision	industrial	permanent	stomach
alcohol	definite	interesting	persuade/persuasion	straight
although	design	interrupt	physical	strategy
analyse/analysis	development	issue	possession	strength
argument	diamond	jealous	potential	success
assessment	diary	knowledge	preparation	surely
atmosphere	disappear	listening	prioritise	surprise
audible	disappoint	lonely	process	survey
audience	embarrass	lovely	proportion	technique
autumn	energy	marriage	proposition	technology
beautiful	engagement	material	questionnaire	texture
beginning	enquire	meanwhile	queue	tomorrow
believe	environment	miscellaneous	reaction	unfortunately
beneath	evaluation	mischief	receive	Wednesday
buried	evidence	modern	reference	weight
business	explanation	moreover	relief	weird
caught	February	murmur	remember	women
chocolate	fierce	necessary	research	
climb	forty	nervous	resources	
column	fulfil	original	safety	
concentration	furthermore	outrageous	Saturday	
conclusion	guard	parallel	secondary	
conscience	happened	participation	separate	
conscious	health	pattern	sequence	
consequence	height	peaceful	shoulder	
continuous	imaginary	people	sincerely	
creation				

Maths Core Knowledge

hegartymaths

http://hegartymaths.com

Maths Lesson Essentials!

- Have you written and underlined the date and title?
- Have you written the question and shown your working out?
- Have you shown your units?
- Have you brought your calculator?
- Have you marked your answer in green pen?
- Does your answer make sense?

Number and Algebra

Ascending	Solution
Descending	Decimal
Denominator	Percentages
Numerator	Binary
Solve	Integer

Data

Mean
Median
Mode
Range
Scale
Proportion
Discrete data
Continuous data
Frequency
Cumulative frequency
Upper quartile
Lower quartile
Interquartile range
Distribution
Correlation
Scatter graph

Shape

Names 3D

Sphere
Cylinder
Tetrahedron
Prism
Cone
Pyramid

Shape

Names 2D

Quadrilaterals
Parallelogram
Trapezium
Rectangle
Rhombus

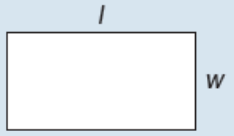
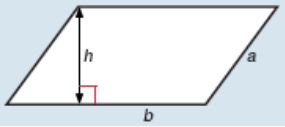
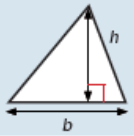
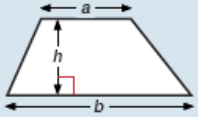
Triangles
Equilateral
Right-angle
Isosceles
Scalene

Keywords

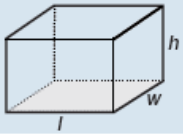
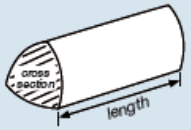
Circle
Polygon
Interior angles
Exterior angles
Acute angle
Right angle
Obtuse angle
Reflex angle
Vertically opposite angles
Corresponding angles
Alternate angles
Co-interior angles
Pythagoras
Trigonometry
Parallel
Perpendicular

Maths Core Knowledge

Areas

Rectangle = $l \times w$	
Parallelogram = $b \times h$	
Triangle = $\frac{1}{2} b \times h$	
Trapezium = $\frac{1}{2}(a + b)h$	

Volumes

Cuboid = $l \times w \times h$	
Prism = area of cross section × length	
Cylinder = $\pi r^2 h$	

Important Formulae

Compound measures

Speed

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

Pressure

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Density

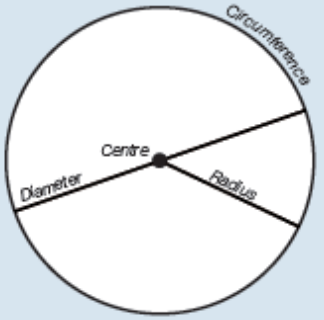
$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

Circles

Circumference = $\pi \times$ diameter, $C = \pi d$

Circumference = $2 \times \pi \times$ radius, $C = 2\pi r$

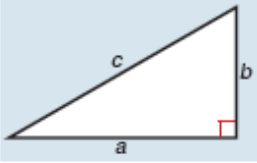
Area of a circle = $\pi \times$ radius squared $A = \pi r^2$



Pythagoras

Pythagoras' Theorem

For a right-angled triangle,
$a^2 + b^2 = c^2$



Trigonometric ratios (*new to F*)

$$\sin x^\circ = \frac{\text{opp}}{\text{hyp}}, \quad \cos x^\circ = \frac{\text{adj}}{\text{hyp}}, \quad \tan x^\circ = \frac{\text{opp}}{\text{adj}}$$

http://hegartymaths.com

hegartymaths

Science Core Knowledge

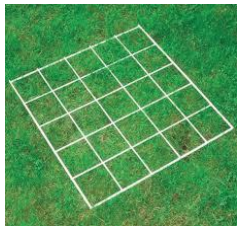
1. How Science Works Keywords

Keyword	Definition
Evidence	A set of data that proves a prediction or hypothesis.
Hazard	Something that could be dangerous.
Risk	Chance of something dangerous happening.
Prediction	Something you think will happen.
Hypothesis	Why you think something will happen.
Variables	Something that changes.
Independent variable	The variable that is changed or controlled in an experiment to test the effects on the dependent variable.
Dependent variable	The variable being tested and measured in an experiment.
Control variable	Something that is constant and unchanged during the experiment.
Repeatability	Closeness of repeats of results to each other.
Reproducibility	Agreement of results from different groups testing the same factor.
Accuracy	Closeness of a measured value to a standard or known value.
Precision	Closeness of two or more measurements to each other.
Reliability	The degree to which the result of a measurement can be depended on to be accurate.

2. Key Equipment

Measuring cylinders – 10 ml cylinders will allow measurement to the nearest 0.1 ml.
100 ml cylinders will allow measurement to the nearest 1 ml.

Thermometers – digital thermometers allow measurement to 1 decimal place, whereas alcohol thermometers only allow measurement to the nearest degree.



Quadrats – are used to do sampling and find the amount of a species in a certain area. Quadrats are placed onto the ground.

Metre ruler – used in multiple investigations in the lab. Allows us to measure to the nearest cm.

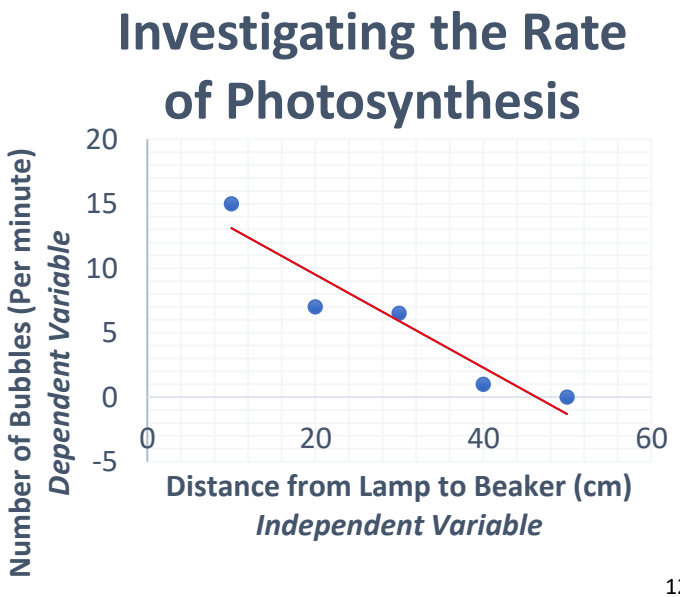
Measuring tape – used in sampling alongside the quadrat. Placed onto the ground to make a transect line to measure against.

Science Core Knowledge

3. Graphing, Analysis and Evaluation Keywords

Keyword	Definition	Example
Hypothesis	An educational guess based on what you already know.	The rate of photosynthesis will increase as the lamp moves closer to the beaker.
Independent Variable	The variable that can be changed by the scientist, it is the cause. Found on the *x*-axis.	Distance from lamp to beaker (cm)
Dependent Variable	The variable that the scientist observes, it is the effect. Found on the *y*-axis.	Number of bubbles (per minute)
Control Variable	The variables that must always be kept the same	Temperature, the size of the pond weed, amount of water
Line of Best Fit	A line that goes roughly through the middle of all the scatter points on a graph.	The red line on the graph above shows the line of best fit for the data plotted
Calculations	Use the correct equation to be used based on the variables of the experiment. Use correct units.	Calculation for mean of number of bubbles per minute: Trial 1 + Trial 2 + Trial 3 ÷ 3 15 + 14 + 15 ÷ 3 = 14.6
Results Analysis	Identify patterns in data. Describe what the table and graph show.	As the lamp is getting closer to the beaker, more bubbles are produced.
Conclusion	Answer your original question. State whether or not the hypothesis was supported.	The results prove that the rate of photosynthesis is effected by the distance of the light source. As the lamp was moved closer to the baker, more bubbles were produced.
Evaluation	Suggest an improvement for the equipment used. Suggest an improvement for the method used.	Use an LED lamp. Measure the volume of oxygen produced.

Distance from lamp to beaker (cm)	Number of bubbles (per minute)			Mean number of bubbles
	Trial 1	Trial 2	Trial 3	
10	15	14	15	14.6
20	7	7	7	7
30	7	7	6	6.7
40	1	2	1	1.3
50	0	0	0	0



Art

Practical Skills Visited

Skills

Colour

- Complementary colours
- Colour and light
- Tertiaries – greys/browns
- Perspective through colour

Drawing

- Directional mark making/shading to create form
- Measuring with a pencil, basic foreshortening
- Proportions of the figure
- Line and stylisation
- Drawing with a pen

Painting

- Colour mixing and variety of colours to create light and shade.
- Brushstrokes to create texture, form and movement

Printing

Printing for pattern Batik or repeat block printing

3D

Sculpture – small scale

Photography

Use of photography to record images to work from in a more independent way – e.g. own landscape images.

Editing images to create contrast/interesting colour ways

Literacy

Ability to compare and contrast two artists' works.

Vocabulary

Complementary colours – colours that are opposite each other on the colour wheel

Tertiary colours – the 'in between' colours e.g. yellow mixed with orange. Purple mixed with red.

Motif – a symbol or image used throughout a particular art work or art style, e.g. the whiplash motif in Art Nouveau

Monet – 'The father of Impressionism'

Impressionism – An art movement that at the time was considered shocking. From the 19th Century, focusing on lose brushstrokes, colour and depicting light.

Henry Moore – British sculptor famous for large-scale semi abstract figures and also drawing of the underground during WW2.

Giacometti – sculptor known for his textured ghost like sculptures.

Sculpture/Sculptor – a 3D art work/an artist who creates sculptures

Maquette – a small try out of a 3D art work

Stretch/Further Reading

Drawing

1. Complete drawings of figures from real life using line only – try to use continuous line
2. Draw a sky using colour only without doing outlines first – paint if you can
3. Draw insects in detail – look at botanical drawings of insects to help you.

4. Find out about Indian Art and pattern

5. Find out about the Impressionists and the Post Impressionists. If possible, visit the National Gallery in London to see some of their work.
Also, the Courtauld Gallery is fabulous for Impressionism.

Artists

The Impressionists and Post Impressionists:

- **Monet**
- **Henry Moore**
- **Giacometti**

Computing – Spreadsheets

Spreadsheets are used to store information and data. Once we have our information in a spreadsheet we can run powerful calculations, make graphs and charts and analyse patterns.

Charts and graphs provide a **visual representation** of data, which can often be easier to understand.

Spreadsheets are used by businesses to keep control of the costs and forecasting sales in the future.

Students use spreadsheets to generate charts and graphs for coursework.

Key Points – Explain (Bitesize)

Columns, rows and cells	- - -
Sorting	
Line graph	
Pie Chart	
Bar Chart	

Accounts (complete in pencil)

Account	Site	Login	P/W hint
Login	18SurnameInitial		
OneDrive/Email	http://outlook.office365.com/owa/theregisschool.co.uk	@theregisschool.co.uk	
Homework / iDEA	https://idea.org.uk Internet & Web , What Is The Cloud? Teamwork, Problem Solving , Automation. Any others.		
Classcharts - H/W	https://www.classcharts.com		
Keywords	https://quizlet.com/login	TRS Year 8 Comp Sci 2019	

Computing – Spreadsheets

Excel Keywords	Definition
ascending	Ascending means starting at the Bottom and going up, for example, 0, 1, 2, 3.. (smallest to largest) or A–Z
axis labels	A label for a graph's horizontal (x) or vertical (Y) axis that explains what the value relates to.
data	Values, typically letters or numbers.
dialogue box	A window that displays some information or an error message for the user and waits for a response.
descending	Descending means starting at the Top and going Down, for example, 10, 9, 8 .. (largest to lowest) or Z - A.
double-click	To quickly click a button twice on a mouse or other computer input device.
duplicates	To make an exact copy of something.
format	The appearance of a document, including the fonts, colours, size and alignment.
formula	The use of symbols to make a calculation e.g. =Sum(A1*B1) or =Sum(A1:A5)
function	A predefined formula that performs calculations using specific values in a particular order. E.g. =Average(A1:A5) or =VLOOKUP(value, table, col_index, [range_lookup]) or =COUNT(A1:A5)

Homework Checklist for first term		
1	Use this to complete the KO	https://www.bbc.com/bitesize/guides/zdydmp3/revision/1
2	Homework – Idea Badges	Problem Solving Internet & Web What Is The Cloud? Teamwork (look on class charts for others to do)
3	Keywords from KO	You could also use Quizlet to practice.
4	Extension work	Create your own spreadsheet to balance your budget. Use some more complicated formulas/Functions – look them up -

Performance (Drama and Dance)

Drama Skills and Techniques

1	**Conscience alley:** Two physical lines of people creating an 'alleyway' between them. Each person in each line speaks a thought allowed (negative or positive) exploring a character's dilemma/morals as they walk through the 'conscience alley.'
2	**Thought tracking:** A character speaks their internal thoughts out loud for the audience, other characters on stage may not be aware of this.
3	**Flashback / Flash-forward:** A scene showing a moment from the past or the future.
4	**Freeze frames:** A still/frozen image of characters on stage in a specific moment.
5	**Transitions:** Movement that links scenes or images from one to the other.
6	**Physical Theatre:** Using your body to make/represent an object or using movement to tell a story.

Drama Skills and Techniques

1	**Marking the Moment:** Highlighting the key/most important moment in your scene by using slow motion or free frame.
2	**Direct Address:** Talking directly to the audience – also known as 'breaking the fourth wall.'

Dance: Mental Skills

1	**Systematic rehearsal**: Repeating something in an arranged or ordered way.
2	**Response to feedback**: Using peer, self and teacher feedback to improve your dance performance.
3	**Capacity to improve**: The ability and desire to improve your performance.

Dance: Physical and Expressive Skills

1	**Alignment**: Correct placement of body parts in relation to each other.
2	**Isolation**: An independent movement of part of the body.
3	**Mobility**: The range of movement in a joint; the ability to move fluently from action to action.
4	**Extension**: Lengthening one or more muscles or limbs.
5	**Facial expression**: Use of the face to show mood, feeling or character.
6	**Sensitivity to other dancers**: Awareness of and connection to other dancers.
7	**Communication of choreographic intent**: The aim of the dance; what the choreographer aims to communicate.
8	**Interrelationship between constituent features of dance works**: How costume, music, set design and action content relate to each other.

English

Keywords

Evidence	the use of information to prove a point that you are making
Quotation	a selection of words or phrases taken, word for word, from a text
Fiction	writing that describes imaginary events and people, e.g. *Private Peaceful*
Non-fiction	writing that describes people's opinions or information on facts and reality, e.g. a newspaper
Identify	to pick out a specific piece of information from a text
Inference (noun)	a thought or opinion about a text that is formed by looking at the evidence
Infer (verb)	to have a thought or opinion about a text, formed by looking at the evidence
Explicit	obvious, specific or clear
Implicit	suggested, not openly stated, an educated guess
Analysis (noun)	the close examination of a text
Narrator	the person telling the story
Perspective	the views and opinions of the writer

Rhetorical Devices

Rhetorical question	Asking a question that gets the reader to consider or do something. Used to emphasise a key point
Direct address	Directing a statement clearly to the reader / audience using the pronoun 'you'
Tripartite sequence	When you list three actions or descriptions in a sentence.
Inclusive pronouns	Use of 'us' / 'our' etc to make the audience feel included and therefore more likely to agree
Hyperbole	Exaggerated or over the top language
Facts / statistics	A statement that is known or proven to be true
Opinions	A view or judgement of something that someone could disagree with
Repetition	Words or phrases repeated across a text for emphasis

Parts of Speech

1	**Noun**	people, place things
	Adjective	describes a noun
	Adverb	tells you how, when, where or why something is being done
2	**Verb**	describes an action
3	**Pronoun**	works as a noun and indicates other people in the discussion
4	**Connective**	a word used to connect clauses or ideas together
5	**Preposition**	usually used in front of nouns or pronouns and they show the relationship between the noun or pronoun and other words in a sentence

Language and Structural Devices

Simile	comparing two objects using 'as' or 'like' to create imagery
Metaphor	comparing one thing to another by saying it is something else.
Personification	giving inanimate objects human properties
Pathetic fallacy	when you give human emotions to nature (specifically the weather) to create atmosphere.
Alliteration	words in a passage / sentence that begin with the same sound.
Onomatopoeia	words that sound like the sounds they are describing
Semantic field	a group of words that suggest a theme / topic
Sequence	the order of events in a text (opening, middle, end)
Flashback / flash-forward	an interruption of the story to describe a past or future event
Past and present tense	identifying whether the events are happening now, or if they have already happened
Narrative viewpoint	writing in the first person ('I'), second person ('you'), or third person (he, she, it, names)
Foreshadowing	Hints about what might happen later in the speech

Food Preparation and Nutrition

KEYWORDS

Nutritional Analysis – Annotation of nutrients and their functions.

Sensory Analysis – Annotation of how the product looks, tastes, texture and smell.

Gluten – Protein found in wheat.

CO_2 – Gas produced from yeast, used to make bread rise.

Modification – Changing the recipe to meet needs of consumer.

Seasonal foods – Foods that are only available at certain times of the year.

THE EATWELL PLATE

1. Base your meals on starchy food
2. Eat lots of fruit and vegetables
3. Eat more fish
4. Cut down on saturated fat and sugar
5. Try to eat less salt – not more than 6 g a day
6. Drink plenty of water
7. Don't skip breakfast
8. Get active and try to be a healthy weight

FARM ASSURED

The Union Jack on the Red Tractor logo confirms that your food has been born, grown, prepared and packed in the UK.

The label also confirms that the welfare of the animals have been regulated to make sure they are well cared for.

FAIRTRADE

Changes the way trade works through better prices, decent working conditions and a fairer deal for farmers and workers in developing countries.

SEASONAL FOOD

These foods are only available at certain times in the year. Choosing seasonal food has many advantages:

- More likely to be locally grown
- Food miles will be low
- Support for local farmers
- More nutrients as they are fresher
- Fruit can be used to make chutneys, pickles or jams.

RICE DISHES

Rice dishes can harbour a bacteria called ***Bacillus cereus.*** The bacteria can form spores that are not easily destroyed by heat.

If rice is cooled down slowly or kept warm for some time before serving, the spores will germinate and produce bacteria. The bacteria will multiply and will not be destroyed by heating.

It is therefore important to cool rice down quickly by running it under a cold tap and placing it into a fridge straight away, or with stir fries, risottos and so on, cool in a shallow dish then refrigerate. All foods stored in a fridge should ne kept at 0–5 degrees Celsius. It will then be safe to reheat rice.

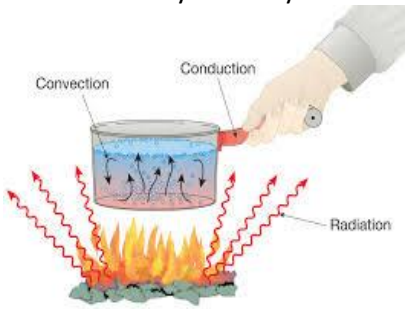
All reheated food should be served piping hot. The rice you prepare will reheat in the microwave for 3–5 minutes, depending on how powerful your microwave is. If you have any left, it must not be heated up again.

HEAT TRANSFERENCES

CONDUCTION – when heat travels through solid materials such as metal and food.

CONVECTION – when heat travels through air or water.

RADIATION – when heat rays directly heat and cook food.



Food Preparation and Nutrition – Recipes

PIZZA

200 g strong bread flour
3 tbsp oil
1 sachet of yeast
50 g cheese
20 0ml passata or thick tomato pasta sauce
2 of your own chosen toppings

FOCACCIA

375 g strong plain flour
1 sachet quick acting yeast
3 tbsp olive oil
at least 2 additional ingredients as mentioned in class e.g. sundried tomatoes, rosemary, garlic, olives, grated cheese

EGG FRIED RICE

2 tbsp vegetable oil
4 rashers of smoked bacon
1 onion
2 spring onions
200 g rice
100 g frozen peas
2 eggs
2 tbsp soy sauce

BOMBAY POTATOES

6 medium sized potatoes
3 tbsp vegetable oil
1 medium onion
2 cloves garlic
1 red pepper
1 × 400 g tin chopped tomatoes
1 tbsp madras curry powder
Fresh coriander and a lemon wedge to garnish

MUFFINS

250 g plain flour
2 tsp baking powder
100 g caster sugar
240 ml semi skimmed milk
2 eggs
125 ml vegetable oil
muffin cases

ROCKY ROAD

250 g digestive biscuits
150 g milk chocolate
150 g dark chocolate
100 g butter
150 g golden syrup
100 g dried apricot, chopped
75 g raisins

CHICKEN NUGGETS

100 g flour
1 egg
100 g bread crumbs
1 chicken breast
3 tbsp oil

SCONES

300 g self-raising flour
1 tsp baking powder
75 g margarine
50 g caster sugar
150 ml milk
25 g of chosen ingredients depending on savoury or sweet

ALWAYS REMEMBER A CONTAINER TO TAKE YOUR FOOD PRODUCTS HOME!!!!

Time Expressions

L'année dernière,	Last year,
Le weekend dernier,	Last weekend,
Il y a trois ans,	Three years ago,
Normalement,	Normally,
D'habitude,	Usually,
L'année prochaine,	Next year,
À l'avenir,	In the future,
Un jour,	One day,

Adjectives (describing)

rapide	fast
lent	slow
dangereux	dangerous
sûr	safe
Bon marché	cheap
cher	expensive
génial	great
flippant	freaky./scary
horrifique	horrific
Un peu	A bit
très	very
extrêmement	extremely
assez	quite

Verb Phrase (past tense)

Je suis allé(e)…	I went…
J'ai fait…	I did…
On s'est deplacé…	we travelled…
Je suis resté(e)…….	I stayed…
C'était…	It was…

Verb Phrase (present tense)

Je vais…	I go…
On va…	We go…
Je fais…	I do…
Je me déplace…	I travel…
Je reste…	I stay…
Je voyage…	I travel…
C'est…	It's…

Verb Phrase (future tense)

Je vais aller…	I'm going to go…
On va voyager…	We are going to travel…
Je vais rester…	I'm going to stay…
Je vais faire…	I'm going to do…
Il sera….	It will be…

Core Questions

1) Où es-tu allé(e) en vacances l'année dernière?	Where did you go on holiday last year?
2) Qu'est-ce que tu fais normalement pendant les vacances?	What do you normally do in the holiday?
3) Quels sont tes projets pour les prochaines vacances?	What are your plans for the next holidays?

Nouns (countries)

En Suisse	To/in Switzerland
En Espagne	To/in Spain
En Allemagne	To/in Germany
En Pologne	To/in Poland
Au Portugal	To/in Portugal
Au Canada	To/in Canada
Aux Etats-unis	To/in the United States

Nouns (transport)

En avion	By plane
En bateau	By boat
En voiture	By car

Nouns (accommodation)

Dans une tente	In a tent
Dans un hôtel	At a hotel
Dans une auberge de jeunesse	In a youth hostel

Nouns (activities)

Les magasins	Some shopping
De l'escalade	Some climbing
De la rando	Some hiking

Nouns (people)

Avec ma famille	With my family
Avec mes copains	With my friends
Avec mon collège	With my school

Geography

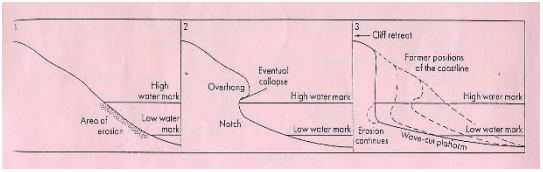
How do waves form?

Waves are formed as a result of wind blowing over the ocean. The longer the fetch (the distance the wind blows over the water), the bigger the wave will be.

Destructive waves: These waves are steep and they are close together.
– They have a weak swash and a strong backwash.
– As a result, these waves erode sand and pebbles from the beach, 'destroying' it.

Constructive waves: These waves are gentle and they are far apart.
– They have a strong swash and a gentle backwash.
– As a result, these waves transport and deposit a large amount of material onto the beach, 'constructing' a new beach.

Landforms of erosion: wave cut platforms



As you can see, the cliff is retreating leaving behind a **sloping wave-cut platform**.

The erosion happens between the **high water mark** (high tide) and the **low water mark** (low tide).

The base of the cliff is eroded, **undercutting** the cliff and forming a **wave cut notch**

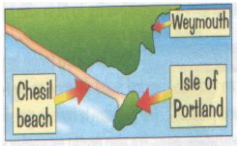
The cliff is **unsupported**, so it **collapses**

The process **repeats** and the cliff **retreats.**

Landforms of deposition: bars and Tombolos

If there is **no river** running into the sea where the spit has formed, it could become a **BAR** and stretch all the way across. Behind the bar is a **Lagoon,** which in time may become a **Salt Marsh.**

If the material reaches an offshore island it is a **tombolo**.

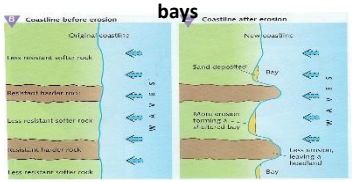


Changes in Sea Level:

Sea levels change on a daily basis due to tides. However, Earth's sea levels are also generally rising due to **global warming**. The increase in the Earth's average temperature is causing the polar ice caps to melt, causing sea levels to rise.

This rise in sea levels can increase **erosion** and can cause area to permanently flood. This affects **coastal areas** but can also affect low lying countries, such as **the Maldives** and cities such as **New York, Shanghai and London**, which will be forced to spend billions on flood defences.

Landforms of erosion: headlands and bays



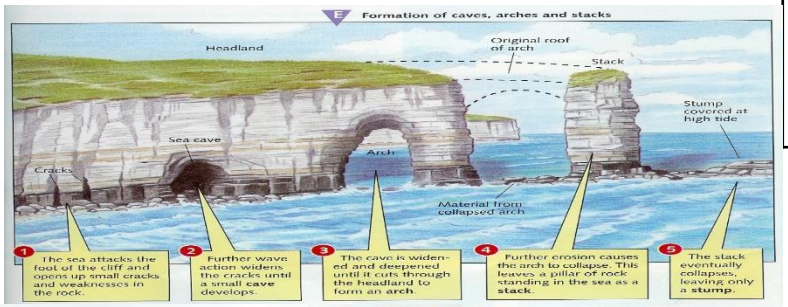
- Due to destructive waves the coastline is **eroded**, by **hydraulic action** and **abrasion.**
- **Soft** rock erodes **quicker** and **retreats.**
- The hard rock **remains** and forms headlands.
- Due to **attrition** the eroded rock is broken down to form **sand** and then **deposited** in the bay.

Coastal erosion and weathering:

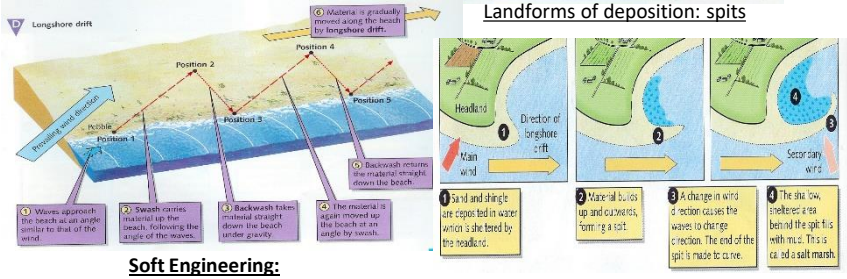
How coasts change depends on the types of rocks that are in different areas. **Harder rock**, like limestone and sandstone, erodes slowly. **Softer rock**, like clay, **erodes more quickly**.

Name	Description
Abrasion	As waves smash rocks against cliff surfaces, they are worn away and become smoother. This is known as the "sandpaper effect".
Hydraulic power	Air becomes trapped in faults in cliffs. When waves break against the cliffs, the air is compressed and forces the fault to become bigger. This eventually causes a piece of the cliff to break away.
Solution	Acids in sea water dissolve certain types of rock, such as limestone or chalk, causing them to gradually erode over time.
Attrition	Material from the coastline collides with other material, breaking into smaller pieces.
Freeze-thaw weathering	Water collects in faults during the day. At night, this water freezes and expands. This makes faults bigger over time and is similar to hydraulic power.

Landforms of erosion: caves, arches and stacks



Landforms of deposition: spits



Soft Engineering:

1. **Beach Nourishment,** which means placing sand in front of the eroding coast.
2. **Managed Retreats** let the coast erode naturally and move the people and businesses away slowly.
3. **Cliff Drainage** – pipes that allow wet cliffs to drain the heavy rain water away.

Case study of coastal management

The Holderness Coast

Holderness Coast is in Humberside, North East England. It suffers one of the fastest rates of erosion in world and loses around 1–2 metres of coastline per year. Mappleton is now in danger of falling into the sea and 29 villages lost from coastline since roman times.

Cause Soft rock, made of till, which contains small pebbles and clay *and* very strong waves.

Response £2 million spent on rock groynes at Mappleton and rip-rap. They spent this money as they did not want to re-route the Hornsea to Withensea road due to cost.

Effects

Positive:

Has stopped erosion at Mappleton, as it now has a beach protecting the foot of the cliff.

Negative:

Further south has no beach, as the groynes have stopped longshore drift taking beach material further down the coast.

Sue Earl who owned Cliff Top farm saw erosion increase from 1 metre a year to 20 metres a year in certain places.

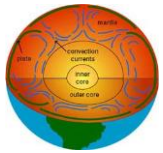
Sue Earl's farm has now been demolished, and she had to live in a caravan. Sue Earl blames the Sea defences at Mappleton for causing the increased erosion near her farm, and is trying to sue the local council.

Hard Engineering:

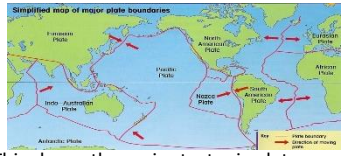
Groynes 	• Stops Longshore Drift = beach. • Wooden posts out to sea. • ***No beach further down coast = more erosion.***
Gabions 	• Stones in mesh cages. • Waves energy is dispersed through them • ***Look ugly and are a danger for animals e.g birds.***
Sea Wall 	• Concrete Wall – reflects waves energy. • ***Can increase wave backwash meaning the beach is removed.*** • ***Ugly, expensive, graffiti.***
Off-Shore Break Water 	• A build up of rocks out at sea. • Disperses waves energy out at sea. • Beach builds up behind them as there is little sea current. • ***Ugly, expensive, dangerous – children.***
Revetments 	• Sloping concrete / wooden platform. • Allows wave energy to be dispersed as it travels up the revetment. • ***Ugly, expensive.***

Geography

Layers of the Earth

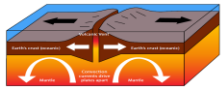


Inner Core: centre of the earth; solid; 5500°C.
Outer Core: 2000 km thick, second hottest, liquid metal.
Mantle: 3000 km thick; semi-molten; convection currents active here.
Crust: Rocky outer layer; broken in to oceanic crust (approx. 5km thick, holds the Earth's oceans, can be destroyed) and the continental crust (approx. 35–50 km thick, holds the Earth's continents, cannot be destroyed). **Convection Currents** occur in the mantle. The core heats the magma, which rises towards the crust, cools, spreads, sinks and the process repeats. Without these currents there would be NO tectonic activity.



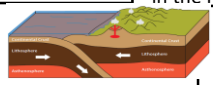
This shows the major tectonic plates and the movement at their boundaries. At the edges of plate boundaries, the majority of tectonic events will occur i.e. volcanoes and earthquakes. There are a few anomalies to this general rule, e.g. the "hotspots" around Hawaii in the Pacific Ocean.

Divergent (Constructive) Margin



Convection currents move the plates away from each other; **Tremors** will be felt, and a **gap** will be created; Fast flowing **lava** seeps out creating **shield volcanoes** and **new land** e.g. Iceland; The **Mid-Atlantic Ridge** is a famous constructive margin creating 3 cm of new land each year.

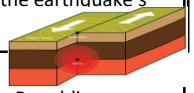
Convergent Destructive Margin



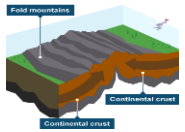
A **destructive margin** occurs due to **convection currents** moving the plates **towards** each other; **oceanic crust** moves towards the **continental crust.** The oceanic is forced down as continental cannot be destroyed; as it is forced down it enters the **subduction zone,** earthquakes happen and the oceanic crust melts in the **magma chamber**; **pressure builds up** and an eruption takes place producing sticky lava = **composite volcano** formed.

Conservative Margin

Conservative margins occur due to **convection currents** causing plates to **slide past** each other, sometimes they will **stick**, causing **pressure to build up** and **friction**; The **convection currents** keep trying to move the plates until they **slip past** each other causing an **earthquake**; **Seismic waves** now rush from the earthquake's **focus.**



Convergent Collision Margins



A collision margin Occurs due to Convection currents pushing two **continental** plates towards each other. Remember**, continental crust cannot be destroyed**; As they hit **violent earthquakes** happen (e.g. Nepal 2014); They push upwards to create **fold mountains** (e.g. Himalayas).

Why do people live near volcanoes?

Creates **tourism** (e.g. Vesuvius in Italy);
They form **new land** (e.g. Surtsey, Iceland);
Precious stones can be found nearby;
Geothermal power plants can locate near volcanoes; the ash makes the **land fertile** meaning jobs for farmers;
friends and family may live here;
some people **take the risk** as it has not erupted in so long; **some people cannot afford to live elsewhere**.

Predicting volcanic eruptions

The **shape** may change (measured by **tilt-meters**);
Measure **gas emissions** (e.g. sulphur);
Monitor **tremors**;
Smoke coming out the top;
Nearby **water temperatures** rising;

Preparing for volcanic eruptions

Evacuation and exclusion zones around the volcano;
Train the **emergency services**;
Reinforce roofs of buildings so unaffected by falling ash;
Ensure **medical, food and water supplies** are stocked; **Diversion channels** for lava flows can be created.

Case Study 2 LIC - *Haiti 2010*

Located in the **Caribbean**, shares Island with Dominican Republic

Cause

- **Conservative boundary** (read about me!) – **North American plate** and **Caribbean plate** moving in different directions.
- 7 Richter scale, epicentre close to capital Port au Prince.

Effect

- **250,000 dead** due to poorly built buildings collapsing on them, many injured could not be treated as hospitals were overwhelmed.
- **1.5 million homeless**, many have had to live in shanty settlements, as Port au Prince building collapsed.
- Outbreaks of **Cholera** due to the lack of clean water available as people forced to live in shanty settlements
- The local jail collapsed, **4000 inmates** escaped.
- The **destroyed port** also led to the **economy** suffering as trade could not take place causing **people to lose jobs.**

Response (Are these Sustainable??)

- This was made difficult as the **port was destroyed** meaning aid could not get in
- People responded by building houses on the edge of the city – these were poor quality and lacked toilets and running water, this lead to the **spread of Cholera** (Not sustainable).
- **USA** sent troops to restore order by stopping looting and organising search and rescue. (Sustainable as it reduced death).
- **Red Cross** raised **$7 million in 24 hrs**, sending **food, water and medicine** across from the USA.

Case Study 1- HIC *Japan 2011* – Japan is located in Asia.

Cause

- Japan sits between the Pacific and North America plate.
- Japan sits on a **convergent destructive** plate boundary.
- The Pacific plate is subducting beneath the North American plate.
- Measured a 9 on the Richter scale.

Effect

- **15,000 deaths** mostly as a result of the tsunami that followed the earthquake.
- **230,000 homeless** from the tsunami.
- **120,000 buildings destroyed** but many were protected as they were earthquake resistant.
- Total economic cost estimated at **$235 billion.**
- The tsunami **flooded the Fukushima nuclear power plant**, releasing 300 tonnes of radioactive water into the surrounding area

Response

- **100,000 Japanese soldiers** sent out to search and rescue.
- Specialist **search and rescue** teams flown in from **overseas**.
- Exclusion zone set up around Fukushima, **people evacuated** from area.
- **91 countries have offered aid**, from blankets and food to search dogs and military transport.
- Modern innovations, such as **Twitter** were **bringing updates** on the situation far earlier than the media.
- A **Meteorological Agency** official **appeared on TV** urging those affected by the quake not to return home because of possible tsunamis.

Why do people live in and around seismic areas?

Industry and jobs in that area; **friends and family** may live here; people place a lot of faith in earthquake prediction and/or prevention methods; some people **take the risk** as it has not erupted in so long; **some people cannot afford to live elsewhere**.

Predicting earthquakes

Monitor using **seismographs** for irregularities in tremors and plate movements;
Monitor **local animal behaviour** – they will sense minor earthquakes and tremors;
Measure **radon gas** – this will increase as cracks appear in the rocks;
Measure **underground water levels** – these will rise as the plates lock;
NB – earthquakes cannot be effectively predicted!

Preparing for earthquakes

- Retro-fit existing buildings with earthquake proof measures (e.g. cross-bracings, springs, etc);
- Ensure new buildings are built to withstand or absorb seismic activity;
- Practice earthquake drills;
- Train the emergency services;
- Prepare earthquake kits at home;
- Ensure streets are as wide as possible (e.g. San Francisco) so emergency services can access.

Other important information: Two ways to measure earthquakes:

- **Richter Scale** – uses a **seismograph** to measure the size (magnitude) of the **seismic waves**. Measured on a logarithmic scale (e.g. a "8" on the scale is 10× stronger than a "7", and 100x stronger than a "6", and so on).
- The **Mercalli Scale** – visual scale, get a ranked score of 1 (least) to 12 (most) of the **damage caused** by tremors.

LEARN VOCAB — German — BUILD SENTENCES

Time Expressions

letztes Jahr	Last year,
Letztes Wochenende	Last weekend,
Vor drei Jahren	Three years ago,
Normalerweise	Normally,
Gewöhnlich	Usually,
Nächstes Jahr	Next year,
In der Zukunft	In the future,
Eines Tages	One day,

Adjectives (describing)

schnell	fast
langsam	slow
gefährlich	dangerous
sicher	safe
billig	cheap
teuer	expensive
toll	great
gruselig	freaky/scary
furchtbar	awful
ein Bißchen	a bit
sehr	very
total	totally
ziemlich	quite

Verb Phrase (past tense)

Ich bin ……gefahren	I went….
Ich habe… gemacht	I did…
wir haben … besucht	we visited…
Ich bin….geblieben	I stayed…
Es war …	it was…

Verb Phrase (present tense)

Ich fahre	I go / travel …
Wir fahren	We go…
Ich mache	I do…
Ich besuche	I visited…
Ich bleibe	I stay…
Ich fliege	I fly
Es ist….	It is…

Verb Phrase (future tense)

Ich werde …fahren	I'm going to go…
wir werden..fahren	We are going to travel
Ich werde….bleiben	I'm going to stay…
Ich werde…machen	I'm going to do…
Es wird….sein	It will be…

Core Questions

1) Wohin bist du letztes Jahr auf Urlaub gefahren?	Where did you go on holiday last year?
Was machst du normalerweise in den Ferien	What do you normally do in the holidays?
Wohin wirst du nächstes Jahr auf Urlaub fahren?	What are your plans for the next holidays?

Nouns (countries)

nach Frankreich	To France
nach Spanien	To Spain
nach Deutschland	To Germany
nach Polen	To Poland
nach Portugal	To Portugal
in die Schweiz	To Switzerland
nach Amerika	To the United States

Nouns (transport)

mit dem Flugzeug	By plane
mit dem Schiff	By boat
mit dem Auto	By car

Nouns (accommodation)

in einem Zelt	In a tent
in einem Hotel	At a hotel
in einer Jugenherberge	In a youth hostel

Nouns (activities)

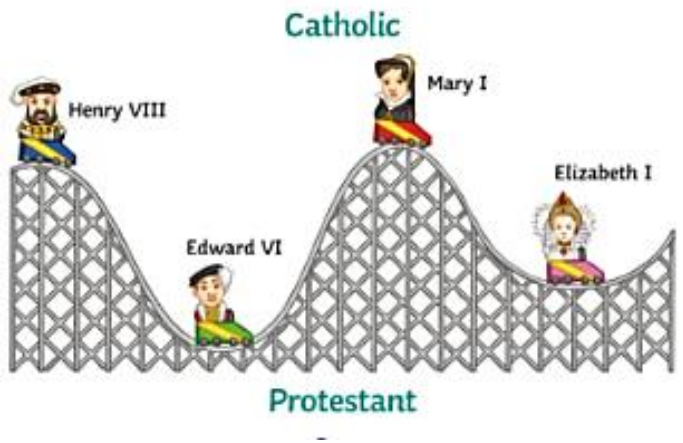
Einkaufen	shopping
Klettern	climbing
Wandern	some hiking

Nouns (people)

mit meiner Familie	With my family
mit meinen Freunden	With my friends
mit meiner Schule	With my school

History – The Tudors

Keywords	
Wars of the Roses	The **Wars of the Roses** were a series of battles fought in medieval England from 1455 to 1485 between the House of Lancaster and the House of York.
Catholic	Main Christian religion that was followed by people across Europe.
Protestant	A movement that questioned the Catholic Church.
Monastery	A place where monks lived. Destroyed by Henry VIII between 1536 and 1541.
Reformation	A period of time when the Catholic church was challenged.
Treason	The process of trying to remove the king or queen. It was punishable by death.
New World	Modern day America and Canada. It was discovered by Europeans during this time and many countries tried to claim it as their own.
Elizabeth's middle way	Elizabeth's compromise to help Catholics and Protestants live peacefully in Tudor England.
Tudor Period	The period of time between 1485 and 1603.



Key Individuals	
Henry VII	Won the War of the Roses and began the Tudor dynasty.
Henry VIII	Made the break from Rome. Son of Henry VII.
Edward VI	Henry VIII's only son. Protestant.
Mary I	She set about making England Catholic again. Known as bloody Mary. Henry VIII's daughter.
Elizabeth I	She made England a protestant country. Henry VIII's daughter.
Mary, Queen of Scots	Catholic Queen of France and had a claim to the English throne.
Phillip II of Spain	Leader of Catholic Spain. Was a rival of Elizabeth I.
Pope Gregory XIII	Supported Spanish attempts to overthrow Elizabeth.

Key Dates	
1485	Henry VII won the Battle of Bosworth.
1509–1547	Henry VIII ruled England.
1534	Henry VIII created the Church of England, separating England from the Catholic Church.
1547–1553	Edward VI ruled England.
1553–1558	Mary I ruled England.
1558–1603	Elizabeth I ruled England.
1577–1580	Francis Drake circumnavigated the globe.
1585	Spanish Armada was defeated.

Useful links:
http://www.primaryhomeworkhelp.co.uk/Tudors.html

https://www.bbc.com/bitesize/topics/zynp34j

http://www.primaryhomeworkhelp.co.uk/tudors/waroftheroses.htm

Maths

1. Prime Numbers

Prime numbers are only divisible by themselves and 1. They have only 2 different factors. 1 is not a prime number because it has only 1 factor. The first 10 prime numbers are: 2, 3, 5,7, 11, 13, 17, 19, 23, 29

2. Indices

Indices (plural of index) are the numbers written above a base number.

2^4 — Index number / Base number

You would pronounce this as "2 to the power of 4"

The index number indicates how many times the 2 appears in the multiplication. For example: $2^4 = 2 \times 2 \times 2 \times 2$

Square numbers

The result of multiplying a number by itself.

When you raise a base number to the power of 2 (the index number is 2).

We call this squaring a number.

Example:

$3^2 = 3 \times 3$

$= 9$

" 3 squared equals 9"

$1^2 = 1$, $2^2 = 4$, $3^2 = 9$, $4^2 = 16$, $5^2 = 25$, $6^2 = 36$, $7^2 = 49$, $8^2 = 64$, $9^2 = 81$, $10^2 = 100$, $11^2 = 121$, $12^2 = 144$, $13^2 = 169$, $14^2 = 196$, $15^2 = 225$, $16^2 = 256$

Cube numbers

When you raise a base number to the power of 3 (the index number is 3).

We call this cubing a number.

Example:

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

$= 27$

"3 cubed equals 27"

$1^3 = 1$, $2^3 = 8$, $3^3 = 27$, $4^3 = 64$, $5^3 = 125$, $6^3 = 216$, $7^3 = 343$, $8^3 = 512$, $9^3 = 729$, $10^3 = 1000$

Roots

Square roots:

$\sqrt{1} = 1$, $\sqrt{4} = 2$, $\sqrt{9} = 3$, $\sqrt{16} = 4$, $\sqrt{25} = 5$, $\sqrt{36} = 6$, $\sqrt{49} = 7$, $\sqrt{64} = 8$, $\sqrt{81} = 9$, $\sqrt{100} = 10$, $\sqrt{121} = 11$, $\sqrt{144} = 12$, $\sqrt{169} = 13$, $\sqrt{196} = 14$, $\sqrt{225} = 15$, $\sqrt{256} = 16$

Cube roots:

$\sqrt[3]{1} = 1$, $\sqrt[3]{8} = 2$, $\sqrt[3]{27} = 3$, $\sqrt[3]{64} = 4$, $\sqrt[3]{125} = 5$, $\sqrt[3]{216} = 6$, $\sqrt[3]{343} = 7$, $\sqrt[3]{512} = 8$, $\sqrt[3]{729} = 9$, $\sqrt[3]{1000} = 10$

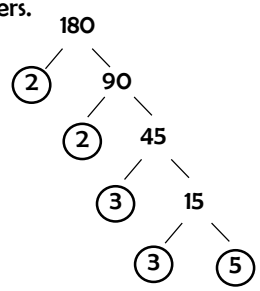
3. Prime Factor Decomposition

Any number can be expressed as a product of its prime factors. To do this, we use a prime factor tree.

Example:

Express 180 as a product of its prime factors

Divide by prime numbers until all the 'branches' end in prime numbers.



$180 = 2 \times 2 \times 3 \times 3 \times 5$

$180 = 2^2 \times 3^2 \times 5$

4. Rounding

Rounding Rules:

1. Identify the digit with the place value you are rounding to.
2. Check the digit in the place value column immediately to the right of this.
3. If it is 5 or more round up. If it is less than 5 round down.

Rounding to the nearest 100:

Th	H	T	U
4	6	2	4

The digit is a 2. This "rounds down" and so keeps the 6 the same. The answer is 4600

Rounding to the nearest integer:

T	U	.	$\frac{1}{10}$	$\frac{1}{100}$
2	3	.	6	7

The digit is a 6. This "rounds up" and so the 3 becomes a 4. The answer is 24

Rounding to 1 decimal place:

U	.	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
2	.	4	7	5

The digit is a 7. This "rounds up" and so the 4 becomes a 5. The answer is 2.5

5. Fractions

Simplify Fractions:

Divide the numerator and denominator by the same number

Your fraction is fully simplified when the Highest Common Factor between your numerator and denominator is 1

Example:

$\frac{18}{24} \overset{\div 6}{=} \frac{3}{4}$

Multiply Fractions:

Multiply the numerators

Multiply the denominators

Simplify as much possible

Example:

$\frac{4}{9} \times \frac{3}{5} = \frac{12}{45}$

$= \frac{4}{15}$

Multiply Mixed Numbers:

Convert to improper fractions

Multiply the numerators

Multiply the denominators

Simplify as much possible

Example:

$1\frac{2}{3} \times 2\frac{1}{2} = \frac{5}{3} \times \frac{5}{2}$

$= \frac{25}{6}$

$= 4\frac{1}{6}$

Divide Fractions:

Keep, Change, Flip

Keep the first fraction the same

Change the sign to a multiplication symbol

Flip the second fraction

Simplify as much as possible

Example:

$\frac{2}{3} \div \frac{4}{7} = \frac{2}{3} \times \frac{7}{4}$

$= \frac{14}{12}$

$= \frac{7}{6}$

$= 1\frac{1}{6}$

Divide Mixed Numbers:

Convert to improper fractions

Keep, Change, Flip

Keep the first fraction the same

Change the sign to a multiplication symbol

Flip the second fraction

Simplify as much as possible

Example:

$2\frac{1}{3} \div 1\frac{2}{5} = \frac{7}{3} \div \frac{7}{5}$

$= \frac{7}{3} \times \frac{7}{5}$

$= \frac{49}{15}$

$= 3\frac{4}{15}$

6. Negative Numbers

Multiplying and dividing rules:

positive x positive = positive positive x negative = negative negative x positive = negative negative x negative = positive	positive ÷ positive = positive positive ÷ negative = negative negative ÷ positive = negative negative ÷ negative = positive

When multiplying OR dividing, if the signs are different the answer will always be negative.
If the signs are the same the answer will always be positive.

Examples:

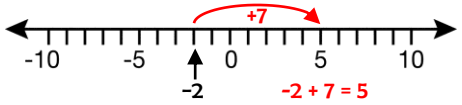
$-5 \times 4 = -20$ $\quad$ $24 \div -6 = -4$

$-4 \times -8 = 32$ $\quad$ $-18 \div -3 = 6$

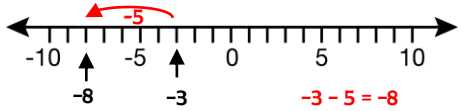
Adding and subtracting rules:

Refer to a number line.

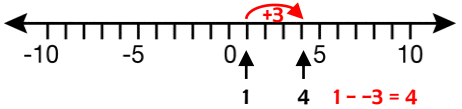
Example: $-2 + 7$ → −2 is the starting number. Add 7 onto this.



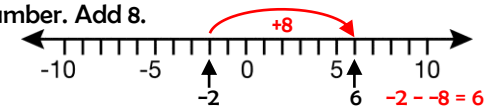
Example: $-3 - 5$ → −3 is the starting number. Subtract 5 from this.



Example: $1 - -3$ → becomes $1 + 3$. 1 is the starting number. Add 3



Example: $-2 - -8$ → becomes $-2 + 8$. −2 is the starting number. Add 8.



7. Inverse Operations

An inverse operation is an operation that reverses the effect of another operation.

Examples:

The inverse of addition is subtraction.

Start with 5 and add 2: we get 7. Subtract 2 and we get back to 5.

$5 + 2 = 7$

Inverse: $7 - 2 = 5$

The inverse of subtraction is addition.

$9 - 6 = 3$

Inverse: $3 + 6 = 9$

The inverse of multiplication is division.

$5 \times 3 = 15$

Inverse: $15 \div 3 = 5$

The inverse of division is multiplication.

$30 \div 5 = 6$

Inverse: $6 \times 5 = 30$

8. Solving Linear Equations

To solve a linear equation you find the value of the unknown by isolating it on one side of the equals sign (making it the subject).

To solve equations you use inverse operations.

Example Solve $x + 5 = 18$

$-5 \quad -5$

$x = 13$

To solve we need to do the inverse of +5 which is −5.

Example Solve $x - 10 = -2$

$+10 \quad +10$

$x = 8$

The inverse of −10 is +10

Example Solve $4x = 24$

$\div 4 \quad \div 4$

$x = 6$

The inverse of multiplying by 4 is dividing by 4

Example Solve $\frac{x}{5} = 4$

$\times 5 \quad \times 5$

$x = 20$

The inverse of dividing by 5 is multiplying by 5

9. Solving More Complex Linear Equations

When there is more than one operation then we will need to perform the inverse operations in the correct order – this is the "reverse" order to "undo" the operations.

Example Solve $2x - 7 = 11$

$+7 \quad +7$

$2x = 18$

$\div 2 \quad \div 2$

$x = 9$

The x is being multiplied by 2 and we then subtract 7. Reverse this and perform the inverse operations

Example Solve $8f = 2f - 12$

$-2f \quad -2f$

$6f = -12$

$\div 6 \quad \div 6$

$f = -2$

When the unknown is on both sides of the equals sign, resolve this by rearranging.

Example Solve $\frac{3w}{4} = 6$

$\times 4 \quad \times 4$

$3w = 24$

$\div 3 \quad \div 3$

$w = 8$

The w is being multiplied by 3 and then divided by 4. Reverse this and perform the inverse operations

Example Solve $3(2c - 7) = 9$

$6c - 21 = 9$

$+21 \quad +21$

$6c = 30$

$\div 6 \quad \div 6$

$c = 5$

Expand any brackets first

Example Solve $7x - 6 = 2x + 19$

$-2x \quad -2x$

$5x - 6 = 19$

$+6 \quad +6$

$5x = 25$

$\div 5 \quad \div 5$

$x = 5$

Rearrange by subtracting $2x$. Always chose to resolve unknowns on both sides by 'eliminating' the 'smaller' one

Example Solve $\frac{2x}{7} - 3 = 1$

$+3 \quad +3$

$\frac{2x}{7} = 4$

$\times 7 \quad \times 7$

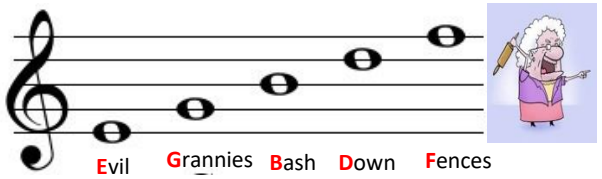
$2x = 28$

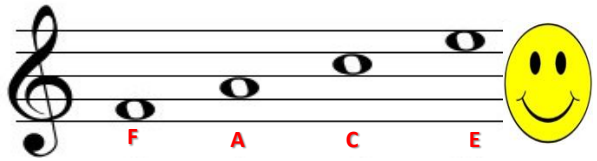
$\div 2 \quad \div 2$

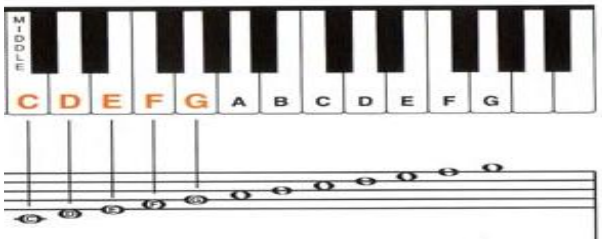
$x = 14$

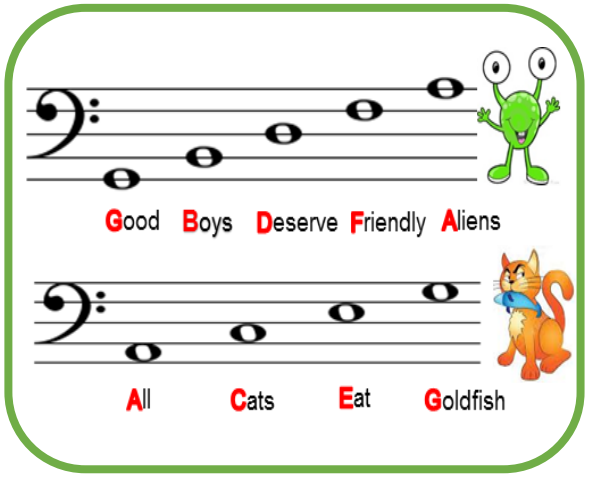
Only the $2x$ is being divided by 7. So we need to reverse the '−3' first, before reversing the division.

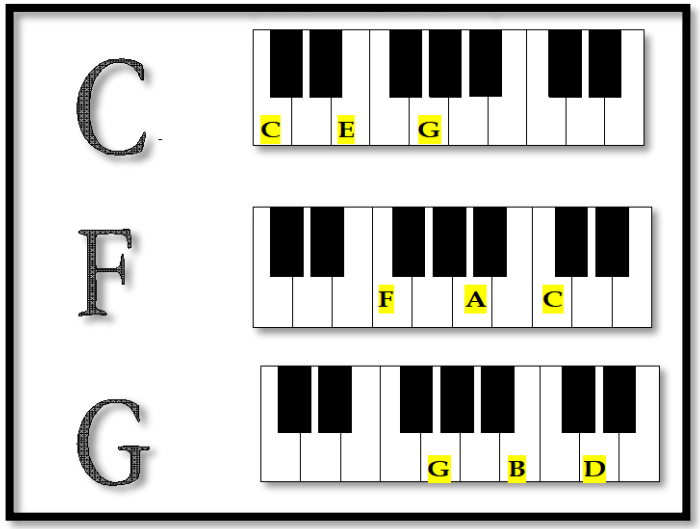
Music







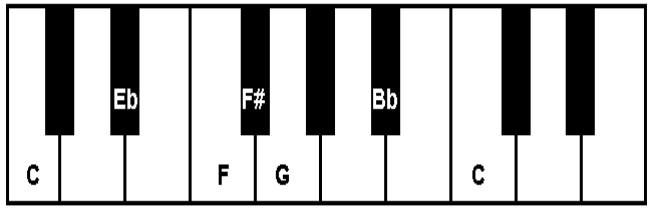




12-Bar Blues – chord sequence (in C)

C / / / | C / / / | C / / / | C / / / |
F / / / | F / / / | C / / / | C / / / |
G / / / | F / / / | C / / / | C / / / :||

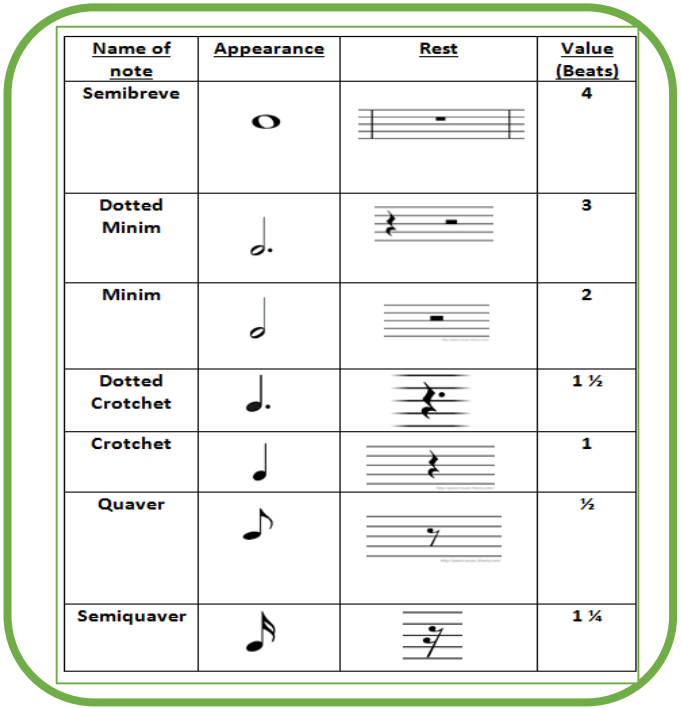
BLUES SCALE ON C



Terms Used in Blues	
12 bar blues	A set pattern of chords which makes a backing for Blues based music including Boogie-Woogie and Rock'n'Roll.
Blues Scale	A scale or collection of notes for improvising with.
Improvise	Making new melodies up to fit in with the structure of the 12-bar blues.
Syncopation	Rhythms that have strong notes (accents) in between beats, or 'on the off beat' as they say!
Jazz	A term for lots of Afro-American styles that use syncopation and improvising.
Motif	A short idea that forms part of an improvisation.
Call & Response	One idea or motif is answered by another – when two players are involved it's called 'trading riffs'.

Music

Word	Meaning
Polyrhythm	A rhythm that makes use of two or more different rhythms simultaneously
Cyclic Pattern	A cyclic pattern is a melodic or rhythmic pattern that is repeated over and over again
Atumpan	The atumpan is the main talking drum of the Akan people
M'bira	The mbira is an African musical instrument consisting of a wooden board with attached staggered metal tines
Kora	The kora is a 21-string lute-bridge-harp used extensively in West Africa
Djembe	A djembe is a rope-tuned skin-covered goblet drum played with bare hands, originally from West Africa
Djundjun	A djundjun is a rope-tuned cylindrical drum with a rawhide skin at both ends, most commonly cow and goat.
Chekere/ Calabash	the calabash is a percussion instrument of the family of idiophones consisting of a dried half of a large calabash, which is struck with the palms, fingers, wrist or objects to produce a variety of percussive sounds
Agogo bells	A single or multiple bell now used throughout the world but with origins in traditional Yoruba music
Mnemonic notation	In general, a mnemonic is a memory aid, such as an abbreviation, rhyme or mental image that helps to remember something



Name of note	Appearance	Rest	Value (Beats)
Semibreve			4
Dotted Minim			3
Minim			2
Dotted Crotchet			1 ½
Crotchet			1
Quaver			½
Semiquaver			1 ¼

Keywords

Dynamics	Symbol	Definition
Fortissimo	*ff*	Very Loud
Forte	*f*	Loud
Mezzoforte	*mf*	Moderately Loud
Mezzopiano	*mp*	Moderately Quiet
Piano	*p*	Quiet
Pianissimo	*pp*	Very Quiet
Crescendo		Becoming gradually louder
Decrescendo		Becoming gradually quieter

Tempo	Definition
Lento	Slowly
Largo	Slow and stately
Adagio	Leisurely
Andante	At a walking pace
Allegro	Fast
Vivace	Lively
Presto	Very Quickly

Further Listening

https://www.bbc.com/bitesize/guides/z2xbgk7/video

https://www.bbc.com/bitesize/guides/z2xbgk7/revision/2

Physical Education

Sports

Invasion
Netball
Handball
Basketball
Football
Rugby
Hockey

Artistic
Gymnastics
Trampolining

Striking and fielding
Stoolball
Rounder
Cricket
Softball
Tennis

Athletics

Swimming

Key Skills

Passing
Shooting
Dribbling
Tackling
Catching
Throwing
Kicking

Balancing
Travel
Vaulting
Landing
Rotation

Striking
Hitting
Catching
Throwing
Stopping

Sprinting
Jumping
Throwing
Pacing

Legs
Arms
Breathing
Timing

Components of Fitness

Balance – the ability to maintain centre of mass over a base of support. There are two types of balance: static balance and dynamic balance. A gymnast uses static balance when performing a headstand and dynamic balance when performing a cartwheel.

Coordination – the smooth flow of movement needed to perform a motor task efficiently and accurately.

Reaction Time – the time taken for a sports performer to respond to a stimulus and the initiation of their response.

Agility – the ability of a sports performer to quickly and precisely move or change direction without losing balance or time.

Power – the product of strength and speed.

Expressed as the work done in a unit of time.

Muscular Endurance – the ability of the muscular system to work efficiently, where a muscle can continue contracting over a period of time against a light to moderate fixed resistance load.

Muscular Strength – the maximum force (in kg or N) that can be generated by a muscle or muscle group.

Aerobic Endurance – the ability of the cardiorespiratory system to work efficiently, supplying nutrients and oxygen to working muscles during sustained physical activity.

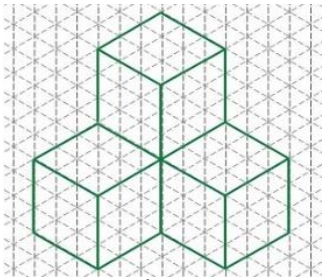
Flexibility – having an adequate range of motion in all joints of the body; the ability to move a joint fluidly through its complete range of movement.

Speed – distance divided by the time taken. Speed is measured in metres per second (m/s). The faster an athlete runs over a given distance, the greater their speed.

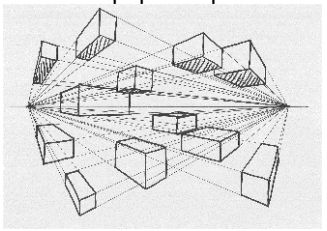
Product Design – Materials, Drawing and Evaluation

Material Knowledge

Material	Description	Example	Use	Advantages	Disadvantages
Hardwood	Broad leaved trees that drop the leaves in winter. Tend to be harder wearing with no need for treatment if used outside.. Slow growing so the grain is closer together making it tougher but heavier. Balsa is soft and light though.	Oak, mahogany, balsa, beech	Outside furniture, good quality child's toys. Boats. Balsa – model aircraft	Stronger, hard wearing, can be used outside	Expensive. Take a long time to replace so damaging to habitats. Harder to work with
Softwood	Trees with needles that stay on in winter.	Pine family (like Christmas trees)	Cheap construction, toys, doors	Cheap, easy to work with	Not good outside without protection, mostly weaker
Man made board	Board manufactured for wood for a specific purpose	MDF (medium density fibreboard), plywood	Lots, building, furniture	Any size or function you want. Predictable properties. Can be cheap	Sometime not attractive
Thermoset Plastic	Made from oil that will run out. Plastic that cannot be re-melted due to rigid cross links	Glass reinforced plastic. Epoxy resin	Boats, fishing rods, glue	Resists heat, strong	Brittle and cannot be recycled
Thermoform plastic	Mostly made from oil that will run out. Can be re-melted and recycled into something else	PET – drinks bottles HDPE – milk bottles	Lots!	Easy to mould, lots of different properties	Often cannot be recycled due to being mixed with other plastic or contaminated with labels or food or metal.
Elastomer	Spring like molecule structure allows flexibility	Rubber, elastic	Lots! Rubber bands, clothes, seals	Flexible	Hardens with age

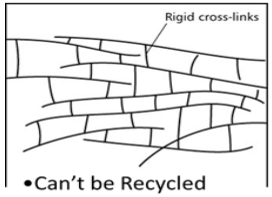


Isometric drawing: Used for practising drawing in 3D for design ideas. Ask for isometric paper to practise on!



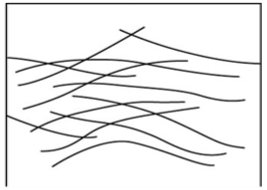
Perspective drawing: Often used architecture. All lines that are not vertical go back to vanishing points.

Thermosets



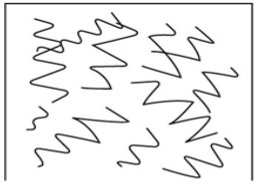
- Can't be Recycled
- Resist heat
- Rigid Cross links

Thermoplastics



- Easily moulded into shape
- Can be recycled
- Can be reheated and remoulded

Elastomers



- Good elasticity
- Can be thermosetting or thermoforming plastic

Literacy – Be able to Write an Evaluation

- What skills have you learnt during this project?
- What skills have you developed (improved)?
- What aspects (parts) of your project do you think have gone well?
- What aspects of your project do you think have gone badly?
- Compare your finished project to your final design drawing, what changed did you make and why?
- If you were given a chance to re do the project, what would you do differently?

Pillar drill

We use this for drilling vertical holes in material. Almost always you will clamp your work down first. Wear glasses, use the guard and know how to turn it off in an emergency. Do not use if you are unsure – ask!

Batch Production

To save time, we can do more than one thing at once. In Food Tech, this may be baking a whole load of bread or cakes at the same time. What advantage to you see here?

When making your lorries we could:

- use the line bender to bend more than one plastic cab at once
- get all the cutting tools out and cut as many wood cuts as possible while the tools are out
- line all the wheels and countersink the holes one after the other
- drill all the axle holes at the same time.

Product Design – Tools

Tenon Saw for cutting straight vertical cuts. The depth of the cut is restricted by the brass spine. You must stretch the index finger out when using this saw to steady it and get a more accurate cut. Start cutting on a corner, drawing back several times. Use a bench hook

Fret Saw for cutting **curved** lines in **thin** material with a thin blade. Always keep your fingers clear. Make sure the guard is intact. Cut slowly. Use the clamp to stop wood rattling about. The manual equivalent is a **coping saw** – you can turn the blade around by unscrewing the handle then tightening up again.

Bench Hook and Clamp use the bench hook to help cut wood with accuracy. Top tip - always cut all the way through your work into the bench hook to avoid splintering the back of your work. Use a clamp for shorter pieces of wood

Squares: 45 degree and 90 degree Take care of these – your work accuracy depends on them being accurate! You must keep the stock (wooden bit) tight against your work and your pencil must be sharp!

Bevel Edge Chisel for removing wood. Always chisel away from yourself. Use only for cutting wood – they must be razor sharp! Bevel edge facing down .

Vernier Measuring with accuracy. Accurate to 0.01 of a mm. Do not forget to zero it first! You will use this to check the sizes of drills and your work

Steel Rule Measuring with accuracy up to 1/2 mm depending on your eyes! It starts at zero on the end, unlike a ruler that has material on the end first. Make sure that you look at the measurements from above to get an accurate reading. You also need a sharp pencil!

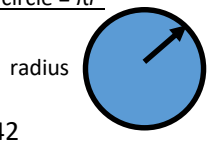
Wood Plane For shaving slithers of wood off your work. The aim is to take a shaving cut that is complete and lasts the whole length of your work. Always rest it on its side so you don't blunt the blade or damage my desk. Usually, we use a wood plane along the grain.

Year 8 Product Design Knowledge Organiser – Maths

Area: the two-dimensional space taken up by something
Measured in: a size appropriate to the problem – either cm^2 or m^2 for larger problems.
Area of a rectangle = width × length

Examples – rectangle area.
1) If the width of a piece of fabric is 10cm and its length is 15cm, what is its area in cm^2?
2) Width = 12cm, length = 32cmm, what is the area?
3) Width = 3m, length = 8m, what is the area in m^2

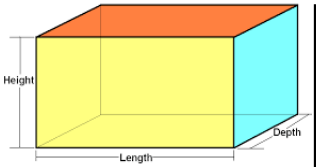
Area of a circle = πr^2



Examples – circle area.
1) If the radius of a piece of metal is 5 cm, what is its area in cm^2?
2) Radius is 3 cm, what is the area?
3) Radius = 9.5 cm, what is the area
4) Diameter = 12 cm, what is the radius?

π = 3.142
The radius is half the diameter

Volume: the space taken up by something
Measured in: a size appropriate to the problem – either cm^3 or m^3 for larger problems
Volume of a cuboid = depth × length × height
Applications – this could be useful to work out the volume of a material and therefore its cost, or the amount of paint or other liquid used if we use litres or ml instead of cm or metres



Examples - cuboid volume. *Work out the volumes below*
1) The depth of a piece of wood is 3 cm, its length is 4 cm and the height 6 cm
2) depth = 18 cm, length = 36 cm, height 19 cm
3) depth = 3 m, length = 8 m, height = 5 m
4) Length 42 cm, depth = 19 cm, height 2 cm

Average or Mean is adding up all the data you have and dividing by the number of sets of data you have.
Example: you want to know the average head size so you can design a hat that would fit an average person.

P1 head size 420 mm
P2 head size 480 mm
P3 head size 520 mm
P4 head size 360 mm

The Average = $\frac{420 + 480 + 520 + 360}{4}$ = 445

For you to do
1). What is the average bottle volume size? 140 ml, 210 ml, 183 ml, 189 ml, 112 ml, 439 ml
2). What is the mean shoe size? 10, 6, 9, 8, 15

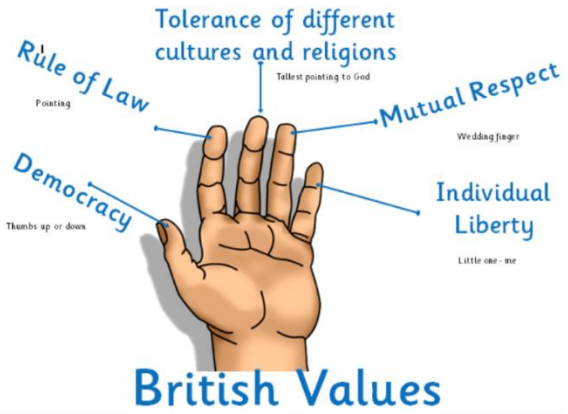
Answers:
Rectangle area: 1) 150 cm^2. 2) 384 cm^2. 3) 24 m^2
Circle area: 1) 78.57 cm^2. 2) 28.2 cm^2. 3) 283.6 cm^2. 4) 452.4 cm^2
Cuboid volume: 1) 72 cm^3. 2) 12 312 cm^3. 3) 120 m^3. 4) 1596 cm^3
Average: 1) 212. 2) 9.6

Religious Education

Christian Beliefs and Practices

Keyword	Definition
Omnipotent	God is all powerful
Omnipresent	God is everywhere
Omniscient	God is all knowing
Eternal	God is beyond time and space and without end
Omnibenevolent	God is all loving
Monotheism	Belief in one God
Forgiveness	Choosing to no longer remember wrong doing against you
Parable	A story with a meaning or moral
Sacrifice	To give up something valued for the sake of others
Salvation	Freedom from sin and its consequences
Messiah	One who saves, saviour
Trust	Faith in another person
Miracles	An act which seems to break the laws of nature
Incarnation	A person who is God in human form
Sin	Wrong doing or thinking (disobedience against God
Trinity	Christian belief that God is three persons in one: God the Father, God the Son, and God the Holy Spirit
Love	Agape love is a sacrificial love God has for mankind
Prayer	Communication with God
Worship	Expressing the value of God for a believer
Justice	Fairness; bringing about what is right or fair according the law, or making up for what has been done wrong
Stewardship	The idea that humans have a duty to look after the environment on behalf of God
Compassion	A feeling of pity that makes one want to help
Religious organisation	An organisation based on religious principles, usually set up by one particular religion

Theme	Explanation
Helping the poor and needy	Christians help those in need because all people hold the sanctity of life (all life is God-given and important), everyone is of equal worth, all people should be loved and when making mistakes all people should be forgiven.
CAFOD	Catholic charity who focus on helping the poor and needy. Christians believe that everyone deserves their human rights so many Christians fight for social justice when seeing the unfair treatment of people in society. In over 50 countries, CAFOD partners work alongside people in poor communities. Often this means helping people to learn alternative farming methods or set up new businesses. As a consequence, thousands of people can now feed their families and achieve a decent standard of living.
Mother Teresa	Mother Teresa helped the sick and poor as she became a nurse and started a school in the streets. She showed her Christian faith through action – 'faith without deeds is dead' – as she believed that she needed to be poor and give as much as she could to others.
Martin Luther King	Martin Luther King fought for equality in society through fighting for the human rights of black African Americans. He wrote a speech called 'I have a dream' and worked to have all different races working together in society. He followed the Bible quote 'do unto others, as I do unto you'.



CHALLENGE

Go to this website for further research on Christianity: http://www.bbc.co.uk/religion/religions/christianity/

Go to this website, watch the videos and complete the quizzes: https://www.bbc.com/bitesize/subjects/zh3rkqt

Religious Education

Christian Beliefs and Practices

Belief	Explanation
Trinity 	Three persons in one: God the Father, God the Son, God the Holy Spirit. Each person has a different role. God the Father existing first and enabling the creation of the world, God the Son, created second and re-educating society, and God the Holy Spirit created for to those who believed Jesus so they would continue to have a guide to help. Each of these persons reveals a different characteristic of God.
The Golden Rule	Christians believe that they should 'Do to others as you would wish them to do to you' or 'love your neighbour as you love yourself'. Meaning 'treat others the way you wish to be treated' so Christians will show this belief through their practices by helping the needy and supporting the sick and poor.
Jesus	Christians believe that Jesus was fully God and human at the same time. Jesus role of earth was to teach, preach and heal people in society, to prove that he was God and to be the ultimate sacrifice so humans could go to heaven and be with God. His role was to educate humanity and repair the relationship between man and God after the separate due to sin created by Adam and Eve.
Prayer	Jesus spoke about prayer on a number of occasions. Some Christians follow set prayer, such as the Lord's prayer, which Jesus taught his disciples, whereas others make them more personal and create their own prayers.
Parables	A parable is a story used to teach a lesson or a moral. For example: **The Good Samaritan:** Jesus tells a story of a Samaritan helping a Jew even though at the time they would have been enemies. This teaches Christians today to 'Love your neighbour as you love yourself'. **The sheep and the goats:** Jesus tells a story about the different types of people in life. Those who help the needy, the sheep, and those who do not, the goats. Jesus said 'Whatever you did for the least of these brothers of mine, you did for me'. This teaches Christians today to give to others as then they will be rewarded with an afterlife. **The lost son:** Jesus tells of a story where a son leaves his father with his future inheritance. He spends all the money on gambling, alcohol and a partying lifestyle. He ends up working with pigs on a farm. He realised that his own father's servants are being treated better than him and decides to return to his father. His father is so happy that he return as he thought he was lost but now he is found. This teaches Christians today that God will always welcome people back to him, even the sinners will have a place in the kingdom of God.
Miracles	A miracle is an extraordinary event that breaks the laws of science and therefore is often seen to be the works of a divine being such as God. Christians believe that Jesus performed miracles that proved he was God and showed that he had been sent to repair the relationship between man and God. Jesus performed different types of miracles, such as calming the storm showing power over nature and the healing a paralysed man.
Salvation and redemption	Christians believe that Jesus was the ultimate sacrifice. Meaning that those who accept believe in Jesus can be saved through his sacrifice and death on the cross. Some Christians believe to be saved from going to hell, believe in Jesus as the son of God is necessary, whereas others believe that good people will be allowed into heaven. Christians believe that Jesus redeemed the situation after Adam and Eve caused original sin to be placed on every human.

Year 8BD: Digestion and Nutrition

1. Diet: Keywords

Keyword	Definition	Examples
Carbohydrate	Provides energy	bread, pasta, rice
Protein	Growth and repair	meat, eggs, beans
Lipids (Fats)	Stored energy in the body	butter, oil, nuts
Minerals and Vitamins	Needed to maintain health	salt, calcium (milk), vegetables
Dietary Fibre	Ensure movement of food through the gut	vegetables, brain
Water	Needed for hydration of body	water, fruit juice, milk

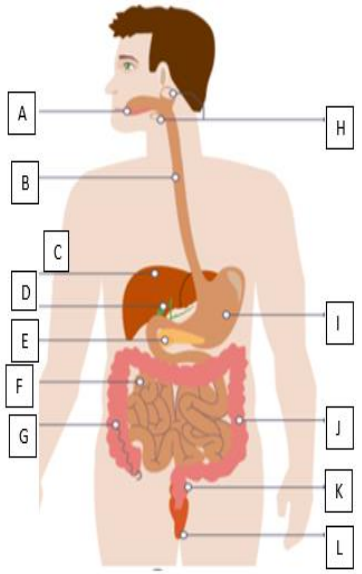
2. Diet: Balanced and Unbalanced

Unbalanced Diet	Health Problem
Too much fat	Heart disease
Too much sugar	Tooth decay
Not enough protein	Poor growth
Not enough carbohydrate	Not much energy

3. Digestion: Keywords

Keyword	Definition
Digestion	When large insoluble food particles are broken down into small soluble particles
Enzyme	Digests food. Breaks down large molecules into small molecules
Biological Catalyst	Speeds up digestion
Respiration	The chemical reaction that happens in mitochondria to release energy from glucose.

4. Digestive System



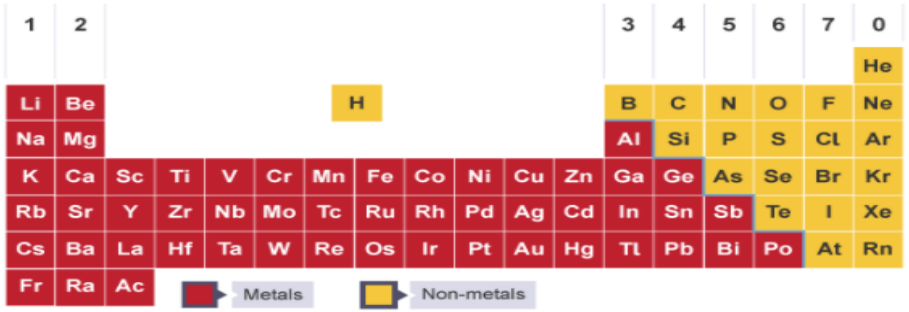
A	**Mouth**: mechanical breakdown/chewing food	**G**	**Appendix**: useless organ that harbours bacteria (good and bad)
B	**Oesophagus** (gullet): pushes chewed food to stomach	**H**	**Salivary Glands**: produce saliva with enzymes to breakdown starch
C	**Liver:** makes digestive juices	**I**	**Stomach**: Partial digestion of food/mechanically churns food with HCl and enzymes
D	**Gall Bladder**: makes bile, which breaks down fats (lipids)	**J**	**Large Intestine**: re-absorption of water/faeces
E	**Pancreas**: production of digestive enzymes	**K**	**Rectum**: muscular section of the large intestines where faeces is produced
F	**Small Intestine:** absorption of small soluble particles	**L**	**Anus**: where faeces leaves the body

5. Enzymes

Nutrient	Enzyme	Product
Carbohydrate (Starch)	Carbohydrase	Sugar
Protein	Protease	Amino acids
Fat	Lipase	Fatty acids and glycerol

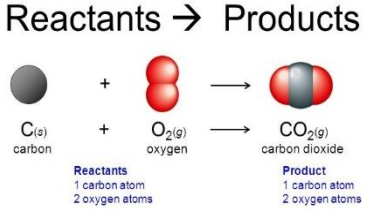
Science – 8CP Periodic Table

1. Keywords	
Atom	The smallest particle of a chemical element that can exist
Element	A substance made from only one type of atom
Compound	A substance made of two or more different types of atom chemically bonded together
Reactants	The chemicals that react with each other at the start of a chemical reaction
Products	The chemicals that are formed in a chemical reaction
Conservation of mass	The mass of the reactants equals the mass of the products
Word equation	An equation in which only the names of the reactants and products are used to model a reaction
Symbol equation	Gives more information about a chemical reaction because it includes the symbols and formulae of the substances involved
Period	Elements in the same row going across the Periodic Table
Group	Elements in the same column going down the Periodic Table



2. Periodic Table	
Invented by	Dmitri **Mendeleev**, a Russian scientist.
How did he arrange the elements?	In order of **atomic mass**, and by their **chemical properties**
What was special about his periodic table?	**Predicted** the existence of **other elements** not discovered, and **left gaps** for them in his table.
Why did scientists use Mendeleev's Periodic Table?	**New elements** were **discovered** that **matched these gaps**.

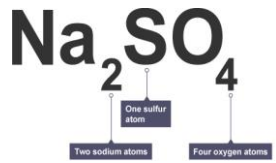
How to use chemical symbols and equations



Numbers in formulae

BIG number apply to everything *after* them
Small numbers apply only to the symbol before them

The **small numbers go at the bottom**. For example:
- CO_2 is correct;
- CO^2 and CO2 are wrong.



3. Properties – Metals and Non-Metals		
Property	**Metals**	**Non-Metals**
Density	High (they feel heavy for their size)	Low (they feel light for their size)
Strength	Strong	Weak
Malleable or brittle	Malleable (they bend without breaking)	Brittle (they break or shatter when hammered)
Conduction of heat	Good	Poor (they are insulators)

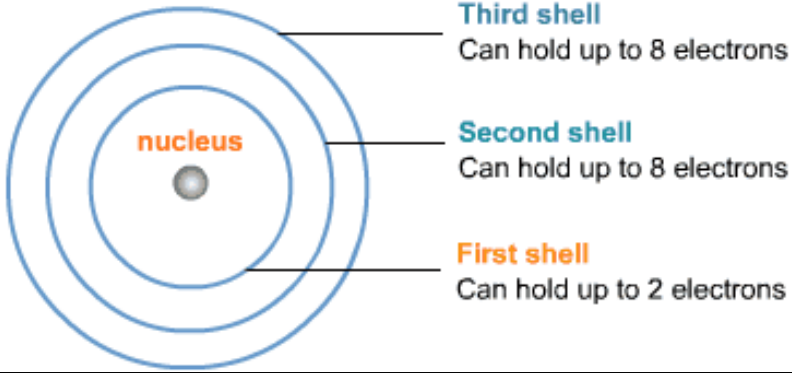
4. Properties – Groups 1 and 7							
Group 1 (I)	**Melting point**	**Density**	**Reactivity**	**Group 7 (VII)**	**Melting point**	**Density**	**Reactivity**
Lithium (Li)	**Decreases** down the group	**Increases** down the group	**Increases** down the group	Fluorine (F)	**Increases** down the group	**Increases** down the group	**Decreases** down the group
Sodium (Na)				Chlorine (Cl)			
Potassium (K)				Bromine (Br)			
Rubidium (Rb)				Iodine (I)			

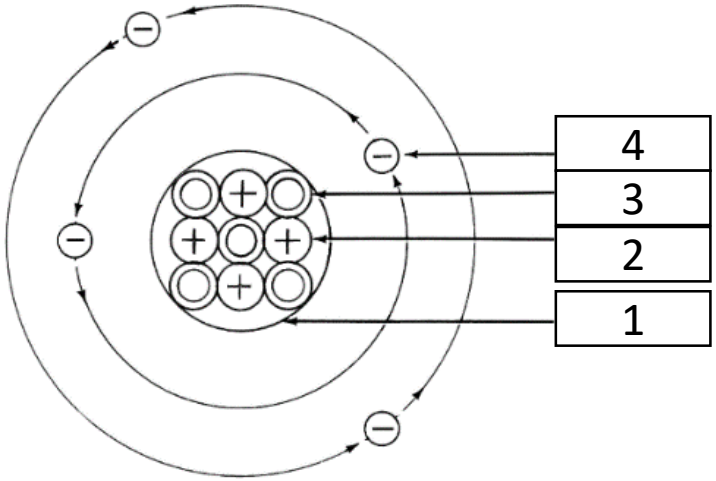
Science – 8CP Periodic Table

5. Atomic Structure	
1 Nucleus	The centre of an atom. Contains protons and neutrons
2 Proton	A positively charged particle found in the nucleus
3 Neutron	A neutral particle found in the nucleus. Has no charge
4 Electron	A negatively charged particle found in energy levels (shells) around the nucleus

6. Properties of Sub-atomic Particles			
Particle	Relative mass	Relative charge	Location
Proton	1	+1	Nucleus
Neutron	1	0	Nucleus
Electron	0	−1	Shells

7. Electron Arrangement Rules	
1.	Always fill from the inside to the outside
2.	The first shell can only hold 2 electrons
3.	The second and third can hold 8

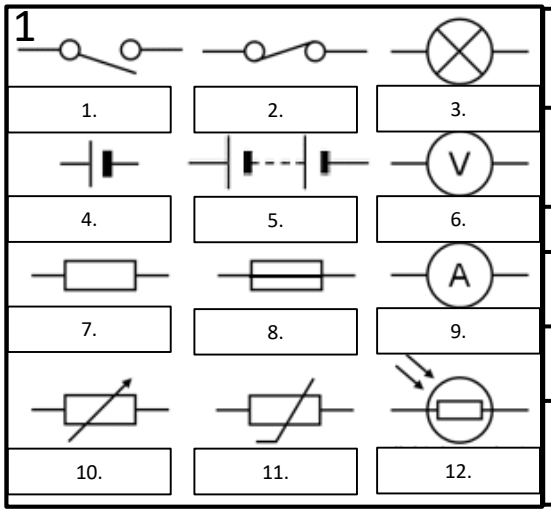




8. Properties – Metals and Non-Metals		
Property	**Metals**	**Non-Metals**
Density	High (they feel heavy for their size)	Low (they feel light for their size)
Strength	Strong	Weak
Malleable or brittle	Malleable (they bend without breaking)	Brittle (they break or shatter when hammered)
Conduction of heat	Good	Poor (they are insulators)
Conduction of electricity	Good	Poor (they are insulators) apart from graphite

Science – 8PE Electricity and Magnetism

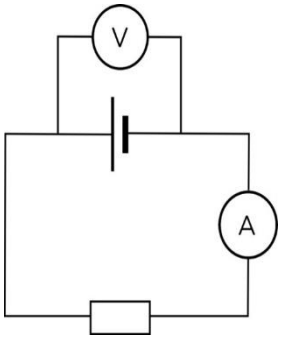
1



1	Open switch	7	Resistor
2	Closed switch	8	Fuse
3	Bulb	9	Ammeter
4	Cell	10	Variable Resistor
5	Battery	11	Thermistor
6	Voltmeter	12	Light Dependent Resistor

2

2	Series	Parallel
Components	connected on one loop	connected by separate loops
Current	same everywhere on circuit	shared evenly between loops
Voltage	shared between components	same everywhere



Property	Unit	Unit Symbol
Voltage or Potential Difference (V or p.d)	Volts	V
Current (I)	Amps (Amperes)	A
Resistance (R)	Ohms	Ω

4 Keywords

Poles	The ends of the magnets (South/North)
Charge	Positive or negative (+ / -)

Magnetic field lines:
Lines with arrows that move from North to South.

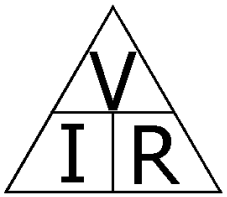
Electromagnet:
A magnetic field caused by current flowing through a conductor.

To increase the strength of an electromagnet you can do the following:

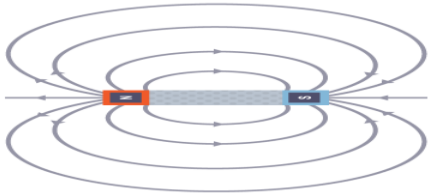
1. Increase the turns of the coil
2. Increase the current
3. Use a soft iron core

Similarities between magnets and charges:

Poles/Charges	**Like/same**	**repel**	each other
	Opposites	**attract**	each other



Conductor: allows charge to flow through it. Does not hold charge, e.g. ALL metals and graphite.
Insulator: does not allow current to flow. Holds charge, e.g. Wood, plastic, glass, rubber.



Science – 8PL Light and Space

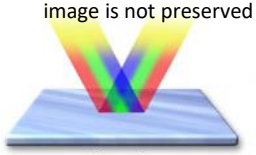
1. Light Keywords

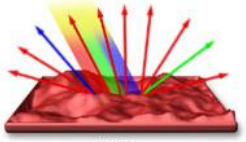
1	Reflection	Light bounces off surface
2	Refraction	Light is bends as it enters and leaves
3	Primary colours	Red/Blue/Green makes all colours
4	Eyes	Senses the light we see
5	Filters	Absorbs light of the same colour
6	Transmitted/ Emitted	Light that is given out
7	Absorbed	Light that is taken
8	Scattered	Light that is spread when it reflects
9	Boundary	A place where lights bounces off or bends
10	Secondary light	When primary light mixes

4. Types of Reflection

1. Specular reflection is what you see in a mirror – the image is not distorted

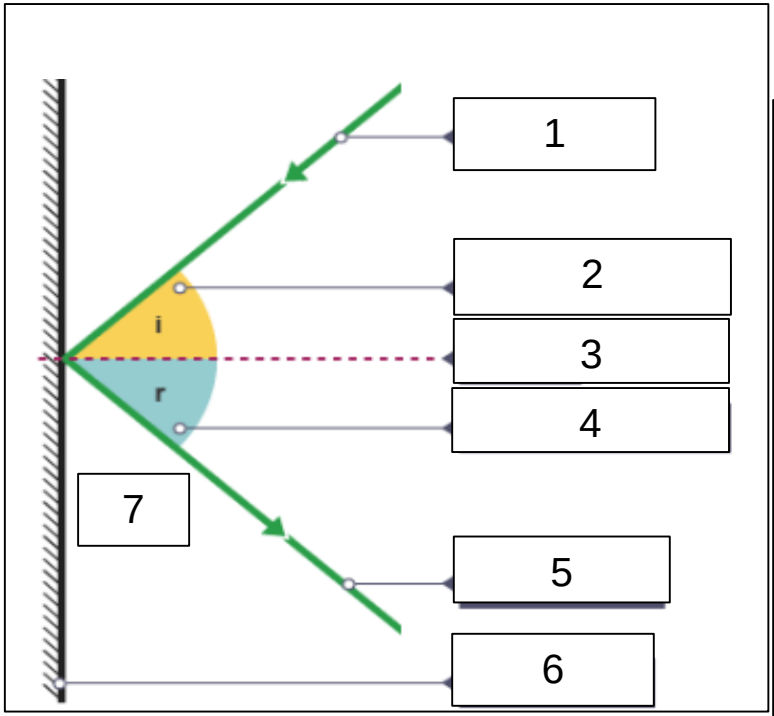
2. Diffuse reflection is what happens from most materials – the light is reflected but the image is not preserved





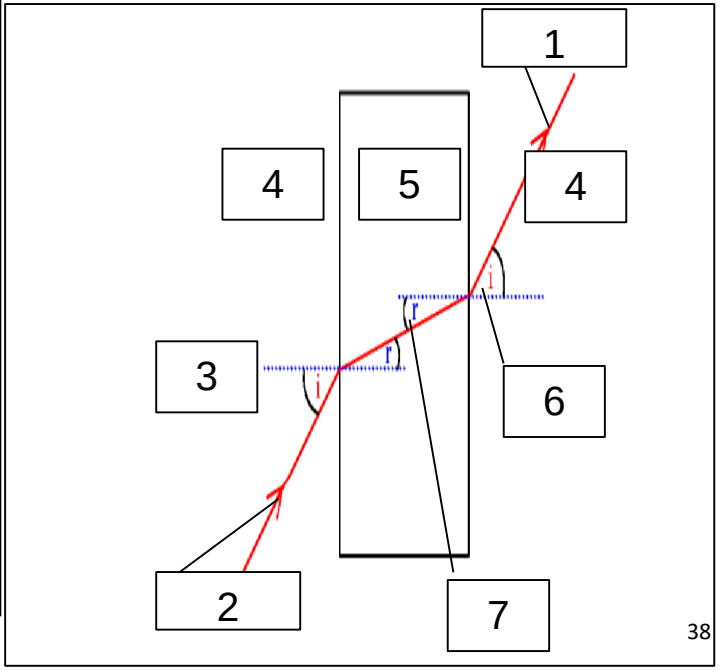
2. Law of Reflection

1	Incident ray	A beam of light that comes from the light source.
2	Incidence angle	The angle made between the incident ray to the normal line
3	Normal line	This line is 90 degrees to the mirror
4.	Reflected angle	The angle made between the reflected ray to the normal line
5	Reflected ray	A beam of light that leaves the mirror
6	Mirror	Light reflective surface
7	Law of reflection	Angle of incident = angle of reflection



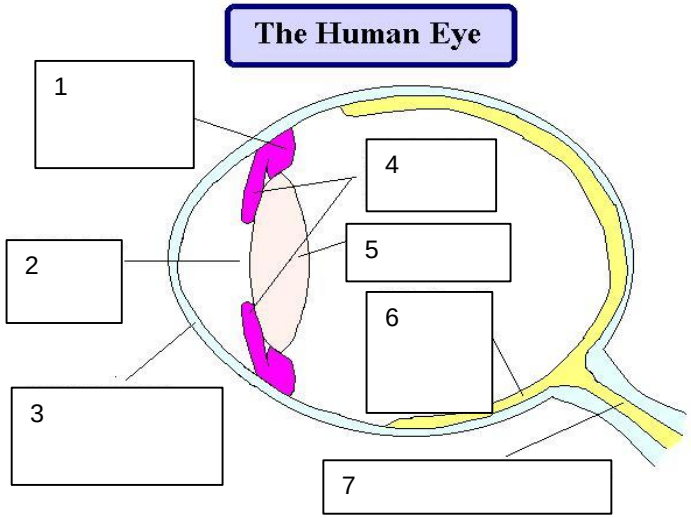
6. Law of Refraction

1	Refracted ray	A beam of light that leaves the glass block
2	Incident ray	A beam of light that comes from the light source.
3	Normal line	This line is 90 degrees to the surface
4	Medium 1	Air
5	Medium 2	Glass block
6	Incidence angle	The angle made between the incident ray to the normal line
7	Refraction angle	The angle made between the refracted ray to the normal line
8	Law of refraction	The beam will bend towards the normal line as it goes from a less dense medium to a more dense medium

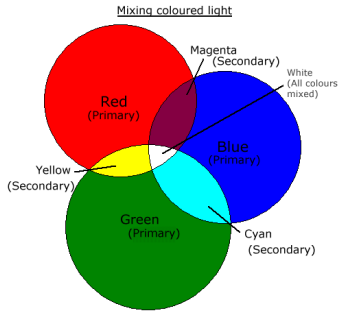


Science – 8PL Light and Space

5. The Eye		
1	Muscle	Controls shape of the lens. Relaxes makes the lens fat.
2	Pupil	Hole that light in like a camera aperture
3	Cornea	Transparent front of the eye
4	Iris	Coloured muscle that controls the amount of light entering the eye
5	Jelly lens	Can change shape to focus light onto the retina
6	Retina	Layer of light sensitives on the back of the eye
7	Optic nerve	Carries the electrical signals to the brain

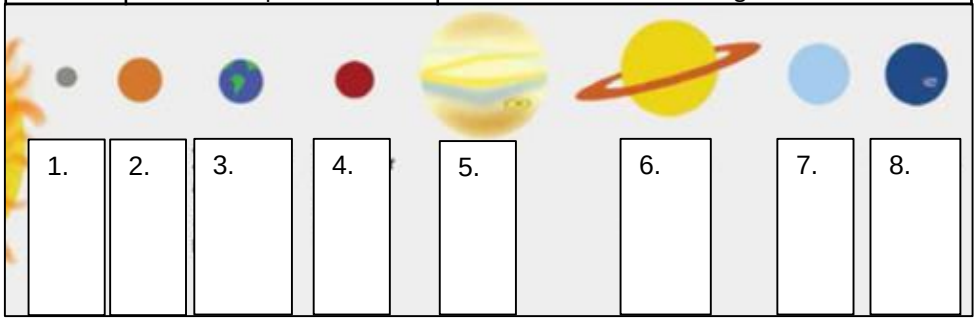


6. Colours	
Primary colours	**Secondary Colours**
Red	Magenta
Green	Cyan
Blue	Yellow



7. Space	
Gravity	Non-contact force of attraction between masses. The larger the mass, the larger the pull of gravity
Light	Travels in straight lines
Light	Travels very fast – 300,000,000 m/s
Galaxies	Contain many solar systems

8. Solar System		
1	Mercury	My
2	Venus	Very
3	Earth	Easy
4	Mars	Method
5	Jupiter	Just
6	Saturn	Speeds
7	Uranus	Up
8	Neptune	Naming



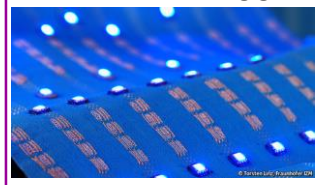
Textiles

Keywords

Interpret	Inspiration
Applique	Reverse applique
Embroidery	Stencilling
Quilting	Layering and fraying
Label	Annotate
Design	Target Market

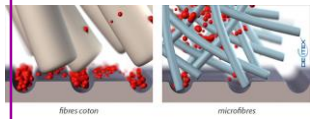
Health and safety rules:
- Long hair must be tied back.
- **NO** food or drink in the workshop.
- **One** person using a machine.

Technical textiles are materials and products made for their technical and performance properties rather than their aesthetic (appearance) characteristics. They have a function or purpose rather than looking good.



A **conductive textile** is a fabric which can conduct electricity with metal strands woven into the construction of the textile.

A **fire resistant material** is one that is designed to resist burning and withstand heat.

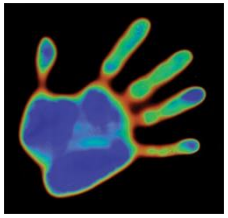


Microfibres are 60 to 100 times finer than a human hair. They are used for clothing for outdoor and active sportswear.

Kevlar® is extremely strong, **lightweight**, corrosion and heat resistant. It is often used in combination with other materials, forming composites

Smart materials are reactive materials. Their properties can be changed by exposure to stimuli, such as electric and magnetic fields, stress, moisture and temperature. They react to environmental conditions.

Hydrochromic inks change colour according to the amount of water they detect.



Thermochromic colour change is effected by heat. The different colours can determine the temperatures much in the same way as a thermometer.

Photochromic inks Special pigments change colour when exposed to solar light and reverse back to clear when the light source is removed.

Phosphorescent pigments absorb light energy so that it can be released once it is dark. The energy is released as a glowing light effect.

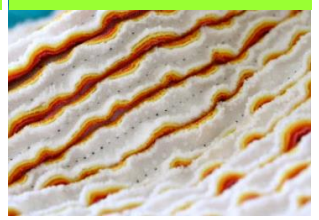
Tie Dye

Reverse applique

Applique

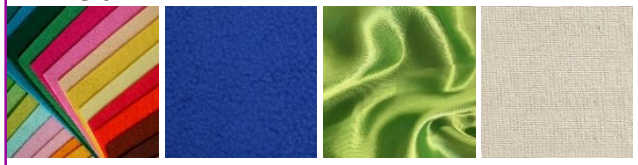
Quilting

Stencilling

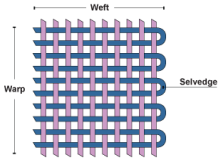


Layering and fraying

Felt Fleece Satin Cotton



Fabric Production Methods



Woven

Non-Woven

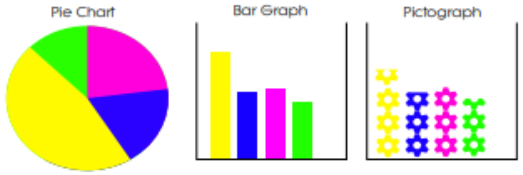
Knitted

Textiles and Maths

NUMERACY IN JAMBLED&T

KNOWLEDGE

Data Collection:
Start with a client interview or questionnaire to gain opinions. Now analyse data.

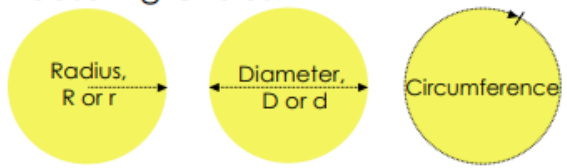


In D&T we are usually designing for others. It is vital to find out what our target market wants out of the product. Analyse these answers & show we have considered them in our designs. Use annotations to link designs to your customer.

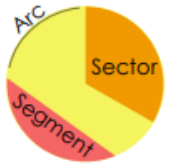
NUMERACY IN JAMBLED&T

DESIGN

Measuring Circles:



Parts of a circle:



Area of a circle:

$$\pi r^2$$

Key facts…

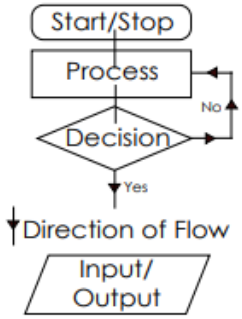
- Diameter, Ø = 2r
- Circumference, C = 2πr
- Pi or π is the ratio of a circle's circumference to its diameter
- $\frac{\text{Circumference}}{\text{Diameter}} = \pi = 3.14159$
- *Food for thought…* **3.14=ΨΙ.Ε**

NUMERACY IN JAMBLED&T

KNOWLEDGE

Flow Diagrams:

Key:



Flow Diagrams will help you to order a series of instructions and decisions in a task. These decisions are often your QA's (Quality Assurances).

MEASURES OF AVERAGES

This help you draw conclusions from data

The **mean** is the most common measure of average. To calculate the mean add the numbers together and divide the total by the amount of numbers:
Mean = sum of numbers ÷ amount of numbers

If you place a set of numbers in order, the **median** number is the middle one.

The **mode** is the value that occurs most often.

WRITING ABOUT YOUR DESIGN IDEAS

Being able to write about your own ideas and sources

Example: "I am really pleased with the storage unit that I have designed. **I like it because** it **reflects** the art deco era as shown in my research. Whilst **I think that** the 1st idea also portrays the art deco era **I feel that** the size of the product might be too big".

I think that	reflects	another idea would be to	next time	this particular idea
reminds me of	I like...because	makes me feel	it's almost as if	what I like about this idea is
portrays	signifies	gives the impression that		of all the ideas that I have drawn
suggests that	reinforces	it could be that		it satisfies the specification