WOOTTON PARK

'Ipsum quod faciendum est diutius'

Knowledge Maps
Term 6

Target Grades 4-9

Contents page

Subject: English Literature	Term: 6	Topic: English Literature Revision

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'Ipsum quod faciendum est diutius durant'

Macbeth — Week 1

https://www.bbc.co.uk/bitesize/topics/zgq3dmn
https://www.sparknotes.com/shakespeare/macbeth/
https://www.youtube.com/watch?v=nkrQmkZznxo
https://senecalearning.com/en-GB/
https://www.physicsandmathstutor.com/english-revision/gcse-aqa/macbeth/

Macbeth — Week 2

https://www.bbc.co.uk/bitesize/topics/zgq3dmn
https://www.sparknotes.com/shakespeare/macbeth/
https://www.youtube.com/watch?v=nkrQmkZznxo
https://senecalearning.com/en-GB/
https://www.physicsandmathstutor.com/english-revision/gcse-aqa/macbeth/

Poetry of Power and Conflict — Week 3

https://www.physicsandmathstutor.com/english-revision/gcse-aqa/power-and-conflict/
https://senecalearning.com/en-GB/
https://www.bbc.co.uk/bitesize/topics/z4nc87h
https://www.youtube.com/results?search_query=power+and+conflict+poetry+revision

Poetry of Power and Conflict — Week 4

https://www.physicsandmathstutor.com/english-revision/gcse-aqa/power-and-conflict/
https://senecalearning.com/en-GB/
https://www.bbc.co.uk/bitesize/topics/z4nc87h
https://www.youtube.com/results?search_query=power+and+conflict+poetry+revision

An Inspector Calls — Week 5

https://www.physicsandmathstutor.com/english-revision/gcse-aqa/an-inspector-calls/
https://senecalearning.com/en-GB/
https://www.bbc.co.uk/bitesize/topics/zpr639q
https://www.sparknotes.com/drama/an-inspector-calls/
https://www.youtube.com/watch?v=M75yUsyNySY

An Inspector Calls — Week 6

https://www.physicsandmathstutor.com/english-revision/gcse-aqa/power-and-conflict/
https://senecalearning.com/en-GB/
https://www.bbc.co.uk/bitesize/topics/z4nc87h
https://www.youtube.com/results?search_query=power+and+conflict+poetry+revision

Specification

https://www.aqa.org.uk/subjects/english/gcse/english-literature-8702/specification-at-a-glance

Subject: Maths Higher	Term: 6	Topic: Number Properties

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Product rule for counting

A **factorial** is the result of multiplying a sequence of descending integers. We write it using an exclamation mark.

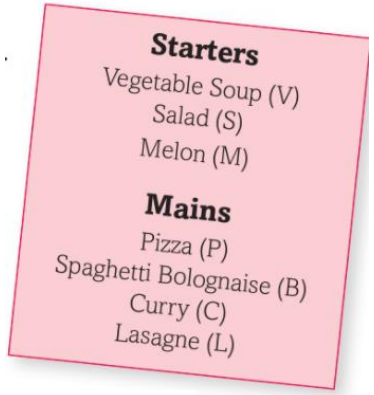
For example: '4 factorial' = 4! = 4 x 3 x 2 x 1.

Make sure you can use the factorial button on your calculator

If there are m ways of performing the first task and *n* ways of performing the second task, the total number of ways of doing the first task and the second task is *m x n*

Worked Example:

In a restaurant there are three starters
And four main courses.



The total number of different
Combinations is therefore 3 x 4 = 12.

If the restaurant offered 4 desserts as well as the starters and the mains, then there would be:

3 x 4 x 4 = 48 different meal combinations.

Place Value and Estimation

When we **estimate** we need to round numbers to 1 **significantt figure**. This means that each value should contain one non-zero digit, and it will always be the first non-zero digit that is either rounded up or kept the same.

Remember: When we round, we locate the "**key digit**" and then look at the number to the right. If the number to the right is 5 or more we round the "**key digit**" up; but if the number to the right is 4 or less then the "**key digit**" stays the same.

We can also use the **place value system** to help us to evaluate answers to slightly altered calculations.

For example:
If we know that **3.7 x 9.86 = 36.482**
Then we also know that…
37 x 98.6 = 3648.2
0.37 x 0.986 = 0.36482
3.7 x 98.6 = 364.82
3648.2 ÷ 98.6 = 37

Notice that depending on how the values in the question have changed in the place value system, the answer is equally affected by the change.

Subject: Maths Higher	Term: 6	Topic: Number Properties

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HCF and LCM

Using **prime factor trees**, we can break numbers down in to a **product** of their **prime factors**. When we know the product of primes of 2 or more numbers, we can use this to help us to find the **highest common factor** and **lowest common multiple**.

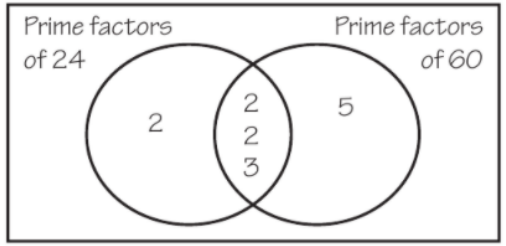
Remember…
A **factor** is number that goes in to another number
A **multiple** is a number that appears in the times table of another number
A **prime number** is a number that has only two factors, 1 and itself.

You can use a **Venn diagram** to help you find the **HCF** and **LCM** using the product of primes.

Find the highest common factor and lowest common multiple of 24 and 60.

$24 = 2 \times 2 \times 2 \times 3$
$60 = 2 \times 2 \times 3 \times 5$

Write each number as a product of prime factors.



Draw a Venn diagram.

The highest common factor (HCF) of 24 and 60
$= 2 \times 2 \times 3 = 12$

Multiply the common prime factors.

The lowest common multiple (LCM) of 24 and 60
$= 2 \times 2 \times 2 \times 3 \times 5 = 120$

Multiply all the prime factors.

Indices

Indices are a way to express when a number is multiplied by itself a number of times.

For example:
$3 \times 3 \times 3 \times 3 \times 3 = 3^5$

We can simplify calculations that involve indices when the base number is the same.

If multiplying, we add the powers

$$x^m \times x^n = x^{m+n}$$

If dividing, we subtract the powers

$$x^m \div x^n = x^{m-n}$$

Any number to the **power of 0** will always be **equal to 1**, when $x \neq 0$

If the **power is negative**, we should fist apply the integer power to the base number. The negative sign means the opposite, and therefore the answer becomes its **reciprocal.**

For example:
$5^{-2} = \frac{1}{5^2} = \frac{1}{25}$

$$x^{-n} = \frac{1}{x^n} \text{ for any number } n, x \neq 0$$

Sometimes, the **power may be a fraction**. In this instance the base number is rooted by the **denominator** of the **fractional index.**

For example:
$16^{\frac{1}{2}} = \sqrt[2]{16} = 4$
$125^{\frac{1}{3}} = \sqrt[3]{125} = 5$

$$x^{\frac{1}{n}} = \sqrt[n]{x}$$

$$x^{\frac{n}{m}} = (\sqrt[m]{x})^n$$

Subject: Maths Higher	Term: 6	Topic: Number Properties

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Standard Form

Scientists use numbers written in **standard form** because it allows them to work out using calculations using really large or really small numbers.

A number is in standard form when it is in the form A x 10^n, where 1 ≤ A < 10 and *n* is an integer. 63 x 10^4 is not written in standard form, because the first number is not between 1 and 10

14624 (ordinary number) → 1.4624 x 10^4 (standard form)
0.568 (ordinary number) → 5.68 x 10^{-1} (standard form)

A negative power means that the original number is a small number (a decimal number).
A positive power means that the original number is a large number.

We can calculate with numbers in standard form, by using our knowledge on indices.
For example:

7.8 x 10^2 × 6.3 x 10^3
7.8 x 6.3 x 10^2 × 10^3 = 49.14 x 10^5
However, this answer is not written in standard form. We must adapt our answer so that it is in standard form.
7.8 x 6.3 x 10^2 × 10^3 = 49.14 x 10^5 = 4.914 x 10^6

Surds

A **surd** is a number written exactly using **square or cube roots**.

$\sqrt{3}$ and $\sqrt[3]{5}$ are examples of surds. This is because we cannot simplify the expressions any further.

$\sqrt{4}$ and $\sqrt[3]{27}$ are not examples of surds. This is because we can simplify the expressions fully.

We can generalise some of the rules to do with simplifying surds, as shown below:

$$\sqrt{mn} = \sqrt{m} \times \sqrt{n} \qquad \sqrt{\frac{m}{n}} = \sqrt{m} \div \sqrt{n}$$

Rational numbers can be written as a fraction in the form $\frac{a}{b}$, where *a* and *b* are integers and *b* ≠ 0

2 is a rational number because it can be written as $\frac{2}{1}$
$\sqrt{2}$ is an **irrational number**

To rationalise a **denominator** we can multiply $\frac{\sqrt{a}}{\sqrt{b}} \times \frac{\sqrt{b}}{\sqrt{b}}$

Further examples

$\sqrt{75} = \sqrt{25}\sqrt{3} = 5\sqrt{3}$ — First simplify $\sqrt{75}$

$\frac{5}{\sqrt{75}} = \frac{5}{5\sqrt{3}} = \frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{\sqrt{9}} = \frac{\sqrt{3}}{3}$ — Simplify the fraction before rationalising.

Subject: Maths 11 Foundation	Term: 5	Topic: Number and Algebra

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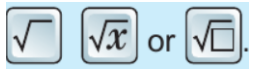
Week 1: Integers

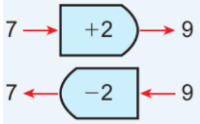
Squares- The answer when a number is multiplied by itself. For example, 16 is a square number as 4x4=16.

Cubes- The answer when a number is multiplies by itself three times. Fro example, 27 is a square number as 3x3x3=27

Square root- This is the inverse of squaring a number. On your calculator, it may look like this:



A function is a rule. The inverse function reverses the rule



Brackets
Indices
Division
Multiplication
Addition
Subtraction

+	-	x	÷
Add Plus Sum Total	Subtract Minus Take away Difference	Multiply Times Product	Divide Half Split

BIDMAS- This is the order of operations which tells you what step to do first.

Week 2: Decimals and place value

Rounding to decimal places- To round a number to 1 decimal place (1dp), look at the digit in the 2nd decimal place. If it is 5 or more, round up.

For example, 35.23 is 35.2 (1 d.p.) and 35.27 is 35.3 (1 d.p.).

Work out 35.1 ÷ 1.5

$35.1 \div 1.5 = \frac{35.1}{1.5}$

$\frac{35.1}{1.5} \xrightarrow{\times 10} \frac{351}{15}$

1.5 has 1 decimal place, so multiply both numbers by 10.

$15\overline{)351.0}$ = 23.4

Divide.

Check: $15 \times 23.4 \approx 20 \times 20 = 400$

Check using an inverse operation and estimation.

Communication hint ≈ means 'approximately equal to'.

To estimate an answer to a calculation, round each number to one significant figure

Significant figures- There is a lazy way of writing this, which is **sf** or **sig fig**.

Crucial: The first significant figure is always the first non-zero number you come across. The second significant figure is the number to the right of that, and so on…

Remember: the size of your rounded number should be a similar size to the number in the question, and you must use zeros to help you with this.

Subject: Maths 11 Foundation	Term: 5	Topic: Number and Algebra

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Week 3: Factors, multiples and squares

HFC- This stands for highest common factor. The HCF of two (or more) numbers is the largest number that is a factor of both numbers.

LCM- This stands for lowest common multiple. The LCM of two (or more) numbers is the smallest number that is a multiple of both (or all) numbers.

Find the highest common factor of 6 and 8

Factors of 6: 1, 2, 3, 6

Factors of 8: 1, 2, 4, 8

HCF= 2

Q. Find the LCM of 4 and 6

4 → 4, 8, 12, 16, 20, 24,....

6 → 6, 12, 18, 24, 30, 36,...

Prime- A number that only has two factors; 1 and itself. E.g. 13

Factors- A number which goes into another number without leaving a remainder. E.g. 3 is a factor of 18.

Multiples- A number in its timetables. E.g. 10 is a multiple of 2.

Examples

Squares	Primes	Cubes
1	2	1
4	3	8
9	5	27
25	7	64
36	11	125
49	13	1000
64	17	
81	19	
100	23	
	29	

Week 4: Index notation and prime factors

In index notation, the number that is being multiplied by itself is called the base. The number written above the base is called the index or power. The index tells you the number of times the base has been multiplied by itself.

Index or power

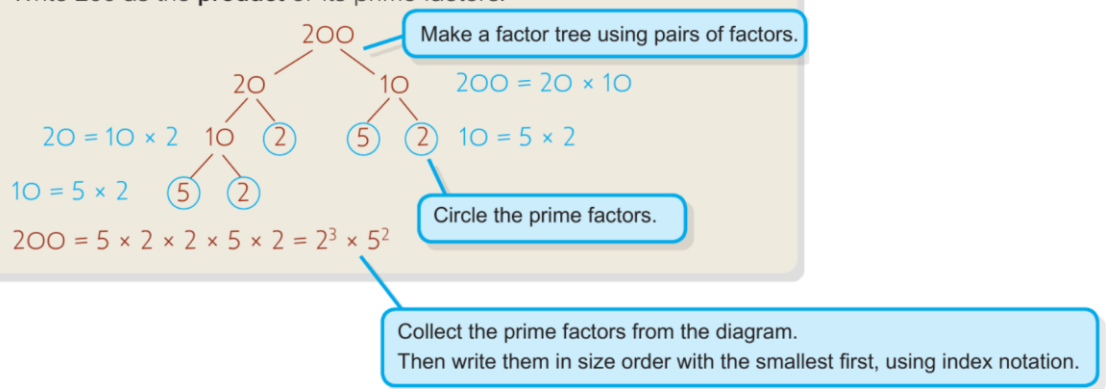
Base → $10^{11} = 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10$

$$a^b \times a^c = a^{b+c}$$

$$a^b \div a^c = a^{b-c}$$

Prime Factor Decomposition- This could also be written as 'product of its prime'. It means finding all of the prime factors of that number. A factor tree is a quick and easy way to do this. An example is below.

Write 200 as the **product** of its prime factors.



Subject: Maths 11 Foundation	Term: 5	Topic: Number and Algebra

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Week 5: Expressions

A term is a number, a letter or a number and letter multiplied together.

Like terms contain the same letter to the same power (or do not contain a letter). You can simplify an expression by collecting like terms.

expression
$3x + 1$
terms

Simplify these expressions by collecting like terms.

a $2a + 3 + a + 4$

b $2x^2 - 2x + 7x^2 + 4x$

a $2a + 3 + a + 4 = 3a + 7$ — Add the letter terms: $2a + a$. Add the numbers: 3 + 4

b $2x^2 - 2x + 7x^2 + 4x = 9x^2 + 2x$ — x^2 and x are not like terms.

You can write an algebraic expression by using letters to stand for numbers. The letter is called a variable because its value can change or vary.

Simplify

a $6 \times y$ **b** $5 \times 2p$ **c** $c \times b$ **d** $t \div 5$

a $6y$ — 6 lots of y

b $10p$ — Multiply the numbers first: $(5 \times 2) \times (p)$

c bc — Write letters in alphabetical order.

d $\frac{t}{5}$

Simplify $2a \times 3b$

$2a \times 3b = 2 \times 3 \times a \times b$ — Multiply the numbers first: 2 × 3. Then multiply the letters: $a \times b$

$= 6ab$ — Put the number first, then the letters in alphabetical order.

Week 6: Expressions continued and substitution

Terms can be simplified when multiplying or dividing, even when they are not like terms.

$a \times b = ab$ $x \div y = \frac{x}{y}$

When multiplying:
Write letters in alphabetical order
Write numbers before letters

To divide algebraic terms, divide the numbers first and then the letters.

$\frac{10x}{2} = \frac{10}{2} \times x = 5x$

$\frac{1}{2}x = \frac{x}{2}$ These fractions both mean 'half of x'.

When $x = 2$ and $y = 5$ work out the value of

a $x + y$ **b** xy **c** $\frac{5x}{y}$ **d** $4x + 3y$

a $2 + 5 = 7$ — Replace x and y with the values given.

b $2 \times 5 = 10$

c $5 \times 2 \div 5 = 10 \div 5 = 2$

d $4 \times 2 + 3 \times 5 = 8 + 15 = 23$ — Use the priority of operations.

Substitution refers to changing a letter for a number.

Subject: Y11 Separate Science	Term: 6	Topic: Biology Revision – paper 2

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Human nervous system

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SharePoint Revision
Kerboodle textbook: Pages 146-159

Hormonal coordination

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Homeostasis

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Kerboodle textbook: Pages 196-217

Variation and evolution

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Kerboodle textbook: Pages 218-255

Ecology

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Physics and math's tutor
SharePoint Revision: Adaptation, interdependence and competition, organising an ecosystem , biodiversity and ecosystems
Kerboodle textbook: Pages 258-311

Required practical's

Paper 1 and 2
Practical skills
Physics and math's tutor
SharePoint Revision

Specification

https://filestore.aqa.org.uk/resources/biology/specifications/AQA-8461-SP-2016.PDF

Subject: Y11 Separate Science	Term: 6	Topic: Chemistry Revision

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The rate and extent of chemical change

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Seneca
Kerboodle textbook: Pages 128-147

Chemistry of the atmosphere

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Kerboodle textbook: Pages 194-205

Organic Chemistry

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Kerboodle textbook: Pages148-177

Using resources

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Seneca
Kerboodle textbook: Pages 206-237

Chemical analysis

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Seneca
Kerboodle textbook: Pages 180-193

Chemistry – Paper 2

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Kerboodle textbook: page 242

Required practical's

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Paper 2
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Specification

https://filestore.aqa.org.uk/resources/chemistry/specifications/AQA-8462-SP-2016.PDF

Subject: Physics	Term: 6	Topic: Revision Energy

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'Ipsum quod faciendum est diutius durant'

Energy stores

Chemical energy store: Different chemical bonds store different amounts of energy.
Kinetic energy store: Anything which is moving.
Gravitational potential energy store: Anything above the surface of a planet.
Thermal energy store: Anything which is above -273oC
Elastic potential energy store: Anything which is stretched out of its resting shape.
Vibrational energy store: Anything moves to and fro.
Nuclear energy store: Atoms being split apart of fused together.
Magnetostatic/electrostatic energy store: When magnets and electric charges are attracting or repelling.

Energy moving between stores

- An object projected upwards: (e.g. ball thrown upwards)

Kinetic energy store of ball → **Gravitational potential energy** store of ball

- A moving object hitting an obstacle: (e.g. car hitting a traffic cone)

Kinetic energy store of moving object → **Kinetic energy** store of obstacle

- An object accelerated by a constant force: (e.g. skydiver accelerated by their weight)

Gravitational potential energy of skydiver → **Kinetic energy** of skydiver

- A vehicle slowing down (e.g. car applying brakes)

Kinetic energy store of car → **Thermal energy** store of brake pads

- Bringing water to boil in an electrical kettle

Thermal energy store of element → **Thermal energy** store of water in kettle

Changes in amount of energy stored

- **heating**

($\Delta E = mc\Delta\theta$)
Change in thermal energy = mass x specific heat capacity x change in temperature

- **work done by forces**

($W = Fd$)
Work done = Force x distance

- **work done when a current flows**

($W = IVt$)
Work done = Current x potential difference x time

Energy equations

The equation for kinetic energy is:
$E_K = 0.5 \times m \times v^2$
Kinetic energy = 0.5 x mass x velocity^2

E_K = Kinetic energy (J)
m = mass (kg)
v = velocity (m/s)

$$E_K = \frac{1}{2} \times m \times v^2$$

The equation for elastic potential energy is:
$Ee = 0.5 \times k \times e^2$
Elastic potential energy = 0.5 x spring constant x extension2

E_e = Elastic potential energy (J)
k = Spring constant (N/m)
e = extension (m)

$$E_e = \frac{1}{2} \times k \times e^2$$

The equation for gravitational potential energy is:
$E_P = m \times g \times h$
Gravitational potential energy = mass x gravitational field strength x height

E_P = Gravitational potential energy (J)
m = Mass (kg)
g = gravitational field strength (N/kg)
h = Height (m)

$$E_P = m \times g \times h$$

The equation for change in thermal energy is:
$\Delta E = m \times c \times \Delta\theta$
Change in thermal energy = mass x specific heat capacity x change in temperature

ΔE = Change in thermal energy (J)
m = Mass (kg)
c = Specific heat capacity (J/kg°C)
$\Delta\theta$ = Change in temperature (°C)

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

The specific heat capacity of a substance is the amount of energy required to raise the temperature of one kilogram of the substance by one degree Celsius.

Using equations

Worked example
Calculate the kinetic energy stored in a vehicle of mass 500 kg moving at a speed of 12 m/s.

Solution
Kinetic energy $= \frac{1}{2} m v^2$
$= 0.5 \times 500\,\text{kg} \times (12\,\text{m/s})^2$
$= \mathbf{36\,000\,J}$

Worked example
A student of weight 300 N climbs on a platform that is 1.2 m higher than the floor. Calculate the increase in her gravitational potential energy store.

Solution
Increase of $E_p = 300\,\text{N} \times 1.2\,\text{m} = \mathbf{360\,J}$

Worked example
A 2.0 kg object is raised through a height of 0.4 m. Calculate the increase in the gravitational potential energy store of the object. The gravitational field strength of the Earth at its surface is 9.8 N/kg.

Solution
Gain of E_p = mass × gravitational field strength × height gain
$= 2.0\,\text{kg} \times 9.8\,\text{N/kg} \times 0.4\,\text{m}$
$= \mathbf{7.8\,J}$

Subject: Physics	Term: 6	Topic: Revision Energy

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Efficiency

Energy can be **transferred** usefully, **stored** or **dissipated**, but energy cannot be **created** or **destroyed**.

Sometimes energy is dissipated, so that it is stored in less useful ways. This energy is often described as being 'wasted'.

Because energy cannot be lost: **Total energy = useful energy + wasted energy**

Unwanted energy transfers can be reduced by a range of methods, for example through lubrication and the use of thermal insulation.

The higher the thermal conductivity of a material the higher the rate of energy transfer by conduction across the material.

The rate of cooling of a building is affected by the thickness and thermal conductivity of its walls.

Efficiency is a measure of how much something does what we want it to do.

The energy efficiency for any energy transfer can be calculated using the equation:

efficiency = useful output energy transfer ÷ total input energy transfer

Efficiency may also be calculated using the equation:

efficiency = useful power output ÷ total power input

Efficiency

Efficiency can be written as a decimal number (that is always less than 1) or as a percentage.

For example, a light bulb with an efficiency of 0.15 would radiate 15 J of energy as light for every 100 J of energy you supply to it.

- Its efficiency (as a number) $= \frac{15}{100} = 0.15$
- Its percentage efficiency $= 0.15 \times 100 = 15\%$

Types of energy sources

A renewable energy resource is one that is being (or can be) replenished as it is used.

The uses of energy resources include: transport, electricity generation and heating.

Energy Resource	Renewable/ Non-renewable	Description	Environmental impact	Uses of energy resource	Reliability
Fossil fuels	Non-renewable	Coal, oil and gas can be burned to heat water, to make stream, to turn a turbine.	Greenhouse Gases	Electricity generation, transport	Reliable
Nuclear	Non-renewable	Nuclear fission heats water, to make steam, to turn a turbine.	Radioactive waste	Electricity generation	Reliable
Biofuel	Renewable	Biofuel is burnt to heat water, to make steam, to turn a turbine.	Carbon - neutral	Electricity generation, heating, transport	Reliable
Wind	Renewable	Wind turns a turbine.	Noise	Electricity generation	Unreliable
Hydro-electric	Renewable	Water through a dam turns a turbine.	Flooding of habitats	Electricity generation	Reliable
Geothermal	Renewable	Heat from underground heats water, to make steam, to turn a turbine.	None	Electricity generation, heating	Reliable
Tides	Renewable	Water is trapped behind a barrage at high tide and released turning a turbine.	Flooding of habitats	Electricity generation	Reliable
Sun	Renewable	Photovoltaic cells turn light into electricity. Solar cells heat water for heating.	None	Electricity generation, heating	Unreliable
Water waves	Renewable	The motion of a wave turns a turbine.	None	Electricity generation	Reliable

Subject: Physics	Term: 6	Topic: Energy Required practicals

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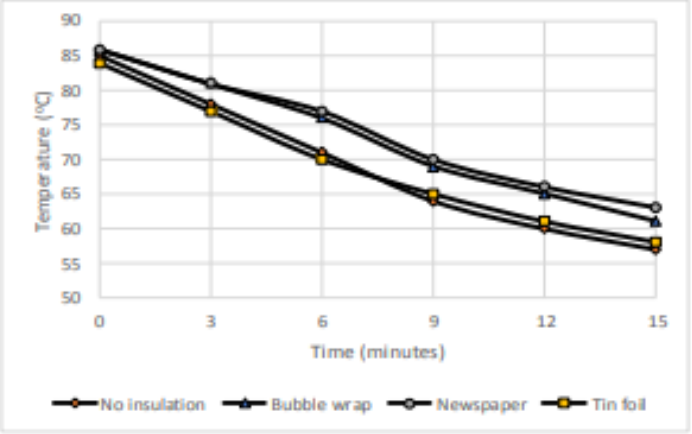
Thermal Insulators

Required Practical: Thermal Insulators

1. Get a set of 5 boiling tubes and wrap one in each of the insulating materials (leave one beaker without any insulation.)
2. Use the kettle to boil water.
3. Measure 50ml of hot water into each container.
4. Insert the thermometer so that its bulb is in the hot water.
5. Record the temperature of the water and start the stopwatch.
6. Record the temperature of the water every 3 minutes for 18 minutes
7. Add your results to the results table.

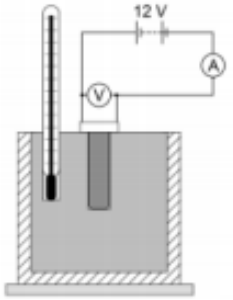
Time mins	Material used for insulation			
	No insulation	Bubble wrap	Newspaper	Tin foil
	Temperature °C			
0	85	86	86	84
3	78	81	81	77
6	71	76	77	70
9	64	69	70	65
12	60	65	66	61
15	57	61	63	58
Change in temperature °C				

8. Plot cooling curve graphs for each material with:
   'Temperature in °C' on the y-axis
   'Time in minutes' on the x-axis.
9. Use your graphs to determine which material is the best insulator.

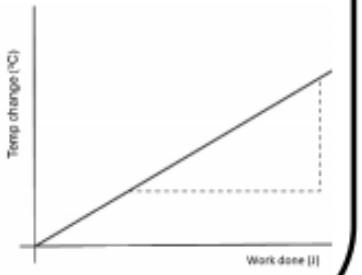


Specific Heat Capacity

Required Practical: Specific Heat Capacity



1. Measure and record the mass of the copper block in kg.
2. Wrap the insulation around the block.
3. Place the heater in the larger hole in the block.
4. Connect the ammeter, power pack and heater in series.
5. Connect the voltmeter across the heater.
6. Use the pipette to put a small amount of water in the other hole.
7. Put the thermometer in this hole.
8. Set the power pack to 12 V. Switch on the power pack to turn on the heater.
9. Record the ammeter and voltmeter readings. These shouldn't change during the experiment.
10. Measure the temperature and start the stopwatch.
11. Record the temperature every minute for 10 minutes.
12. Calculate the power of the heater in watts.
    Power in watts = potential difference in volts x current in amps
13. Calculate the energy transferred (work done) by the heater. To do this, multiply the time in seconds by the power of the heater.
14. Plot a graph of the temperature in °C against work done in J.
15. Draw a line of best fit. Take care as the beginning of the graph may be curved.
16. Calculate the gradient of the straight part of your graph.
    (The gradient is $\Delta\theta \div \Delta E$)
17. Rearrange the equation for Change in thermal energy to get:
    $$\frac{\Delta\theta}{\Delta E} = \frac{1}{mc}$$
18. We therefore know that the gradient is equal to:
    $$\text{gradient} = \frac{1}{mc}$$
19. We can calculate c (specific heat capacity)
    $$c = \frac{1}{m \times \text{gradient}}$$



Subject: Physics	Term:6	Topic: Revision Energy

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

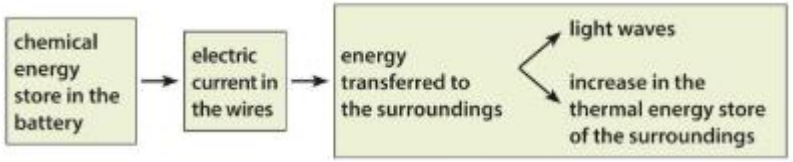
Changes in energy stores

Energy can be **stored** in different ways and is **transferred** by heating. Some examples are:

- Chemical energy
- Kinetic energy
- Gravitational Potential energy (GPE)
- Elastic Potential energy
- Thermal energy

Energy can be transferred from one store to another. E.g. in a torch chemical energy from the battery is transferred to light and thermal energy.

These transfers can be shown in flow diagrams:



Conservation of energy

The **conservation of energy** tells us that energy can be transferred usefully stored or dissipated, but can never be **created** or **destroyed**.

Energy and work

When an object is moved by a force, **work** is done on the object by the force. So the force is transferring energy to the object.

Energy transferred = work done

We can calculate work done, and therefore energy transferred using the following equation:

Work done, W = Force applied, F x distance moved along the line of action of the force, s

(Joules, J) = (Newtons, N) x (meters, m)

Gravitational Potential Energy

Every time you lift an object up, you do some work. Your muscles transferred energy from the chemical energy store in the muscle to the gravitational energy store of the object. In a calculation we refer to this store as gravitational potential energy, E_p.

Changes in object's gravitational potential energy store = weight x change of height

(Newton, N) (metres, m)

(Joules, J)

Kinetic energy

The energy an object has because of its **motion** (movement) depends on its mass and speed. This is called **Kinetic energy**.

We can calculate kinetic energy (E_k) using the following equation:

Kinetic energy, E_k = ½ x mass, m x speed^2, v^2

(joules, J) (kilograms, kg) (metres per second, m/s)^2

When stretching a rubber band or a spring, the work you do is stored in it as **elastic potential energy**.

We can calculate elastic potential energy (E_e) using the following equation:

Elastic potential energy, E_e = ½ x spring constant, *k* x extenstion^2, e2

(joules, J) (Newtons per metre, N/m) (meters, m)

Subject: Physics	Term: 6	Topic: Energy and electricity

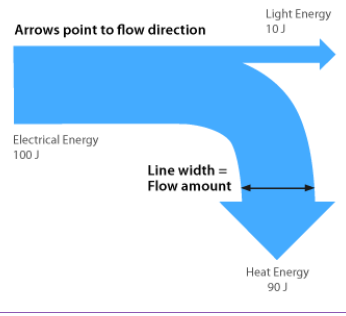
WOOTTON PARK
'Ipsum quod faciendum est diutius durant'

Energy dissipation

When energy is transferred or dissipated. It can be done in one of two ways:

- **Useful energy** – energy is transferred way we want
- **Wasted energy** – energy is not transferred in the way we want

We can represent these changes in energy is a Sankey diagram.



Energy and efficiency

The **efficiency** of an appliance is how well an object turns input energy into useful energy, wasting as little energy as possible.
It can be calculated using:

Efficiency = Energy output energy transferred by the device (J) / Total input energy supplied to the device (J)

Electrical appliances

All electrical appliances transfer energy.
For example; a light bulb has a useful energy transfer where light is emitted from the glowing filaments and a wasteful energy transfer where the filament heats and thermal energy is dissipated around.
You should chose electrical appliances that are more efficient so money isn't wasted.

Energy and power

The **rate** at which **energy is transferred** affects the **power** of an appliance. **The more powerful an appliance is, the faster the rate at which it transfers energy**
We can calculate power using:

Power, P = energy transferred to appliance, E (Joules, J) / (Watts, W) **time taken for energy to be transferred, *t*** (seconds, s)

Electrical charges and fields

When you rub a balloon and it sticks to the ceiling, the rubbing action charges the balloon with **static electricity**.
Inside the atom there are **protons** and **neutrons**, the **electrons** move around the space around the nucleus.
When we rub something like a balloon we turn it into an **ion.** An ion is made by

- adding electrons to make it negative
- Removing electrons to make is positive

This can be done by friction, like in the diagram →

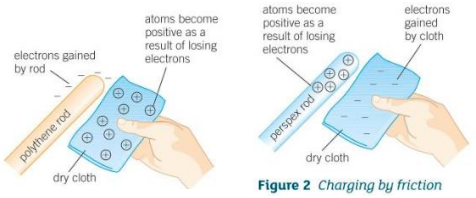


Figure 2 *Charging by friction*

When two objects are charged each creates and **electric field** around itself. If objects have **oppositely charged** electric fields, the two objects will **attract**. If objects have the **same charge** the two objects **repel**.

Current and charge

Make sure you know the symbols and their names →
An **electric current** is a *flow of charge*. When an electrical appliance is on, millions of **electrons** pass through the torch bulb every second.
The size of an electric current is the rate of flow of electric charge.

$$\textbf{Charge flow}, Q = \textbf{current}, I \times \textbf{time take}, t$$
$$(couloumbs, C) \quad (amperes, A) \quad (seconds, s)$$

Potential difference

Potential difference:

- It is measured by a voltmeter, in volts (V)
- Voltmeters are connect in parallel

$$Potential\ difference\ across\ a\ component, V = \frac{energy\ transferred, E}{charge, Q}$$

$$Resistance, R = \frac{Potenical\ difference, V}{Current, I}$$

Subject: Physics	Term: 6	Topic: Revision Particle model of matter

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Density

The density of substance is defined as its mass per unit volume. It has the unit of kilogram per cubic metre, kg/m^3

$$\boldsymbol{Density, \rho} = \frac{\boldsymbol{mass, m}\ (kilograms, kg)}{\boldsymbol{volume, V}\ (metres^3, m^3)}$$

Internal energy

The energy stored by the particles of a substance is called the substance's **internal energy**. This is the energy of the particles that is caused by their individual motion and positions. Internal energy of the particles is the sum of:

- The kinetic energy they have due to their individual motions relative to each other, and
- The potential energy they have due to their individual positions relative to each other

Internal energy

Specific latent heat of fusion L_F, of a substance is the energy needed to change the state of 1 kg of a substance from a solid to a liquid.

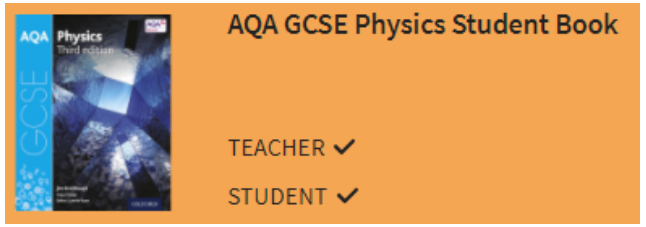
$$\boldsymbol{Specific\ latent\ heat\ of\ fusion, L_F}\ \left(\frac{J}{kg}\right) = \frac{energy, E\ (\boldsymbol{joules, J})}{mass, m\ (\boldsymbol{kilogram, kg})}$$

Specific latent heat of vaporisation L_V, of a substance is the energy needed to change the state of 1 kg of a substance from a liquid to vapour

$$\boldsymbol{Specific\ latent\ heat\ of\ vaporisation, L_V}\ \left(\frac{J}{kg}\right) = \frac{energy, E\ (\boldsymbol{joules, J})}{mass, m\ (\boldsymbol{kilogram, kg})}$$

Useful sites:

Kerboodle –



BBC Bitesize –

https://www.bbc.co.uk/bitesize/topics/zycbsrd
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https://www.bbc.co.uk/bitesize/topics/zxsh2nb

YouTube –

https://www.youtube.com/watch?v=-zy9eWzmGe4&list=PL9IouNCPbCxWNjJvmqwZ4vKy4VfcAhsCj
https://www.youtube.com/watch?v=CEBfn4ndQWI&list=PL9IouNCPbCxXc2NQoIZN7-3jIKN7vW-Sq
https://www.youtube.com/watch?v=-EZmXVOSa20&list=PL9IouNCPbCxWdHszkb6n6503ommOpg_t7

Physics and Maths tutor –

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https://www.physicsandmathstutor.com/physics-revision/gcse-aqa/particle-model-of-matter/

Subject: Physics	Term: 6	Topic: Revision - Forces

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Force and acceleration

Force (N) = mass (kg) x acceleration (m/s^2)

Newton's second law of motion states that the acceleration of an object is;

- Proportional to the resultant force on the object
- Inversely proportional to the mass of the object

A resultant force is needed to change the velocity of an object. The tendency of an object to stay at rest or to continue in uniform motion (i.e. moving at a constant velocity) is called its **inertia**. The inertial mass of an object is a measure of the difficulty of changing the object's velocity.

Inertial mass can be defined as $\frac{force}{acceleration^2}$

Weight and terminal velocity

The **weight** of an object is the force acting on it due to gravity, measured in Newton's (N)

The **mass** of an object depends on the quantity f matter in it. Mass is measured in kilograms, kg.

The gravitational force on a 1 kg object is the **gravitational field strength**, on Earth this is 9.8 N/kg.

Weight, N = mass, kg x gravitational field strength, N/kg

Terminal velocity is when a falling object reaches a constant velocity when the frictional velocity is equal and opposite to its weight. The resultant force is zero and so its acceleration is zero.

Forces and braking

A **stopping distance** is the shortest distance a vehicle can safely stop in, and is in two parts, the **thinking distance** and the **braking distance**.

Stopping distance = thinking distance + braking distance

Both of these factors can be affected by things such as;

- Drugs and alcohol
- The speed at which the vehicle travels
- Adverse road conditions
- Poorly maintained vehicles.

Momentum

Momentum has size and direction and is a vector quantity.

Momentum (kg m/s) = mass (kg) x velocity (m/s)

When two objects collide the momentum of both objects changes:

- If the two objects has the same mass the velocity is halved by the impact. The combined mass after the collision is twice the moving mass before the collision. So the momentum after the collision is the same as the momentum before the collision
- If one object has double the mass of a second upon impact, the velocity of the smaller trolley is reduced to one-third. The combined mass after the collision is three times the initial mass. So the momentum after the collision is the same as the momentum before the collision.

This is an example of **conservation of momentum:**

In a closed system, the total momentum before an event is equal to the total momentum after the event.

Using conservation of momentum

(mass of A x velocity of A) = -(mass of B x velocity B)

Worked example

A 0.5 kg trolley **A** is pushed at a velocity of 1.2 m/s into a stationary trolley **B** of mass 1.5 kg as shown in Figure 2. The two trolleys stick to each other after the impact. Calculate:

a the momentum of the 0.5 kg trolley before the collision

b the velocity of the two trolleys straight after the impact.

Solution

a Momentum = mass × velocity = 0.5 kg × 1.2 m/s = **0.6 kg m/s**

b The momentum after the impact = the momentum before the impact = 0.6 kg m/s

(1.5 kg + 0.5 kg) × velocity after the impact = 0.6 kg m/s

the velocity after the impact = $\frac{0.6\text{ kg m/s}}{2\text{ kg}}$ = **0.3 m/s**

Worked example

An artillery gun of mass 2000 kg fires a shell of mass 20 kg at a velocity of 120 m/s. Calculate the recoil velocity of the gun.

Solution

Applying the conservation of momentum gives:

mass of gun × recoil velocity of gun = –(mass of shell × velocity of shell)

If you let V represent the recoil velocity of the gun:

2000 kg × V = –(20 kg × 120 m/s)

$V = -\frac{2400\text{ kg m/s}}{2000\text{ kg}}$ = **–1.2 m/s**

Subject: Physics	Term: 6	Topic: Revision - Forces

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Impact forces

The longer the impact time, the more the impact force is reduced.

If we know the impact time, we can calculate the impact force as follows. We know;

$$Accerleration = \frac{(final\ velocity\ - initial\ velocity)}{time\ taken} = \frac{change\ in\ velocity}{time\ taken}$$

We also know;

$$force = mass\ \times accleration$$

Because mass x change of velocity = change in momentum, then;

$$Force = \frac{mass\ \times change\ in\ velocity}{time\ taken}$$

Forces and eleasticity

An object is elastic if it returns to its original shape when the forces deforming it are removed.

Extension is the increase in length from its original length.

Extension= length at the stage – original length

Hooke's Law states t**he extension of a spring is directly proportional to the force supplied, as long as its limit of proportionality is not exceeded.**

Hooke's Law can be written as:

Force applied (N) = spring constant (N/m) x extension (m)

The spring constant is equal to the force per unit extension needed to extend the spring, assuming that its limit of proportionality is not reached. The stiffer the spring, the greater the constant.

Stretch tests

You can investigate how easily a material or a spring stretches by hanging weights from it (Figure 1).

- The spring to be tested is clamped at its upper end. An empty weight hanger is attached to the spring to keep it straight.
- The length of the spring is measured using a metre ruler. This is its original length.
- The weight hung from the spring is increased by adding weights one at a time. The spring stretches each time more weight is hung from it.
- The length of the spring is measured each time a weight is added. The spring should be measured from the same points each time to ensure accurate results. The total weight added and the total length of the spring are recorded in a table.

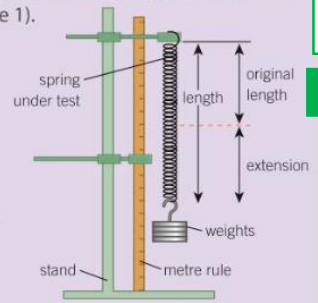


Figure 1 *Investigating stretching*

Safety: Clamp the stand to the bench and take care with falling weights. Wear eye protection.

Pressure and surfaces

Pressure is the force per unit area, unit of pressure is the pascal (Pa), which is equal to one newton per square metre (N/m²).

$$Pressure, p\ (pascal, Pa) = \frac{force, F\ (Newtons, N)}{area, A\ (metres\ squared, m^2)}$$

Pressure in a liquid at rest

The pressure of a liquid increases with depth. The further the hole is below the level of water in the bottle, the greater the force with which the jet leaves the bottle. The pressure in a liquid depends on the density of the liquid.

The pressure of a liquid column

The pressure, *p*, at the bottom of a column of liquid depends on the height of the column and the density of the liquid. For a column of liquid of density, *p,* and height, *h*, the pressure caused by the liquid at the base of the column is given by the equation:

$$p = h \times \rho \times g$$

Atmospheric pressure

Atmospheric pressure is due to air molecules colliding with surfaces. Each impact exerts a tiny force on a surface, but the number of molecules that collide wit the surface each second is very large.

Using atmospheric pressure – rubber suction caps pressed onto a wall tile stays on the tile and does not fall off. This is because atmospheric pressure acts on the outside of the cap but not on the inside between the cap and the wall.

Up thrust and floatation

Up thrust is a force exerted upwards on an object in the water.

Up thrust explained – the water level in a water container rises when an object is lowered into the water. This is because the object *displaces* some of the water:

- The more the object is lowered into the water, the bigger the volume of water displaced and the bigger the up thrust
- When the object is fully immersed, the volume of water displace is equal to the volume of the object

An object floats when its weight is equal to the up thrust.

An object sinks when its weight is greater than the up thrust.

Subject: Year 11 Physics	Term: 6	Topic: Revision - Waves

WOOTTON PARK
'Ipsum quod faciendum est diutius durant'

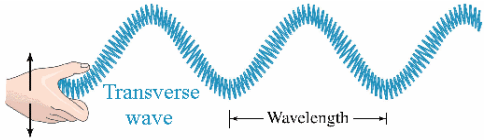
Wave Properties

The nature of waves

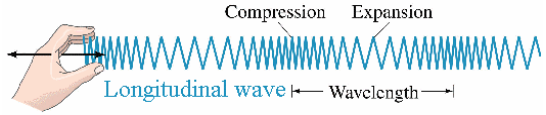
There are different types of waves:

- **Mechanical waves** – like sound waves or water waves. This type travel through a medium (a substance)
- **Electromagnetic waves** – like light waves or radio waves. This type can travel through a vacuum.

Transverse waves - The oscillations of a transverse wave are perpendicular to the direction in which the waves transfer.

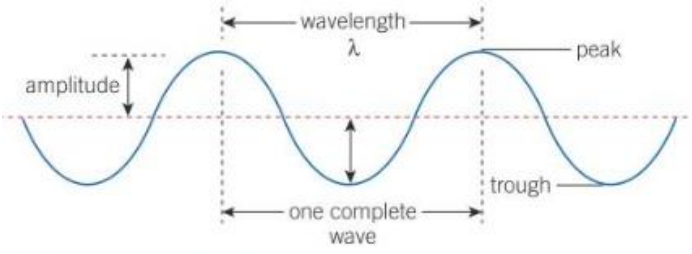


Longitudinal waves – The oscillations of a longitudinal wave are parallel to the direction in which the waves transfer energy.



Properties

Wave properties



The bigger the amplitude of the waves, the more energy the waves carry.

Wavelength – is the distance from one point on the wave to the equivalent point on the adjacent wave.

Frequency – is the number of waves per second and is measured in Hertz, Hz.

Wave speed – the speed of the waves is the distance travelled by each wave every second through a medium. Energy is transferred by the waves at this speed.

Wave speed (m/s) = frequency (Hz) x wavelength (m)

Measuring the speed of sound in air:

Speed (m/s) = Distance (m) ÷ Time (s)

Reflection and refraction

Required practical

Reflection of waves can be investigated using the ripple tank. Each ripple is called a wavefront because it is the front of each wave as it travels across the water surface. Incident waves are produced, for example, when dipping a ruler in water repeatedly. The incident rays may then be reflected off a barrier.

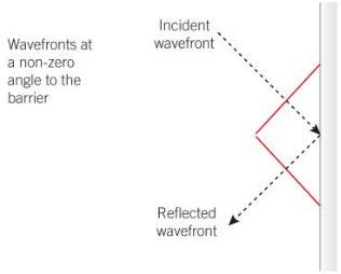


Figure 1 *Reflection of plane waves*

Refraction of waves occurs when a plane wave crosses a boundary at a non-zero angle to the boundary causing each wavefront to change speed and direction.

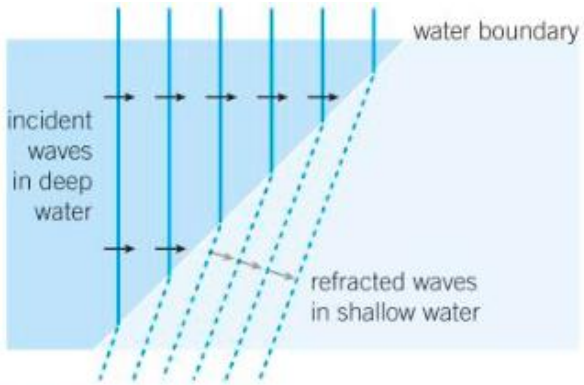


Figure 2 *Refraction*

Subject: Year 11 Physics	Term: 6	Topic: Revision - Waves

More about waves

Investigating waves

Investigating waves

Investigate waves on a stretched string using the apparatus shown in Figure 4. The oscillator sends waves along the string. You can adjust the frequency of the oscillator until there is a single loop on the string. Its length is half the length of one wavelength. The vibrating string sends out sound waves at the same frequency into the surrounding air.

- Note the frequency of the oscillator.
- Make suitable measurements to find the length, L, of a single loop and calculate the wavelength of the waves ($= 2L$)
- Calculate the speed of the waves on the string using the equation: wave speed = frequency × wavelength
- Increase the frequency to obtain more loops on the string. Make more measurements to see if the wave speed is the same.

To measure the speed of the waves in a ripple tank (Figure 2, Topic P12.2), use a ruler to create plane waves that travel towards one end of the ripple tank.

- Use a stopwatch to measure the time it takes for a wave to travel from one end of the ripple tank to the other.
- Measure the distance the waves travel in this time.
- Use the equation speed = distance ÷ time to calculate the speed of the waves.

Observe the effect on the waves of moving the ruler up and down faster. More waves are produced every second and they are closer together.

- Determine whether the speed of the waves has changed.

Safety: Take care not to spill any liquids and, if you do, let your teacher know. You should also take care with hanging weights – clamp the stands to the bench and wear eye protection.

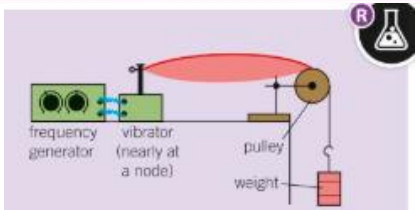


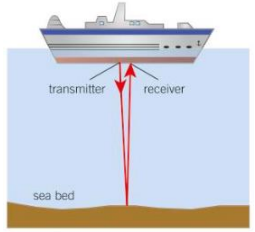
Figure 4 *Investigating waves on a string*

Types of wave

Sound waves

The ear can detect an enormous range of sound waves of different intensities as well as a wide range of frequencies, from 20 Hz to about 20 kHz. When a sound wave makes your ear drum vibrate your ear sends signals to your brain about what you are hearing.

Echo sounding uses pulses of high-frequency sound waves to detect objects in deep water and deep water to measure water depth below a ship.



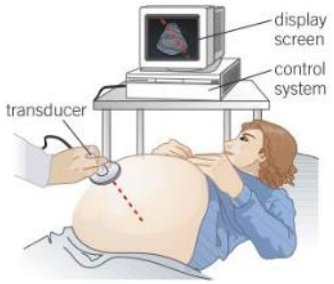
The uses of ultrasound

Sound waves above the highest frequency that humans can detect are called **ultrasounds**. Each ultrasound wave pulse from the transducer:

- Is partially reflected from the different tissue boundaries in its path
- Returns to the transducer as a sequence of ultrasound waves reflected by the tissue boundaries, arriving back at different times.

$$Distance\ travelled\ by\ the\ wave, m = \frac{speed\ of\ ultrasound\ waves\ in\ body\ tissue, m/s}{time\ take, s}$$

$$The\ depth\ of\ the\ boundary\ below\ the\ surface, m = 0.5 \times speed\ of\ the\ ultrasound \times time\ taken$$



Seismic waves

Seismic waves are shock waves created by energy being transferred from the Earth's core and the movement of tectonic plates. A seismometer can record and measure the size of seismic waves and display three main types;

- **Primary waves (P-Waves)** cause the initial tremors lasting about one minute. These are longitudinal waves that push or pull on material as they move through the Earth.
- **Secondary waves (S-waves)** cause more tremors a few minutes later. They are transverse waves that travel more slowly than P-waves. They shake the material that they pass through inside the Earth from side to side.
- Long waves (L-waves) arrive last and cause violent movements on the surface up and down as well as backwards and forwards. They travel more slowly than P-waves or S-waves, and they only happen in the Earth's crust.

Subject: Year 11 Physics	Term: 6	Topic: Revision - Light

WOOTTON PARK
'Ipsum quod faciendum est diutius durant'

Light

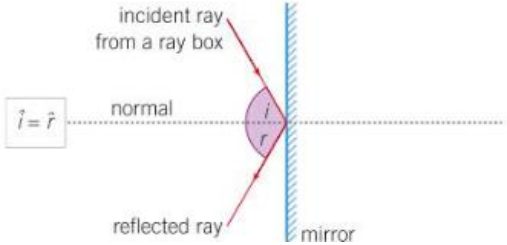
Reflection of light

The law of reflection tells us that the angle of incidence = the angle of reflection.

A **virtual image** is formed at a place where light rays appear to come from after they have been reflected (or refracted). It can't be projected onto a screen like the movie images you see at a cinema. AN image that can seen on a screen is described as a real image because it is formed by focusing light onto the screen.

Specular reflection – is when parallel light rays are reflected in a singular direction

Diffuse reflection – is when light rays are scattered when reflected from a rough surface.



Refraction of light

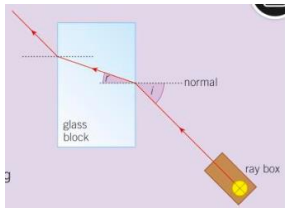
Refraction

Refraction is the change of direction of a light wave once is has changes speed.

Refraction rules

Your investigation should show that a light ray:

1. Changes direction towards the normal when it travels from air into glass. The angle of refraction (r) is smaller than the angle of incidence (i).
2. Changes direction away from the normal when it travels from glass into air. The angle of refraction (r) is greater than the angle of incidence (i).



Light and colour

Colour filters work by absorbing certain wavelengths and transmitting other wavelengths of white light.

Direct current is when the current only flows in one direction whereas **alternating current** is when the current repeatedly reverses its direction.

Frequency is the number of cycles passed through each second. It is measure in Hertz (Hz)

Every mains circuit has a **live wire** and a **neutral wire**. The live wire is dangerous as it its potential changes repeatedly form + to – every cycle. It can reach 325V.

The national grid is a nationwide network of cables and transformers. A power station typically generates electricity at an alternating potential difference of about 25 000 V.

- *Step-up transformers* – used to make the size of the alternation potential difference much bigger (25 000 → 132 000V)
- *Step-down transformers* – used to make the size of the alternation potential difference much smaller again.

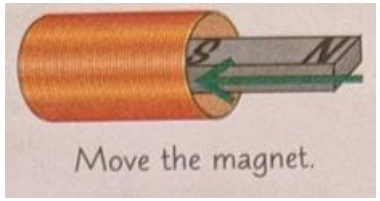
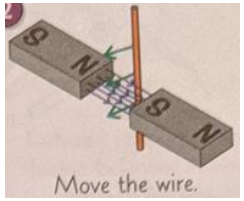
Subject: Physics	Term: 6	Topic: Revision Electromagnetism

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

The generator effect

Generator effect – when a potential difference is induced in a wire which is moving relative to a magnetic field, or experiencing a change in magnetic field.

Two ways to induce a potential difference…		
To swap the direction of the potential difference…	Move the magnet in the opposite direction, or, Start with the magnet the other way round	Move the wire in the opposite direction, or, Start with both magnets the other way round
To increase the size of the induced potential difference…	Increase the speed of the movement, or, Increase the magnetic field strength.	

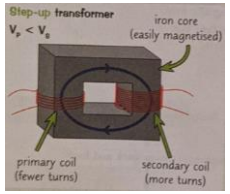
Alternator vs generators

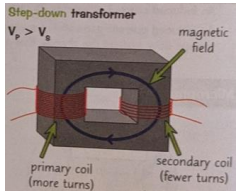
Alternators generate alternating current.

Generators generate direct current.

Transformers

Alternative current passed through primary coil → Changing magnetic field induced in iron core → Alternating current induced in secondary coil



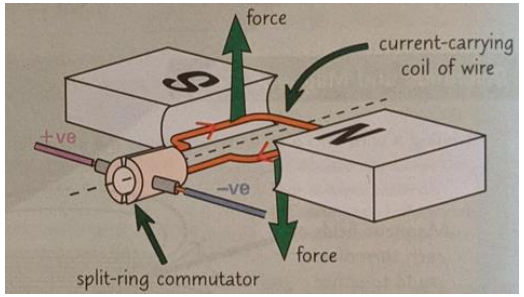


Ratio between primary and secondary potential difference = ratio between number of turns on primary and secondary coils

If a transformer is 100% efficient: input power = output power

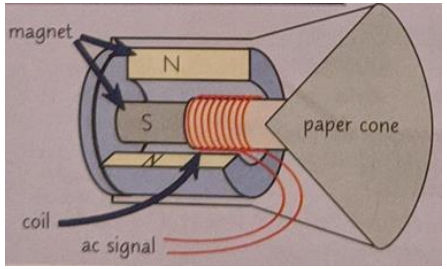
Electric motors

Direct current is passed through the wire
↓
Each side of the coil experiences opposite forces
↓
Coil rotates



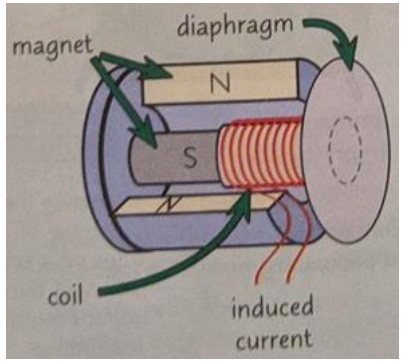
Loudspeakers and headphones

Alternating current is sent through coil
↓
Coil moves back and forth
↓
Paper cone moves back and forth
↓
Sound waves are created



Microphones

Sound waves hit diaphragm
↓
Diaphragm moves back and forth
↓
Coil of wire moves back and forth
↓
Alternating current is generated



Subject: Physics	Term: 6	Topic: Revision Space

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Circular orbits

Gravitational force keeps planets and satellites in circular orbits.
It causes the objects directions to constantly change.
This means the object's velocity constantly changes.

Stable orbits

If the speed of an object in a stable orbit changes, the radius (size) of the orbit changes.

Red-shift

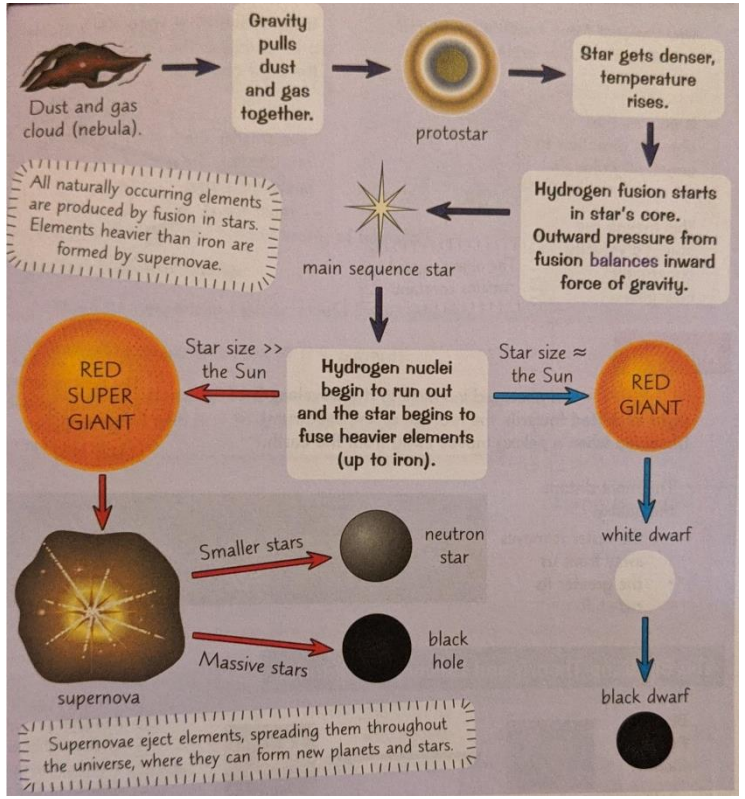
Red-shift – an observed increase in the wavelength of light (light is shifted towards the red end of the spectrum). Observed when a galaxy moves away from Earth.

The Big Bang theory and Universal mysteries

Big Bang Theory – all the matter in the universe occupied a dense and hot tiny space. Then it exploded and space started expanding.

Three things in the Universe that aren't fully understood:
1) Why distant galaxies are receding at increasing speeds (shown by observations of supernovae since 1998)
2) Dark matter
3) Dark energy

The life cycle of a star



Our solar system

Our solar system is a tiny part of the Milky Way galaxy.
It contains the Sun, eight planets, dwarf planets, moons (natural satellites) and artificial satellites.
Planets orbit the Sun, moons orbit planets and artificial satellite (generally) orbit the Earth.

Subject: Y11 Separate Science	Term: 6	Topic: Physics Revision

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'Ipsum quod faciendum est diutius durant'

Forces in Balance

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Forces in Motion

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Waves

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Magnetism & Electromagnetism

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Required practicals

Paper 1
Paper 2
Practical skills
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Specification

Specification

Subject: Y11 Trilogy Science	Term: 6	Topic: Revision

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Biology – Paper 1

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Subject: Y11 Trilogy Science	Term: 6	Topic: Revision

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Biology - Paper 2

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Chemistry – Chemistry of the atmosphere

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Physics – Paper 2

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Biology – Practical Skills

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Chemistry – Using resources

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Subject: Y11 Trilogy Science	Term: 6	Topic: Revision

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'Ipsum quod faciendum est diutius durant'

Chemistry – Paper 1

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Chemistry – Paper 2

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Subject: Geography	Term: 6	Topic: The urban world

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

New housing for Bristol

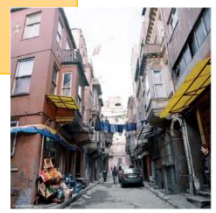
housing demand
when more house are needed for the population

greenfield site
an area of land **not** previously built on

urban sprawl
when a city spreads over rural land

brownfield site
an area that **has** been previously built on

regeneration
when a brownfield area is improved



New housing for Bristol

We know that Bristol's population has grown and housing demand is increasing, so where do they build their new homes?

Do they **regenerate brownfield sites?**

Do they create **urban sprawl** and build on **greenfield sites**?

They do both!

Harbourside- Brownfield site

In the past Bristol docks were an important industrial area with shipbuilding and warehouses right in the centre of the city. Over time the docks became outdated and too small for big container ships. This led to their decline.

During recent years the dockland area has undergone a huge transformation. It is now known as **Bristol Harbourside** and contains many new functions.

Developments include…

Wapping Wharf. 600 new homes with 'urban dockside character' amongst a range of offices & shops have all been built on previously derelict land.

Canon's Marsh. We are the Curious, Bristol Aquarium, Watershed (bar & cinema), hotels, bars, quayside apartments & a marina has replaced an industrial area

MShed. A £25m project has restored the old Industrial Museum. It's dedicated to the History & People of Bristol & offers free entry. It is now hosting the Wildlife Photographer of the Year Exhibition.

Bradley Stoke- Greenfield site

Urban sprawl began after WW2 because of bomb damage and demolition of old slum housing. Council estates were built on the city outskirts. Recently, settlements surrounding Bristol have rapidly grown to house commuters who work in Bristol. In the 1970's and 80's new towns like Bradley Stoke were built on the edge of the city.

Bradley Stoke, with a population of ever 21000, was Europe's largest housing development. 'urban sprawl' has been controversial because of fears over; increased congestion, road traffic noise and reduced air quality; Has/will also destroy wildlife habitats and impact ecology (Great Crested Newt population affected); Loss of open space/recreational land; pressure on existing services; Increase local flood risk.

Some people think it is a success because It's a very accessible place by the motorway, has few graffiti problems and there are wide range of houses to choose from and they all have modern facilities.

Subject: Geography	Term: 6	Topic: The urban world

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Temple Quarter regeneration

An example of an urban regeneration project to show:

- **Reasons why the area needed regeneration**
- **The Main Features of the Project.**
- **Example: The Temple Quarter.**

Why regeneration was needed	• The area was very run down with derelict buildings due to industries closing down. • Temple Quay had abandoned potteries, ropeworks and timber yards. • The remains of the cities ironworks and gas works were an eyesore. • The area gave a very bad impression of Bristol to visitors arriving by train to Bristol Temple Meads Station. • The area suffers from high unemployment and poor access to the rest of the city.
Main features of the project	• Temple Meads Station has been improved with a more accessible road network which links to the rapid transit network and the cycle path network. • The target is to create 17,000 new jobs by 2037. • A new bridge has been built over the River Avon to improve access. • The 'Engine Shed' has been renovated to create a location for new high tech business. • The Bristol Arena and associated island will create a new concert, exhibition and sporting venue for the whole of the West Midlands. • The area has been given Enterprise Zone status to encourage businesses to move to the area.

sustainable cities- Freiburg, Germany

Freiburg is known as **the "Jewel of the Black Forest."** By German standards it is a major city in southwest Germany, situated on the edge of the Black Forest. Freiburg is a laid-back, beautiful university city. Known throughout Germany for Albert Ludwig University of Freiburg, good weather, and vineyards, Freiburg is considered by Germans to be a desirable place to live. Some highlights include **Münster cathedral**, which is Freiburg's biggest sight in the city, one of the oldest and most beautiful in all of Europe. **Bächle** are small canals that line the streets of the inner city. These canals were once meant as a way to fight fires in medieval Freiburg.

How is Freiburg Sustainable?

- The entire city centre is completely car free.
- There are about 400 solar panel installations in the city.
- Rainwater is collected and reused.
- In the Risefeld District only 78 hectares are built on, leaving 240 hectares of open space.
- Enough bio-gas is produced to heat Freiburg's three swimming pools!
- Freiburg is a city where people come to attend conferences of sustainability, this provides jobs for local people.
- The city plans to be 100% powered by renewable energy by 2050.
- 10 million kilowatts of electricity a year is created through solar energy.
- River Dreisam is allowed to flow unmanaged to provide natural habitats for flora and fauna.

Subject: Geography	Term: 6	Topic: The urban world

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'Ipsum quod faciendum est diutius durant'

Sustainable cities- Freiburg, Germany

- Only native trees and shrubs are planted in the 600 hectares of parks. More than 1,000 people are employed in the solar technology industry producing advanced solar cells and the machinery to make them.
- There are financial incentives for inhabitants to use water sparingly.
- The inner city district of Vauban houses 5,500 people in low-energy buildings.
- More than 10,000 people are employed in 1,500 environmental businesses in the city.
- Many jobs have been created in the research and manufacture of solar technology.
- There is 350 community collection points for recycling.
- Local people were involved in the planning and help make decisions e.g. financial rewards for people who compost their green waste and use textile nappies.
- Tram journeys have increased by over 25,000 in one year, while car journeys have reduced by nearly 30,000.
- 70% of the population live within 500m of a tram stop with a tram every 8 minutes.

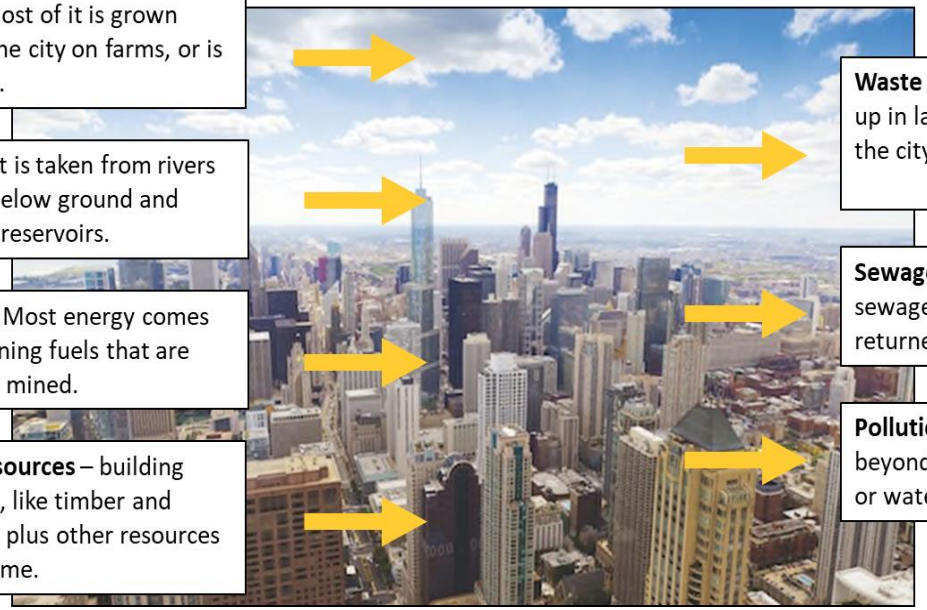
A City Has Input's and Outputs

Food – Most of it is grown outside the city on farms, or is imported.

Water – It is taken from rivers or from below ground and stored in reservoirs.

Energy – Most energy comes from burning fuels that are drilled or mined.

Other resources – building materials, like timber and concrete, plus other resources we consume.



Waste – A lot of it ends up in landfill sites outside the city, or is burnt.

Sewage – It is treated in sewage works before it is returned to a river.

Pollution – It can spread beyond the city in the air or water.

Sustainable traffic management strategies

Sustainable transport

A city can plan to make transport more sustainable. This includes:

•Discouraging the use of private transport. In London this is achieved by a congestion charge for vehicles driving through certain areas.

•Investing in public transport - improving the efficiency and safety of buses and trains.

•Encouraging the use of bicycles. Bristol was the UK's first cycling city. It encourages the use of bikes by having bike festivals, investing in cycle lanes and supporting projects which promote cycling.

•Promoting car sharing schemes for areas poorly served by public transport.

Case study of sustainable transport: The BRT in Curitiba, Brazil

Curitiba is the capital city of the Parana state in Brazil. Nearly 2 million people live there. The city has had an urban master plan since 1968. Part of the plan is the Bus Rapid Transport (BRT) System.

•It was the first city in Brazil to have dedicated bus lanes.

•A bus rapid transit system operates. This is cheaper to run than a tube system. Some employers subsidise their employees who use it.

•80 per cent of travellers use the BRT.

•The bus rapid transit system uses triple section bendy buses. It carries 2 million passengers a day.

•The bus fare is the same wherever you go.

•No one lives more than 400 metres from a bus stop.

•Urban growth is restricted to corridors of growth - along key transport routes. Tall buildings are allowed only along bus routes.

Subject: History	Term: 6	Topic: Migration, Empires and the People

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Vikings and Anglo-Saxons

Key Content

- The Vikings **invaded Britain in the 790s** (AD). They began by invading monasteries and villages in the north. Later they sailed up rivers and attacked further inland.
- They attacked Britain because of its **wealth, farming opportunities, religious freedom** and **inheritance opportunities**.
- **871 AD Alfred the Great** becomes king. He fought the Vikings and helped bring peace to the country.
- **876 AD, the Vikings tried to attack Wessex**. Alfred and his army go into hiding. 878 AD, Alfred beat the Vikings at the **Battle of Edington** – they both agree peace terms. **Danelaw** is created, meaning Vikings like in the north and east.
- After Alfred's death, his descendants recaptures parts of Danelaw, but Viking presence remained. **Edgar the Peaceful** (Alfred's great-grandson) become king in 959 and continues to keep the country peaceful.
- **Aethelred becomes king in 978**, he was considered a poor judge of character and was ill-advised. In **991, the Great Heathern Army (Vikings) invade**, Aethelred paid the Vikings to leave (**Dangeld**) but this becomes expensive so a mass killing of Vikings perused (**St Brice's Day Massacre**).
- **1016 Cnut becomes king.** Cnut added Britain to his **North Sea Empire** (Denmark, Norway and Sweden.) **Cnut married Emma of Normandy** (widow of Aethelred) – this helped Cnut forge the old way in England. She also brought lads to her marriage. Emma was a **strong leader** who was respected, she improved relations with the church, and was financially smart.

Key Questions:

-Why did the Vikings invade Britain?
-Why was Alfred so 'great'?
-How did the Vikings attempt to gain control?
-How did the Anglo-Saxons respond to Viking invasions?

A Norman Kingdom and Angevin Empire

Key Content

- **Edward became King of England in 1042** after his half-brother (Cnut's son) died. Edward had strong links with the Normans, so when he died in 1066 there was a rush to the throne.
- **William Duke of Normandy**, **Harold Godwinson** and **Harald Hardrada** were contenders to the throne. **Godwinson was elected by the Witan**.
- William Duke of Normandy invaded in October 1066 and fought Godwinson at the **Battle of Hastings**, the Normans won. This made **Britain a Norman kingdom**.
- When William died in 1087, the Norman Kingdom was divided between his two sons. His son **Henry soon became Henry I of England and Duke of Normandy.**
- Henry's daughter Matilda agreed with Stephen that Henry II would be king when Stephen passed away. **1154, Henry II becomes king.** A series of marriages to powerful French women helps establish the Angevin Empire.
- By 1216, **King John loses** most of this empire and is forced to sign the **Magna Cater in 1215.**
- In **1337, the English try to reclaim the French throne and lands**, this starts the **Hundred Years War lasting until 1453.**

Key Questions:

-Why was there a fight for the throne?
-What claims did William, Harold and Harald all have to the English throne?
-How did England change under the Normans?
-How did the Normans keep control after William's death?
-How was the Angevin Empire established and dismantled?
-What is the significance of the Magna Carter?

Subject: History	Term: 6	Topic: Migration, Empires and the People

WOOTTON PARK

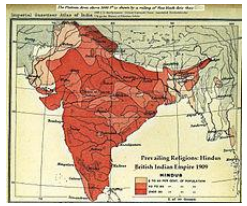
'Ipsum quod faciendum est diutius durant'

Key Content

- The **scramble for Africa**: Until the 1800s, European countries weren't really interested in Africa – unless it was to make use of people from west Africa to use as slaves. Between 1562 and 1807, British ships took around **3 million Africans into slavery**. By 1900, European nations controlled over 90% of Africa: **16 colonies were added to the British Empire between 1870 and 1900**.
- Explorers and missionaries brought back tales of African **gold, diamonds, ivory** and **rubber, coffee and timber**. Between 1880-1900 there was a 'scramble for Africa' where many wanted to make their riches.
- Many Africans **fought to defend their lands**, but European armies had a major advantage over the Africans. Many Africans suffered hardship and hunger as their traditional way of life was destroyed.
- **Cecil Rhodes** is regarded as one of Britain's **greatest empire-builder**, and most recently a **very controversial figure**. He was an **imperialist** and believed Britain should extend its power and influence over other parts of the world.
- Britain fought for control for land in **southern Africa**, the British invaded Cape Colony in 1806 and the **Boers (farmers)** fought back. The first and second Boer wars followed after British troops were sent to force the Boers to accept British rule. **First Boer War 1867-1881**, **Second Boer War 1899-1902**.
- There was a huge surge in **Irish immigration** after the **Irish potato harvest** failed in 1846. Hundreds of thousands fled to Britain, peaking in the **1840s and 1850s** – over half a million Irish left their homeland. **Britain's canals, roads and railways** could not have been built without Irish natives.

Key Questions:

-What was the impact of the empire on Britain and India?
-Why is Cecil Rhodes a controversial figure?
-Why did the Boers become interested in Cape Colony?
-Why did war break out in southern Africa in 1899?
-Why did thousands of Irish immigrate to Britain?



Key Content

- In the **1870s and 1880s**, there was a **new influx of Jews from Eastern Europe**. They had been **wrongly blamed for the assassination of Russian emperor** Tsar Alexander II in 1881, and a series of laws were placed against them. As a result, between **1881 and 1914 around 120,000 Jews arrived in Britain**.
- The impact of world wars meant Britain was **no longer on the world's stage** and man countries began to create their own industries/supplies. By the end of WWII, many **British colonies were demanding independence**. In August **1947 India became independent**, alongside African countries such as Kenya. **The Suez Crisis** showed Britain could no longer preserve their interests if others disapproved.
- **June 1948, the Windrush** boat arrived in London with 492 people from Jamaica who wanted a new life. Thousands more followed – they became known as the '**Windrush generation**.'
- Several colonies remained as part of the British Empire, one of those was a group is islands in the south Atlantic Ocean – the **Falkland Islands**. In 1982, Britain fought hard to keep them when Argentina invaded.
- After WWII, **European leaders were determine to avoid another war** – they joined forces to develop Europe peacefully. Britain had been long divided over its relationship with Europe, but it joined the **European Economic Community** (renamed as the European Union in 1992) in **1973**. Britain has a referendum in **2016, the result is 52% against 48% to leave the EU**. Britain **left the EU in 2020**.

Key Questions:

-Why were Jewish migrants treated differently?
-Why did some colonies demand independence from British rule?
-What was the Suez Crisis and what was the impact of Britain?
-What was the 'Windrush generation' and why did they migrate to Britain?
-Why did Argentina invade the Falklands and what impact did this have?
-Why did many European countries want to increase cooperation between themselves in the 1950s?

Subject: History	Term: 6	Topic: Conflict and Tension: Interwar: The Road to War (KQ3)

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Key question 1: What were the Nazi aims on the road to war?

Hitler's aims were largely

- Overturning the **Treaty of Versailles**
- **Rearming** Germany to make it strong again and create jobs
- **Lebensraum**, living space in the east
- Uniting **Volksdeutsche and creating a Greater Germany**
- Uniting Germany and Austria in the **Anschluss**
- Destroying **communism**

These aims created a road to war, which started on the 1st September 1939.

Key question 2: What were Hitler's steps between 1936 and 1939?

The Nazis systematically broke several aspects of the Treaty of Versailles:

1th March 1936: **Reoccupation of the Rhineland** (Hitler sent troops into the Rhineland, which had been demilitarised since the Treaty of Versailles. The was a gamble as the allies might stop him – it paid off as they did not!

March 1938: **Anschluss with Austria**: Hitler always wanted to unite with Austria and made an attempt to do so in 1934, which failed. The Anschluss was successful in 1938, first by staging demonstrations against the government, later by moving troops into the area.

May- September 1938: Hitler wanted to take over the **Sudentenland** of Czechoslovakia, an area with many ethnic Germans. Again, the Nazis got Czech Nazis to stage a protest against the government. In an attempt to avoid war, Hitler was given the area in the **Munich Agreement** if he promised not to invade the rest of the country.

Key question 3: How did the allies react?

The allies followed the policy of **appeasement,** which meant giving Hitler a little of what he wanted in the hope that this would avoid war. **Neville Chamberlain**, British Prime Minister, flew to Germany three times to find a solution with Hitler to the Czech crisis. He thought he had brought about **'Peace in our time'.** France would have gone to war over Hitler breaking the Treaty of Versailles, but Britain was reluctant. There are many reasons for and against appeasement and whether it was the correct policy.

Key question 4: What finally caused the outbreak of World War 2?

It soon became apparent that Hitler had no intentions of sticking to the Munich Agreement. Several events marked the increase in aggression and ultimately the road to war:

August 1939: **Nazi – Soviet Pact** between Hitler and Stalin
1st September 1939: **The Invasion of Poland and the declaration of war**

Further reading and research:

https://www.bbc.co.uk/bitesize/guides/z9s9q6f/revision/1
https://www.bbc.co.uk/bitesize/topics/zfd82hv
https://www.bbc.co.uk/bitesize/guides/z92hw6f/revision/1
https://www.bbc.co.uk/bitesize/guides/znxdnrd/revision/1

Subject: History	Term: 6	Topic: America – The Boom (KQ1)

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Key question 1: Why was there a boom?

America was a divided country – by race and wealth as well as other factors
Several developments after the First World War lead to a 'Boom', a significant economic upturn in America. The car industry, inspired by the success of Henry Ford, was particularly productive. America found itself in a 'Cycle of Prosperity' due to several reasons

- Natural resources
- The effects of the war
- Hire purchase
- Advertising and marketing strategies
- The Republican government
- The Stock Market and others

However, not everyone benefitted from the Boom: people in the countryside, African-American workers and Native Americans all lost out.

Key question 2: Social and cultural developments?

America found itself in the 'Roaring Twenties', a time of fun and loud music! Many aspects of life changed during this time and people became more focused on entertainment:

- Games
- Sport was now viewed by mass audiences
- Jazz music became very popular
- People loved going to the cinema (Charlie Chaplin)
- Hays Code
- 'Talkies'

Life changed particularly for American women. Before the war, American society had been very conservative. Now, women had an enhanced role in society and young women became known as 'flappers': they went to nightclubs, rode motorbikes and challenges other previously held views on 'female behaviour'.

Key question 3: Why was American society divided?

Many elements of 1920s life in America divided people.

1. **Prohibition: from 16 January 1920, a new law was introduced, which prohibited the sale of alcohol.** It was hard to enforce and lead to significant impacts on society (speakeasies, bootleggers, moonshine). Prohibition ultimately failed.
2. **Gangsters: Al Capone is a well known gangster in America** and his story highlights the amount of crime in the 1920s.
3. **Immigration has a significant impact on society** and divided it into various groups of 'old immigrants' and 'new immigrants' as well as people who agreed and disagreed with immigration.
4. **Then experience of African- Americans remained poor. They were free, but not equal and racist terror groups like the KKK maintained their views of 'white supremacy'.**
5. Americans worried about the 'Red Scare' coming from Russian citizens immigrating to America. They feared that Bolsheviks wanted to stage a communist revolution like they had in Russia in 1917.

Further reading and research:

https://www.bbc.co.uk/bitesize/guides/zsggdxs/revi
https://www.bbc.co.uk/bitesize/topics/zthf6yc
https://www.bbc.co.uk/bitesize/guides/z9c8v9q/revision/3
https://www.history.com/topics/crime/al-capone

Subject: History	Term: 6	Topic: America – Experiences of Depression and New Deal (KQ2)

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Week 1-3

Key question 1: What was American society like during the Depression?

During the 1920s, many of Americans played the stock market. This meant that share prices rose and banks would be willing to lend people more money.

This caused a problem:

- American factories were overproducing and profits began to fall
- Companies struggled to sell good abroad

In September 1929, many people started to sell their shares as they were concerned about whether the 'boom' situation would last – the market collapsed and banks went bankrupt (Black Thursday)!

Impact:

Shareholders: They lost a lot of cash. Many faced homelessness as they struggled to pay rent

Factory workers: Many lost their jobs. Many lose their savings as banks went bankrupt.

Factory owners: They struggled to sell their goods as less people had cash to buy products (underconsumption)

Bank managers: Many lost their jobs when banks went bankrupt.

The very rich: Many have to sack staff and reconsider spending. They have property to fall back on.

Farmers: Many faced losing their farms and sacking their workers.

Overall there were violence, protests, camps for the homeless (Hooverville) and breadlines.

Key question 2: How effective was the New Deal?

Franklin D Roosevelt (FDR, a Democrat) won the 1932 election and promised America a 'New Deal' out of the Depression.

Changes:

1. Emergency Banking Act to help the banks/ cash flow in the US
2. Economy Act, which cut public spending
3. Beer Act, which made it legal to buy and sell alcohol again

There was also help for farmers, industry and workers, unemployed and homeless people.

However there was also opposition to the New Deal, for example:

1. The rich did not like the tax increases
2. Business people did not like the changes to employment law
3. Republicans complained that the New Deal was ruling peoples lives and FDR was a dictator!

Overall the New Deal created jobs and for some groups, e.g. Native Americans, life improved. However, most Americans were poor throughout the 1930s.

Popular culture (books, music, movies etc) also did quite well in the 1930s and FDR was keen to support the Arts.

Week 4-6

Key question 3: What was the impact of WW2?

American had followed a policy of Isolationism in the 1920s. This came to an end when the war broke out in 1939 and American sold weapons to Britain and France. America entered the war in 1941 after the Japanese attack at Pearl Harbour.

- The Neutrality Act from 1935 had banned the sale of weapons so far
- The Cash and Carry Plan from 1939 allowed Britain and France to buy weapons from the US. This created jobs.
- In 1941, FDR agreed the Lend Lease Deal with Britain for weapons.

Impact of war:

- America set a target of building weapons at a record rate.
- Unemployment dropped due to rearmament
- War changed the role of women with many now working in stereotypically male jobs
- African-Americans first faced discrimination in the forces, however this broke down after while.

Overall, America financially benefitted from the war. People also trusted that the government could solve 'big issues'.

Further reading and research:

https://www.youtube.com/watch?v=62DxELjuRec
https://www.youtube.com/watch?v=Sv7IP2qL0gg
https://www.youtube.com/watch?v=c0tPZoPWgBI
https://www.bbc.co.uk/bitesize/guides/zxy3k2p/revision/8

Subject: Spanish	Term: 6	Topic: Spanish GCSE Revision

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'Ipsum quod faciendum est diutius durant'

Remember sites like: Linguascope, Conjugemos etc. for general practice too

Module 1 – Travel & Tourism

Week 1

Bitesize: Bitesize AQA SP Travel & Tourism
Quizlet: Quizlet M1 Revision Packs: Revision Packs
Revision Modules – SharePoint: REVISION MODULES Spanish
Active Learn AQA Textbook: Pp 6-24 Kerboodle Book: U8 – Pp 126-142
Present tense practice: Languages Online - Present tense

Module 2 – Studies & School life

Week 2

Bitesize: Bitesize AQA SP Current & Future Study
Quizlet: Quizlet M2 Revision Packs: Revision Packs
Revision Modules – SharePoint: REVISION MODULES Spanish
Active Learn AQA Textbook: Pp 26-44 Kerboodle Book: U10-12 – Pp 146-164
Imperfect tense practice: Languages Online - Imperfect Practice

Module 3 – Family , friends, relationships & technology

Week 3

Bitesize: Bitesize AQA SP Relationships Bitesize AQA SP Tech
Quizlet: Quizlet M3 Revision Packs: Revision Packs
Revision Modules – SharePoint: REVISION MODULES Spanish
Active Learn AQA Textbook: Pp 46-64 Kerboodle Book: U1-2 Pp 18-46
Preterite tense practice: Languages Online - Preterite Practice

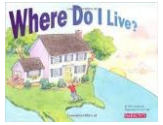
Module 4 – Free time, role models and life

Week 4

Bitesize: Bitesize AQA SP Free Time
Quizlet: Quizlet M4 Revision Packs: Revision Packs
Revision Modules – SharePoint: REVISION MODULES Spanish
Active Learn AQA Textbook: Pp 66-86 Kerboodle Book: U3 Pp 48-80
Present continuous practice: Languages Online - Pres Cont

Module 5 – Region, area and home

Week 5



Bitesize: Bitesize AQA SP Home & Area
Quizlet: Quizlet M5 Revision Packs: Revision Packs
Revision Modules – SharePoint: REVISION MODULES Spanish
Active Learn AQA Textbook: Pp 88-108 Kerboodle Book: U5 Pp 84-94
Conditional practice: Languages Online - Conditional

Module 6 – Lifestyle, tradition and festivals

Week 6

Bitesize: Bitesize AQA SP Customs & Festivals Bitesize AQA SP Food & Drink
Quizlet: Quizlet M6 Revision Packs: Revision Packs
Revision Modules – SharePoint: REVISION MODULES Spanish
Active Learn AQA Textbook: Pp 110-130 Kerboodle Book: U4 Pp 64-80
Future tense practice: Languages Online - Future

Module 7 – Jobs, employment & the future

Week 7

Bitesize: Bitesize AQA SP - Jobs & Employment
Quizlet: Quizlet M7 Revision Packs: Revision Packs
Revision Modules – SharePoint: REVISION MODULES Spanish
Active Learn AQA Textbook: Pp 132-150 Kerboodle Book: U 12 Pp 158-164
Mix Grammar practice: Bitesize AQA SP Mix GCSE Grammar

Module 8 – Global & Social Issues

Weeks 1&2

Bitesize: Bitesize AQA SP Social Issues
Quizlet: Quizlet M8 Revision Packs: Revision Packs
Revision Modules – SharePoint: REVISION MODULES Spanish
Active Learn AQA Textbook: Pp 152-170 Kerboodle Book: U6 & 7 Pp 96-124

Specification

https://www.aqa.org.uk/subjects/languages/gcse/spanish-8698/specification-at-a-glance

Subject: Business Studies	Term: 6	Topic: Making financial decisions

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'Ipsum quod faciendum est diutius durant'

Week 1 – Gross profit and Net profit

Gross profit

Gross profit is the difference between the money received from selling goods and services and the cost of making or providing them. It does not take account of any fixed costs (overheads) so it is useful in showing how much profit each product or service generates (it's contribution per unit).

The money received from selling goods and services is sales revenue (quantity of sales x selling price). The cost of making the goods or providing the services is called the **cost of sales**, since it reflects the directly related to production, such as raw materials.

Calculating gross profit

In order to calculate gross profit, a business will use the following formula:

Gross Profit = Sales Revenue – Cost of sales

Improving gross profit
Reduce raw material costs
Reduce labour costs (wages)

For example, a business produces t-shirts:

Selling price = £1 Variable cost = £0.49 GP = £1 - £0.49 = £0.51

Net profit

Net profit is the difference between the amount of money received from selling goods and services and all of the costs incurred in order to make them. Net profit is often considered to be the more important profit figure, as it includes all of the fixed costs and other overheads that a business has to pay.

Net profit can be negative, which would indicate that a business has made a loss, since its costs are greater than its sales revenue.

Calculating net profit

In order to calculate net profit, a business will use the following formula:

Net profit = gross profit – other operating expenses and interest

Improving net profit
Reduce overheads
Reduce rent

e.g. t-shirts GP = £0.51 Other operating expenses and interest = £0.20 NP = £0.51-£0.20 = £0.31

Week 2 – Gross Profit Margin and net profit margin

Gross profit margin

The gross profit margin is the percentage of sales revenue that is left once the cost of sales has been paid. It tells a business how much gross profit is made for every pound of sales revenue received. For example, a gross profit margin of 75% means that every pound of sales provides 75 pence of gross profit.

Calculating the gross profit margin

In order to calculate the gross profit margin, a business will use the following formula:

$$\text{Gross Margin Ratio} = \frac{\text{Total Revenue} - \text{Cost of Goods Sold}}{\text{Total Revenue}} \times 100$$

GPM and NPM are often referred to as profit ratios

e.g. the gross profit margins for this year and last year would be:

	Gross profit	Sales revenue	Gross profit margin (%)
Last year	£50,000	£150,000	(£50,000 ÷ £150,000) × 100 = 33.33%
This year	£100,000	£450,000	(£100,000 ÷ £450,000) × 100 = 22.22%

Where the example shows that sales revenue has tripled the gross profit has only doubled and by looking at the example it can be seen that the GPM has decreased.

Net profit margin

In the same way that net profit is lower than gross profit, because it accounts for more costs, the net profit margin will be lower than the gross profit margin. In markets that are particularly competitive, such as the food retail market, net profit margins can be very small.

Calculating the net profit margin

In order to calculate the net profit margin, a business will use the following formula:

$$\text{Net Profit Margin} = \frac{\text{Gross Profit Margin - Operating Expenses}}{\text{Total Revenue}} \times 100$$

For example, a business that knows its net profit and sales revenue can calculate its net profit margin as follows:

	Net profit	Sales revenue	Net profit margin (%)
Last year	£30,000	£150,000	(£30,000 ÷ £150,000) × 100 = 20%
This year	£45,000	£450,000	(£45,000 ÷ £450,000) × 100 = 10%

This shows that the net profit margin for this business decreased from 20% to 10% over the past two years.

Subject: Business Studies	Term: 6	Topic: Making financial decisions

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Week 3 – Average rate of return

Calculating the average rate of return

The average rate of return is a way of comparing the profitability of different choices over the expected life of an investment. To do this, it compares the average annual profit of an investment with the initial cost of the investment. This is necessary in order to compare investments that might last for different periods of time.

To calculate the average rate of return, a business will use the following formula:

$$\text{ARR (\%)} = \frac{\text{Total net profit / No years}}{\text{Initial cost}} \times 100$$

Inflation: the general increase in prices over time

e.g.

Option	New	Used
Cost of excavator	£40,000	£25,000
Additional profit in year 1	£14,000	£9,500
Additional profit in year 2	£12,000	£7,500
Additional profit in year 3	£9,000	£6,500
Additional profit in year 4	£8,000	£4,500
Additional profit in year 5	£7,000	£0
Total additional profit	£50,000	£28,000
The average rate of return for each option would be calculated as follows:		
Average annual profit =	£50,000 ÷ 5 = £10,000	£28,000 ÷ 4 = £7,000
Average rate of return =	(£10,000 ÷ £40,000) × 100 = 25%	(£7,000 ÷ £25,000) × 100 = 28%

Advantages	Disadvantages
ARR provides a percentage return which can be compared with a target return	Does not take into account cash flows – only profits (they may not be the same thing)
ARR looks at the whole profitability of the project	Takes no account of the time value of money
Focuses on profitability – a key issue for shareholders	Treats profits arising late in the project in the same way as those which might arise early

Week 4 – Understanding business performance

Interpretation of results

Information from graphs and charts

Businesses have access to a lot of numerical information, also called **quantitative** information. Businesses often use this information to help them make business decisions. Such information might be available in internal documents, such as sales reports or financial documents, and other information might come from external sources, such as government statistics.

This information may be presented in a number of different ways. A chart is used to present information in the form of a graph, a diagram or a table. There are many different types of chart, including **pie charts**, **bar charts**, **pictograms** and **infographics**. Businesses can then use these visual representations to perform analysis.

Financial data includes:

- **Costs and revenues**
- **Gross and net profit**
- **Profit margins**
- **Cash flow**
- **Break-even**
- **Average rate of return**

+ Good for comparisons over time
+ Clear and easily communicated

- Becomes outdated quickly
- Can be interpreted differently by people
- Might not necessarily be the most significant success factor for an ethical or environmentally focused company

When extracting information from charts and graphs, it is important to:

- identify any trends the graph or chart shows
- check the scales used on the **axes**
- be aware of whether the data show units, **percentages** or **percentage change**
- read the chart title and any labels used

It is very easy to misinterpret information from graphs and charts, so **always double check** that you have read them correctly.

Making business decisions

Businesses make decisions using the information that they have available. It is important to ensure that any information used is:

- accurate
- sufficient
- up to date

Market data

Primary Research – new research completed by the business e.g. surveys, questionnaires or focus groups

Secondary Research – existing data that the business reviews e.g. news papers, previous reports, competitor actions

+can aid with planning
-different methods may be less reliable or have bias

Subject: Business Studies	Term: 6	Topic: Making financial decisions

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Week 5 – Organisational structures

Hierarchical Structures – "tall" lots of layers of management

Advantages

+ more opportunities for promotion which can lead to greater staff motivation
+ staff gain more support from their line manager
+ there is a higher degree of supervision as each line manager has a limited number of people they are responsible for

Disadvantages

-many levels of hierarchy
- span of control is narrow, and the chain of command is long, making communication slower as instructions take longer to travel through the levels of the organisation
- longer lines of communication can make the firm less responsive to change
- can be expensive to run due to high wage costs

Flat structures – few layers of management

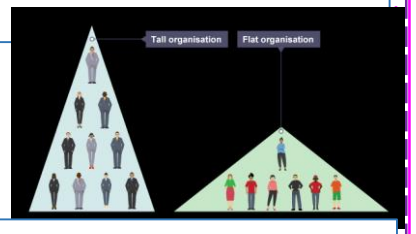
Advantages

- ✓ few levels of **hierarchy**
- ✓ lines of communication are short, making the firm responsive to change and decision-making quicker
- ✓ staff working in a flat management structure can be empowered to work independently and take on more responsibility

Disadvantages

- wide span of control means that tasks must be delegated, which can lead to employees feeling stressed and managers feeling overstretched
- less promotion opportunities within a flat structure, which may lead to the company losing staff to other organisations

Span of control - the number of subordinates for whom a manager is directly responsible.



Centralised vs decentralised

Centralised means that decisions are made at the centre of the organization. Decisions must be approved by the highest levels of management.

- ✓ Activities are all coordinated and focused
- ✓ Vision is clear
- ✓ Performance can be tracked
- ✓ High levels of control
- ✓ Accountability is clear

Decentralised means decisions can be made locally and at a lower level

- ✓ Managers can focus on the bigger picture
- ✓ Local managers might be better equipped to respond
- ✓ Employees feel empowered

Effective communication

Not enough (insufficient) communication can lead to managers being unaware of problems and employees unaware of how to manage issues

Too much communication (excessive) can lead to high levels of stress and important messages becoming 'lost'

Barriers to communication include:
Poor spelling Poor handwriting
Cultural barriers Linguistic barriers
Wrong type of communication chosen e.g. letter vs email

Week 6 – Different ways of working

Hours

Full-time – 35 hours and above each week
Part-time – Less than 35 hours a week. Part-time workers may work shorter days or less days a week
Flexible hours – some offer flexible hours, they can be annualised and divided how is most suitable for the employee
Zero hours contract – employees are not guaranteed hours but can be called upon to work when is suitable for the business
Job share – two employees combine to make one employees role and hours

Contracts

Permanent – employee is employed on an ongoing basis

Temporary – an employee is employed for a fixed amount of time e.g. the Christmas period

Freelance – a freelancer works for them on a particular project

Freelancer = someone who is self-employed and contracted by a business to work for them

The impact of technology on ways of working

Technology has made working more efficient in many ways but there are also some difficulties. Although technology can reduce the barriers to communication it can make employees feel distanced

Benefits of remote working

Benefits for Employers	Benefits for Employees
Lower costs due to reduced travel and workplace requirements	Reduced time spent travelling to and from work
Lower sickness as staff are less likely to take time off	More flexible times to start and end of work days
Happier staff because they can work more flexibly and therefore can be more productive	Less chance of interruption from colleagues or meetings

Subject: Business Studies	Term: 6	Topic: Business Studies Revision

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Topic 2.1 Growing the business

BizConSesh YouTube Unit 2.1 Play list
2.1 PowerPoint Materials
Bitesize 2.1

Topic 2.2 Making marketing decisions

BizConSesh YouTube Unit 2.2 Play list
2.2 PowerPoint Materials
Bitesize 2.2

Topic 2.3 Making operational decisions

BizConSesh YouTube Unit 2.3 Play list
2.3 PowerPoint Materials
Bitesize 2.3

Topic 2.4 Making financial decisions

BizConSesh YouTube Unit 2.4 Play list
2.4 PowerPoint Materials
Bitesize 2.4

Topic 2.5 Making human resource decisions

BizConSesh YouTube Unit 2.5 Play list
2.5 PowerPoint Materials
Bitesize 2.5

Exam Technique

BizConSesh YouTube Exam Technique Play list
BizConSesh YouTube MCQ Technique Play list
Bitesize Exam Technique

Specification

https://qualifications.pearson.com/content/dam/pdf/GCSE/Business/2017/specification-and-sample-assessments/GCSE_Business_Spec_2017.pdf

Subject: KS4 D&T	Term:6	EXAM PREP

WOOTTON PARK
'Ipsum quod faciendum est diutius durant'

Production Methods

Week 1

Computer aided design (CAD) allows designers to draw, design and model on screen.

Products can be designed in one location and made at a location in another part of the country or another part of the world.

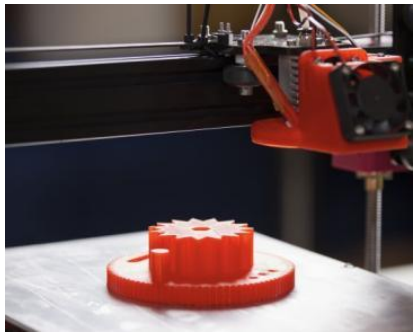
CAD can be linked to a compatible machine to produce products using **computer aided manufacturing (CAM)**.

CAM can create a faster production process and generally only uses the necessary amount of raw materials.

3D PRINTING

Small-scale car production is now being developed where all the exterior body parts are 3D printed and assembled.

Click here to watch the video.



Flexible manufacturing systems (FMS)

Production is organised into cells of machines performing different tasks. Each cell has a range of **computer numerically controlled (CNC)** machines.

- FMS are highly flexible because:
- they can produce different products at the same time
- they can be set up to produce new products quickly and easily, saving time and effort.

Just in Time (JiT)

JIT production is a method of organising a factory so that materials and components are ordered to arrive at the product assembly plant just in time for production. It helps to create **lean manufacturing**, which means it focuses on giving customers value for money by reducing waste.

Click here to watch a video about JiT manufacture.

The Nissan Factory in Sunderland operates JiT

Computer aided design (CAD): using computer software to draw, design and model on screen.

Computer aided manufacturing (CAM): manufacturing products designed by CAD.

Flexible manufacturing system (FMS): a system in which production is organised into cells of machines performing different tasks.

Computer numerically controlled (CNC): machine tools that are controlled by a computer.

Just in Time (JIT): a production method that means materials and components are ordered to arrive and the product assembly point just in time for production.

Lean manufacturing: focusing on reduction of waste when manufacturing.

Subject: KS4 D&T	Term:6	**Manufacturing Specification & Product Analysis**

WOOTTON PARK
'Ipsum quod faciendum est diutius durant'

Video Links – What is a Product Analysis

Week 1

What is a Product Analysis

Click on the links to learn more on Product Analysis:

https://www.youtube.com/watch?v=gIa079pY3JE&t=522s

https://www.youtube.com/watch?v=K-63trEEqng

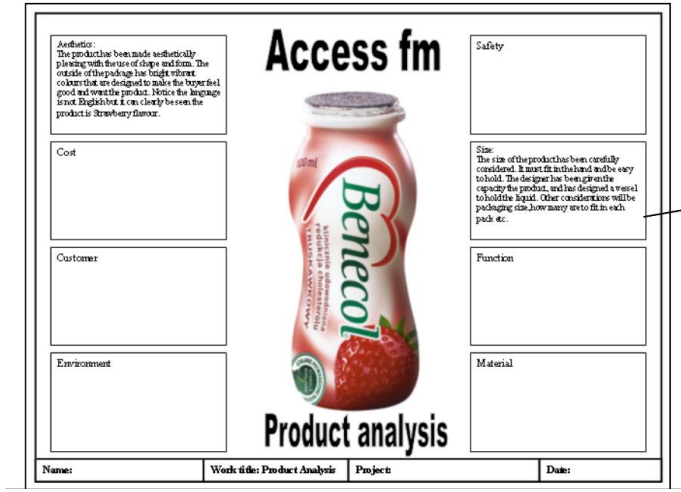
https://www.youtube.com/watch?v=4vdxFVnHcy0

Video Support Link	Learning Outcomes
https://www.youtube.com/watch?v=2E7QtgTK798 https://www.youtube.com/watch?v=w_Y_9fNHwE4	**Understand how to produce a Market Research page**
https://www.youtube.com/watch?v=xVvkONMT3zs https://www.youtube.com/watch?v=rr87IxgXAk4	**How to create a client profile for your project**

A manufacturing specification

A manufacturing specification is a more detailed list of criteria that the product must fulfil. There are a set list of headings that can be used to structure the specification. This list of requirements will be used to judge the success of designs later on in the design process.

- function
- performance criteria
- safety
- environments it may operate or be kept in
- measurement targets
- ergonomics
- aesthetics
- materials availability.



Size:

The size of the product has been carefully considered. It must fit in the hand and be easy to hold. The designer has been given the capacity the product, and has designed a vessel to hold the liquid. Other considerations will be packaging size, how many are to fit in each pack etc.

ACCESS FM

ACCESS FM is an acronym that stands for

- **Aesthetics** – how attractive the product looks – colour, pattern, shape, fonts, images etc.
- **Cost** – consider the retail cost; how have costs been kept to a minimum for manufacture?
- **Customer** – who is the product aimed at? How can you tell this?
- Environment – where is the product to be placed, stored and displayed for sale? How has this affected the design?
- **Safety** – does the product have any safety concerns? How are these communicated?
- **Size** – what size should the product be, and why? How does the size affect the use?
- **Function** – how does the product meet the required needs?
- **Materials** – why have materials been chosen for the different parts/components of the product?

ACCESS FM is used to analyse products in detail. The information can then be used to help design and develop new and creative products.

Design ideas and CAD/CAM options

You may want to start thinking about a range of ideas

https://www.youtube.com/watch?v=gMLvmQriku0

Subject: KS4 D&T	Term:6	**Materials**

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Materials

Week 2

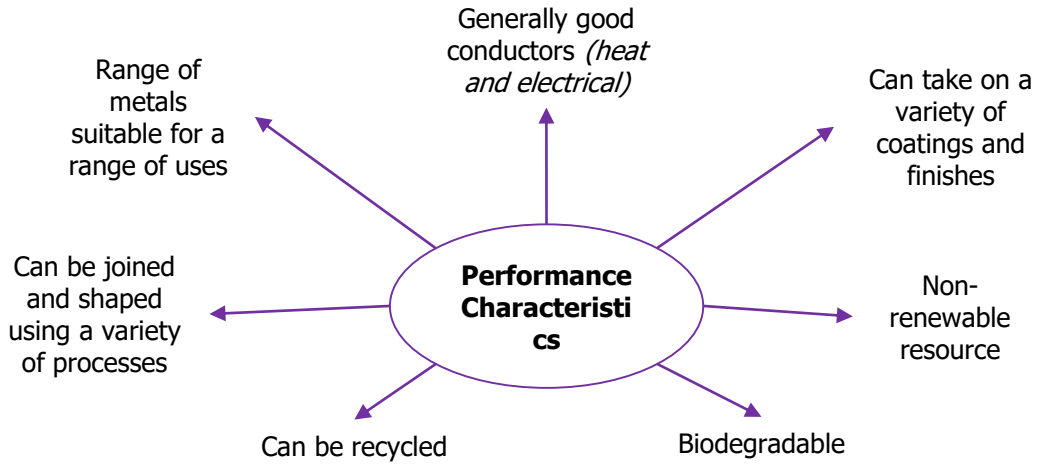
Alloys are mixtures of two or more metals, in order to get the best properties of both		
Name	**Key info**	**Uses/ Examples**
Brass	Malleable and easy to cast	Musical instruments, plumbing
Stainless Steel	Doesn't rust, hard and smooth	Cutlery, medical tools, etc
High Speed Steel	Hard, tough, highly resistant to frictional heat	Tool blades, drill bits, milling cutters
Bronze	Tough, corrosion resistant and can be cast	Statues, coins and bearings
Pewter	Malleable, low melting point and casts well	Jewellery, goblets, decorative items

Non-Ferrous Metals are metals that **do not contain iron**, so **are not** magnetic and will tarnish		
Name	**Key info**	**Uses/ Examples**
Aluminium	Light, high strength to weight ratio and ductile	Pots, pans, cars, cans
Copper	Ductile, malleable and good conductor	Plumbing supplies and cables
Tin	Soft, malleable and good conductor	Used as a protective coating
Titanium	Hard, good strength to weight ratio and high corrosion resistance	Hip replacements, golf clubs and aircraft
Gold	Malleable, ductile and corrosion resistant	Jewellery, electronic components
Silver	Malleable, ductile and can be soldered	Jewellery, cutlery and plating other metals

Stock Forms
Stock Forms for metals include; sheets, plates, bars, tubes and structural angular shapes.

Ferrous Metals are metals that contain **iron**, so are magnetic and will rust		
Name	**Key info**	**Uses/ Examples**
Low Carbon Steel	Tough and ductile and easily machined and welded	Construction, screws, cars
High Carbon Steel	Hard and wears well	Tools, blades and knives
Cast Iron	Hard but brittle. Easily cast but hard to machine	Pots, pans, vices
Medium Carbon Steel	Less ductile, malleable and tough	Springs and gardening tools

Primary Processing
Metals are processed from ores in the ground. then go through an extraction process. This happens by putting the ore in a **blast furnace**. The metal is then separated from the waste material. However, aluminium is processed differently, through **electrolytic processing**



Subject: KS4 D&T	Term:6	**Materials**

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Materials

Week 2

Alloys are mixtures of two or more metals, in order to get the best properties of both		
Name	**Key info**	**Uses/ Examples**
Brass	Malleable and easy to cast	Musical instruments, plumbing
Stainless Steel	Doesn't rust, hard and smooth	Cutlery, medical tools, etc
High Speed Steel	Hard, tough, highly resistant to frictional heat	Tool blades, drill bits, milling cutters
Bronze	Tough, corrosion resistant and can be cast	Statues, coins and bearings
Pewter	Malleable, low melting point and casts well	Jewellery, goblets, decorative items

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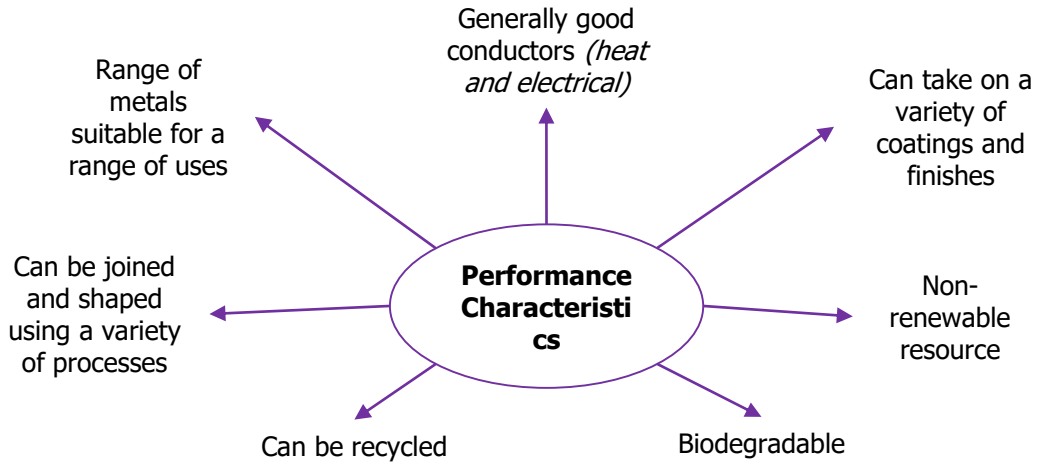
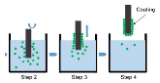
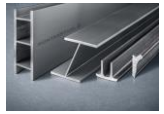


Subject: KS4 D&T	Term:6	**Materials**

WOOTTON PARK
'Ipsum quod faciendum est diutius durant'

Week 2

Metal finishings

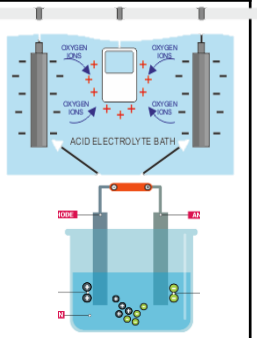
Finish	Key info	Diagram
Cellulose and Acrylic Paints	Once the metal is cleaned and degreased the primer is applied. Then a coloured undercoat, then the final paint colour. The colour can be applied using a brush or sprayed. Special effect and texture paints can be added	
Electroplating	The metal product and 'donor' material are placed in a container with an electrolyte solution. Direct current is applied and the product attracts the donor metal. Examples of 'donors' include; gold, zinc, copper and silver	
Polymer Dip Coating	The metal product is heated to 230 degrees and dipped into a tank of fine polymer powder. The tank has air blowing through to provide an even coating. The heat melts the polymer onto the product, then is left to cool	
Metal Dip Coating	Metal products are dipped into a tank of molten plating metal (a donor metal). There is also tin plating, and zinc plating is known as galvanising.	
Powder Coating	The metal product is (negatively) statically charged. Thermoset polymer resin (positively charged) is sprayed using an airgun. The charging results in a strong attraction and the heat melts the polymer to the metal	
Metal Varnishing	Metal is polishes and varnish applied by either spray or with a fine brush	
Sealants	Sealant is applied with a cloth or machine pad to produce a film that is then allowed to cure. Then it is buffed in with a cloth to a shine	

Metal Finishing

Except steels, most metals have an oxide layer. This provides a slight barrier to environmental effects

Copper's oxide layer turns it form a reddish colour to a greenish colour

Steels have a porous oxide later which lets moisture through. This is what causes rust

Finish	Key info	Diagram
Preservatives	Applied with a cloth, spray or immersion. Silicon sealants can also be classed are preservatives. Often used on moulds and dues for preventing imperfections appearing on surfaces, etc	
Anodising	An electric current passes through sulphuric acid electrolyte solution, from the part to be treated to a negative cathode. As the current flows from the positive to the negative, the aluminium oxide layer builds up on the treated part, producing an anodised finish	
Cathodic Protection	Cathodic protection helps prevent the natural voltage of metals from corroding parts, when exposed to water. There are two methods of cathodic protection – impressed current and sacrificial anodes. Impressed current protects components by flowing a current through any liquid to the component For sacrificial anodes, the electrochemically active metal is joined to a less active metal to provide more resistance to corrosion.	

Subject: KS4 D&T	Term:6	**Environment**

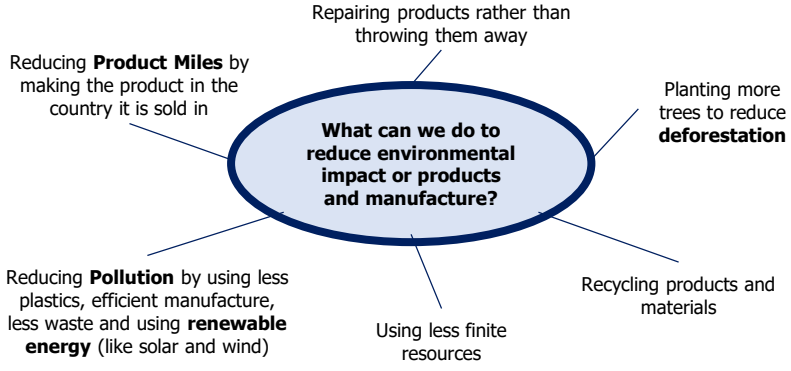
WOOTTON PARK
'Ipsum quod faciendum est diutius durant'

Sustainable Products

Week 2

Using Sustainable Materials and Components
Designers have an ever-increasing responsibility to design products that have minimal environmental impact and must consider: • How to conserve materials • How to conserve energy during manufacture • The products are as sustainable and environmentally friendly as possible • Total carbon footprint • The total product miles

Sustainability is maintaining our planet and its resources and making a minimal negative impact	
Finite Resources *Will run out of eventually*	**Infinite Resources** *Can be re-grown and re-bread. Will not run out of*
Plastics	Paper
Metals	Boards
Polymers (Textiles)	Natural Timbers
	Cotton
	Leather



Life Cycle Assessment	
This is when a designer looks at the environmental impact a product makes over its life time and how it could be reduced. Including: • Impact of materials • Impact of processes • Impact of packaging • Product Miles (how far a product has to travel to get from factory to consumer) • Impact while in use • Impact when disposed of (6Rs)	

Steels have a porous oxide later which lets moisture through. This is what causes rust

Impact of Packaging
Designers and manufacturers need to consider factors that use the optimum amount of packaging to protect and preserve products and prevent waste. E.g.: • Making packaging lightweight • Using recycled content • Making the packaging recyclable or reusable • The use of refills and concentrates • Using minimal packaging materials • Charging for items – like supermarket carrier bags

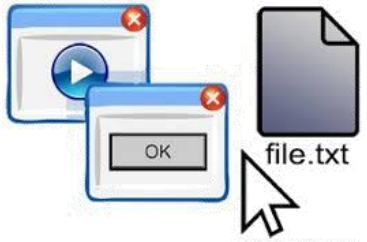
Subject: Creative iMedia	Term: 6	Topic: RO85 Creating a multipage website revision

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Understanding the properties and features of multipage websites

Websites and the internet are part of everyday life; they are used for any number of purposes and are often the first port of call for access to information and services because most websites are public domain.
Multi page websites have several pages that are linked in one or more ways. Websites can have different purposes and features.
Purposes of websites; Education, Online retail, Information and services, Promotion, Entertainment.
Features of websites; House style – Colours, fonts and banners to match the company's 'look'. Consider functional navigation. GUI - graphical user interface.
Extended learning: https://www.bbc.co.uk/bitesize/guides/z3gqhv4/revision/1



Example of a GUI

Devices used to access webpages

There are an ever increasing number of devices that can be used to access webpages. They fall into a number of categories;
Laptops and personal computers, Tablets, Mobile devices and smartphones, Games consoles and digital television.

Extended learning: https://www.ictlounge.com/html/accessing_internet.htm

Methods of internet connection

Wired broadband: requires a router. The router connects the computer(s) and the phone socket, so you can connect the wired local area network in the building to the wide area network (WWW). An internet service provider manages access.
WIFI: Provides broadband internet access and typically connects via a wired router. WIFI is often used to connect laptops, mobile devices and tablets to the internet.
3G, 4G and 5G wireless broadband: Via the mobile network using radio wave transmission. Speed and availability will vary by location.
Extended learning: https://www.bbc.co.uk/bitesize/guides/zh4whyc/revision/4 Identify three purposes fulfilled by websites

Subject: Creative iMedia	Term: 6	Topic: RO85 Creating a multipage website revision

WOOTTON PARK

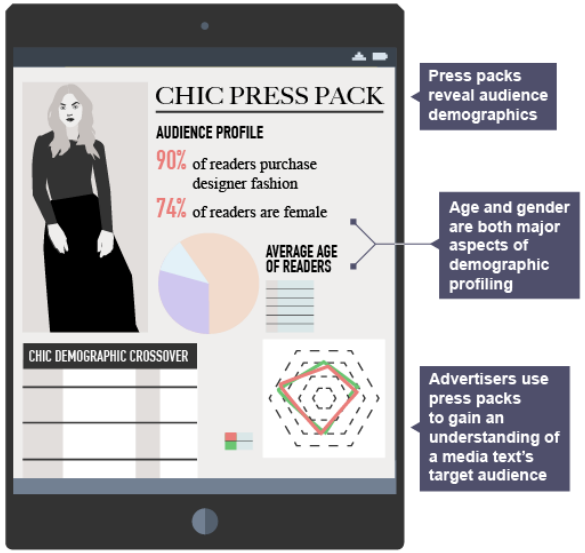
'Ipsum quod faciendum est diutius durant'

Interpreting the client requirements and target audience for a multipage website;

Understanding client requirements is vital when creating a successful product. When reviewing the client brief you need to be able to interpret clearly what the client needs you to make and the elements the website needs to have.

As well as style and design you need to think about the functional elements such as:
Number of pages, Media content, Information on each page, Type of navigation and Additional requirements of your client

Some key elements include understand the requirements of your target audience:
Categorisation of the target audience
Literacy levels
Accessibility needs
Devices and connection method they might use.



Extended learning:

Producing a work plan for a multipage website;

When creating a complex project such as a multipage website it is particularly important to plan your time.
There are many different tasks and features that need to be incorporated into a plan to ensure that you create a working website which meets the client brief and is delivered on time.

There are a range of elements to consider when planning your project which you have looked at in RO 81 and RO 82.
Creating a Gantt chart to include; workflow, resource is, milestones, contingencies.

Gantt chart tutorial: https://www.youtube.com/watch?v=un8j6QqpYa0
Extended learning: https://www.bbc.co.uk/bitesize/guides/z2yxtyc/revision/6

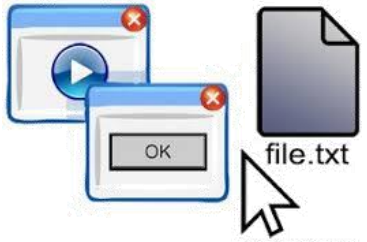
Subject: Creative iMedia Supported content	Term: 6	Topic: RO85 Creating a multipage website revision

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Understanding the contents and features of multipage websites

Websites and the internet are part of everyday life; they are used for any number of purposes and are often the first port of call for access to information and services because most websites are public domain which means they are available for everyone to access.
Multi page websites have several pages that are linked in one or more ways – usually by clicking on hyperlinks. Websites can have different purposes and features. Reasons for websites include; Education, Selling stuff online, Information and services, Promotion, Entertainment.
Features of websites; House style – Colours, fonts and banners to match the company's 'look'. GUI - graphical user interface – using pictures to get around.
Extended learning: https://www.bbc.co.uk/bitesize/guides/z3gqhv4/revision/1



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Subject: Creative iMedia Supported content	Term: 6	Topic: RO85 Creating a multipage website revision

WOOTTON PARK

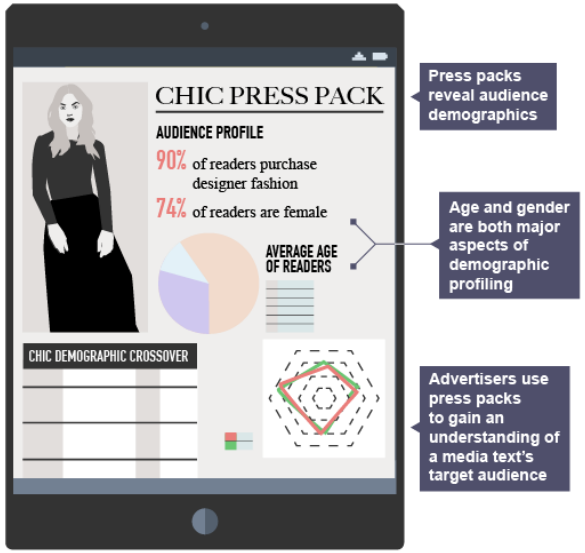
'Ipsum quod faciendum est diutius durant'

Understanding the client requirements and target audience for a multipage website;

Understanding what the client wants is really important when creating a successful product. When reviewing the client brief you need to be able to interpret clearly what the client needs you to make and the things they want you to include.

As well as style and design you need to think about how it will work:
Number of pages, Media content, Information on each page, Type of navigation and Additional requirements of your client

Some key elements include understand the requirements of your target audience:
Talking in detail about your target audience
Literacy levels
Accessibility needs
Devices and connection method they might use.



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There are a range of elements to consider when planning your project which you have looked at in RO81 and RO82.
Creating a Gantt chart to include; workflow, resource is, milestones, contingencies.

Gantt chart tutorial: https://www.youtube.com/watch?v=un8j6QqpYa0
Extended learning: https://www.bbc.co.uk/bitesize/guides/z2yxtyc/revision/6

Subject: Psychology	Term 6	Topic: Criminal Psychology: Revision

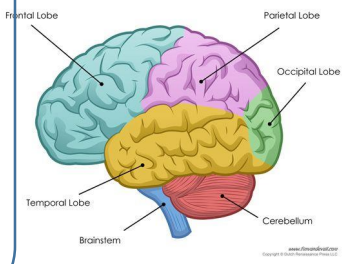
WOOTTON PARK
'Ipsum quod faciendum est diutius durant'

Overview

This week you will revise how to develop an awareness of reasons behind why people commit crimes and how this behaviour can be changed to prevent repeat offences or a crime being committed in the first place.

Key Terms:

- Crime
- Anti-social behaviour
- Drug related offences
- Acquisitive offences
- Sexual offences
- Social construct
- Deviation from norms
- Culture
- Role model
- Identification
- Vicarious reinforcement
- Internalisation
- Genetic inheritance
- Extraversion
- Neuroticism
- Psychoticism
- Punishment
- Deterrent
- Rehabilitation
- Central nervous system
- Reticular activation system
- Dopamine reward system
- Pro-social behaviour
- Restorative justice



Key Theories

Nature vs Nurture

Eysenck's Criminal Personality Theories(1964and 1992) andthe Biological Basis of Personality (1967)

This theory suggests criminal behaviour is something fixed that we are born with.

Criticisms

- It ignores individual differences and categorises people
- There are too many crimes for people to share a similar personality
- It is too deterministic and means people would not take responsibility for their actions

The Social Learning Theory of Criminality

This theory suggests we learn our criminal behaviour through the process

- Identification
- Observation and imitation
- Reinforcement

Criticisms

- Focuses too much on nurture
- If it were true it would mean we could control crime
- It doesn't explain crime when there has been no exposure to a criminal role model

Key Studies:

Social Learning Research Study: Cooper and Mackie (1986) A study into the transmission of aggression through imitation and aggressive models.

Laboratory experiment, IV = the game children played/observed DV = aggression levels cross-sectional study, independent measures design.

Criminal Personality Theory Research Study: Heaven (1996) a study into delinquency extraversion, psychoticism and self-esteem.

Longitudinal, correlational study using a questionnaire. Hypothesis: Measures of psychoticism, extroversion and self-esteem would be predictors for self-reported delinquency

Applications:

- How use of the social learning theory has lead to rehabilitation methods that reduce crime/antisocial behaviour including restorative justice and the use of positive role models
- The effects of punishment and deterrents in reducing criminal behaviour including community service, prisons and fines

Subject: Psychology	Term 6	Topic: Psychological Problems Revision

WOOTTON PARK
'Ipsum quod faciendum est diutius durant'

Week 3 –Biological Theories of Depression
The Social Rank Theory

A01- Evolutionary theories suggest- All adaptive behaviours have a survival value which means they allow us to live long enough to reproduce and pass on our genes.
Social rank theory suggests that Schizophrenia has evolved as it helps us to survive.

E.G Experience loss of a loved one → feel depressed → so we withdraw and lose motivation.

E.G Lose a partner to someone else → don't want to fight back due to risk of failure → withdraw

According to this theory, by accepting the lower rank of others around us and feeling depressed instead of fighting back, we cope better in society and keep a place in the community.

A03

☹ Too reductionist as it simplifies depression into an instinctive reaction to loss. Other psychologists argue it is not just one factor on its own

☹ Depression does not just occur with people in lower ranks. People with a high status in society have it and so it doesn't apply to modern day

☹ Severe depression can lead to suicide which would not be a survival instinct

Week 4- Key Study- Tandoc et al (2015) Is Facebook Depressing?

Aim: To see if depression is linked to Facebook usage and whether Facebook use links to feelings of envy.
Hypotheses:
1. FB users would report higher levels of envy
2. The higher the network of friends the greater the feeling of envy
3. Higher envy would link to more symptoms of depression
Method: A questionnaire conducted online which measured FB use, levels of envy and symptoms of depression.
Sample: 736 students from an American Uni with an average age of 19.
Findings:
- Heavy FB users had higher levels of envy
- Size of network didn't relate to levels of envy
- FB envy was a positive predictor of depression
- No relationship between frequency of use and how depressed people felt

A03

☹ Culturally biased- All USA and educated which may influence how they deal with feelings and FB usage

☹ Social desirability bias could have occurred where pps underplayed their use, level of envy and depression levels

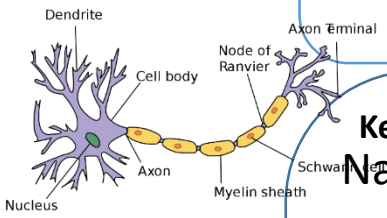
☹ Construct validity may lack- as it is hard to measure envy and depression quantitatively

Subject: Psychology	Term 6	Topic: Development Revision

WOOTTON PARK

Overview

This term you will develop an awareness of the stages of development, including brain development, with reference to the nervous system, neurons and synapses



Key Terms:

- Development
- Pre-Natal
- Childhood
- Adolescence
- Adulthood
- Nervous System
- Neuron
- Synapse
- Cognitive Development
- Egocentrism
- Reductionism
- Holism
- Fixed Mindset
- Growth Mindset
- Education
- Intelligence
- Assimilation
- Schemas
- Accommodation
- Decentration

Key Theories

Nature

Piaget's Theory of cognitive development (1936)

Jean Piaget was interested in how children's thinking changed over time

Four stages:

1. Sensori-motor stage: 0 – 2 years
2. Pre-operational stage: 2 – 7 years
3. Concrete operational stage: 7 – 11 years
4. Formal operational stage: 11+

vs

Nurture

Learning Theories of development:

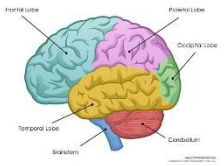
Dweck's ideas on fixed and growth mindset

Fixed = Where people think their intelligence is innate and cannot be changed
Growth = Where people think they can develop their intelligence over time
Praise for effort

Willingham's idea on the importance of meaning for learning

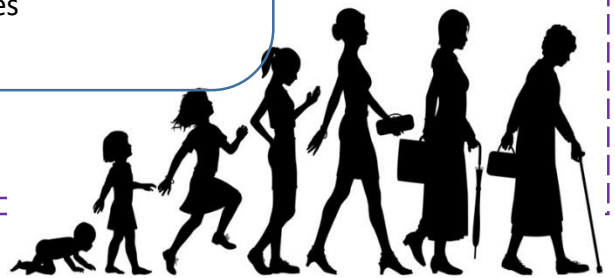
Key Studies:

Cognitive development research study: Piaget (1952) – a study into the conservation of number
Natural experiment, IV = age of children, DV = ability to conserve number, cross-sectional study, independent measures design.
Blackwell et al (2007) Implicit theories of intelligence predict achievement across an adolescent transition
Longitudinal, correlational field study. Hypothesis: There will be a relationship between 7th grade students' mindset and their achievement grades on mathematics tests



Applications:

- How Piaget's ideas have been applied to education through the use of key stages, readiness, active learning and the concept of intelligence
- How learning theories apply to the development of education intelligence through growth mindsets and teaching through meaning not learning styles



Subject: Psychology	Term 6	Topic: Psychological Problems

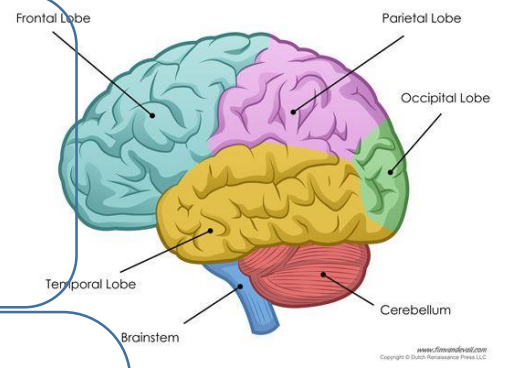
WOOTTON PARK

Overview

This term you will develop an awareness of ways of defining mental health, the current prevalence of mental health problems, the incidence of significant mental health problems over time and changes in attitudes towards mental health.

Key Terms:

- Mental Health
- Dopamine
- Stigma
- Self-fulfilling Prophecy
- Discrimination
- Schizophrenia
- Social Drift Theory
- Neuro-transmitter
- Temporal Lobe
- Hippocampus
- Placebo
- Depression
- Evolutionary Psychology
- Free will
- Determination
- Social Rank Theory
- Envy
- Anti-Psychotics
- CBT



Key Theories

Psychological vs Biological

The social drift theory of schizophrenia

An explanation as to why there is a relationship between social class and schizophrenia

The ABC Model of clinical depression (Ellis 1962)

Rational vs irrational beliefs
A = Activating event
B = belief
C = Consequences

The Biological theory of schizophrenia

An explanation of schizophrenia by looking at the biological factors behind it, e.g. too much dopamine

Social rank theory of clinical depression (Stevens and Price 2001)

The evolutionary function of depression and the role of a lower rank in reducing conflict

Key Studies:

Daniel et al. (1991) – a study into the effect of amphetamine on regional cerebral blood flow during cognitive activation in schizophrenia

lab experiment, IV = amphetamine or not, DV = performance on the Wisconsin card sorting test

Tandoc et al. (2005) – a study into Facebook use, envy and depression among college students

Correlational research, self-reports, 736 students, average age 19,

Applications – the development of treatments:

- The use of anti-psychotics to treat schizophrenia and how they improve mental health
- The use of psychotherapy for treating clinical depression and schizophrenia and how it improves mental health
- The development of neuropsychology for studying schizophrenia and depression

Subject: Psychology	Term 6	Topic: Psychological Problems Revision

WOOTTON PARK

'Ipsum quod faciendum est diutius durant'

Antipsychotics to treat Schizophrenia

These reduce the symptoms of Schizophrenia like hallucinations and delusions.

The chemicals in these drugs block some of the receptors (e.g dopamine receptors) which reduces the messages that are sent through the brain.

Anti-depressants to treat depression

These raise people's moods. The drugs increase the amount of serotonin and noradrenaline in the brain. For example SSRI's prevent the reabsorption of serotonin by blocking the neurons that released it which means serotonin remains in the synapse and lifts the mood.

Psychotherapy for Schizophrenia

Psychoanalysis involves uncovering childhood traumas that may have lead to Schizophrenia in adulthood. These unresolved conflicts have often been buried in the unconscious mind.

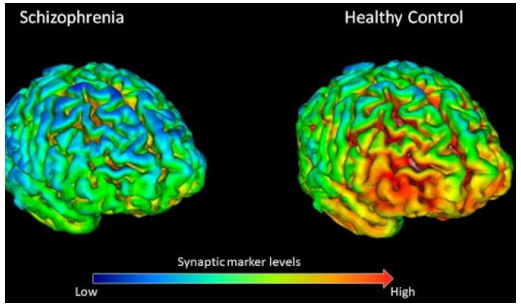
Psychoanalysis aims to discover these conflicts and resolve them in therapy sometimes with the therapist playing the role of the parent. Dream analysis and hypnosis can also be used.

Psychotherapy for Depression

Counselling involves clients recognizing their own problems and addressing them. CBT aims to rationalize the irrational beliefs and other therapies aim to focus on the clients self-esteem and having a better view of themselves.

Neuropsychological Tests

These measure how well a brain is functioning. The scores of people with mental health issues can be compared to those without. The WCS test can be used to check cognitive ability (card sorting task). Depression symptoms can also be measured through multiple choice questionnaires that have been created.



Brain Imaging Techniques

Brain scans allow us to look at images of the brain so we can see structure and functions. PET scans have shown us the brains of someone with Schizophrenia have larger ventricles than normal. fMRI scans have been used to measure the connections between neural circuits in the brain which have explained different types of depression.

Subject: Psychology	Term 6	Topic: Social Influence

WOOTTON PARK

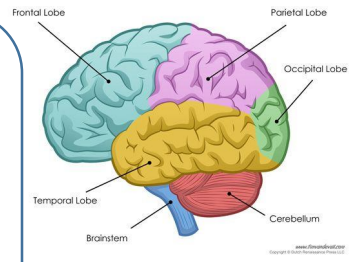
"Ipsum quod faciendum est diutius durant"

Overview

This term you will develop an awareness of how other people influence our behaviour, thoughts and feelings. We will look at what influences people to obey, conform and how we behave in crowds. We will consider things about our environment and our personality that determine whether we obey or conform.

Key Terms:

- Majority influence
- Conformity
- Obedience
- Collective behaviour
- Group norm
- Confederate
- Informational conformity
- In-group
- Out-group
- Deindividuation
- Collectivist culture
- Individualistic culture
- Altruism
- Autonomous state
- Agentic state
- Dispositional
- Locus of control
- Morality
- Psychopath
- Authoritarian personality
- Minority influence



Key Theories

Situational factors

The idea that other people and society will influence our behaviour including:

- Majority influence
- Collective and crowd behaviour
- Pro-social/anti-social behaviour
- Authority figures

Criticisms

- Ignores free will
- Crowds are not always violent
- Individual differences
- Gives people excuses for bad behaviour
- Ignores why some people do not obey

vs Dispositional factors

The idea that personality (disposition) influences our behaviour including:

- Self-esteem
- Locus of control
- Morality
- Authoritarian personality
- The brain

Criticisms

- Generalisations are difficult
- Reductionist theories
- Locus of control differs depending on situation
- Authoritarian personality doesn't explain why those who haven't had harsh parenting are obedient

Key Studies:

Situational Factors Research Study: Bickman (1974) a study into the social power of uniform

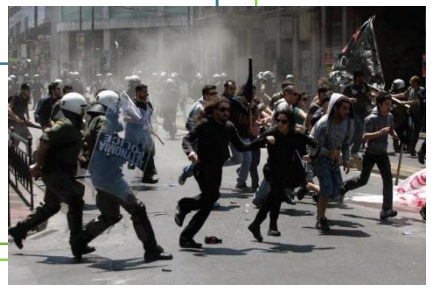
Field experiment, IV = the three different types of uniform people saw DV = obedience levels. Independent measures design. Hypothesis: A uniformed guard has more influence over individuals than the same person in non-authoritative clothes

Dispositional Factors Research Study: NatCen Morell et al (2011) A study into the August riots in England

An interview to investigate what triggered the riots and the extent and nature of the youth involvement (what, who and why)

Applications:

- How minority and majority influence can lead to a change in attitudes and behaviour towards mental health stigma including increasing awareness and reducing discrimination

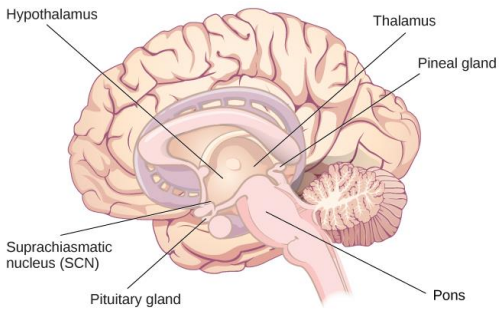


Subject: Psychology	Term 6	Topic: Sleep and Dreaming Revision

WOOTTON PARK
'Ipsum quod faciendum est diutius durant'

The Neuropsychology of Sleep/Causes of Sleep Disorders

Endogenous pacemakers= Internal body clocks that manage our bodily rhythms e.g SCN
Exogenous pacemakers= Features of the environment that help manage bodily rhythms e.g light



Melatonin= A hormone released in the brain that is responsible for regulating sleep

When night falls the pineal gland is 'switched on' by the SCN and starts to produce melatonin. This is then released into the blood and we begin to feel

Sleep Onset Insomnia (struggle going to sleep)
- Anxiety
- Caffeine or nicotine before bed
- Eating a heavy meal before bed
- Playing computer games or using your phone before bed
- Physical pain

Sleep Maintenance Insomnia (struggle staying asleep)
- Depression
- Drinking alcohol
- Restless leg syndrome
- Sharing a bed with a snorer
- Menopause (for women)

Theories of Dreaming

A01 The Freudian Theory of Dreaming
He believed the human mind is made up of the unconscious mind which drives our behaviours without us being aware. Freud believed that dreams act as wish fulfilment where people dream about their deepest desires that they cannot fulfil in real life. This helps people to release the anxiety they feel from these urges.
Manifest content of dreams is the actual content and the latent content is the underlying meaning.
A03
☹ Too subjective- dream interpretation is open to opinion
☹ Difficult to test- we cannot observe or ask about the unconscious mind
☹ It is based on unreliable research using case studies

A01 The Activation Synthesis Theory of Dreaming
Dreams occur when the mind tries to make sense of the brain activity that happens during sleep. **Dreams have no meaning.**
Hobson and McCarley's theory argues that the electrical signals in the brain during REM cause surges of stimulation and that activates the whole cerebral cortex. This makes the brain try to attach some meaning to what is happening. It draws on its own memories to do this which is why dreams can be confusing
A03
☹ Reductionist- it is too simple to reduce all dreams to this theory
☹ Some people have recurring dreams or pick up dreams where they left off which goes against the idea they are random
☹ Patients with damage to the brain stem do not stop dreaming