YEAR 7
CURRICULUM INFORMATION FOR TERM 1

CRAMLINGTON LEARNING VILLAGE

WHERE THE ART OF TEACHING MEETS THE SCIENCE OF LEARNING

WHAT IS A KNOWLEDGE ORGANISER?

A knowledge organiser sets out the most important facts and ideas that teachers believe pupils need to study in their subject during each term or topic. Pupils will use it to support their learning, memorise information and revise the key ideas for each of their topics before key assessments. For parents they are a simple way to know what is being taught and a handy way to test your child's understanding too!

HOW ARE KNOWLEDGE ORGANISERS USED?

They are used inside and outside of lessons to structure the knowledge that we expect pupils to develop and retain over time.

They are designed to help pupils make sense of what they learn in lessons, allowing them to complete more challenging tasks.

They should give pupils the opportunity to feel more expert or specialist in a subject, and learn more for themselves.

They help to make homework more meaningful and to link it directly to what is learned in lessons.

They help to develop the techniques needed to memorise information, ready for GCSEs.

Knowledge organisers are useful for memorisation techniques and teachers will help pupils to understand ways to use these for revision.

HOW DOES OUR MEMORY WORK?

Your brain stores information in both our long term and short term memories. Our short term memory is our 'working memory'-we use it for day to day thinking and problem solving and only store memories in here for a short amount of time. Our long term memory contains information that we know really well, and our short term memory 'calls it up' when we feel we need to use it. If we don't memorise information, our short term memory soon forgets it. Also, if we try to remember too much information in too short a period we overload our short term memory- this can affect our ability to think clearly and lead us to make mistakes.

If you have any questions about the content of these knowledge organisers then please direct your enquiries to Mr Clark.

Year 7 Art

These are the skills and facts that you need to know and use in your insect project

Colour Vocabulary

Primary colours are the 3 main colours. They cannot be made, but are used to make all other colours.

Secondary colours are made by mixing 2 primary colours.

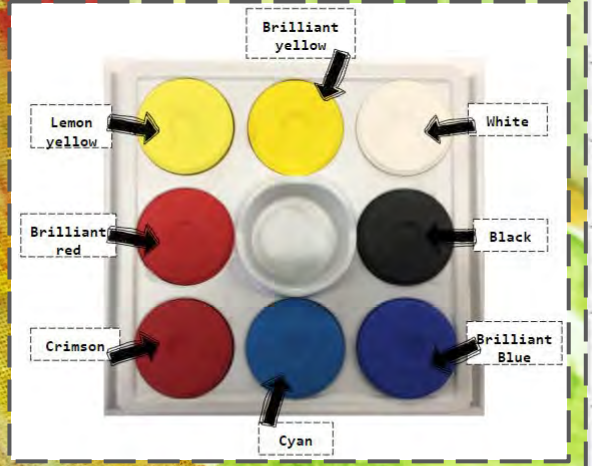
Tertiary colours are made by mixing a primary and secondary colour together.

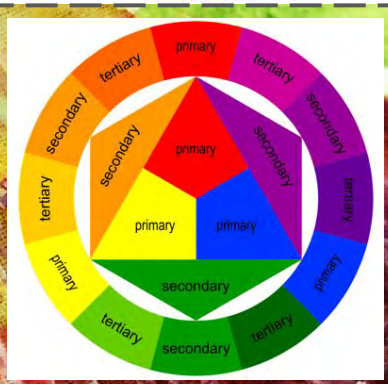
Complementary colours are opposite on the colour wheel.

Harmonious colours are next to each other on the colour wheel.

Tint - when you add white to a colour to make it lighter

Shade - when you add black to a colour to make it darker





Art Formal Elements

Colour	What you see when light reflects off something. Red, yellow and blue are primary colours.
Line	A mark which can be long, short, wiggly, straight etc.
Tone	How light or dark something is.
Texture	How something looks or feels - eg rough or smooth.
Pattern	A symbol or shape that is repeated.
Shape	A 2D area which is enclosed by a line - eg triangle.
Form	Something which has 3 dimensions - eg a cube, sphere or sculpture.

Making objects look 3D

To prevent your drawings from looking flat, you should use a range of tones and marks. Pressing harder and lighter and layering with your pencil creates different tones. Use the direction of your pencil to help enhance the 2D surface,and you can also include shadows which will also help objects appear 3D.

Markmaking

To make your drawings look more realistic, you should try to use different marks to show textures and surfaces. You can do this by changing the direction, pressure or length of your marks.

Art Technique Key Words

Media/Medium	The materials and tools used by an artist to create a piece of art
Technique	The way an artist uses tools and materials to create a piece of art
Composition	Where you place objects on the page
Highlight	The bright or reflective area on an object or piece of art
Shadow/shade	The darker areas within a piece of art or object
Proportion	The size relationship between different parts - eg height compared to width

Grades of pencil

Pencils come in different grades, the softer the pencil, the darker the tone.

H=Hard B=Black

In art the most useful pencils for shading are 2B and 4B. If your pencil has no grade, it is most likely HB(hard black) in the middle of the scale.

Year 7 - Insects

Project specific information

Brief overview of topic

In this project you will explore the theme of insects. You will work in a small handmade zine sketchbook and learn how to draw and print insects using a range of 2D techniques. You will use the work of other artists to inspire your own final painting composition applying your knowledge of colour theory.

Places to visit

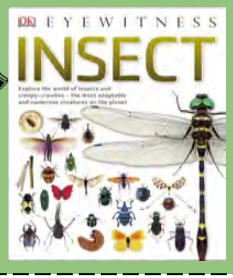
Great North Museum - Hancock
Kirkley Hall Zoological Gardens
Northumberland Wildlife Trust
The Alnwick Garden - bees

Websites

http://www.insects.org
http://www.britishbugs.org.uk
http://www.nationalinsectweek.co.uk
http://www.buglife.org.uk
http://www.ukbutterflies.co.uk

Great books about insects

Eyewitness Insect - DK
Ultimate Bugopedia - National Geographic
Drawing and Painting Insects - Andrew Tyzack



Artists

Cornelia Hesse Honegger

Esra Rosie

Damien Hirst

Abby Diamond

Christopher Marley

Lucy Arnold

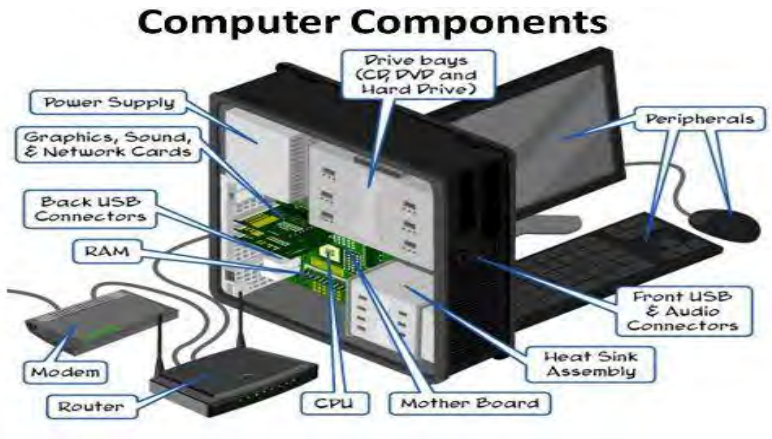
Insect Project Key Words

Insect	Any group of small animals having no backbone and three parts to their body.
Exoskeleton	The hard covering on the outside of the insect that protects or supports the body.
Thorax	The thorax is one of the three main body parts of an insect. The thorax is the middle segment, behind the head and before the abdomen. The six legs and two pairs of wings (if present) are attached to the thorax.
Arthropod	The scientific name for insects and arachnids(spiders)
Abdomen	This is the last of the three parts of an insect and other arthropods body.
Antennae	The antennae are a pair of sense organs located near the front of an insect's head.
Swarm	A large group of insects all moving together.
Compound Eye	A type of eye that some arthropods have that is made up of many parts.
Wings	Insect wings enable them to fly and are usually attached to the thorax. The two pairs are often referred to as the forewings and hindwings.
Segmented	Insects have a **segmented** body which means that is is divided. The three segments are the head, thorax and abdomen. They also have **segmented** legs.
Mandible	Insect mandibles are a pair of appendages near the insect's mouth. Their function is typically to grasp, crush, or cut the insect's food, or to defend against predators or rivals.
Proboscis	The most well known example of a **proboscis** in **insects** is the feeding tube used by adult butterflies and moths.
Colony	Some insects, such as **bees**, **ants**, and **termites**, live together in groups called colonies. Millions of insects may live in a single colony, building a giant nest.
Cocoon	The silky enclosure spun by caterpillars that they live in while they're turning into adult insects.
Chrysalis	The stage of caterpillars, moths, and other insects that is between the larva and the adult stage.
Hive	A structure where bees live, especially a beehive or the group of bees living there.

KS3 Computing Knowledge Organiser HT1 – I'm a Computer Hardware Engineer

COMPUTING HARDWARE VOCABULARY	
Hardware	The components kept inside a computer.
Peripheral	A device which can add extra functionality to a computer system. Peripherals can either input or output data from the computer.
Input	A peripheral device which takes data from the real world and enters it into a computer systems.
Output	A peripheral device which takes data from a computer system and presents it into the real world.
Motherboard	Connects all components in the computer together.
Processor (CPU)	Performs any calculation and fetches, decodes and executes instructions.
RAM	Short term (volatile) memory, which stores currently in-use programs and instructions.
Hard Drive	Devices that store all the data and applications on a computer when the power is turned off.
E-SAFETY VOCABULARY	
Cyber Bullying	The bullying of another person using the internet, mobile phones and other digital devices, with the intent to deliberately upset them.
Netiquette	Correct or acceptable way of communication on the internet.
Cyberstalking	Repeated use of electronic communication to harass or frighten someone.
Online Grooming	Deliberate act taken to befriend and create an emotional connection with a child, resulting in not good intentions.
Cyperpal	A friend who you only communicate with through the internet or cyberspace.

COMMON PERIPHERALS		
Input	**Mouse**	Controlling a pointer on a screen.
	Keyboard	Typing commands/text.
	Scanner	Taking a digital copy of a document.
	Microphone	Records real-life sound and makes it into a digital sound.
Output	**Screen/Projector**	Displays visual information from a computer.
	Printer	Making a real-life, physical copy of a document.
	Speaker/Headphones	Outputs digital sound.
	Motor	Outputs movement,
Storage	**External Hard Drive**	Used in computers/games consoles – largest capacity for portable storage.
	Memory Stick	Used for transferring data easily.
	SD Card	Regularly used in cameras/phones – very small memory with fast access.
	CD	Usually used for files that shouldn't be changed (eg. games, albums)



KS3 Computing Knowledge Organiser HT2 – I'm a Computer Scientist

KEY VOCABULARY	
Denary	Base 10 number system. Uses digits 0,1,2,3,4,5,6,7,8,9
Binary	Base 2 number system. Uses digits 0 and 1 only.
Hexadecimal (Hex)	Base 16 number system. Uses characters 0-9 and A,B,C,D,E and F
BIT	BINARY DIGIT – a single value of 0 or 1
Binary Code	Representation of values using multiple bits
Character Set	A list of unique values, stored in binary, which represent the letters, numbers and symbols a computer can show/use.
ASCII	American Standard Code for Information Interchange. A character set which uses 7 bits to store 128 (2^7) characters
Extended ASCII	A character set which uses 8 bits to store 256 (2^8) characters
UNICODE	A characters set which uses 16 bits to store 65,535 characters (2^{16})
Pixels	An individual dot of colour, used to produce an onscreen image. (**Pic**ture-**el**ement)
Colour Depth	The amount of bits used to map colour to an image (measure by 2^n) e.g. 4 bits is 2^4 *(16 colours)*
Resolution	Height x width (measure in pixels)

REMEMBER MAXIMUM VALUES!

Max value which can be represented with 8 bits (1 byte) = **255**

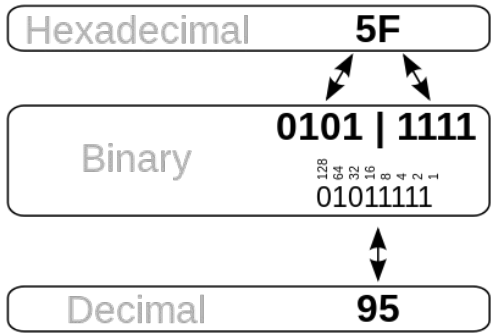
Total number of available values = **256 (255 + 0)**

BINARY PLACE VALUES

BASE Exponent	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
PLACE VALUE	128	64	32	16	8	4	2	1

CONVERTING DENARY TO BINARY TO HEX

HEXADECIMAL	
DENARY	HEX
0-9	0-9
10	A
11	*B*
12	*C*
13	D
14	E
15	F



There are two methods for converting a HEX value to Denary

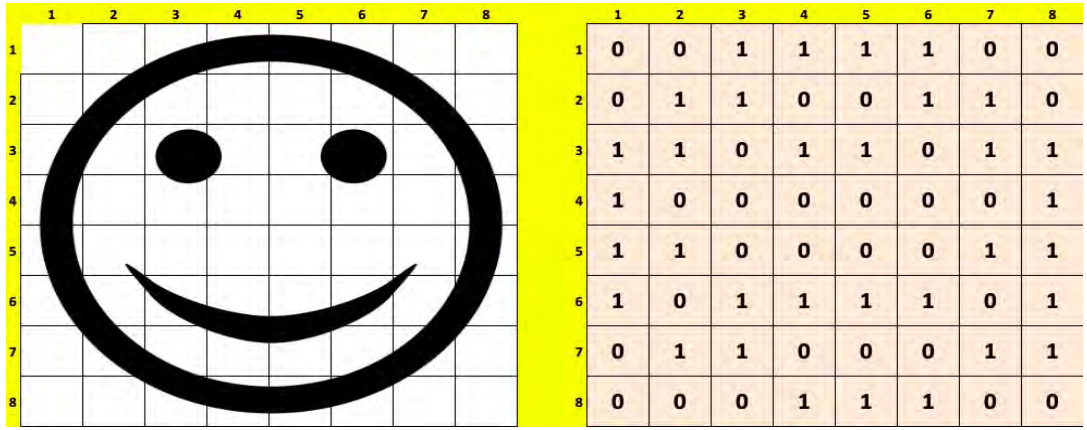
OR:

5F = (**5**x16) + **F**

5F = 80 + 15

5F = 95

IMAGE REPRESENTATION

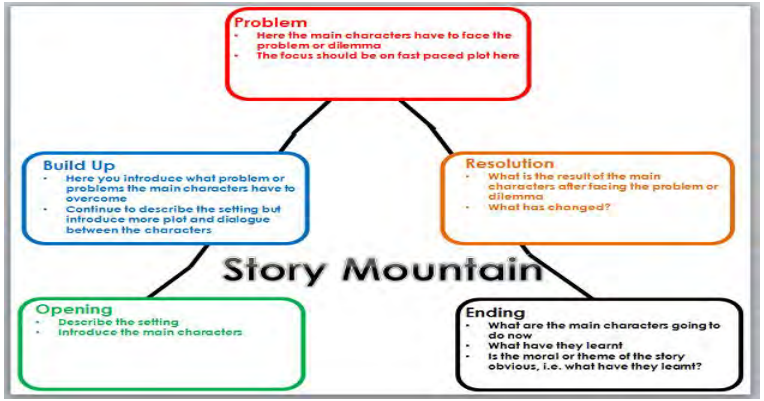


	1	2	3	4	5	6	7	8
1	0	0	1	1	1	1	0	0
2	0	1	1	0	0	1	1	0
3	1	1	0	1	1	0	1	1
4	1	0	0	0	0	0	0	1
5	1	1	0	0	0	0	1	1
6	1	0	1	1	1	1	0	1
7	0	1	1	0	0	0	1	1
8	0	0	0	1	1	1	0	0

English

Year 7 - The Unforgotten Coat and Adventure writing

Key Themes **The Unforgotten Coat:**	Key Themes **Adventure Writing:**
Culture Friendship Folk tales Family New experiences Memories	Culture Friendship Danger Travel New experiences Risk



Key Terms	Meaning
Tension	Making the reader feel nervous and anxious.
Narrative structure	The order of events in a story.
Narrator	The person who tells us the story.

Key Characters

The Unforgotten Coat:
Chingis
Nergui
Julie
Mimi
Mrs Spendlove
Duncan
Shocky
Julie's mum

Adventure Writing:
Bear Grylls
Joe Simpson (Touching the Void)
Jessica Ennis
Usain Bolt
Captain Scott

Key Quotations: The Unforgotten Coat

I saw that coat today for the first time since we all left.

And that's how I found these pictures.

I really did want to be a good guide.

In Mongolia we are nomads

Don't talk about demons. Don't even mention them.

Mad coats- long, like dressing gowns, with fur inside.

Baseline: write a story about an adventure in Mongolia.

Varied sentence openers:
- Adverbial -ly opener
- Connective opener
- Time phrase opener

Ambitious Language:
- Adjectives
- Adverbs
- Similes
- Alliteration

Punctuation Accuracy:
- Capital letters
- Full Stops
- Commas in a list
- Commas to separate subs (complex sentences)
- Commas after adverbial -ly opener
- Semi Colons

English Year 7 - Poetry

Key Themes

Children
Growing up
Families
Trust
Birth
Loss
Death
Love
Circle of life
Nature

Key Words

Simile
Metaphor
Alliteration
Personification
Stanza
Quotation
Analysis
Explicit
Implicit
Enjambement
Theme

Nettles- Vernon Scannel

My son aged three fell in the nettle bed.
'Bed' seemed a curious name for those green spears,
That regiment of spite behind the shed:
It was no place for rest. With sobs and tears
The boy came seeking comfort and I saw
White blisters beaded on his tender skin.
We soothed him till his pain was not so raw.
At last he offered us a watery grin,
And then I took my billhook, honed the blade
And went outside and slashed in fury with it
Till not a nettle in that fierce parade
Stood upright any more. And then I lit
A funeral pyre to burn the fallen dead,
But in two weeks the busy sun and rain
Had called up tall recruits behind the shed:
My son would often feel sharp wounds again.

Key Poems

Tay Moses
Nettles
Messy FIngers
Prayer Before Birth
Childhood Tracks

Key Quotations

Tay Moses-
'You'll drift to the uplands'
Nettles-
'Bed seemed a curious name for those green spears'
Messy Fingers-
'Sticky fingers, tangled hair'
Prayer Before Birth-
'I'm afraid the human race with tall walls will wall me'
Childhood Tracks-
'Slants of evening sunlight slowly disappear'

Key Terms	Meaning
Stanza	A section or paragraph in a poem.
Quotation	Words taken from the poem or text.
Theme	An important idea that runs throughout the poem or text.

Year 7 Module 1.1

Les devoirs: www.quizlet.com or www.languagenut.com

I can...

- Recognise, understand and use three essential French verbs: **ÊTRE**, **AVOIR** and **FAIRE**
- Recognise, understand and use the following phonic sounds: **'a'**, **'i'** and **'eu'**, **'e'** and **'au(eau/o)'**, **'u'** and **'ou'**, **'é (-er, -et)'**, **'en'** , **'an'**, **'on'**, **'-ain' / '-in'**, , **'è' / 'ê'**, and silent final letters
- Understand and explain adjectival agreement
- Describe people and things

Les verbes essentielles

Être - to be (being)	Avoir - to have (having)	Faire - to do (doing)
Je suis	J'ai	Je fais
Tu es	Tu as	Tu fais
Il/elle est	Il/Elle a	Il/elle fait

Adjectival Agreement

When an adjective describes a feminine noun, the adjective's spelling and sometimes its sound change. The most common change is to add an 'e' to the end of the adjective. (This is for adjectives not already ending in 'e'.)

Masculine C'est - it is / Il est - He is	Feminine C'est - it is / Elle est - she is	English meaning
grand	grand**e**	big
petit	petit**e**	small
anglais	anglais**e**	English
français	français**e**	French
intelligent	intelligent**e**	intelligent
amusant	amusant**e**	funny

Genders in French

All nouns in French have a gender. They are either masculine or feminine. This does not mean they are male or female. For example, a dog, 'un chien' is always masculine, regardless of its actual gender

Indefinite articles

Masculine	Feminine	Vowel	Plural
Un	Une	-	Des
One/a/an	One/a/an	-	Some

Definite articles

Masculine	Feminine	Vowel	Plural
Le	La	L'	Les
The	The	The	The

Key Sounds

Year 7 French 1.1

VOCABULARY

- learning what it means to know a word from recognition, to pronunciation, spelling and using the word in sentence
- high-frequency words relevant to context
- mixed word class vocabulary sets (10 words per week) here

GRAMMAR

- *to be, being*: **ÊTRE**
- *to have/having*- **AVOIR** (1st, 2nd, 3rd person singular)
- indefinite articles, singular and plural nouns
- adjectives- gender and agreement
- yes/no questions with raised intonation

PHONICS (SSC- Sound-symbol correspondence)

Recognise, understand and use the following phonic sounds: **'a'**, **'i'** and **'eu'**, **'e'** and **'au(eau/o)'**, **'u'** and **'ou'**, **'é (-er, -et)'**, **'en'** , **'an'**, **'on'**, **'-ain' / '-in'**, , **'è' / 'ê'**, and silent final letters

SPEAKING

- describing people and things
- Talk about doing and making things
- use specific phonic sounds: **'a'**, **'i'** and **'eu'**, **'e'** and **'au(eau/o)'**, **'u'** and **'ou'**, **'é (-er, -et)'**, **'en'** , **'an'**, **'on'**, **'-ain' / '-in'**, , **'è' / 'ê'**, and silent final letters

READING

- understanding short sentences with familiar language and essential verbs: **ÊTRE**, **AVOIR** and **FAIRE**
- Distinguish between 'having' and 'being'

LISTENING

- understanding specific phonic sounds
- understanding questions through raised intonation

WRITING

- producing short sentences with familiar language essential verbs: **ÊTRE**, **AVOIR** and **FAIRE** in the 1st , 2nd and 3rd person singular
- Using adjectival agreement

HOME LEARNING

- **Learning**: key vocabulary 1/cycle (quizlet based)
- **Activities**: language nut

Humanities
Year 7 -Exploring the United Kingdom

Key Idea 1: What is Geography?

There are three different branches of Geography:
Human: Human landscape
Physical: Natural Landscape.
Environmental: The impact on our surrounding.
However, all three branches overlap.

Key Idea 2: What are the physical characteristics of the UK?

The UK landscape is extremely diverse with the Grampian Mountains in Scotland and lowland areas in the South East of England. The relief of the landscape has been shaped by millions of years of physical processes such as erosion. Rivers have carved their way through the landscape with longest being the Severn.

Key Idea 3: What is flooding and how can we reduce our risk?

Natural hazards cannot be helped, they'd occur with or without us.
However Humans have often exacerbated them and made them become more frequent, especially as the population has grown.
River flooding is an increasing concern for the UK with both physical and human causes.

Key Idea 4: Where do people live in the UK?

The UK's population is continuously growing and currently stands at 66.6million.
The majority of the population live in urban areas rather than rural. The growth of urban areas is known as urbanisation. This has created both problems and benefits for UK cities.

Key Idea 5: Why do people migrate and what impact does it have on the UK?

Migration has always played a part in the story of the United Kingdom but in recent years immigration has seen to be portrayed as negative by the media. It is important to understand that this is a misconception.

Key words

Continent: A very large area of land, that usually consists of several countries. There are seven continents: Africa, Antarctica, Asia, Europe, Oceania, North America and South America.
Environmental Geography: Referring to the natural landscape and issues that can be placed upon it.
Erosion: The wearing away or removal of land by the action of physical features (sea/rivers/ice).
Human Geography: The study of the human landscape and population.
Physical Geography: The study of the natural landscape and its features.

Religious Studies | Year 7 - Should we cancel Christmas?

Key Idea 1 - The Nature of God
Christians have clear beliefs about what God is like. They consider God to be part of the Holy Trinity. Christians see God as omnipotent, omnipresent and benevolent.

Christians believe God is **OMNIPOTENT** which means all powerful; **OMNIPRESENT** which means He is everywhere; **OMNISCIENT** which means all knowing and **BENEVOLENT** which means loving.

Christians believe that, in order to be all of these things, God has to be more than a physical thing. Christians believe God is made up of three different parts:

1. The Father is the God who is said to have created man.
2. The Son is God in human flesh, who we know as Jesus.
3. The Holy Spirit is what was left on earth when Jesus went to heaven after his crucifixion.

Key Idea 2 - The Life of Jesus shapes Christian Belief
Jesus was a person who lived and died over 2000 years ago. Christians tell the story of his life in the New Testament of the Bible through parables and stories. His life inspires the main Christian teachings and beliefs. The worship of Jesus is central to the Christian beliefs about the importance of Christmas.

Christians think God came to earth as a human in the form of Jesus. They believe that God thought this was necessary because people were forgetting about God. Christians think Jesus came to remind people about how to behave and the importance of believing in God so that people could achieve salvation from sin.

TEACHINGS: there is historical evidence which shows that there **was** a man over 2000 years ago in Jerusalem claiming that he was God in human form. Whether he actually was God in human form is debated because people argue the Bible is a bias source. Jesus taught using simple stories called PARABLES. For example:

- **The Lost Sheep** - the lesson of this parable is that God cares for every person as an individual, so we should do the same.
- **The Good Samaritan** - the lesson of this parable is that God is pleased when people show kindness to others, especially people they don't much like.

ACTIONS: The people who wrote the Bible included many examples of miracles which are used by them as evidence that Jesus is God incarnate.
Examples of the miracles Jesus did include him **healing a paralysed man** and **bringing Jairus' daughter back from the dead**.

Some people agree Jesus did these miraculous things because they believe he was God so had the power to be omnipotent when he wanted to be. They also use examples from modern times to argue miracles are possible. Others disagree and argue that the Bible writers made the stories up.

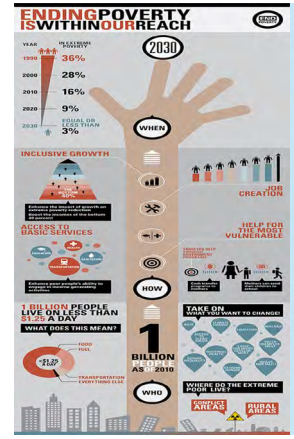
EASTER: Some of these things Jesus did received negative attention from the Jewish and Roman authorities. This eventually led to Jesus' arrest and death. Holy Week is what Christians call the last week of Jesus' life and there are many key events that happened in this week:

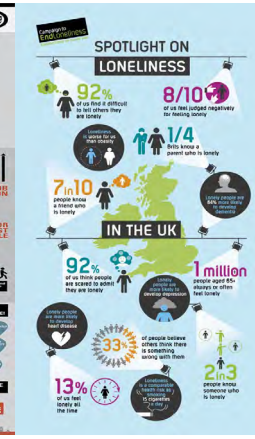
- **Palm Sunday** – Jesus returns to Jerusalem
- **Maundy Thursday** – Jesus hosts the Last Supper and is betrayed and arrested
- **Good Friday** – Jesus is crucified
- **Easter Sunday** - Jesus rises from the dead

Key Idea 3 - Has Christmas lost its true meaning?
Christmas traditions have been shaped by culture, religion and people over centuries. For example, the pagan festival of light took place on 25th December. In modern Britain some people argue that Christmas has lost its true meaning.

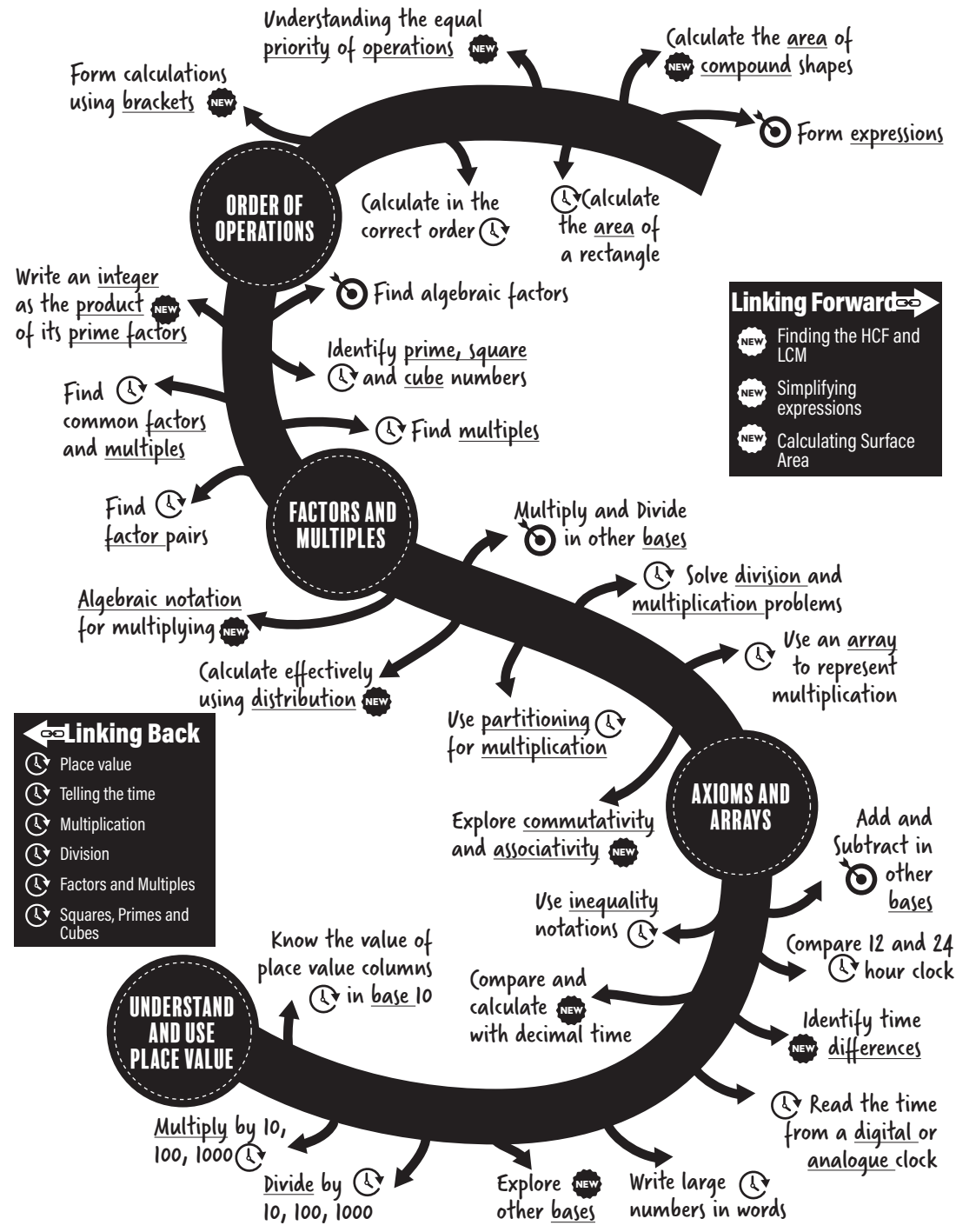
Christmas SHOULD be cancelled for non-Christians	Christmas SHOULD NOT be cancelled for non-Christians
Christmas has become too commercialised and the real meaning of the festival has been forgotten. Followers of other religions feel left out as they do not get a public holiday for their special festivals.	Christmas is a time when people are encouraged to be charitable and to think of others. Atheists could argue that businesses and the Government make a lot of money at Christmas which can be put back into the country.

Key Idea 4 Christmas in Modern Britain
Christmas can be a time in modern Britain where we focus on **social issues** like loneliness, homelessness and poverty. Different groups in society value Christmas for lots of different reasons.



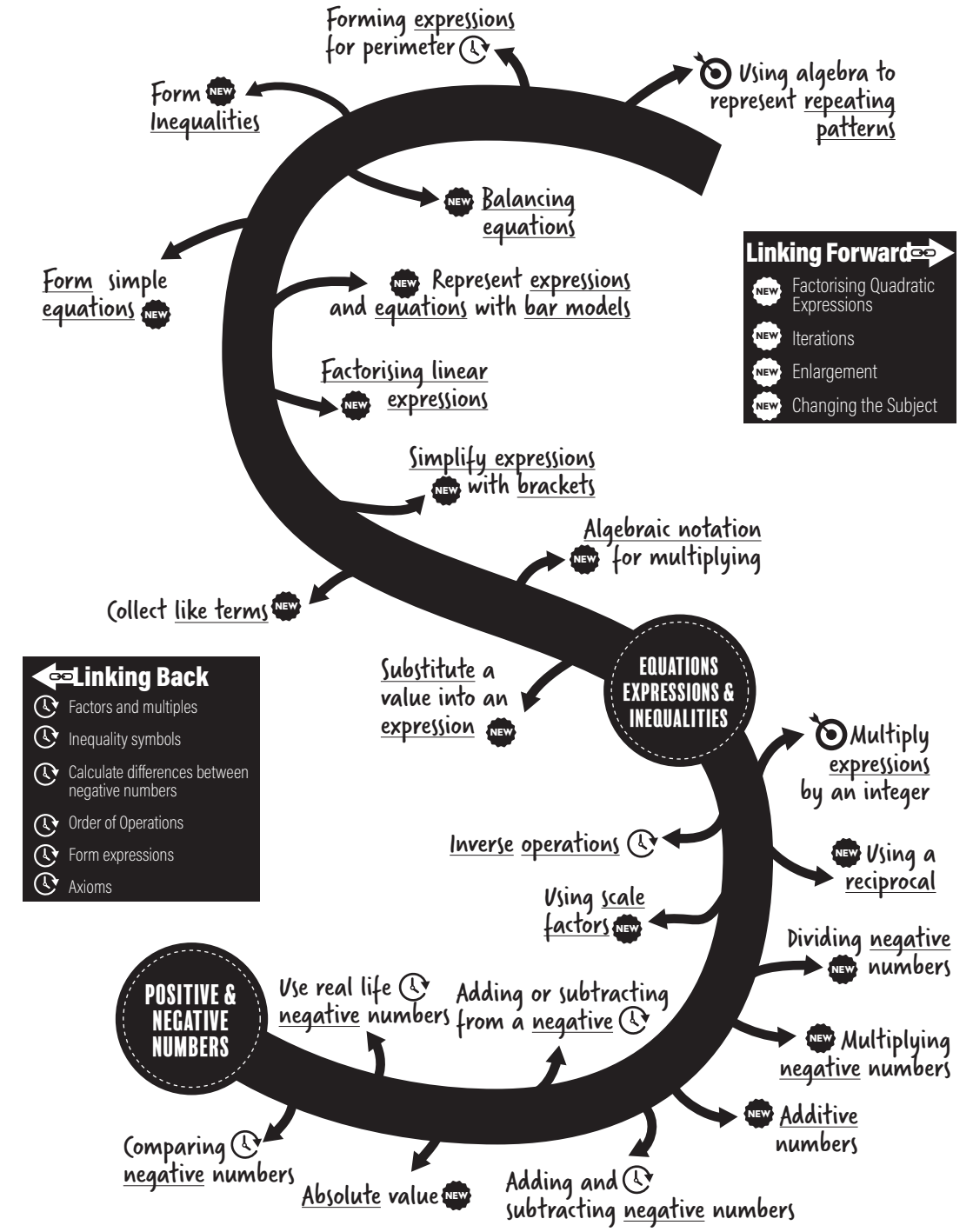


MATHS AUTUMN 1



Key: Prior content | NEW New content | Challenge content | Opportunity to develop calculator skills

YEAR 7 AUTUMN 2



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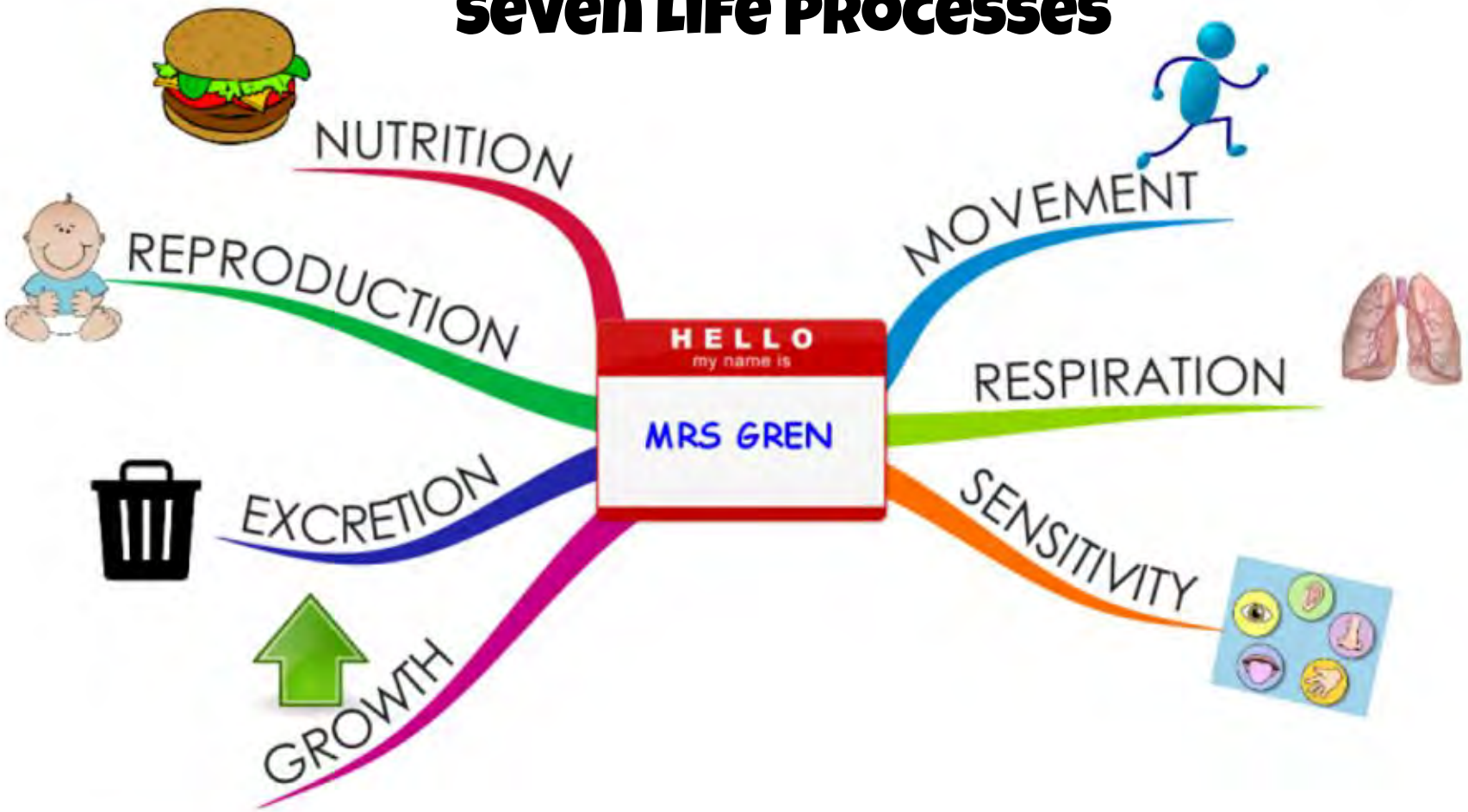
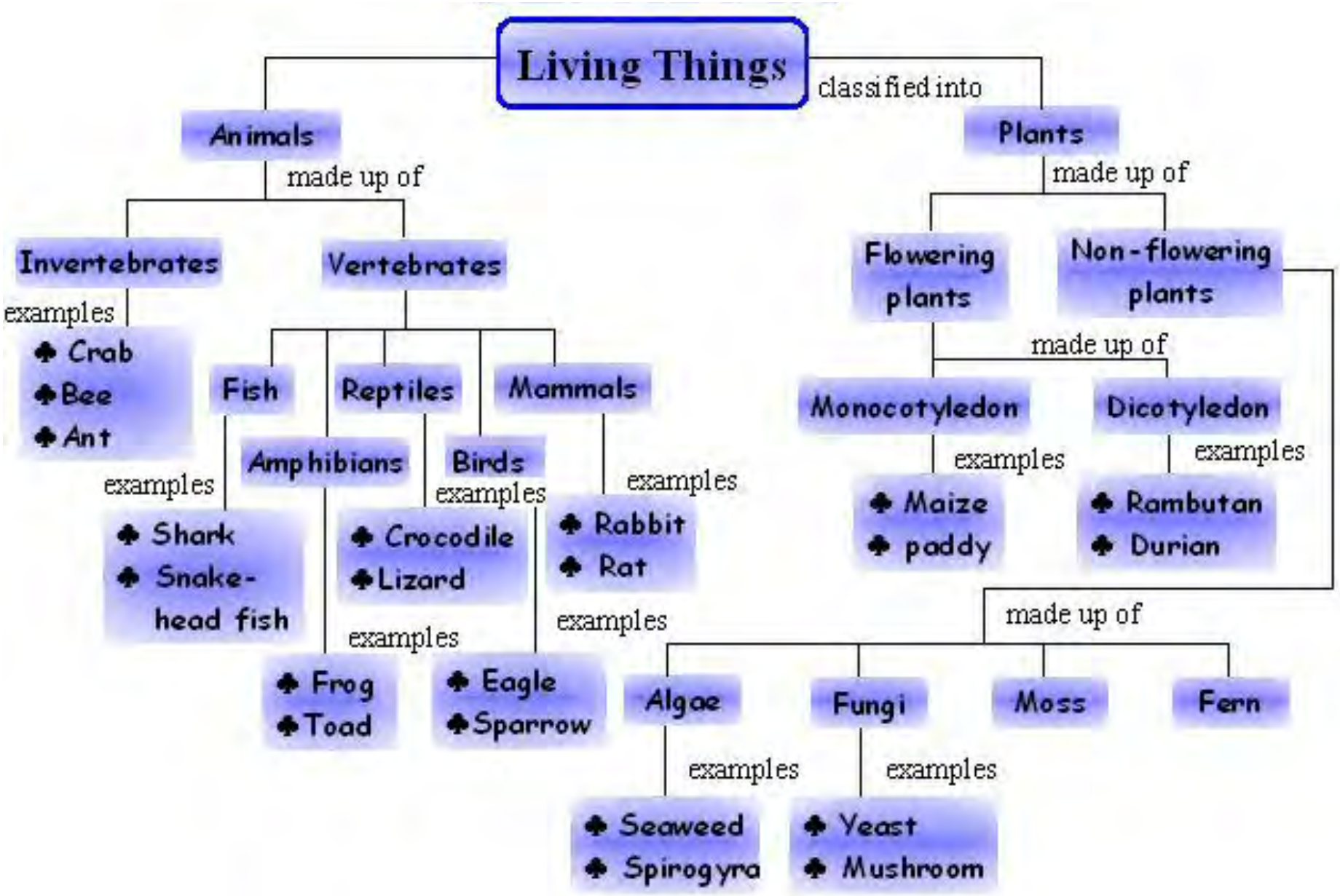
Y7 Science - 7 Bio 1

Seven Life Processes



CLASSIFYING LIVING THINGS



Amphibian

- cold-blooded
- breathe with lungs and gills
- smooth, moist skin (no scales)
- lay eggs

Bird

- warm-blooded
- lay eggs
- have feathers & wings
- two legs
- breathe with lungs
- have bills or beaks

Fish

- cold-blooded
- breathe with gills
- lay eggs
- have fins

Mammal

- warm-blooded
- have hair
- produce milk for young
- give live birth
- have hair or fur
- breathe with lungs

Reptile

- cold-blooded
- breathe with lungs
- lay eggs
- dry scaly skin

Structural Adaptations
Sharp quills for protection from predators
Protruding snout (for accessing termite mounds)
Sharp claws for digging / burrowing

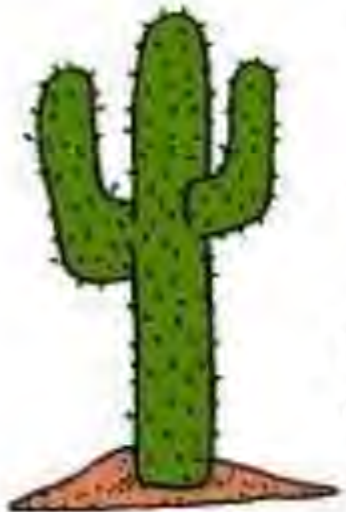
Behavioural Adaptations
Curls into ball when threatened (exposes quills)
Digs burrows in which to nest and rest
May hibernate during winter in very cold regions

Physiological Adaptations
Ears sensitive to low frequencies (detect ant sounds)
Well developed olfactory system (used for detection)
Tongue can stiffen and penetrate soil due to blood flow

Cactus

1. No leaves – reduce water loss.

2. Small surface area – reduce water loss.



3. Very thick stem – store water.

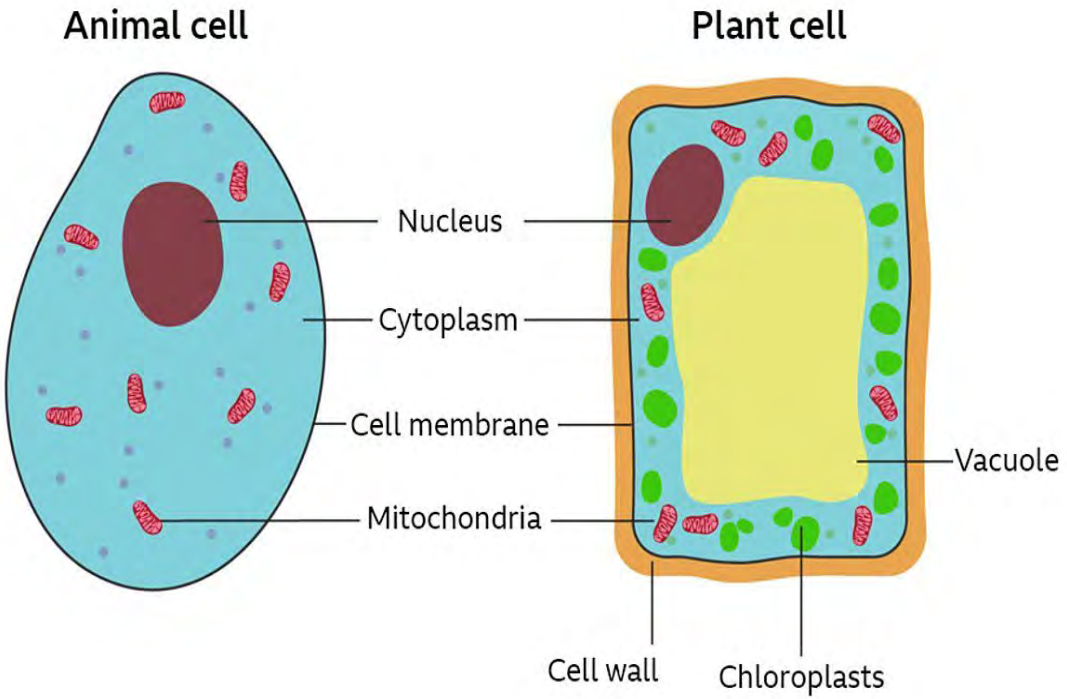
4. Spines – stop animals eating it.

5. Shallow but extensive roots – absorb water quickly when it rains.

ADAPTATIONS

Cells

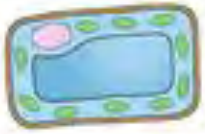
Organelle	Function (job)
Nucleus	Controls the cell
Cytoplasm	Where chemical reactions happen.
Cell membrane	Controls what goes into and out of the cell.
Mitochondria	Where energy is released in the cell.
Cell wall	Provides structure and support.
Chloroplast	Where photosynthesis happens (they absorb sunlight)
Vacuole	Contains sap

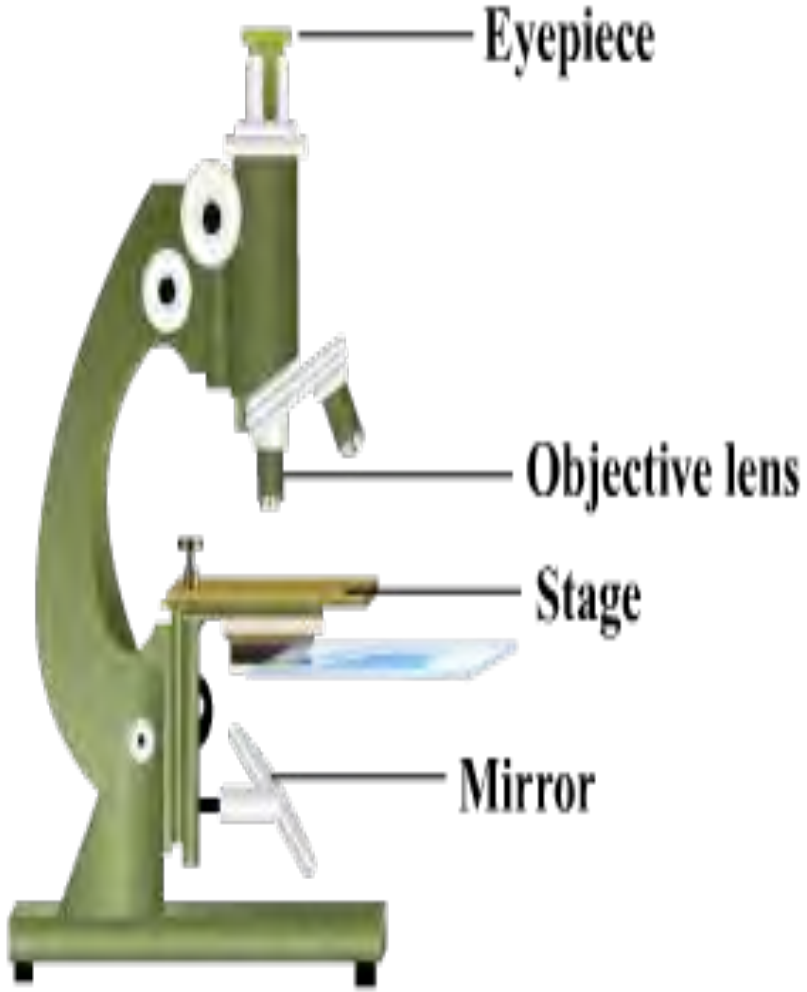


Found in plant cells only

Keywords:

cell, nucleus, cytoplasm, mitochondria, membrane, chloroplast, vacuole, microscope, microscopic, specialised, palisade cell, sperm cell, red blood cell, root hair cell, ciliated cell, cilia.

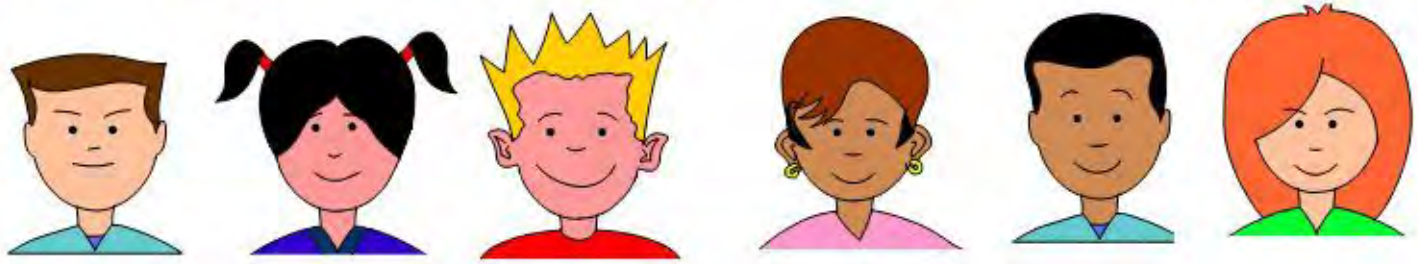
Specialised cell	Specialisation	Found in
Red blood cell 	No nucleus and, large surface area for carrying more oxygen.	Blood
Sperm cell 	Tail for swimming to the egg.	Testes
Egg cell 	Large nucleus to aid fertilisation..	Ovaries
Ciliated cell 	**Has microscopic hairs (cilia) to push particles along.**	**Trachea (windpipe) and fallopian tubes.**
Root hair cell 	**Absorbs water from the soil in the roots.**	**Roots of plants.**
Palisade cell 	**Contains many chloroplasts for photosynthesis. Found in the leaves.**	**Leaves of plants.**



Parts of a Light Microscope

Different types of variation

People are similar, but not identical, to their parents or each other. The differences in a species are called **variation**.



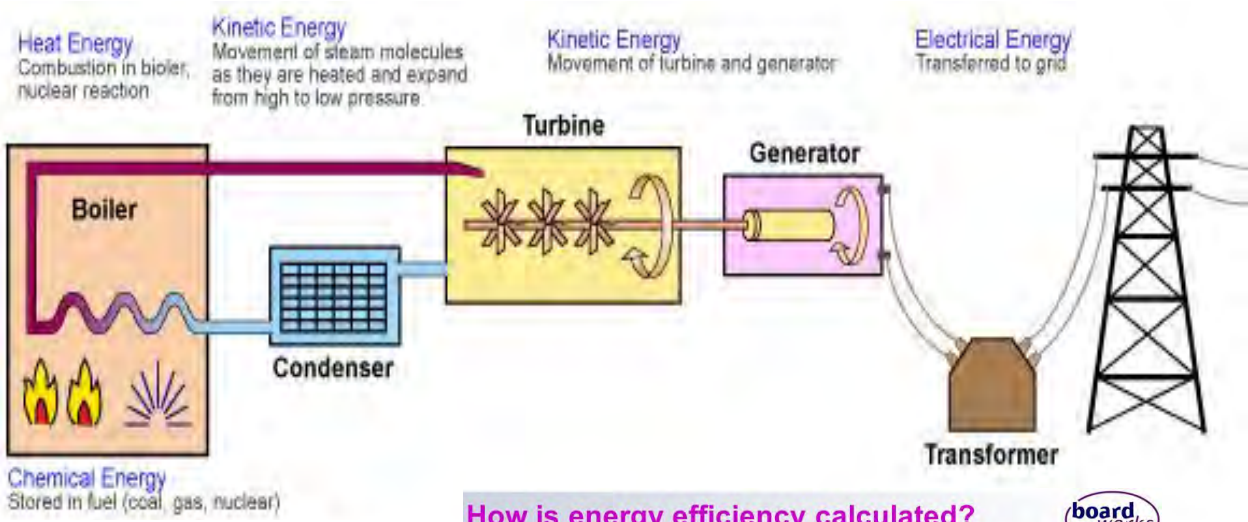
Variation can come about for two reasons. What are they?

1. People **inherit** characteristics from **both** of their parents and each person gets a different combination of features. This is called **inherited variation**.
2. Other characteristics are affected a person' surroundings. This called **environmental variation**.

Which features are environmental and which are inherited?

7PHYS1 - Energy

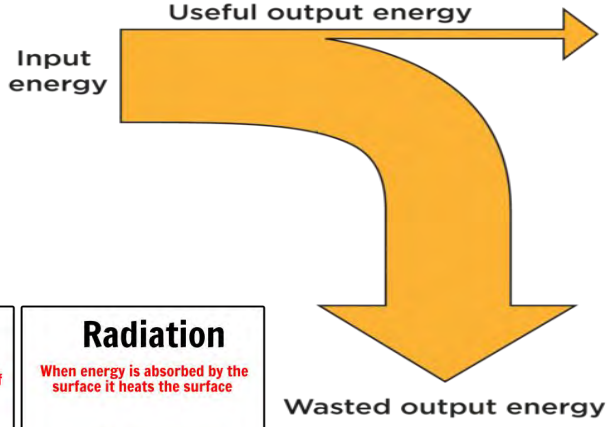
7 Stores of Energy
Thermal
Kinetic
Nuclear
Chemical
Electrical
Gravitational potential
Elastic potential



Energy is measured in Joules (J) or kilojoules (kJ)

Total ENERGY = Joules (J)

Joules (J)
kilo - thousand
kilojoule (kJ) - 1000 J



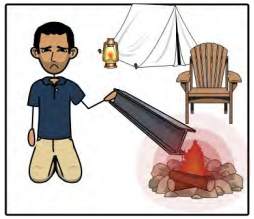
How is energy efficiency calculated?

The energy efficiency of a device can be calculated using this formula:

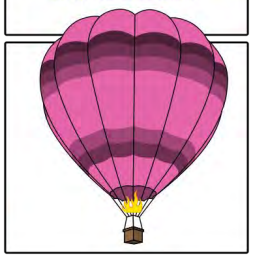
$$\text{energy efficiency} = \frac{\text{useful output energy}}{\text{total input energy}}$$

- Useful energy is measured in **joules** (**J**).
- Total energy is measured in **joules** (**J**).
- Energy efficiency does not have any units.
  It is a number **between 0 and 1** which can be converted into a percentage by multiplying by 100.

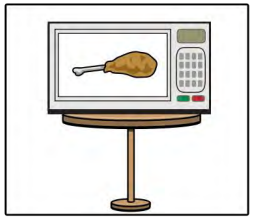
Conduction
The transfer of thermal energy from one material to another by direct contact.
If you use a metal stick for fire your hand will get hot because the heat transfers from the fire to the metal to your hand.



Convection
The transfer of thermal energy by the circulation or movement of a liquid or gas
In a hot air balloon, the hot gas from the fire raises the balloon.



Radiation
When energy is absorbed by the surface it heats the surface
Using a microwave creates radiation to heat up food in your microwave.



Fossil fuels (coal/oil/gas) release carbon dioxide into the atmosphere when they are burned in cars and power stations.

Energy is neither **created** nor **destroyed**.

It can be transferred from one object to another or transformed from one form to another.

Law of conservation of energy.

Calculating Work Done (J)

A force acting through a distance

Work = Force x Distance

- The equation for power-

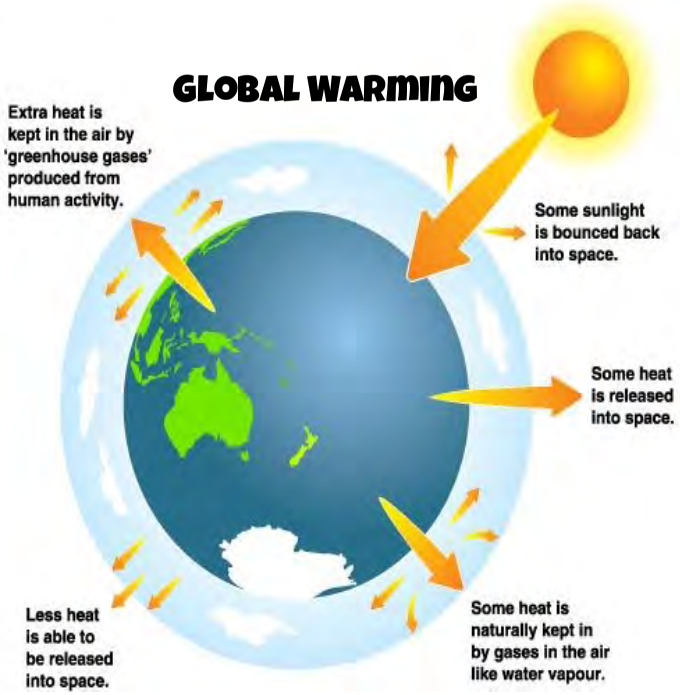
Word Equation: $\text{Power} = \frac{\text{Work Done}}{\text{Time Taken}}$

Dimensions: P = W / t

Units: Watt = Joule / second

Method	How it works	Advantages	Disadvantages
Solar	- Solar cells turn the sun's energy into electricity	- No fuel costs - Renewable - No Pollution	- High initial costs - Only works in sunlight - Energy must be stored
Tidal Energy	- Waves are constantly moving - Water flows through turbines.	- No fuel costs - Renewable - No Pollution - Generates energy 24/7/365	- Expensive to construct - Needs proper location
Wind	- Wind blows giant fans that generate electricity	- No fuel costs - Renewable - No Pollution	- High cost of construction *and* maintenance - Needs a windy location
Geothermal	- The earth's core is hot - Heat turns water into steam - Steam turns turbines.	- No fuel costs - No pollution - Generates energy 24/7/365	- Geothermal stations are expensive to build - Needs to be set up in very specific places around the world
Hydro-electric	- Dams are built. - Water flows through turbines.	- No fuel costs (free once in place) - Renewable (infinite supply) - No Pollution - Generates energy 24/7/365	- Expensive to construct - Changes the environment
Biofuels	- Plant matter is broken down and releases bioethanol and biodiesel	- Can replace, or be blended with, petrol - Reduced pollution by 50-90%	- Decreased fuel efficiency - Uses potential food

GLOBAL WARMING



CLIMATE CHANGE