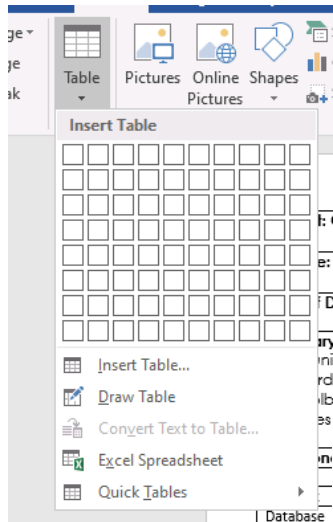


# Year 9 Computing Spring Term Knowledge Organiser

Bold	Italic	Alignment	Format	Clipboard	Copy	Paste	Crop
Text box	Format	Undo	Redo	Column	Header	Footer	Mail Merge
Database	Table	Cell	Border	Tab	Font	Indent	Clipboard

A table is made up of rows and columns. The intersection of a row and column is called a cell. Tables are often used to organize and present information, but they have a variety of other uses as well. You can use tables to align numbers in columns, and then sort and perform calculations on them. You can also use tables to create interesting page layouts.

Mail merge lets you create a batch of documents that are personalised for each recipient. For example, a form letter might be personalized to address each recipient by name. A data source, like a list, spreadsheet, or database, is associated with the document.



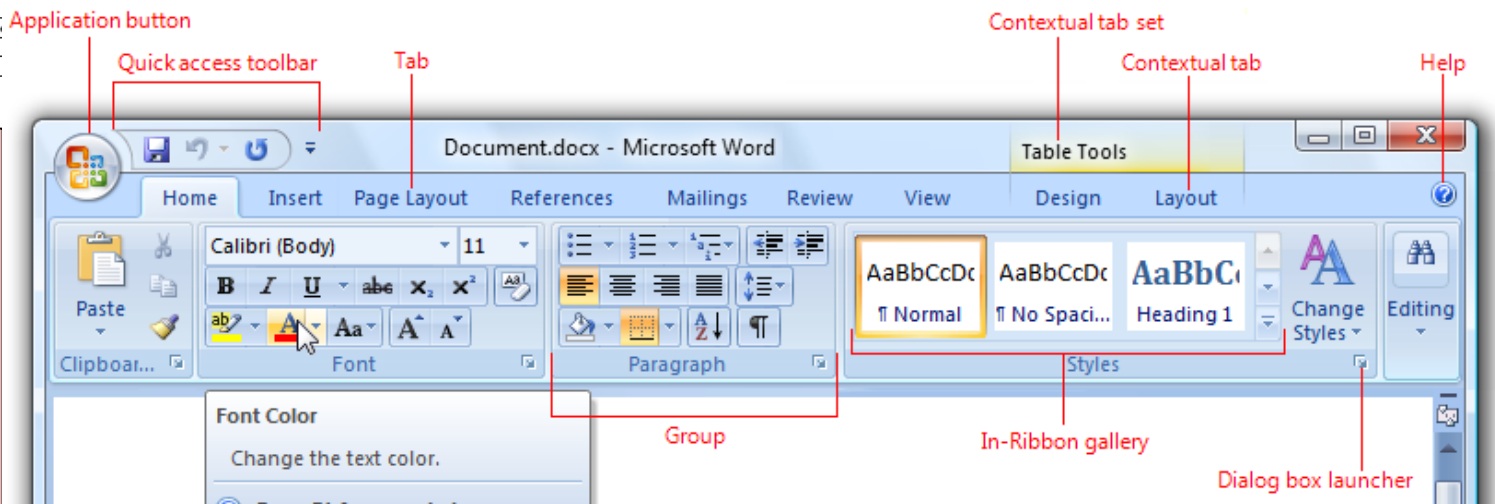
## Special use of keys within tables

### Tab Key

To move forward one cell in the table.  
When at the end of the table, pressing the Tab key creates a new row.

### Shift+Tab

To move one cell backward in the table



# Year 9 Geography Knowledge Organiser – Exploring Decision Making

## Resource Required

**Resources such as food, energy and water are what is needed for basic human development.**

### FOOD

Without enough nutritious food, people can become **malnourished**. This can make them ill. This can prevent people working or receiving education.

### WATER

People need a supply of **clean and safe water** for drinking, cooking and washing. Water is also needed for food, clothes and other products.

### ENERGY

A good supply of energy is needed for a basic standard of living. People need **light and heat** for cooking or to stay warm. It is also needed for industry.

## Demand outstripping supply

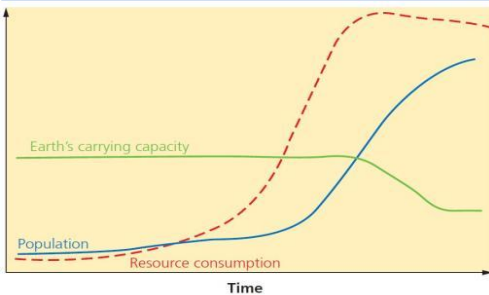
**The demand for resources like food, water and energy is rising so quickly that supply cannot always keep up. Importantly, access to these resources vary dramatically in different locations**

### 1. Population Growth

- Currently the global population is **7.3 billion**.
- Global population has risen **exponentially** this century.
- Global population is expected to reach **9 billion by 2050**.
- With more people, the **demand** for food, water, energy, jobs and space **will increase**.

### 2. Economic Development

- As **LIDCs** and **EDCs** develop further, they require **more energy** for industry.
- **LIDCs** and **EDCs** want similar lifestyles to **ACs**, therefore they will need to **consume more resources**.
- Development means **more water is required** for food production as diets improve.



### Resource Reliance Graph

**Consumption** – The act of using up resources or purchasing goods and produce.

**Carry Capacity** – A maximum number of species that can be supported.

**Resource consumption exceeds Earth's ability to provide!**

### 3. Changing Technology and Employment

- The demand for resources has driven **the need for new technology** to reach or gain more resources.
- More people in the **secondary and tertiary industry** has increased the **demand for resources** required for electronics and robotics.

## What is Resource Reliance?

Resources are things that humans require for life or to make our lives easier. Humans are becoming increasingly dependent on exploiting these resources, and as a result they are in high demand.

## Reasons for NOT Meeting Modern Resource Demands.

### Climate

- Global warming effects cycles and seasons and therefore farming.
- Rainfall patterns are changing and are becoming unpredictable. This is a problem for farming.

### Geology

- Not all countries have access to fossil fuels or suitable landscape for renewables.
- Many minerals are finite and therefore once used will reduce the resources available.
- Rock types might limit the availability to store water.

### Conflict

- War can disrupt transport of resources by damaging roads and water pipes.

### Poverty

- LIDCs are unable to afford technology to effectively exploit the natural resources available.

### Natural Hazards

- Increase in hazard events due to climate change.
- Prime agricultural regions in Asia and Africa and are also in hazard zones.
- Has the ability to destroy infrastructure needed to transport resources.

## Environment and Food: Fishing and Farming

	Methods	Environmental and Ecosystems
Fishing	<ul style="list-style-type: none"> <li>• <b>Bigger nets and fishing boats</b> have allowed for greater catches. <b>GPS and sonar</b> has also find the fish easily.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Overfishing</b> of certain fish has caused their decline.</li> <li>• <b>Dredging</b> can damage seafloor habitats.</li> <li>• Decline of one species has a <b>knock on</b> effect on other marine species.</li> </ul>
Farming	<ul style="list-style-type: none"> <li>• <b>Tractors, computer programming and GPS</b> technology is producing food more effectively and at a larger scale.</li> </ul>	<ul style="list-style-type: none"> <li>• Field sizes have caused <b>hedgerows to decline</b> in biodiversity.</li> <li>• <b>Fertilisers and pesticides</b> enter water courses and harm or kill organisms.</li> <li>• Heavy machinery can cause <b>soil erosion</b>.</li> </ul>

## Environment and Water: Reservoirs and Water Transfer

	Methods	Environmental and Ecosystems
Reservoirs	<ul style="list-style-type: none"> <li>• Increasing <b>storage to hold more water</b> and constructing more dams to <b>control river flow</b> can provide a reliable source of water.</li> </ul>	<ul style="list-style-type: none"> <li>• Can <b>flood</b> a large area of land and damage <b>habitats</b> and <b>natural landscapes</b>.</li> <li>• Dams can be a <b>barrier for certain species</b> to migrate upstream.</li> <li>• Natural flow of sediment is disrupted, which then <b>reduces fertility of land</b> further down.</li> </ul>
Water Transfer	<ul style="list-style-type: none"> <li>• Constructing pipes and canals to divert water surplus to areas in need of a water supply.</li> </ul>	<ul style="list-style-type: none"> <li>• Large-scale engineering works can <b>damage ecosystems</b> along the route.</li> <li>• <b>Lots of energy</b> is required to pump water over long distances.</li> </ul>

## Food Security

**'Food Security'** is when people at all times need to have physical & economic access to food to meet their dietary needs for an active & healthy life. This is the opposite to **'Food Insecurity'** which is when someone is unsure when they might next eat.

### Human

- **Poverty** prevents people affording food and farmers buying modern equipment.
- **Poor infrastructure** makes food difficult to transport fresh food.
- **Conflict** disrupts farming and prevents supplies.
- **Food waste** due to poor transport and storage.
- **Climate Change** is affecting rainfall patterns making food production difficult.

### Physical

- **Temperature** needs to be ideal for certain crops to grow.
- The **quality of soil** is important to ensure crops have the necessary nutrients.
- **Water supply** needs to be reliable to allow food to grow.
- **Pest, diseases and parasites** can destroy vast amounts of crops that are necessary to feed large populations.
- **Extreme weather** events can damage crops (i.e. floods).

## ¿Llevas una dieta sana?

### Do you have a healthy diet?

Llevo una dieta sana = I have a healthy diet

Me gusta (n) mucho = I really like

Me gusta (n) bastante = I quite like

No me gusta (n) = I don't like

No me gusta (n) nada = I really don't like

el arroz = rice

el pan = bread

el pollo = chicken

el pescado = fish

la carne = meat

la ensalada = salad

la pasta = pasta

la pizza = pizza

los caramelos = sweets

los huevos = eggs

los pasteles = cakes

las galletas = biscuits

las verduras = vegetables

como = I eat

comí = I ate

bebo = I drink

bebí = I drank



## Useful Phrases

Empecé a jugar = I started to play

a los (diez) años = at the age of (ten)

Voy a empezar a jugar = I'm going to start playing

Voy a empezar a hacer = I'm going to start doing

## Expressions of Frequency

tres veces al día = three times a day

cada día = each day

todos los días = every day

dos veces a la semana = twice a week

los fines de semana = at the weekends

una vez al mes = once a month

muy a menudo = very often

a veces = sometimes

de vez en cuando = from time to time

casi nunca = almost

nunca = never



## ¿Qué haces para estar en forma?

### What do you do to keep in shape?

Me gusta mucho hacer deporte = I like to do sport

Hago artes marciales = I do martial arts

Hago atletismo = I do athletics

Hago footing = I do jogging

Hago gimnasia = I do gymnastics

Hago natación = I do swimming

Juego al baloncesto = I play basketball

Juego al ping-pong = I play table tennis

Juego al tenis = I play tennis

Juego al voleibol = I play volleyball

Juego a la pelota vasca = I play pelota

en el parque = in the park

en el gimnasio = in the gym

Voy al polideportivo = I go to the sports centre

Soy miembro de un club = I'm a member of a club

Voy a clases de baile = I go to dance classes

Prefiero jugar al fútbol = I prefer to play football

Es mi deporte preferido = it's my favourite sport



### Mi Rutina Diaria = My Daily Routine

me despierto = I wake up

temprano = early

tarde = late

a las siete = at 7.00am

me levanto = I get up

en seguida = straight away

me ducho = I have a shower

me visto = I get dressed

me acuesto = I got to bed

desayuno = I have breakfast

meriendo = I have an afternoon snack

ceno = I have dinner

salgo (a correr) = I go out (running)

corro (veinte kilometros) = I run for 20K

entreno = I train / I exercise

voy al insti = I go to school

voy al trabajo = I go to work

termino a las dos = I finish at 2.00

duerme (ocho horas) = I sleep (for 8 hours)



### ¿Qué tal? = How are you?

Me duele el brazo = my arm hurts

Me duele el estómago = my tummy hurts

Me duele el pie = my foot hurts

Me duele el brazo = my arm hurts

Me duele la cabeza = my head hurts

Me duele la espalda = my back hurts

Me duele la garganta = my throat hurts

Me duele la mano = my hand hurts

Me duele la pierna = my leg hurts

Me duelen los dientes = my teeth hurt

Me duelen los oídos = my ears hurt

Me duelen los ojos = my eyes hurt

Tengo catarro = I have a cold

Tengo náuseas = I feel sick / nauseous

Tengo quemaduras de sol = I have sunburn

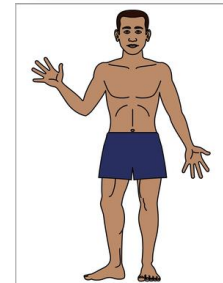
Tengo tos = I have a cough

Estoy cansado/a = I am tired

Estoy enfermo/a = I am ill

No me encuentro bien = I don't feel well

### Parts of the Body



**Para estar en forma = to be in shape / to keep fit**

**Se debe = you should**

beber agua frecuentemente = drink water frequently

comer más fruta y verduras = eat more fruit and veg

comer menos chocolate = eat less chocolate

dormir ocho horas al día = sleep for 8 hours a day

entrenar una hora al día = train / exercise for an hour a day

**No se debe = you shouldn't**

beber alcohol = drink alcohol

beber demasiados refrescos = drink too many fizzy drinks

comer comida basura = eat junk food

fumar = smoke



Scan for more interactive resources on the Healthy Living topic

### High Frequency Words

casi = almost

cada = each / every

ayer = yesterday

hace dos años = 2 years ago

el fin de semana pasado = last weekend

la próxima vez = next time



# Atomic Bomb and the Cold War

## Year 9 Knowledge Organiser

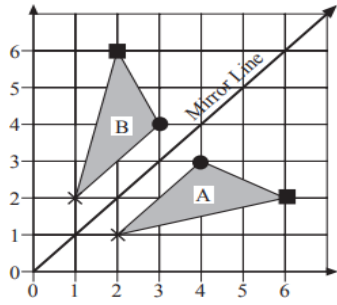
Dropping of the atomic bomb		<b>Key Vocabulary</b>
<b>What happened?</b>	<p>One of the most significant events of World War Two happened in 1945. This was the dropping of atom bombs on the Japanese cities of Hiroshima and Nagasaki by American forces.</p> <p>An atom bomb is capable of causing much greater destruction than the bombs that had been used throughout World War Two, and in previous conflicts. The dropping of the atom bombs was the first and only time that nuclear weapons have been used</p>	<p><b>Allies</b>– Britain, USA, and USSR (Russia) who fought together in WW2</p> <p><b>Axis</b>– Germany, Austria, Italy and Japan who fought together in WW2</p> <p><b>VE Day</b>– Victory in Europe Day during WW2</p> <p><b>Enola Gay</b>– the name of the plane that carried the atomic bomb</p>
<b>What happened to Hiroshima?</b>	<p>The atomic bomb was dropped on Hiroshima by a bomber plane named the Enola Gay. It is thought that at least 140,000 people were killed, of a total population of around 350,000. It exploded with the force of 20,000 tons of TNT. The temperature at the centre of the explosion reached 3000°C - 4000°C – three times hotter than volcanic lava. Everything within a mile of the centre of the blast was flattened.</p> <p>Fires spread and around 67 per cent of Hiroshima's buildings were destroyed.</p>	<p><b>Communism</b> – a political ideology developed by Karl Marx</p> <p><b>Capitalism</b>– an economic system based on private ownership of businesses</p> <p><b>Analysis</b> – a detailed examination</p> <p><b>Surrender</b> – to stop resisting an opponent</p>
<b>Why did it happen?</b>	<p>Truman said that dropping the atom bomb would bring the war to a quicker end, and therefore save the lives of American soldiers.</p> <p>Some historians have also suggested that Truman was worried that the communist Soviet Union might want more influence in Japan and its surrounding countries. Others believe that Truman decided to drop the atom bombs as a big show of 'strength', to show the Soviet Union that the USA was very powerful.</p>	<p><b>Judgement</b>– to make a decision/come to a conclusion</p> <p><b>Cold War</b>– a period of tension between the USA and the USSR and their allies.</p> <p><b>America</b>– a capitalist country that helped win WW2 and feared communism</p>
<b>What were the consequences?</b>	<p>Hundreds of thousands of people were killed, while lots more suffered terrible injuries.</p> <p>Many people who survived the dropping of the atom bombs suffered from poor health, caused by exposure to radiation in the aftermath of the bombs. In Japanese, the survivors of the atom bomb are known as '<b>hibakusha</b>'.</p> <p>By the 1950s, the USA and the Soviet Union had developed an even more powerful weapon, known as the hydrogen bomb. This could cause even more destruction than the atom bombs that were dropped on Hiroshima and Nagasaki.</p> <p>After World War Two, there was a lot of tension between the USA and the Soviet Union, but they did not start a war with one another because both countries had nuclear weapons. Both countries knew that, if they used nuclear weapons, entire countries could be destroyed, and millions of people would be killed. For many years, people lived with great fear that there could be a nuclear war. This period of tension was known as the <b>Cold War</b>.</p>	<p><b>sources</b> – pieces of surviving evidence from the past</p> <p><b>Soviet Union</b>– a community state from 1922-1991 which included Russia</p> <p><b>Atomic bomb</b>– a nuclear device which causes widespread destruction and radiation damage.</p> <p><b>Hiroshima</b>– one of two Japanese cities bombed at the end of WW2 with the aim of forcing Japan to surrender to America and her allies</p>

# Year 9 Mathematics Summer Term Knowledge Organiser

## Transformations

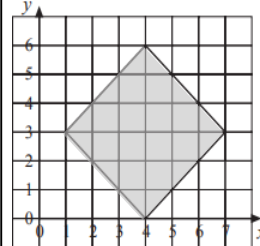
### Reflections

Reflections give shapes which are the same distance to and from a mirror line or line of reflection. In this diagram A and B are reflections of each other.

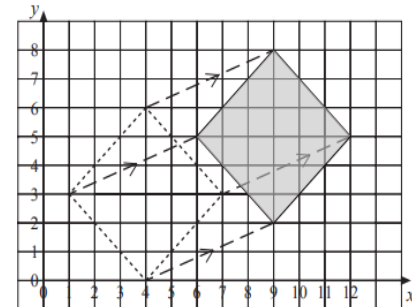


### Translations

A translation is just a movement.



If we translate this square 5 units right and 2 units up, it becomes...

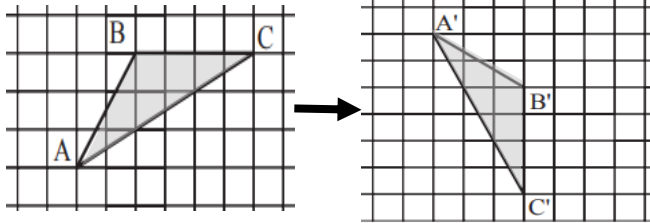


The **translation vector** for this is...

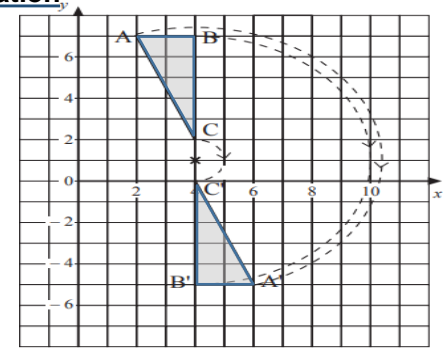
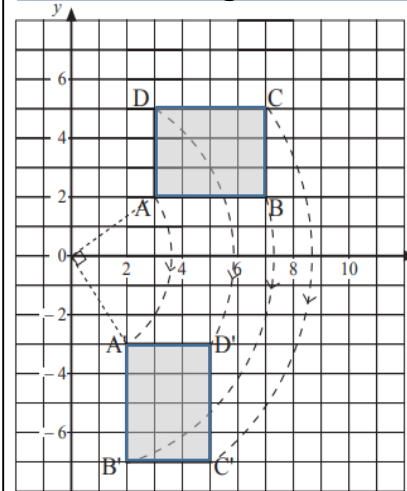
$$\begin{pmatrix} 5 \\ 2 \end{pmatrix}$$

### Rotations

A rotation is a turn. In the diagram on the right, Triangle ABC is rotated clockwise through  $90^\circ$  to give Triangle A'B'C'.



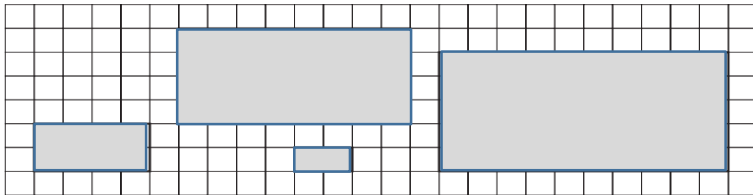
### Rotation – Using a Centre of Rotation



We can also rotate shapes using a centre of rotation. Tracing paper is very useful for these types of question, as you can turn the tracing paper whilst holding your pencil on the centre of rotation.

### Enlargements

An enlargement changes the size of a shape.

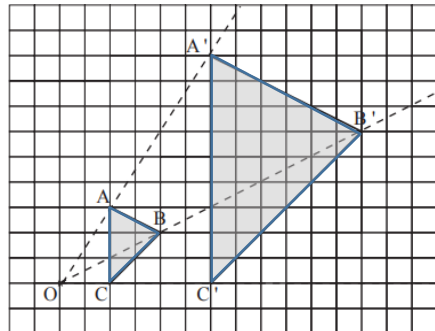


The number of times bigger or smaller a shape becomes is called a scale factor.

### Using a centre of enlargement:

A shape can be enlarged using a centre, so that it gives a new enlarged shape in a specific place. We use enlargement lines to do this.

Example: triangle ABC enlarged by a scale factor 3, centre O



### Describing transformations

When describing transformations, the information must be specific:

**Reflections** must include: reflection and the name of the line of reflection.

**Translations** must say include: translation and the column vector.

$$\begin{pmatrix} 5 \\ 2 \end{pmatrix}$$

**Rotations** must include: rotation, direction of rotation, rotation in degrees and centre of rotation

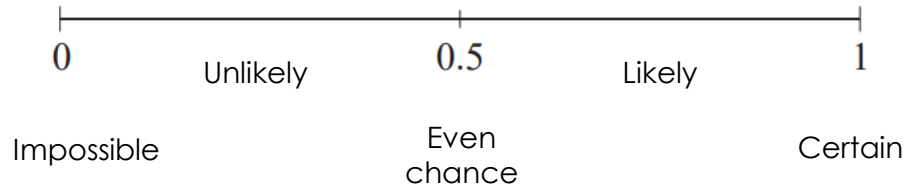
**Enlargements** must include: Enlargement, scale factor and centre of enlargement

# Year 9 Mathematics Summer Term Knowledge Organiser

## Further Probability

### The Probability Scale

All Probabilities lie between 0 (impossible) and 1 (certain) on the probability scale.

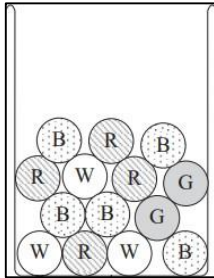


### Probability Theory

Probability can be calculated by:

$$\text{Probability of an outcome} = \frac{\text{Number of ways of getting the outcome}}{\text{Number of Total Outcomes}}$$

The probability of getting a red counter =  $4/14 = 2/7$  Because there are 4 reds out of 14 counters.



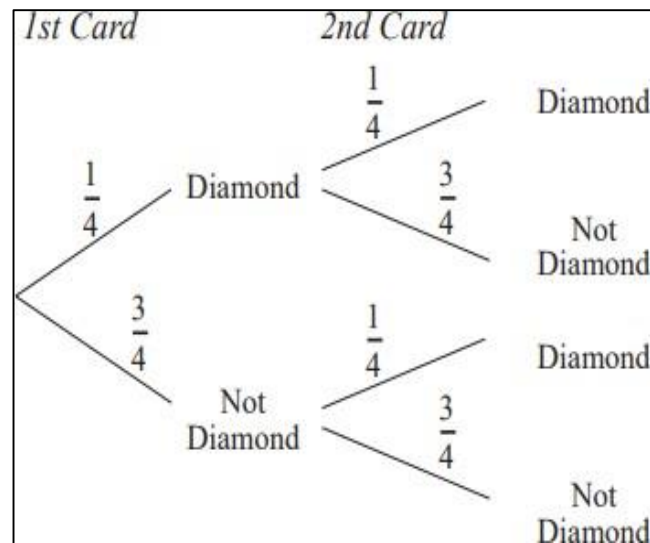
### Probability Trees

Probabilities for two events can also be shown on a tree diagram. Branches will always add up to 1.

#### Example

A card is taken from a pack, returned, and then another one is taken. Find the probability of exactly one diamond.

$p(\text{Diamond}) = \frac{1}{4}$  and  $p(\text{Not Diamond}) = \frac{3}{4}$  and so a tree looks like this...



This outcome shows exactly one diamond.

$$\frac{1}{4} \times \frac{3}{4} = \frac{3}{16}$$

This outcome shows exactly one diamond.

$$\frac{3}{4} \times \frac{1}{4} = \frac{3}{16}$$

$$\frac{3}{16} + \frac{3}{16} = \frac{6}{16}, \text{ or } \frac{3}{8}$$

Remember  
AND means  $\times$

and OR means  $+$

### Experimental Probability

Is when you calculate the probability of an event based on data that has been collected.

Example: a dice rolled 60 times.  
The results are in the table below:

Result	1	2	3	4	5	6
No of Result	20	5	12	10	7	6
Experimental Probability	$\frac{20}{60}$	$\frac{5}{60}$	$\frac{12}{60}$	$\frac{10}{60}$	$\frac{7}{60}$	$\frac{6}{60}$

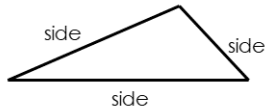
$$\text{Experimental Probability} = \frac{\text{number of times the result happened}}{\text{total trials}}$$

# Year 9 Mathematics Summer Term Knowledge Organiser

## Constructions

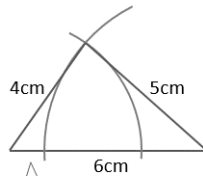
### Constructing SSS Triangles

Side Side Side



Using a ruler and compass only, construct the following SSS triangle accurately.

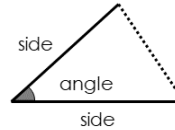
- (1) Draw a 6cm line with a ruler.
- (2) Draw two arcs with lengths 4cm and 5cm from each end of the line.
- (3) Join the ends of the line to the intersection.



Never erase your construction lines!

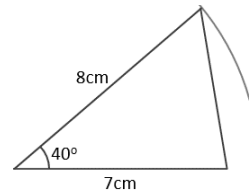
### Constructing SAS Triangles

Side Side Side



Using a ruler, compass and protractor, construct the following SAS triangle accurately.

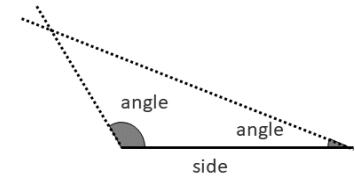
- (1) Draw a 7cm line with a ruler.
- (2) Draw an arc with length 8cm
- (3) Measure an angle of 40°.
- (4) Draw a line through the angle to the arc.
- (5) Join up the end of the lines.



Never erase your construction lines!

### Constructing ASA Triangles

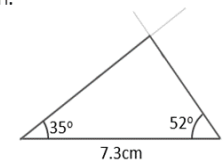
Angle Side Angle



Using a ruler, compass and protractor, construct the following ASA triangle accurately

- (1) Draw a 7.3cm line with a ruler.
- (2) Measure both angles.
- (3) Draw a feint line through each angle and label them.
- (4) Draw a solid line over each feint line up to the intersection.

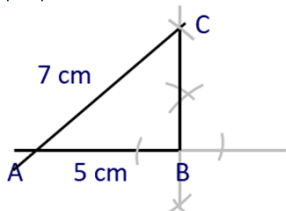
Never erase your construction lines!



### Constructing RHS Triangles

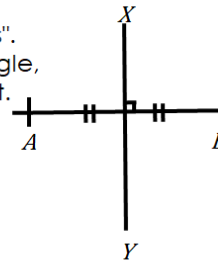
For example, construct triangle ABC with AB = 5cm, BC = 90° and AC = 7cm.

- Step 1: Start by drawing side AB with a ruler.
- Step 2: Extend AB and use compasses to construct a perpendicular at point B.
- Step 3: Open the compasses to 7cm.
- Step 4: Place the compass needle on A and draw an arc on the perpendicular.



### Perpendicular

Perpendicular means "at right angles".  
A line meeting another at a right angle, or 90° is said to be perpendicular to it.



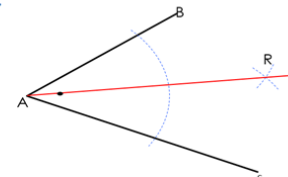
### Bisector

A bisector is something that cuts an object into two equal parts. It is applied to angles and line segments. We say that it bisects the other object.

### Angle bisector

Straight edge and compass constructions

- Draw an arc, centred on the angle, so that it intersects both sides of the angle
- Draw two more arcs, centred on the intersections, so that they make a third intersection 'within' the angle
- Connect the third intersection to the angle to make the angle bisector
- Any point on the bisector is equidistant from AB and AC










# Year 9 Summer Term Knowledge Organiser Music

## The Elements of Music

Element	Definition
Melody	The main tune or musical theme
Articulation	How the notes are played
Dynamics	How loud and quiet the volume is
Instruments	The apparatus used to make and play the music
Structure	How the sections of music are organised
Harmony	The supporting chords used with the melody
Rhythm	The patterns of notes used and their durations
Tempo	How fast or slow the speed of the music is
Texture	How the layers of music fit together

## Note Durations and Rhythms

Note Symbol	Technical name	Note Duration
	Semi-breve	4 Beats
	Minim	2 Beats
	Crotchet	1 Beat
	Quaver	½ Beat
	Semi-Quaver	¼ Beat



# Year 9 Summer Term Knowledge Organiser Music

## Textures: Key Terms

### Key Term

### Definition

Unison

All instruments playing the same melody at the same time.

Polyphonic

Different melodies played together.

Call and Response

A melodic question and answer made by different instruments.

Canon

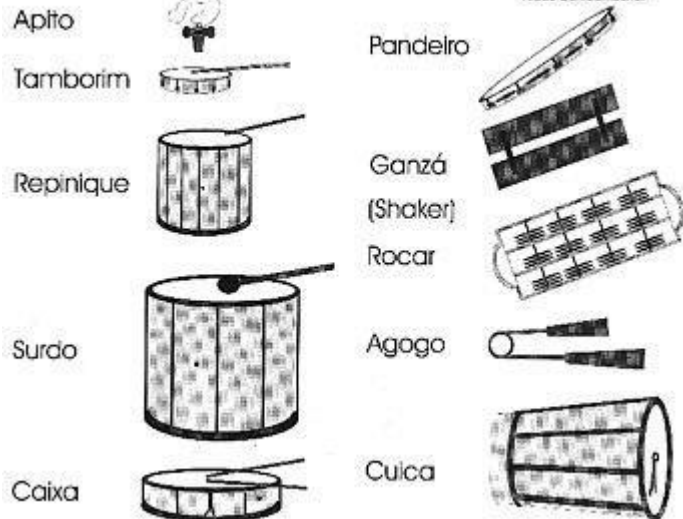
The same melody line is played at different points by different instruments.

## Dynamics: Key Terms

Dynamic symbol	Italian Term	Defintion
	Crescendo	Getting Louder
	De-crescendo	Getting Quieter
<b><i>ff</i></b>	Fortissimo	Very loud
<b><i>f</i></b>	Forte	Loud
<b><i>p</i></b>	Piano	Quiet
<b><i>pp</i></b>	Pianissimo	Very Quiet

### Samba - Batucada - Instrumente

Klaus Schloßmacher



### Harvest Samba



# Poetry Knowledge Organiser Year 9

"Poetry is the spontaneous overflow of powerful emotions"- William Wordsworth

## How to Approach Unseen Poetry

**Form & Structure-** the style of the poem, its rhyme, rhythm, and meter, and how it is set out on the page

### STEP ONE:

Read the title – consider meaning.

Look at the shape – is it a particular style (e.g. Sonnet), how many stanzas, line shapes.

Read the poem slowly in your head.

### STEP TWO:

After reading, make interpretations to consider:

- Speaker and tone.
- Subject and setting.
- Themes.
- Mood (positive/negative/funny)

### STEP THREE:

Re-read closely & annotate:

- Repetition/rhythm/rhyme.
- Poetic devices (simile/metaphor/alliteration).
- Language (word) choices – effects and imagery.

### STEP FOUR:

Personal response – what is your personal opinion of the poem, its message and effectiveness?

**Form** – The form of a poem is its physical structure separated into stanzas, line lengths, and rhyme scheme. Here are some common forms of poetry:

**Sonnet** – A short rhyming poem with 14 lines. Sonnets use iambic meter in each line, and use line-ending rhymes.

**Narrative** – Narrative poems tell the story of events through poetry. There are clear characters and plot.

**Free Verse** – Free verse poems do not follow any rules.

**Ballad** – A long poem in short stanzas, normally quatrains (4 lines) that tells a story. They often use repetition.

**Stanzas-** A stanza is a grouped set of lines in a poem, set apart from other lines by a blank line of indentation (like a paragraph). Stanzas are often used to group related ideas, or show content related to a particular time or place. Poets manipulate the number, type, and length of stanzas to aid meaning.

## Key Questions when reading–

- What is the form of the poem? How do you know?
- Does the poem have a regular or irregular structure? Why?
- How many stanzas does it have? What can be read from this?
- Does the poem rhyme? What rhyme scheme does it use? What is the effect of this? Is the rhyme regular or irregular?
- What can be noted about the line length/ metre?
- What rhythm (if any) runs through the poem? Why did the poet include this line length/ metre/ rhythm in the poem?

**Rhyme** - Poets use rhyme for a number of reasons:

-To make a poem more musical and give it a 'beat' or 'rhythm', or to show creativity and sophistication in language.

-To emphasise particular words/sounds that hold value or add meaning to the poem/ its messages;

Poets organise the rhyme in their poems using **Rhyme schemes**: This can help to establish the form – for example, the English sonnet traditionally holds an ABAB-CD-CD-EFEF-GG rhyme scheme.

**Line Type/Length-** Lines of poetry can end in two ways – **enjambment** (the sentence runs over two lines) or **end-stopped**. Writers of poetry can end lines where they choose, meaning that the line type and length is often employed to support meaning. The use of long lines, containing enjambment, for example, can reflect complex or even confusing ideas, whilst short, end-stopped lines may be used for dramatic effect, or to allow the reader to dwell on ideas. If a line of poetry has a punctuated pause in the middle of the line it is called **caesura**.

# Key Poetic Terminology

<b>Interesting Adjectives</b>	Describing words that are specific or beyond the most obvious, creating a clear effect	"Parting with his poison – Flash of <u>diabolic</u> tail in the <u>dark</u> room - he risked the rain again."
<b>Interesting Verbs</b>	Doing words that are specific or beyond the most obvious, creating a clear effect.	" <u>Stumbling</u> across a field of clods towards a green hedge That <u>dazzled</u> with rifle fire, hearing Bullets <u>smacking</u> the belly out of the air"
<b>Imagery</b>	Words or phrases that appeal to any sense or any combination of senses.	Yellow, and black, and pale, and hectic red, Pestilence-stricken multitudes: O thou, Who chariotest to their dark wintry bed"
<b>Similes</b>	A comparison between two objects using "like" or "as"	"O my Luve is like a red, red rose That's newly sprung in June O my Luve is like the melody That's sweetly played in tune."
<b>Metaphors</b>	A comparison between two things in order to give clearer meaning to one of them.	"Hope' is the thing with feathers— / That perches in the soul And sings the tune without the words/ And never stops - at all"
<b>Alliteration</b>	The repetition of initial consonant sounds	"With <u>swift, slow; sweet, sour; adazzle, dim;</u> He fathers-forth whose beauty is past change."
<b>Assonance</b>	The repetition of initial consonant sounds	"With its leaping, and <u>deep</u> , cool murmur... ... <u>White</u> and <u>shining</u> in the silver- flecked water."
<b>Repetition</b>	The repeating words, phrases, lines, or stanzas	Keeping <u>time, time, time</u> , In a sort of Runic rhyme, To the tintinnabulation that so musically wells From the <u>bells, bells, bells, bells</u> ,
<b>Onomatopoeia</b>	The use of words which imitate sound	"A child sitting under the piano, in the <u>boom</u> of the <u>tingling</u> strings And pressing the small, poised feet of a mother who smiles as she sings."
<b>Oxymoron</b>	A figure of speech in which apparently contradictory terms appear together.	Down the close, darkening lanes they sang their way To the siding-shed, And lined the train with faces <u>grimly gay</u> ."
<b>Personification</b>	A figure of speech which gives animals, ideas, or inanimate objects human traits or abilities	" <u>Death, be not proud</u> , though some have called thee Mighty and dreadful, for thou art not so;"
<b>Hyperbole</b>	Exaggerated statements or claims not meant to be taken literally	" <u>The sea</u> him lent those bitter tears Which at his eyes he always wears/ And from the winds the sighs he bore, Which through his <u>surgin</u> g breast do roar."

# Year 8 Art and Design Summer Term 3 Knowledge Organiser

## Keywords

1. Formal Elements of Art
2. Line
3. Shape
4. Tone and Form
5. Texture
6. Colour Theory
7. The Colour Wheel
8. Pattern

**Line** A Line is a mark or link between two points.

**Shape** Shape is a flat, enclosed area such as a square or triangle.

**Tone** Tone refers to the light and dark values of an object when drawing. There are three different types of tone: shadows, mid tones and high lights.

**Form** A form can refer to a three-dimensional composition or object.

**Texture** The texture stimulates two different senses: sight and touch.

**Colour** Colour is the element of art that is produced when light, striking an object, is reflected back to the eye. Harmonious colours sit beside each other on the colour wheel.

**Pattern** A repeated decorative design.

## The Formal Elements of Art

The formal elements of art are used to make a piece of artwork. The art elements are line, shape, form, tone, texture, pattern, colour and composition. They are often used together, and how they are organised in a piece of art determines what the finished piece will look like.

## Mark Making

Mark making describes the different lines, dots, marks, patterns and textures we create in an artwork. Artists use gesture to express their feeling and emotions in response to something seen or something felt.

## Colour Wheel

A colour wheel is an illustrative organisation of colour hues around a circle, which shows the relationships between primary colours, secondary colours and tertiary colours.

**Warm colours:**  
red, orange, yellow

**Cold colours:**  
blue, purple, green

## Colour Theory

### Primary:

red, yellow, blue

### Secondary:

orange, green, purple

### Tertiary:

Secondary + Primary

**Shades:** add black

**Tint:** add white





# Year 8 Art and Design Summer Term 3 Knowledge Organiser

## Modernism

Modernism is the name given to an art movement that took place in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries.

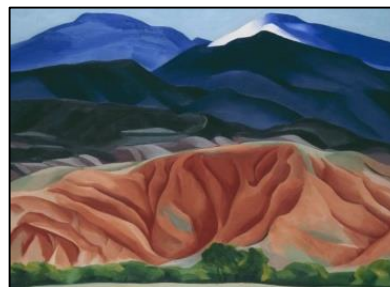
Modernism rejected the traditional way of doing things. In art, painters replaced the traditions of the past with experimentation and new ways of presenting things.

Modernism allowed artists to present their own individual view of ideas, including unique imagery, and adopting light, colour, form and atmosphere to reach their own vision.



## Key Terms

Natural and Manmade Forms



## Georgia O'Keeffe

Georgia O'Keeffe was an American artist, who is often considered the mother of modernism.

She painted nature in a way that showed her feelings. She particularly enjoyed painting flowers and desert landscapes.

She was the first female painter to gain respect in New York's art world in the 1920s.

She created a unique way of painting nature, simplifying shapes and forms. This led many to call her a 'pioneer' of modern art.



# Year 8 Art and Design Summer Term 3 Knowledge Organiser

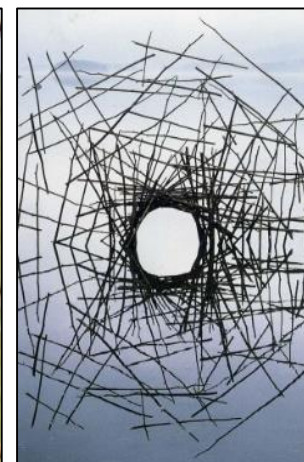
## Sculpture



Sculpture is a type of visual art that operates in three dimensions (as opposed to 2-D art - paintings).

Sculpting used to always consist of carving into stone, metals, ceramics and wood, but since the Modernism era in the 19<sup>th</sup>/20<sup>th</sup> centuries, there is now more freedom in materials used and the process.

Modern sculptures can use almost any material, and can involve assembling, welding, casting and modelling.



## Key Terms

Materials

Media

## Earth Art



Earth art is also known as land art or Earthworks.

It is an art movement that began in the 1960s and 1970s, mainly taking place in the UK and the USA.

This type of art uses the materials of the earth for building sculptures.

Examples of materials used could be rocks, soils, plants, water, and vegetation.

Due to the rural (and sometimes inaccessible) setting of Earth art, many sculptors choose to take photographs of their work to use in art galleries.

Andy Goldsworthy is a British sculptor, photographer and environmentalist.

He likes to create works in a natural landscape, using natural materials.

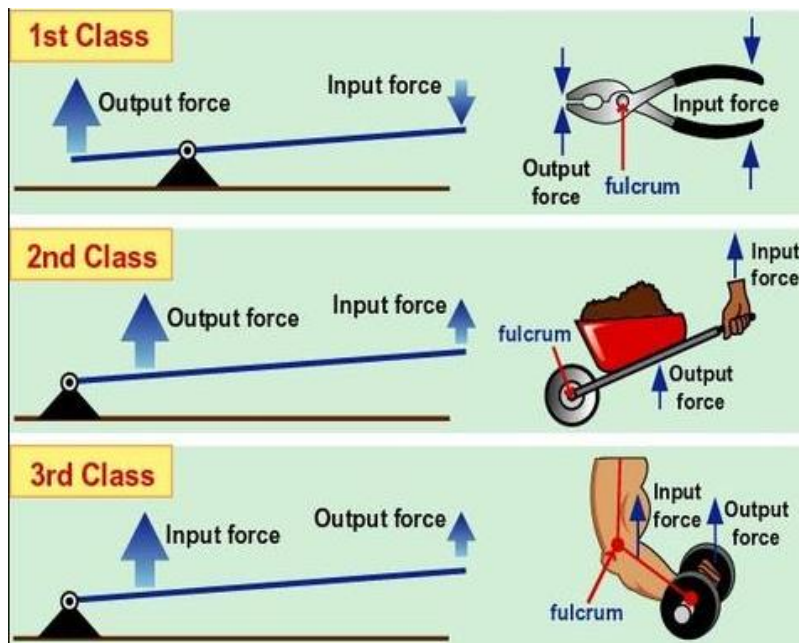
The materials used in his art often include brightly coloured flowers, icicles, leaves, mud, pinecones, snow, stone, twigs, and thorns.

# Year 9 Design Technology Summer Term 3 Knowledge Organiser

## Key Vocabulary

Form  
Function  
Equilibrium  
Orthographic  
Isometric  
Radius  
Diameter  
Lever  
Fulcrum  
Input  
Output  
Beam  
Force  
Design  
Model  
Prototype  
Client  
Manufacture  
Packaging  
Make  
Tools and Equipment  
Health and Safety

## Bottle Balance Project



## Evaluating

I was pleased with the bottle holder because...

It would be better if...

The material was...

People said...

It did balance, so...

I could improve it by...

If there was more time I would... because...

Graphics could be used to....

The laser cutter could be used to...

## Health and Safety

**Follow the teacher's instructions carefully.**

Remove any jewellery and tie back long hair. Wear an apron and roll up your sleeves. Walk safely and calmly around the classroom/ workshop. Keep your work area and floor area clear. Make sure that you are wearing the correct equipment for tasks. Report all spillages and clean up properly after yourself.

# Year 9 Design Technology Summer Term 3 Knowledge Organiser

**Mechanisms:** Mechanisms are the parts that make something work.

## Sliders and Levers

Mechanisms are all around us! Most objects that help us in our lives are made up of different mechanisms.

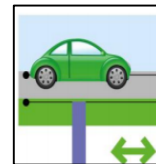
Sliders and Levers are mechanisms that make things move.

Sliders help to move things from side to side and up and down.

Levers are slightly more complex. They use a fulcrum (a fixed point around which the lever can pivot) to make things move in arc (curve).

## Designing

Effective sliders and levers should move smoothly and should create a movement that is appropriate to the subject matter.



### Sliders

Consider where you will place the slot, and how long it will be. This will change how far your slider can slide! You also need to consider where to put your guide, so that the slider only moves where you want it to.

### Levers

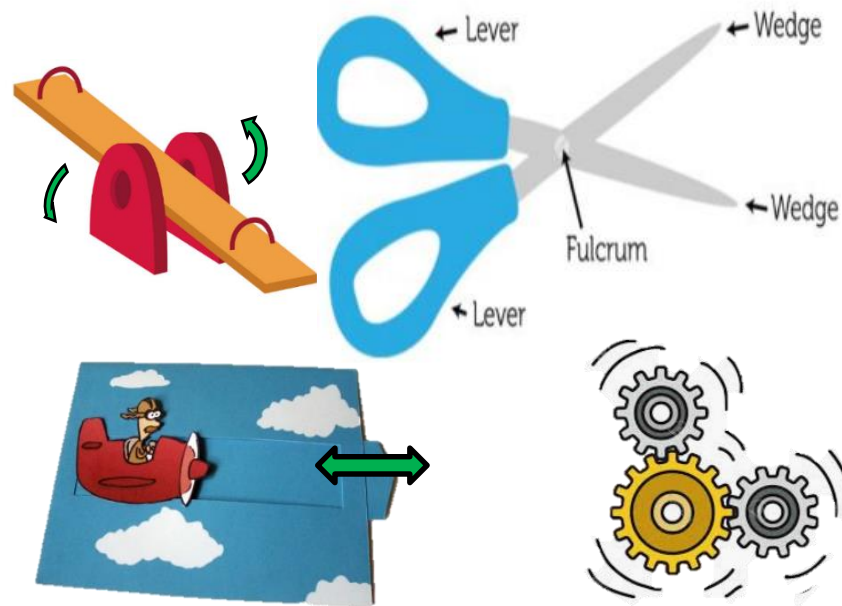
Consider where you will position the fulcrum. The further it is from the object, the more that the subject at the end of your lever can move!

## Example Mechanisms

A seesaw is one example of a lever mechanism. Seesaws are a narrow board supported by a fulcrum in the middle point between the two ends. As one end goes up, the other comes down!

Scissors are another example of a lever mechanism. Scissors have two levers fixed. Handles are squeezed at one end of the levers, the blades come together at the other end.

Some children's books contain slider mechanisms. As the slider is pushed/pulled, characters/objects move up and down or side to side in the book. Drawers also work on a slider mechanism. As you pull/push the handle, drawers slide along a slider track inside the cabinet.





# Year 9 Food and Nutrition Summer Term 3 Knowledge Organiser

**In order to stay healthy, it is important that we eat a balanced diet of foods from each of the five food groups.**



## The Eatwell Guide

Covers 5 main food groups and is suitable for most people over 2 years of age. The guide shows the proportions in which different groups of foods are needed in order to have a well-balanced and healthy diet. The guide shows proportions representative of food eaten over a day or more.

We should aim to eat 5 portions of fruit and veg per day.

To build strong bones and muscles, we should eat enough proteins and dairy.

Try to avoid eating too many fatty or sugary foods. They can make you unhealthy and can damage your teeth.

## There are five main food groups:



**Fruit and vegetables:** For example, apples, tomatoes, lettuce. They contain vitamins and minerals.

**Carbohydrates:** For example, starchy foods like bread and pasta. They give us lots of energy!

**Proteins:** For example, beans, fish, eggs, meat. They help us to build muscle.

**Dairy:** For example, milk, butter, cheese. They contain calcium for our bones.

**Fats and Sugars:** Add fat storage for energy.





# Year 9 Food and Nutrition Summer Term 3 Knowledge Organiser

**In order to stay healthy, it is important that we eat a balanced diet of foods from each of the five food groups.**

## Hydration

- Aim to drink 6-8 glasses of fluid every day
- Water, lower fat milk and sugar-free drinks including tea and coffee all count
- Fruit juice and smoothies also count but should be limited to no more than a combined total of 150ml per day.

## Fibre

- Dietary fibre is a type of carbohydrate found in plant foods
- Food examples include wholegrain cereals and cereal products; oats; beans; lentils; fruit; vegetables; nuts; and, seeds
- Dietary fibre helps to: reduce the risk of heart disease, diabetes and some cancers; help weight control; bulk up stools; prevent constipation; improve gut health
- The recommended average intake for dietary fibre is 30g per day for adults.

## Food Sources

A food source is the place where a food comes from. Food comes from plants and animals. It is important to know exactly where our food comes from!

### From Source to Plate

For us to get food, we need to grow it, raise it, or catch it.

- ✓ Grow it
- ✓ Raise it
- ✓ Catch it

Farms up and down the country grow fruit and vegetables and raise animals for meat and dairy.

Wild plant and animal food can be found in the countryside.

The foods we eat can come from all over the world.

**India:** Herbs and Spices



## Food from Around the World

### Key terms

**The Eatwell Guide:** A healthy eating model showing the types and proportions of foods needed in the diet.

**Hydration:** The process of replacing water in the body.

**Dietary fibre:** A type of carbohydrate found in plant foods.

**Composite/combination food:** Food made with ingredients from more than one food group.

# Year 9 Food and Nutrition Summer Term 3 Knowledge Organiser

## Key Vocabulary

Food



Nutrition

Eatwell Guide



Carbohydrates



Proteins

Fat

Hydration

Fibre

Equipment

Ingredients

Recipe

Mixing

Weighing

Baking

Grilling

## Health and Safety

## Preparing Processes

Preparing processes are the different ways that we get food ready to be eaten.

Mixing: to blend ingredients together, using a spoon, blender, or whisk.

Weighing/measuring: to get the right amount of an ingredient, using scales, tablespoons, or teaspoons.

Knife Skills: Bridge and claw methods.



## Cooking Processes

Cooking processes are the different ways that we heat food before it is eaten.

Baking: to cook food in a heated oven. Make sure that you select the right temperature!

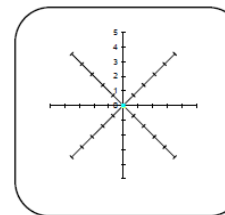
Grilling: to cook food by putting it under a hot grill (like a radiator in a cooker).

**Washing your hands should be done before, during and after preparing food.**



## Evaluating

Use a range of sensory words to explain and comment on your product.



Comment on the aroma, appearance, taste and texture of your Food product.

What changes/adaptations could you make to improve your dish?

**Follow the teacher's instructions carefully.**

**Remove any jewellery and tie back long hair.**

**Wear an apron and roll up your sleeves.**

**Wash your hands with hot water and antibacterial soap.**

**Use different chopping boards and knives for raw meat and other foods.**

**Check that food is cooked right the way through.**

**Make sure that you clean up properly after yourself.**

## Glossary

**Altruism:** selfless concern for others.

**Conscience:** An inner sense (or 'voice') which communicates what is right or wrong in one's behaviour.

**Egoism:** an ethical theory that treats self-interest as the foundation of morality.

**Humanist:** Humanists believe that human experience and rational thinking provide the only source of knowledge and moral code to live by.

**Normative ethics:** A branch of moral philosophy, or ethics, concerned with criteria of what is right and wrong.

**Teleological:** Greek (telos), meaning end, goal or purpose. A moral theory will consider the purpose of moral behaviour to decide whether it is good.

**Utilitarianism:** the doctrine that actions are right if they are useful or for the benefit of a majority.

## The Conscience:

Some Christians believe that the conscience is the **voice of God**. God is speaking to individuals, guiding them to do the right thing in a given situation.

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Conscience can be described a **moral sense of right and wrong**.

An individual can educate their conscience through prayer, scripture, and experience. Indeed the scriptures state that even those who do not have faith to follow still have their conscience.

## Humanism:

Humanists reject the idea or belief in a supernatural being such as God. This means that humanist's class themselves as agnostic or atheist.

---

Humanists base their moral and ethical decision-making on **reason, empathy** and **compassion** for others.

The **British Humanist Society** works on behalf of non-religious people who seek to live **ethical lives** on the basis of **reason** and **humanity**.

## Utilitarianism:

In its simplest form Utilitarianism is a theory that says that you should decide what you do in order to provide the **most happiness** and the **least pain** in a situation.

---

**Jeremy Bentham** (1748-1832) stated that naturally we are ruled by two key things - **pleasure and pain** - two basic instincts. Bentham said that we need to look at the possible things we might do and the various outcomes and calculate how much pleasure and pain they might create, finally choosing the one that best maximises pleasure and minimises pain.

## Egoism:

As a normative ethic, egoism is **teleological**, with the goal of achieving one's own self-interest

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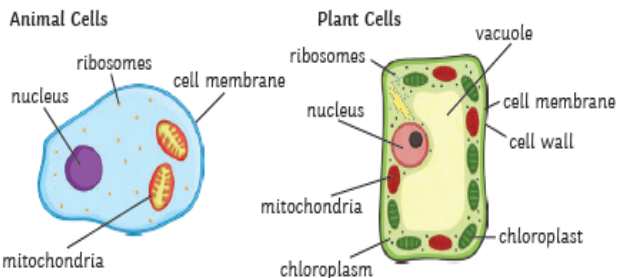
Egoism claims that actions that seem **altruistic** are done out of self-interest.

The **Golden Rule** in Christianity is a good example: '*Do to others as you would have them do to you*' is the claim that if you treat others well, they will treat you well when you need it. Altruism is ultimately egoistic.

# Year 9 Science Knowledge Organiser-Term 3

## Cell Division & Organisation 1

### Prokaryotic and Eukaryotic Cells

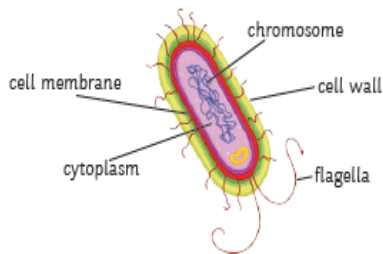


Plant and animal cells have similarities and differences:

	Animal	Plant
nucleus	✓	✓
cytoplasm	✓	✓
chloroplast	X	✓
cell membrane	✓	✓
permanent vacuole	X	✓
mitochondria	✓	✓
ribosomes	✓	✓
cell wall	X	✓

### Bacterial Cells

Bacterial cells do not have a true nucleus, they just have a single strand of DNA that floats in the cytoplasm. They contain a plasmid.



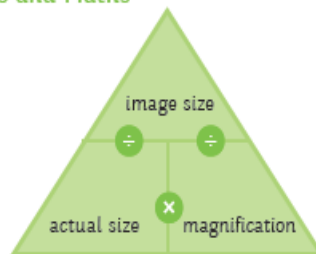
### Specialised Cells

When a cell changes to become a specialised cell, it is called differentiation.

Specialised Cell	Function	Adaptation
sperm	To get the male DNA to the female DNA.	Streamlined head, long tail, lots of mitochondria to provide energy.
nerve	To send electrical impulses around the body.	Long to cover more distance. Has branched connections to connect in a network.
muscle	To contract quickly.	Long and contain lots of mitochondria for energy.
root hair	To absorb water from the soil.	A large surface area to absorb more water.
phloem	Transports substances around the plant.	Pores to allow cell sap to flow. Cells are long and joined end-to-end.
xylem	Transports water through the plant.	Hollow in the centre. Tubes are joined end-to-end.

### Equations and Maths

Equation



### Maths Skills

Conversions:

Micrometres to millimetres: divide by 1000.

Standard Form:

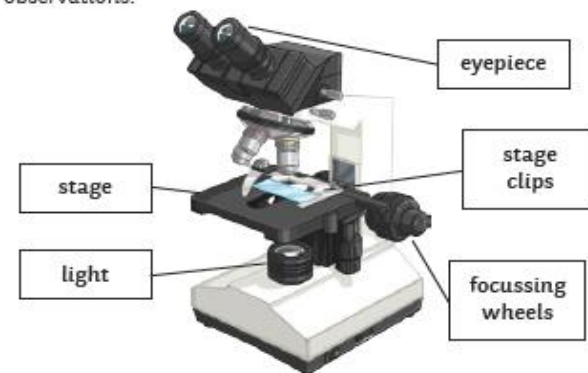
$0.003 = 3 \times 10^{-3}$

$5.6 \times 10^{-5} = 0.0056$

### Required Practical

#### Microscopy Required Practical

- Includes preparing a slide, using a light microscope, drawing any observations – use a pencil and label important observations.



#### Osmosis and Potato Practical

- Independent variable – concentration.
- Dependent variable – change in mass.
- Control variable – volume of solution, temperature, time, surface area of the potato.

The potato in the sugar solution will lose water and so will have less mass at the end; the potato in the pure water solution will gain water.





# Year 9 Science Knowledge Organiser-Term 3

## Cell Division & Organisation 2

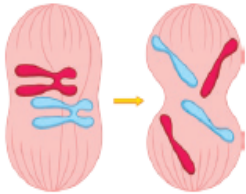
### Chromosomes and Mitosis

In the nucleus of a human cell there are 23 pairs of **chromosomes**. Chromosomes contain a double helix of **DNA**. Chromosomes have a large number of genes.



The cell cycle makes new cells.

Mitosis: DNA has to be **copied/replicated** before the cell carries out mitosis.



### Key Vocabulary

active transport  
alveoli  
chromosome  
diffusion  
eukaryotic  
gas exchange  
mitosis  
multicellular  
osmosis  
prokaryotic  
undifferentiated  
replicated  
specialised  
villi

### Stem Cells

Embryonic stem cells are **undifferentiated** cells, they have the potential to turn into any kind of cell.



Adult stem cells are found in the bone marrow, they can only turn into some types of cells e.g. blood cells.

Uses of stem cells:

- Replacing faulty blood cells;
- making insulin producing cells;
- making nerve cells.

Some people are against stem cell research.

For Stem Cell Research	Against Stem Cell Research
Curing patients with stem cells - more important than the rights of embryos.	Embryos are human life.
They are just using unwanted embryos from fertility clinics, which would normally be destroyed.	Scientists should find other sources of stem cells.

### Stem Cells in Plants

In plants, stem cells are found in the **meristem**. These stem cells are able to produce clones of the plant. They can be used to grow crops with specific features for a farmer, e.g. disease resistant.

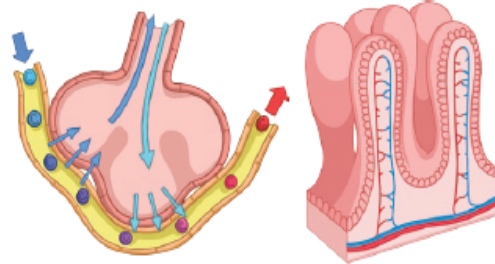
### Exchange – Humans

Multicellular organisms have a large surface area to volume ratio so that all the substances can be exchanged.

Gas exchange: Lungs

The alveoli are where gas exchange takes place.

They have a large surface area, moist lining, thin walls and a good blood supply.

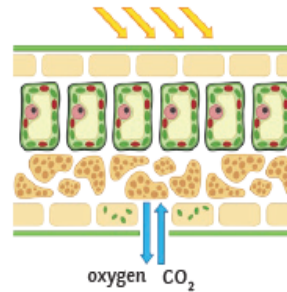


### Villi: Small Intestine

Millions of villi line the small intestine increasing the surface area to absorb more digested food.

They are a single layer of cells with a good blood supply.

### Exchange in Plants



The surface of the leaf is flattened to increase the surface area for more gas exchange by diffusion.

Oxygen and water vapour diffuse out of the stomata. Guard cells open and close the stomata, controlling water loss.

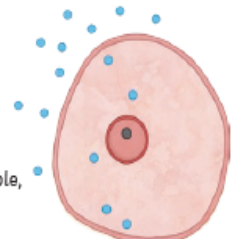
### Key Processes

**Diffusion** is the spreading out of particles from an area of higher concentration to an area of lower concentration.

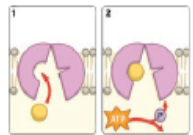
Cell membranes are semi-permeable, only small molecules can get through.

**Osmosis** is the movement of water molecules across a partially permeable membrane from a region of higher concentration to a region of lower concentration.

**Active transport** is the movement of substances against the concentration gradient. This process requires energy from respiration.



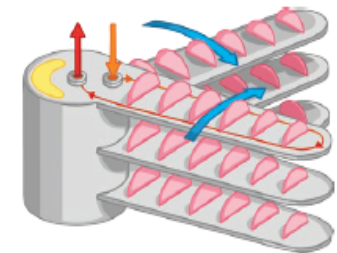
Cell Diffusion



Active Transport in Cells

### Exchange in Fish

Fish have a large surface area for gas exchange. These are called gills. Water enters the fish through the mouth and goes out through the gills. The oxygen is transported from the water to the blood by **diffusion**. Carbon dioxide diffuses from the blood to the water. Each gill has gill filaments which give the gills a large surface area. **Lamellae** cover each gill filament to further increase the surface area for more gas exchange. They have a thin surface layer and capillaries for good blood supply which helps with diffusion.

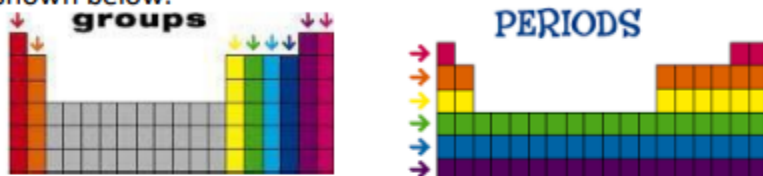




# Year 9 Science Knowledge Organiser-Term 3

## Elements

- An **element** contains only one type of atom. All elements are given a symbol and are found on the periodic table. You need to learn the symbols for the first 20.
- The Periodic Table is arranged into groups (columns) and periods (rows), as shown below.



Elements in the same group have:

- The same number of electrons in their outer shell
- Similar properties

Elements in the same period have:

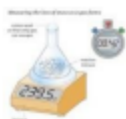
- The same number of electron shells

## Compounds

- Compounds are 2 or more elements that are chemically bonded
- These are made in chemical reactions.
- Compounds are given a formula for example carbon dioxide is  $\text{CO}_2$  means 1 carbon atom and 2 oxygen atoms.
- Another example is calcium hydroxide  $\text{Ca}(\text{OH})_2$  which means 1 calcium, 2 oxygen atoms and 2 hydrogen atoms

## Chemical Reactions

- In some chemical reactions it may appear that there are less products than there were reactants; however this is often because a gas has been made and this has escaped into the atmosphere.



Key Terms	Definitions
Element	A substance that contains only one type of atom
Mixture	A mixture is two or more different atoms which are not chemically bonded – can be separated
Compound	Two or more elements that are chemically bonded
Group	The columns on the Periodic Table
Period	The rows on the Periodic Table
Reactant	What you start with in a chemical reaction
Product	What is made in a chemical reaction

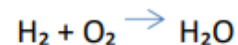
## The Conservation of Mass

- In a chemical reaction, chemical bonds are broken the atoms are rearranged and the chemical bonds are made again.
- In a chemical reaction, **mass is never lost**, you must start and finish with the same mass.

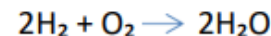


## Balancing Equations

- We need to write balanced chemical equations represent chemical reactions and the conservation of mass.
- For example: The equation below shows hydrogen and oxygen making water but there are more oxygen atoms on the right than the left.



- In the equation below there are 4 hydrogen atoms on the left and right of the equation and 2 oxygen atoms on each side



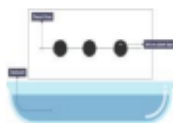
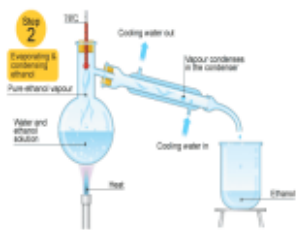
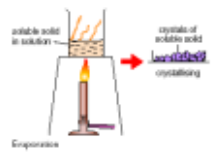
# Year 9 Science Knowledge Organiser-Term 3

## Pure and Impure Substances

- A pure substance contains only one type of **element** or **compound**.
- **An impure substance** contains more than one type of element or compound in a mixture, for example salt water contains NaCl and H<sub>2</sub>O. All mixtures are impure substances.
- Mixtures are much easier to separate than elements or compounds as they are not chemically bonded
- There are a variety of ways that mixtures can be separated and they are outlined below. Remember that these are all physical changes and chemical bonds are not broken during any of these processes.

Key Terms	Definitions
Pure	A substance made of only ONE type of element or compound
Impure	A mixture of elements and/or compounds
Chromatography	A technique where mixtures can be separated based on their solubility.
Distillation	A separation technique which means a mixture of two liquids is heated
Crystallisation	Method of mixture separation where a solvent is evaporated, leaving the solute behind.

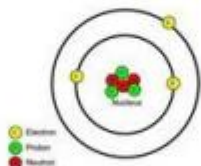
## Separating Impure Substance

Name	Diagram	Explanation
Chromatography		<ul style="list-style-type: none"> <li>• Different substances travel different distances up the paper depending on their solubility in the solvent used (it is often water but not always). The more soluble, the further it moves up the paper</li> <li>• Line must be drawn with pencil because pencil will not run.</li> <li>• Artificial colours in foods can be identified using chromatography. Additives do not necessarily have a colour and therefore are identified using chemical analysis.</li> </ul>
Distillation		<ul style="list-style-type: none"> <li>• <b>Distillation</b> is when two liquids with <i>different boiling points</i> are separated</li> <li>• For example ethanol (alcohol) boils at 78 °C and water boils at 100°C</li> <li>• If you heat a mixture of water and ethanol to 80°C the ethanol will <b>evaporate</b> but the water will not.</li> <li>• You then <b>condense</b> the ethanol and collect the pure ethanol</li> </ul>
Crystallisation		<ul style="list-style-type: none"> <li>• Crystallisation is when a solvent is evaporated from a solute.</li> </ul>

# Year 9 Science Knowledge Organiser-Term 3

## The structure of the Atom

- All matter is made from atoms. Atoms are very small. The radius of atom is about  $1 \times 10^{-10}$  m (this is also known as 0.1 nanometres).
- The central part of the atom is known as the nucleus. It is only  $1 \times 10^{-14}$  m across, which is 10,000 times smaller than the total atom.
- An atom is made up of three subatomic particles: **protons**, **electrons** and **neutrons**.
- Protons and neutrons are found in the nucleus
- Electrons are found orbiting the nucleus in shells (also known as *energy levels*).

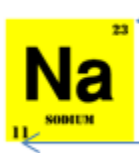


- The mass and charges of the sub atomic particles is shown below:

	Mass	Charge
Proton	1	+1
Neutron	1	0
Electron	0	-1

- Atoms have **no overall charge** because they have the same number of positive protons as negative electrons.

## Atomic Number and Mass Number



← Mass number: This is the total of protons+neutrons

← Atomic number: This is the number of protons

Therefore sodium has 11 protons, 11 electrons and  $23 - 11 = 12$  neutrons

Key Terms	Definitions
Atom	The particles that make up all substances with mass, they contain protons, neutrons and electrons.
Nucleus	The centre of an atom, it contains protons and neutrons.
Nanometre	A unit of measurement: $1 \times 10^{-9}$ m
Proton	A sub atomic particle found in the nucleus, it has a charge of +1 and a relative mass of 1.
Electron	A sub atomic particle found in the shells of an atom, it has a charge of -1 and a negligible mass
Subatomic	These are the smaller particles that make up an atom
Neutron	A sub atomic particle found in the nucleus of an atom, it has a charge of 0 and a mass of 1
Atomic Number	The number of protons in an atom.
Mass Number	The total of protons and neutrons in an atom.

## Electron Configuration

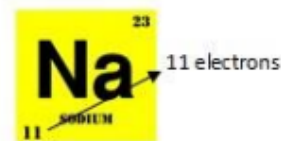
There are very strict rules about how electrons fill up the electron shells, the inner shell is always filled first. Each shell has a maximum number of electrons it can take.

Shell 1: maximum 2 electrons

Shell 2: maximum 8 electrons

Shell 3: maximum 8 electrons

Example:



The electronic configuration of Sodium (Na) can also be written like this 2,8,1. This shows there is 2 electrons in the 1st shell, 8 electrons in the second shell and 1 electron in the 3rd shell.

# Year 9 Science Knowledge Organiser-Term 3

## Energy & Energy Resources 1

### Required Practical

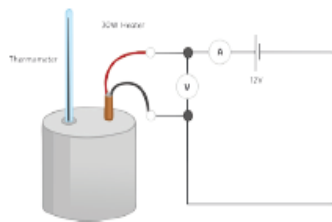
#### Investigating Specific Heat Capacity

independent variable – material

dependent variable – specific heat capacity

control variables – insulating layer, initial temperature, time taken

$$\Delta E = m \times c \times \Delta\theta$$



#### Method:

- Using the balance, measure and record the mass of the copper block in kg.
- Wrap the insulation around the block.
- Put the heater into the large hole in the block and the block onto the heatproof mat.
- Connect the power pack and ammeter in series and the voltmeter across the power pack.
- Using the pipette, put a drop of water into the small hole.
- Put the thermometer into the small hole and measure the temperature.
- Switch the power pack to 12V and turn it on.
- Read and record the voltmeter and ammeter readings – during the experiment, they shouldn't change.
- Turn on the stop clock and record the temperature every minute for 10 minutes.
- Record the results in the table.
- Calculate work done and plot a line graph of work done against temperature.

### Equations

$$E = \frac{1}{2}mv^2$$

$$E_p = mgh$$

$$E_e = \frac{1}{2}ke^2$$

$$\Delta E = m \times c \times \Delta\theta$$

$$P = \frac{E}{t}$$

$$P = \frac{W}{t}$$

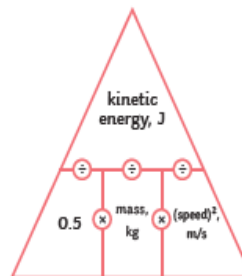
### Kinetic and Potential Energy Stores

#### Movement Energy

kinetic energy –  $\frac{1}{2} \times \text{mass} \times \text{speed}^2$

$$E_k = \frac{1}{2}mv^2$$

(J) (kg)(m/s)

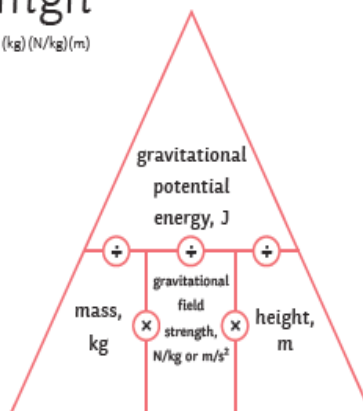


When something is off the ground, it has gravitational potential energy

gravitational potential energy – mass x gravitational field strength x height

$$E_p = mgh$$

(J) (kg)(N/kg)(m)



When an object falls, it loses gravitational potential energy and gains kinetic energy.

Stretching an object will give it elastic potential energy.

elastic potential energy –  $\frac{1}{2} \times \text{spring constant} \times \text{extension}^2$

$$E_e = \frac{1}{2}ke^2$$

(J) (N/m)

#### Transferring Energy by Heating

Heating a material transfers the energy to its thermal energy store - the temperature increases.

E.g. a kettle: energy is transferred to the thermal energy store of the kettle. Energy is then transferred by heating to the water's thermal energy store. The temperature of the water will then increase.

Some materials need more energy to increase their temperature than others.

change in thermal energy – mass x specific heat capacity x temperature change

$$\Delta E = m \times c \times \Delta\theta$$

(J) (kg) (J/kg°C) (°C)

Specific heat capacity is the amount of energy needed to raise the temperature of 1kg of a material by 1°C.



# Year 9 Science Knowledge Organiser-Term 3

## Energy & Energy Resources 2

### Energy Stores and Systems

#### Energy Stores

kinetic	Moving objects have kinetic energy.
thermal	All objects have thermal energy.
chemical	Anything that can release energy during a chemical reaction.
elastic potential	Things that are stretched.
gravitational potential	Anything that is raised.
electrostatic	Charges that attract or repel.
magnetic	Magnets that attract or repel.
nuclear	The nucleus of an atom releases energy.

Energy can be transferred in the following ways:

mechanically – when work is done;

electrically – when moving charge does work;

heating – when energy is transferred from a hotter object to a colder object.

### Conservation of Energy

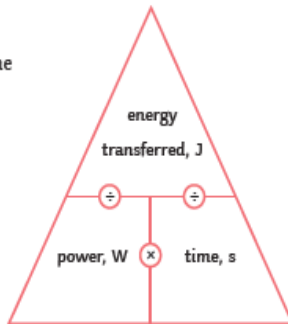
Energy can never be created or destroyed, just transferred from one form to another. Some energy is transferred usefully and some energy gets transferred into the environment. This is mostly wasted energy.

### Power

Power is the rate of transfer of energy – the amount of work done in a given time.

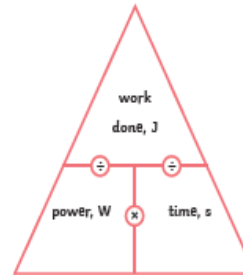
power = energy transferred ÷ time

$$P (W) = E (J) \div t (s)$$



power = work done ÷ time

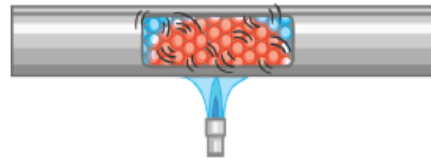
$$P (W) = W (J) \div t (s)$$



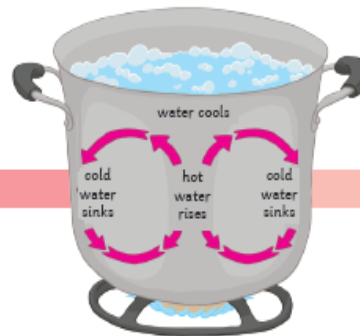
### Energy Transfer

**Lubrication** reduces the amount of friction. When an object moves, there are frictional forces acting. Some energy is lost into the environment. Lubricants, such as oil, can be used to reduce the friction between the surfaces.

**Conduction** – when a solid is heated, the particles vibrate and collide more, and the energy is transferred.

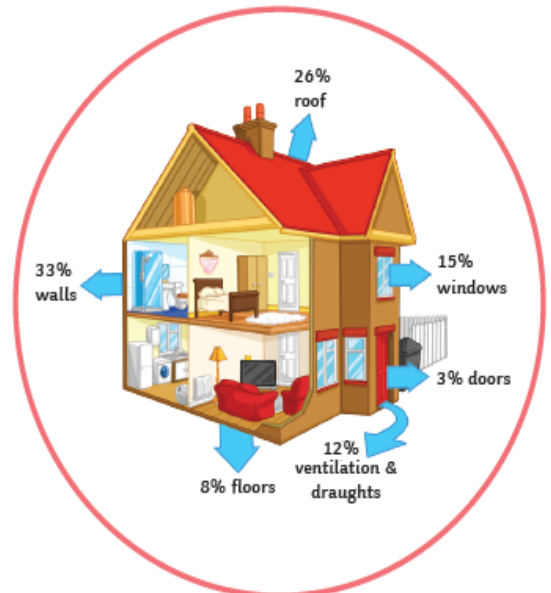


**Convection** – when a liquid or a gas is heated, the particles move faster. This means the liquid or gas becomes less dense. The denser region will rise above the cooler region. This is a convection current.



**Insulation** – reduces the amount of heat lost. In your home, you can prevent heat loss in a number of ways:

- thick walls;
- thermal insulation, such as:
- loft insulation (reducing convection);
- cavity walls (reduces conduction and convection);
- double glazing (reduces conduction).





# Year 9 Science Knowledge Organiser-Term 3

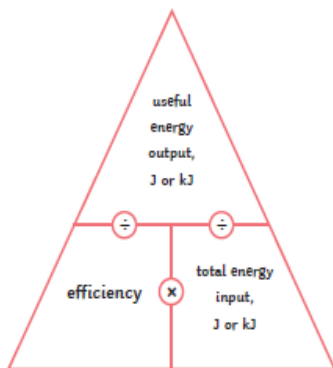
## Energy & Energy Resources 3

### Efficiency

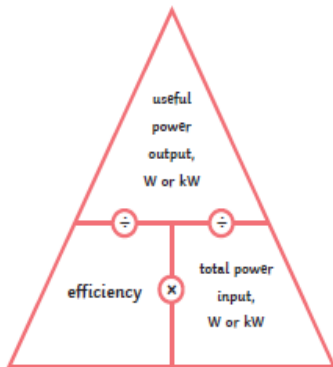
When energy is transferred, some energy is wasted. The less energy that is wasted during the transfer, the more efficient the transfer.

There are two equations to calculate efficiency:

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



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



Some energy is always wasted. Nothing is 100% efficient.

### Efficiency

Non-renewable – coal, oil, gas - they will all run out, they damage the environment, but provide most of the energy.

Renewable – they will never run out, can be unreliable and do not provide as much energy.

Energy Resource	Advantages	Disadvantages
solar – using sunlight	Renewable, no pollution, in sunny countries it is very reliable.	Lots of energy needed to build, only works during the day, cannot increase power if needed.
geothermal – using the energy of hot rocks	Renewable and reliable as the rocks are always hot. Power stations have a small impact on environment.	May release some greenhouse gases and only found in specific places.
wind – using turbines	Renewable, no pollution, no lasting damage to the environment, minimal running cost.	Not as reliable, do not work when there is no wind, cannot increase supply if needed.
hydroelectric – uses a dam	Renewable, no pollution, can increase supply if needed.	A big impact on the environment. Animals and plants may lose their habitats.
wave power – wave powered turbines	Renewable, no pollution.	Disturbs the seabed and habitats of animals. Unreliable.
tidal barrages – big dams across rivers	Renewable, very reliable, no pollution.	Changes the habitats of wildlife, fish can be killed in the turbines.
biofuels	Renewable, reliable, carbon neutral.	High costs, growing biofuels may cause a problem with regards to space, clearance of natural forests.
non-renewable – fossil fuels	Reliable, enough to meet current demand, can produce more energy when there is more demand.	Running out, release CO <sub>2</sub> , leading to global warming, and also release SO <sub>2</sub> which causes acid rain.

**Trends in energy resources** – most of our electricity is generated by burning fossil fuels and nuclear. The UK is trying to increase the amount of renewable energy resources. The governments are aware that non-renewable energy resources are running out; targets of renewable resources have been set. Electric and hybrid cars are also now on the market.

However, changing the fuels we use and building renewable power plants cost money. Many people are against the building of the plants near them and do not want to pay the extra in their energy bills. Hybrid and electric cars are also quite expensive.

**¿En qué trabajas?** *What's your job?*  
 Soy... *I am...*  
 camarero/a *a waiter*  
 cocinero/a *a cook*  
 dependiente/a *a shop assistant*  
 jardinero/a *a gardener*  
 limpiador(a) *a cleaner*  
 peluquero/a *a hairdresser*  
 recepcionista *a receptionist*

**¿Qué tipo de persona eres?** *What type of person are you?*  
 En mi opinión, soy... *In my opinion, I am...*  
 Creo que soy... *I believe I am...*  
 muy / bastante... *very / quite...*  
 ambicioso/a *ambitious*  
 hablador(a) *talkative*  
 independiente *independent*  
 inteligente *intelligent*  
 organizado/a *organised*  
 paciente *patient*  
 práctico/a *practical*  
 responsable *responsible*  
 sociable *sociable*  
 trabajador(a) *hard-working*

**¿Qué tal ayer en el trabajo?** *How did you get on at work yesterday?*  
 Por la mañana... *In the morning...*  
 Por la tarde... *In the afternoon...*  
 A la hora de comer... *At lunchtime...*  
 bebí una botella de cola *I drank a bottle of cola*  
 comí una hamburguesa *I ate a hamburger*  
 dormí un poco *I slept for a bit*  
 escuché música *I listened to music*  
 escribí SMS a mis amigos *I wrote text messages to my friends*  
 hablé por Skype™ *I talked on Skype™*  
 jugué a un videojuego *I played a video game*  
 llegué tarde al trabajo *I arrived late for work*  
 perdí mi trabajo *I lost my job*

**¿Cómo es un día típico?** *What is a typical day like?*  
 Escribo correos (electrónicos). *I write emails.*  
 Hago reservas. *I make reservations.*  
 Hago entrevistas. *I do interviews.*  
 Organizo excursiones. *I organise excursions.*  
 Preparo el programa. *I prepare the programme.*  
 Salgo con los grupos. *I go out with the groups.*  
 Trabajo con mi equipo. *I work with my team.*  
 Viajo mucho. *I travel a lot.*  
 Voy a la oficina. *I go to the office.*  
 ¿Qué idiomas hablas? *What languages do you speak?*  
 Hablo español, inglés y alemán. *I speak Spanish, English and German.*  
 Los idiomas son importantes. *Languages are important.*  
 ¿Te gusta tu trabajo? *Do you like your job?*  
 Me encanta mi trabajo porque... *I love my job because...*  
 es muy práctico *it's very practical*  
 es muy variado *it's very varied*  
 Ayer... *Yesterday...*  
 conocí a... *I met...*  
 fui a... *I went to...*  
 hablé con... *I spoke to...*  
 organicé una visita para... *I organised a visit for...*  
 preparé un programa especial *I prepared a special programme*

**Opiniones** *Opinions*  
 ¿Te gusta tu trabajo? *Do you like your job?*  
 (No) Me gusta (nada) mi trabajo porque es... *I (don't) like my job (at all) because it is...*  
 creativo *creative*  
 estresante *stressful*  
 fácil *easy*  
 interesante *interesting*  
 monótono *monotonous*  
 repetitivo *repetitive*  
 Mi jefe/a es severo/a. *My boss is strict.*  
 Los clientes (no) son simpáticos. *The customers are (not) nice.*  
 Los clientes son horribles. *The customers are awful.*

**¿Qué tienes que hacer?** *What do you have to do?*  
 Tengo que... *I have to...*  
 ayudar a los clientes *help customers*  
 cortar el pelo a los clientes *cut customers' hair*  
 hablar por teléfono *speak on the phone*  
 limpiar habitaciones *clean rooms*  
 preparar comida *prepare food*  
 servir en el restaurante *serve in the restaurant*  
 vender productos en la tienda *sell products in the shop*  
**¿Qué te gustaría hacer?** *What would you like to do?*  
 Me gustaría... *I would like...*  
 No me gustaría (nada)... *I wouldn't like... (at all)*  
 trabajar al aire libre *to work in the open air*  
 trabajar con animales *to work with animals*  
 trabajar con niños *to work with children*  
 trabajar en equipo *to work in a team*  
 trabajar en una oficina *to work in an office*  
 trabajar solo/a *to work alone*  
 hacer un trabajo creativo *to do a creative job*  
 hacer un trabajo manual *to do a manual job*  
 Por eso me gustaría ser... *Therefore I would like to be...*  
 cantante *a singer*  
 diseñador(a) *a designer*  
 enfermero/a *a nurse*  
 mecánico/a *a mechanic*  
 periodista *a journalist*  
 policía *a police officer*  
 profesor(a) *a teacher*  
 veterinario/a *a vet*



# Year 9 Drama Summer Term Knowledge Organiser

## Professional Performance Review

Key Vocabulary	Definitions & Explanations	Examples
<b>Creative Intentions</b>	What was the director/ writer/ creator thinking about? Themes / issues / response to stimulus / style/genre / contextual influences / collaboration with other practitioners / influences by other practitioners.	<i>FUP – look at your creative intentions sheet – have you been able to complete all the boxes?</i>
<b>Purpose</b>	Why was it made? to educate / to inform / to entertain to provoke/ to challenge viewpoints / to raise awareness / to celebrate...	<i>This is not a complete list – what other purposes can you think of?</i>
<b>Practitioners' roles, responsibilities and skills</b>	<b>Performance roles e.g. actor / dancer / singer/ puppeteer, etc &amp; Non-performance roles e.g: choreographer /set designer / director / writer etc.</b> Responsibilities: rehearsing /performing /contributing to the creation and development of performance material, e.g. devising, designing, choreographing, directing, writing / refining performance material / managing self and others. <b>Skills: physical, vocal and music skills, managing and directing skills, communication skills used to liaise, direct and perform, creative skills, such as designing set, costume, lighting or sound, writing scripts and composing songs, organisational skills used to put on a performance by a director or choreographer.</b>	<i>You will be expected to research a number of roles within the Performing Arts business, and explore how they work with each other to create a piece, e.g. How does the musical director of Kneehigh work with the director/ writer/ actors when creating a piece like FUP? Music is integral to the piece – look at how their creative process unfolds – it's all on the website. How do roles differ, depending on the company and the performance piece itself?</i>

# Year 9 Drama Summer Term Knowledge Organiser

## Professional Performance Review

Key Vocabulary	Definitions & Explanations	Examples
<b>Processes used in development, rehearsal and performance</b>	Responding to stimulus to generate ideas for performance material / exploring and developing ideas to develop material / discussion with performers / setting tasks for performers / sharing ideas and intentions / teaching material to performers / developing performance material / organising and running rehearsals / refining and adjusting material to make improvements / providing notes and/or feedback on improvements.	<i>What does a good rehearsal look like? Can you use your rehearsal time productively? How do you do this? Do you assign roles? Do you keep track of decisions made? Are you asking other people to feedback their opinions?</i>
<b>Techniques and approaches used in performance</b>	Rehearsal / production / technical rehearsal / dress rehearsal / performance / post-performance evaluation/review.	<i>You need to track your progress from first ideas right through to post-performance evaluation. How have you made progress?</i>
<b>Evidence</b>	As your qualification is based on continual assessment, rather than a terminal exam, you will be able to present your information in a number of ways: <i>extended writing, a blog, a PowerPoint® presentation, teacher observations, recordings of workshops, recordings of performances.</i>	<i>You can be creative in the way in which you present your information. You will be given a template, but as long as you include all the relevant points, you can use any kind of presentation you want – posters, video interviews, etc.</i>