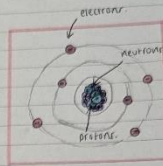


atoms

THE NUCLEUS

- in the middle of the atom.
- contains **protons** and **neutrons**.
- positive charge overall, due to the **protons** (+).
- almost the whole mass of the atom is in the nucleus.



THE ELECTRONS

- move around the nucleus in shells.
- negatively charged (-).
- have almost no mass.

particle	relative mass	relative charge
proton	1	+1
neutron	1	0
electron	0	-1

protons = 11

neutrons = 23 - 11 = 12

electrons = 11

Na

11

atomic number = number of protons
 mass number = number of protons + neutrons
 number of neutrons = mass number - atomic number
 number of electrons = atomic number
 positive = positively charged
 negative = negatively charged
 negative ion = negatively charged

An ion is an atom or group of atoms which has lost or gained electrons.

Non-renewable:

- fossil fuels
 - nuclear fuel
- both burnt to get energy + do damage to environment

Renewables:

- Bio-fuel
 - Tides
 - Geothermal
 - Sun
 - Wind
 - Water waves
 - Hydro-electricity
- can be replenished as damage but are less noisy
 don't provide much energy + some are unreliable
- transport = petrol + diesel (oil)
 coal is used in old fashioned trains
 bio-fuels or a mix
- Heating = natural gas (heat homes + water)
 coal in fireplaces
 geothermal
 solar water heaters

- Solar cells → + no environmental damage
 - expensive
- Wind power → + no pollution
 - noisy, unsightly
- Geothermal → + free energy, reliable
 - aren't many suitable locations
- TEP → + no pollution, no running costs
 - high initial costs
 - no pollution
- tidal Barrages → + no pollution
 - disturbs sea bed, unreliable

What is a Fibonacci Sequence

Advantages of nuclear Power

PI - Energy

Non-renewable resources: fossil fuels, nuclear fuel. Both burnt to get energy + do damage to environment.

Renewable resources: Bio-fuel, Tides, Geothermal, Sun, Wind, Water waves, Hydro-electricity. Can be replenished as damage but are less noisy. Don't provide much energy + some are unreliable.

Transport: petrol + diesel (oil), coal is used in old fashioned trains, bio-fuels or a mix.

Heating: natural gas (heat homes + water), coal in fireplaces, geothermal, solar water heaters.

Solar cells: + no environmental damage, - expensive.

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Advantages of nuclear Power:

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- noisy, unsightly
- + free energy, reliable
- aren't many suitable locations
- + no pollution, no running costs
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- + no pollution
- disturbs sea bed, unreliable

PHYSICS - energy

What are the equations for:

- Kinetic energy
- GPE
- Work done
- Power
- Efficiency

Energy: the ability to do work. It can be transferred from one object to another or from one form to another. It is a scalar quantity.

Work done: the energy transferred when a force moves an object through a distance. $W = F \cdot d$

Power: the rate at which work is done or energy is transferred. $P = \frac{W}{t}$

Efficiency: the ratio of useful energy output to total energy input. $\text{Efficiency} = \frac{\text{Useful energy output}}{\text{Total energy input}}$

Kinetic energy: the energy of an object in motion. $E_k = \frac{1}{2}mv^2$

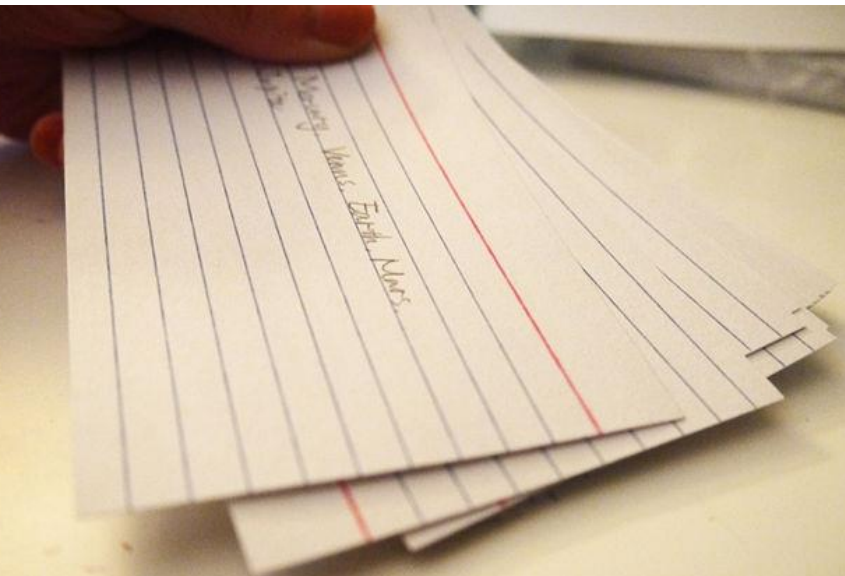
GPE: the energy an object has due to its position. $E_p = mgh$

Work done: the energy transferred when a force moves an object through a distance. $W = F \cdot d$

Power: the rate at which work is done or energy is transferred. $P = \frac{W}{t}$

Efficiency: the ratio of useful energy output to total energy input. $\text{Efficiency} = \frac{\text{Useful energy output}}{\text{Total energy input}}$

Flash cards



Summary sheets

Counter-urbanisation - people moving from M.E.P.C to country side seeking benefits/better lifestyle.

Urban → Rural in Iceland due to...

PUSH

- Crime in the cities
- Pollution in the cities
- Traffic in cities
- Loud busy
- housing

PULL

- Hot springs
- Geysers
- Northern lights
- Isolated relaxed lifestyle
- Only 1hr drive from capitals

There was a large population change in Iceland

- The west lost population
- The east lost population
- The South gained population

Rural areas consist of lots of attractions therefore urban dwellers seek access to rural...

Lots of people are migrating to rural areas so we are losing space and countryside.

Benefits	Drawbacks
<ul style="list-style-type: none"> • more housing • more facilities - shops • affordable housing • making money in the long term • less homeless people • more independence • create jobs • bigger communities 	<ul style="list-style-type: none"> • destroys nature/environment • takes up farmers land for growing crops • pollution • protesters • rural attractions destroyed • loss of jobs with farmers • loss of land

Problems with housing:

- Not enough houses
- Not affordable
- Rent kept rising
- Need banks to provide better mortgages
- Detached houses are selling

Storage devices

devices that can be used to store data in them can be accessed later (like memory)

They can have a range of capacities from 5GB to 1TB. Some of them are portable and some are internal for your computer. Data is measured in bytes and the scale runs up:

1KB 1MB 1GB 1TB

1KB = 1024 bytes
1MB = 1024KB
1GB = 1024MB
1TB = 1024GB

There are two ways of storing data on magnetic metal disks and on data chips. The chips are much faster and smaller making them the better device. They also have a much larger capacity as they are more modern.

be stored on the device
speed - How quickly the data can be transferred.
Portability - Size and how easy it is to carry around.
Reliability - how many times it can be used before it breaks.

Examples: 1TB hard drive

Area of a Triangle = $\frac{1}{2} \times \text{base} \times \text{height}$

a = one length
b = other length
c = angle

height
base

The Quadratic formula =

Any quadratic of any form $a x^2 + b x + c = 0$ will be solved by substituting a, b, c into the formula

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

eg $x^2 + 3x + 2 = 0$
a = 1, b = 3, c = 2

$x = \frac{-3 \pm \sqrt{3^2 - 4(1)(2)}}{2(1)}$
 $x = \frac{-3 \pm \sqrt{9 - 8}}{2}$
 $x = \frac{-3 \pm 1}{2}$

$x = \frac{-3 + 1}{2} = -1$
 $x = \frac{-3 - 1}{2} = -2$

Position to Term Rule

Position to Term rules are the abilities of how a sequence relates to position and the constant of the first term.

eg $2n - 1$

Position = 1, 2, 3, 4, 5
Term = 1, 3, 5, 7, 9

Difference between terms is constant in sequence and this constant is called the common difference.

eg $2n - 1$

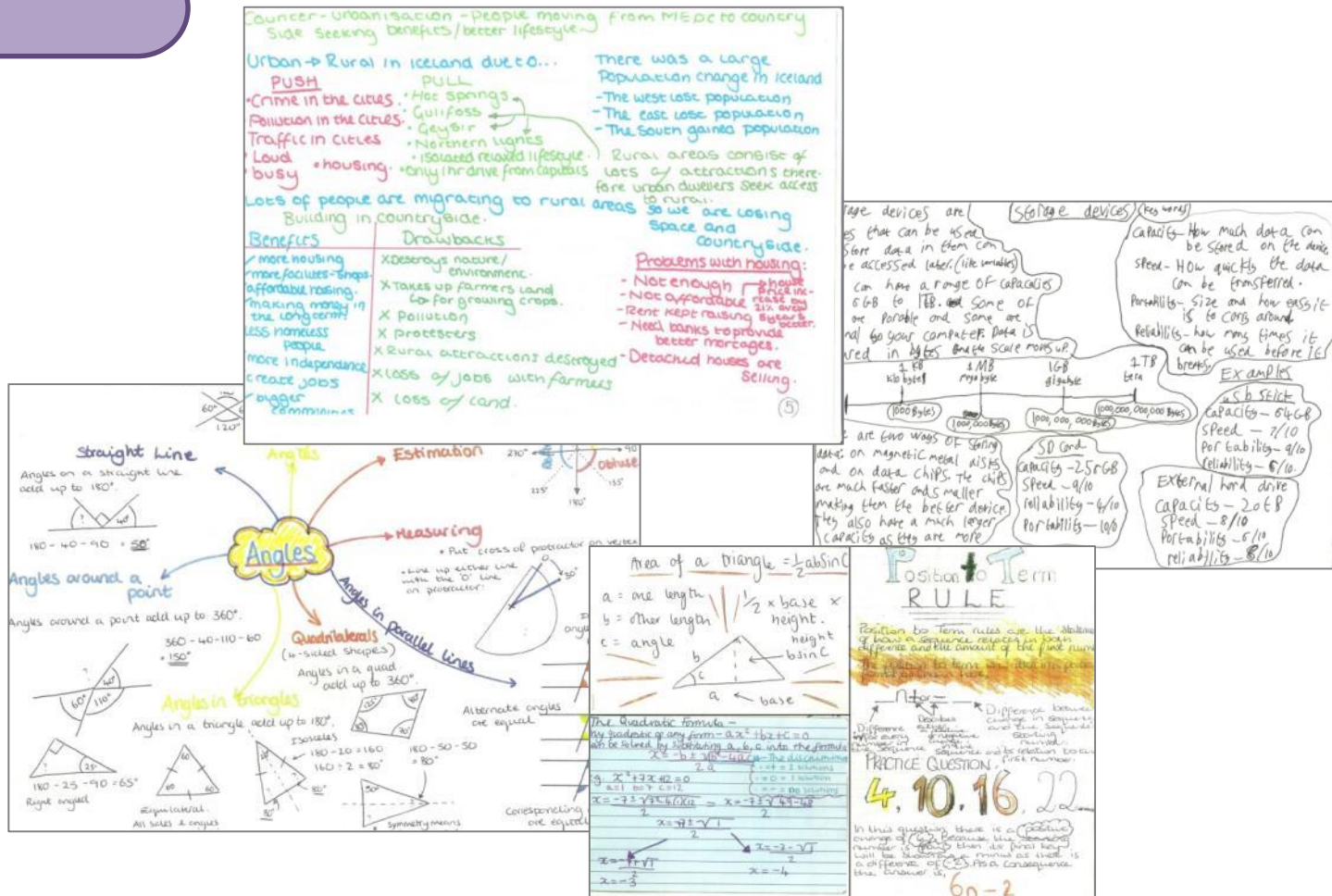
Practice Question

4, 10, 16, 22

In this question there is a positive change of 6. The common difference is 6. The first term is 4. The formula is $6n - 2$.



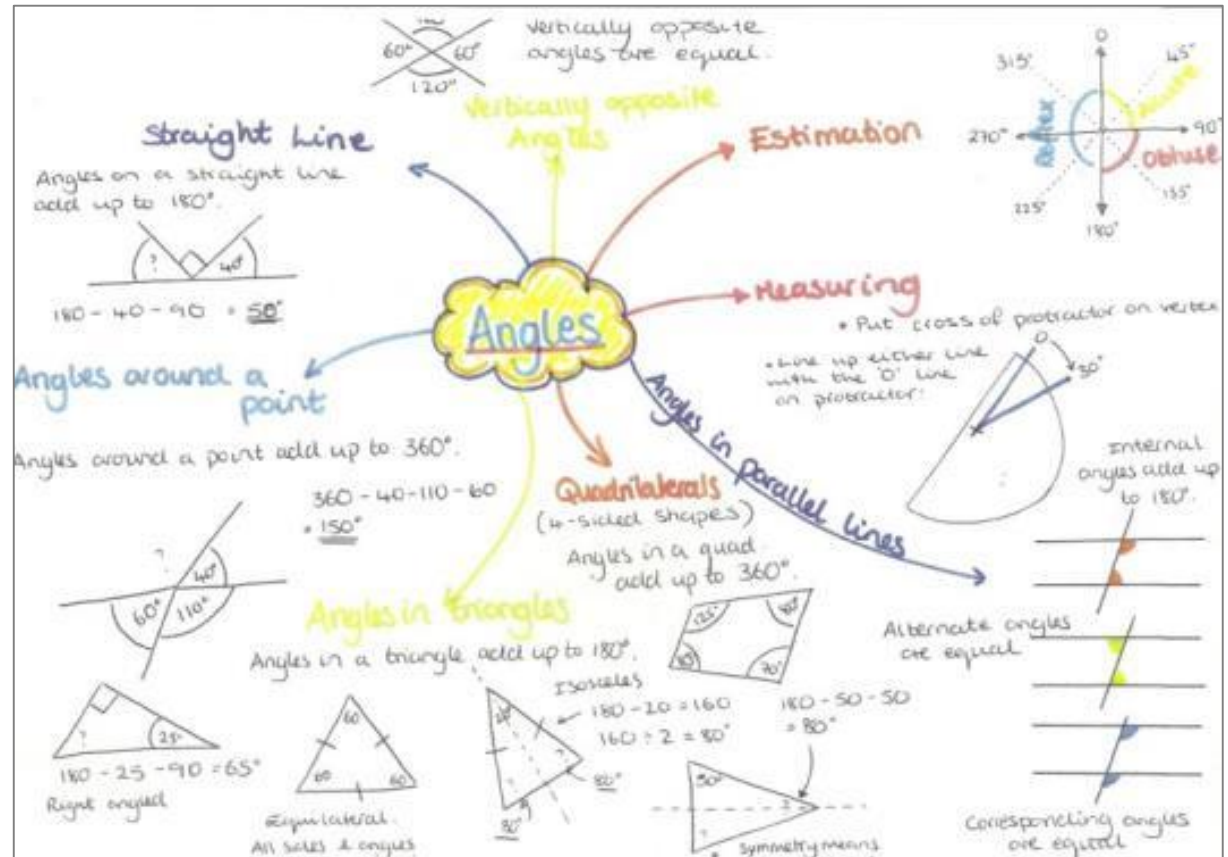
Examples



Summary sheets

Revision techniques

Examples



Summary sheets

Revision techniques

Examples

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Lots of people are migrating to rural areas so we are losing space and countryside.

Building in countryside.

Benefits	Drawbacks
✓ more housing	X destroys nature/environment.
✓ more facilities - shops	X Takes up farmers land for growing crops.
✓ affordable housing.	X Pollution
✓ making money in the long term	X protesters
✓ less homeless people	X Rural attractions destroyed
✓ more independence	X loss of jobs with farmers
✓ create jobs	X loss of land.
✓ bigger communities	

Problems with housing:

- Not enough
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- Rent kept raising
- Need banks to provide better mortgages.
- Detached houses are selling.

house price inc. 21% over 5 years

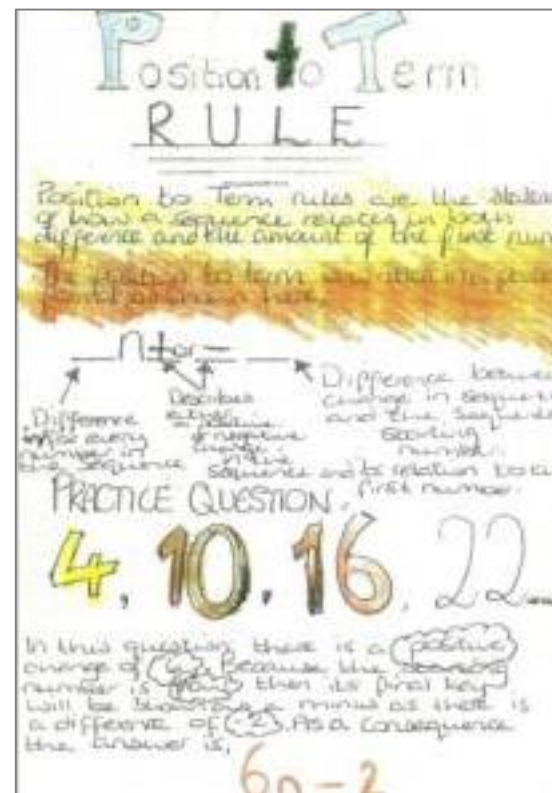
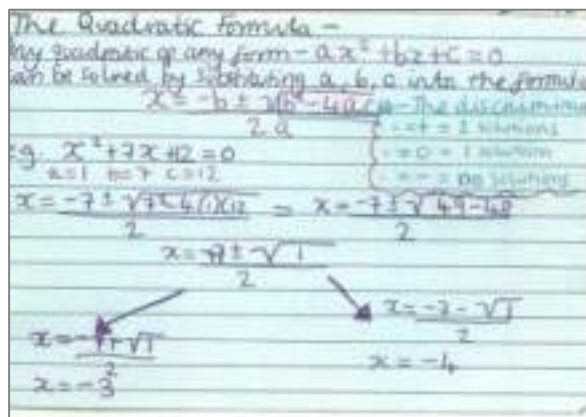
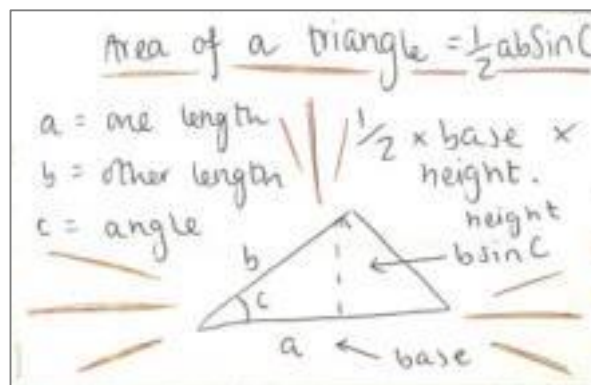
(5)



Summary sheets

Revision techniques

Examples



Summary sheets

Examples



Flash cards

Revision techniques

Examples

How does your body stop microbes from getting in?

- skin
- tears
- mucus
- cilia cells
- earwax
- scabs
- eyebrows
- eyelashes
- saliva
- stomach acid

Community

All the populations of different organisms that live together in a habitat

How do white blood cells protect you?

White blood cells make lots of different types of antibodies as each pathogen can only be killed by one type of antibody. The right antibodies latch onto the antigens.

Order of memory size
(in units eg. KB)

Bit → byte → kilobyte → megabyte → gigabyte

Convert 14,900 B to MB

0.0149 MB

$$\frac{14,900 \text{ B}}{1024} = 14.54 \text{ KB}$$
$$\frac{14.54 \text{ KB}}{1024} = 0.0142 \text{ MB}$$


Flash cards

Revision techniques

Examples

How does your body
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- skin
- tears
- Mucus
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Flash cards

Revision techniques

Examples

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Flash cards

Revision techniques

Examples

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Flash cards

Revision techniques

Extend their use



What is an advantage of nuclear power?

No greenhouse gases

What is a disadvantage of nuclear power?

Used fuel rods contain radioactive waste



Which gases are produced when we burn fossil fuels?

Greenhouse gases, such as carbon dioxide.



How long could our oil and gas reserves last for?

Around 50 years

What is a disadvantage of nuclear power?

Used fuel rods contain radioactive waste

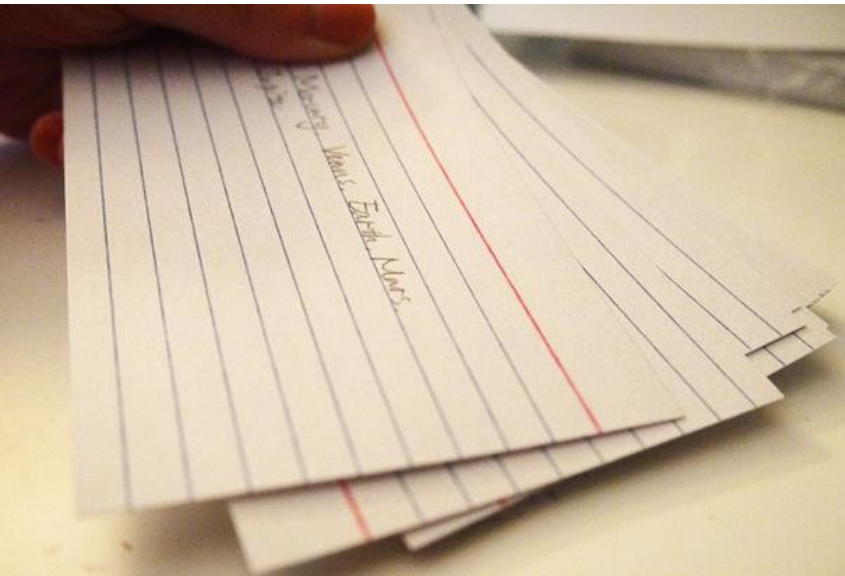


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Flash cards



Summary sheets

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- more facilities shops
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(5)

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be stored on the disk

Speed - How quickly the data can be transferred.

Portability - Size and how easy it is to carry around

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Examples

Position to Term Rule

Position to term rules are the method of how a sequence relates to its position and the constant of the first term.

The position to term rule can be written as:

$$T_n = a + (n-1)d$$

Where:

- T_n = the n th term
- a = the first term
- d = the common difference
- n = the position of the term

Bytes

1 KB = 1024 bytes
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There are two ways of storing data: on magnetic metal disks and on data chips. The chips are much faster and smaller making them the better device. They also have a much larger capacity as they are more modern.

Area of a Triangle = $\frac{1}{2}ab \sin C$

a = one length
 b = other length
 C = angle

Diagram of a triangle with sides a , b , c and angles A , B , C . The height is shown as $b \sin C$.

Practice Question:

4, 10, 16, 22

In this question there is a positive common difference. Because the common difference is 6, then the first term will be 4. The common difference is 6, then the first term will be 4. The common difference is 6, then the first term will be 4.

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For quadratic in the form $ax^2 + bx + c = 0$ can be solved by substituting a, b, c into the formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Example:

$x^2 + 3x - 4 = 0$
 $a=1, b=3, c=-4$
 $x = \frac{-3 \pm \sqrt{3^2 - 4(1)(-4)}}{2(1)} = \frac{-3 \pm \sqrt{9 + 16}}{2} = \frac{-3 \pm \sqrt{25}}{2} = \frac{-3 \pm 5}{2}$
 $x = 1$ or $x = -4$

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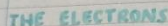
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- in the middle of the atom.
- contains **protons** and **neutrons**.
- positive charge overall, due to the **protons** (+)
- almost the whole mass of the atom is in the nucleus.



- move around the nucleus in shells
- negatively charged (-)
- have almost no mass

protons = 11.
neutrons = $23 - 11 = 12$
electrons = 11. ← mass number

11 ↗

atomic number = number of protons.
mass number = number of protons + number of neutrons.
number of neutrons = mass number - atomic number.
number of electrons = atomic number.
positive ion = negatively charged.
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An ion is an atom or group of atoms which has lost or gained electrons.

Non-renewable:

- fossil fuels
- nuclear fuel

} both burnt to get energy
+ do **damage** to environment

Renewables:	<ul style="list-style-type: none"> • sun • wind • water waves • Hydro-electricity 	<ul style="list-style-type: none"> • Bio-fuel • Tides • Geothermal 	can be replenished no damage but are less useful don't provide
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- Transport:
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 - bio-fuels or a mix
- Heating:
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 - coal in fireplaces
 - geothermal
 - solar water heaters

- Solar cells \rightarrow + no environmental damage
 - Expensive
- Wind power \rightarrow + no pollution
 - noisy, unsightly
- Geothermal \rightarrow + free energy, reliable
 - aren't many suitable locations
- TEP \rightarrow + no pollution, no running costs
 - high initial costs
- Wave power \rightarrow + no pollution
 - disturbs sea bed, unpredictable
- Tidal Barrages \rightarrow + no pollution

What is a Fibonacci sequence

Advantages of nuclear power

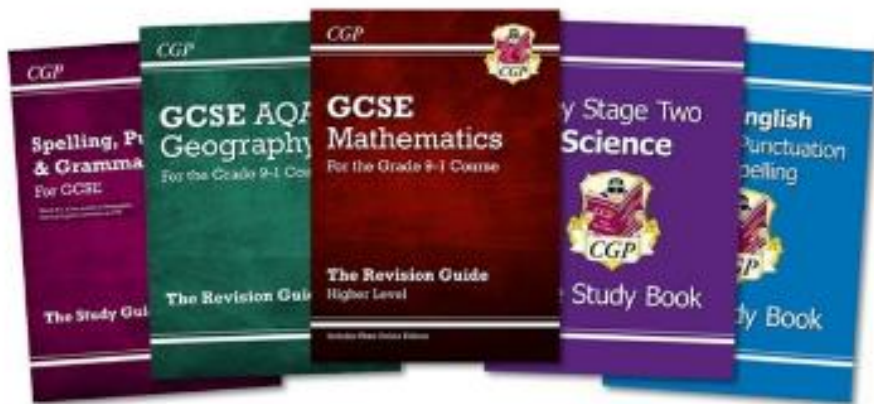
PI - Energy

- 1. High Power**
 - High power sources have had to be developed, meaning loss of materials
 - High power sources (fossil fuels and nuclear) are reliable, meet current demand, supply from the power plant is constant, but the running cost isn't
 - High power sources are not so good at low power, so low power sources (wind, solar, water) are used
 - Coal mining is a bad idea, coal mining is bad for the environment, nuclear power is better than coal, nuclear power is not
- 2. Energy Conversion**
 - Energy conversion is the process of converting energy from one form to another
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- 3. Energy Storage**
 - Energy storage is the process of storing energy for later use
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PHYSICS - energy

What are the equations for:

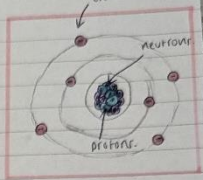
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23 ← mass number

11 ← atomic number

atomic number = number of protons

mass number = number of protons + number of neutrons

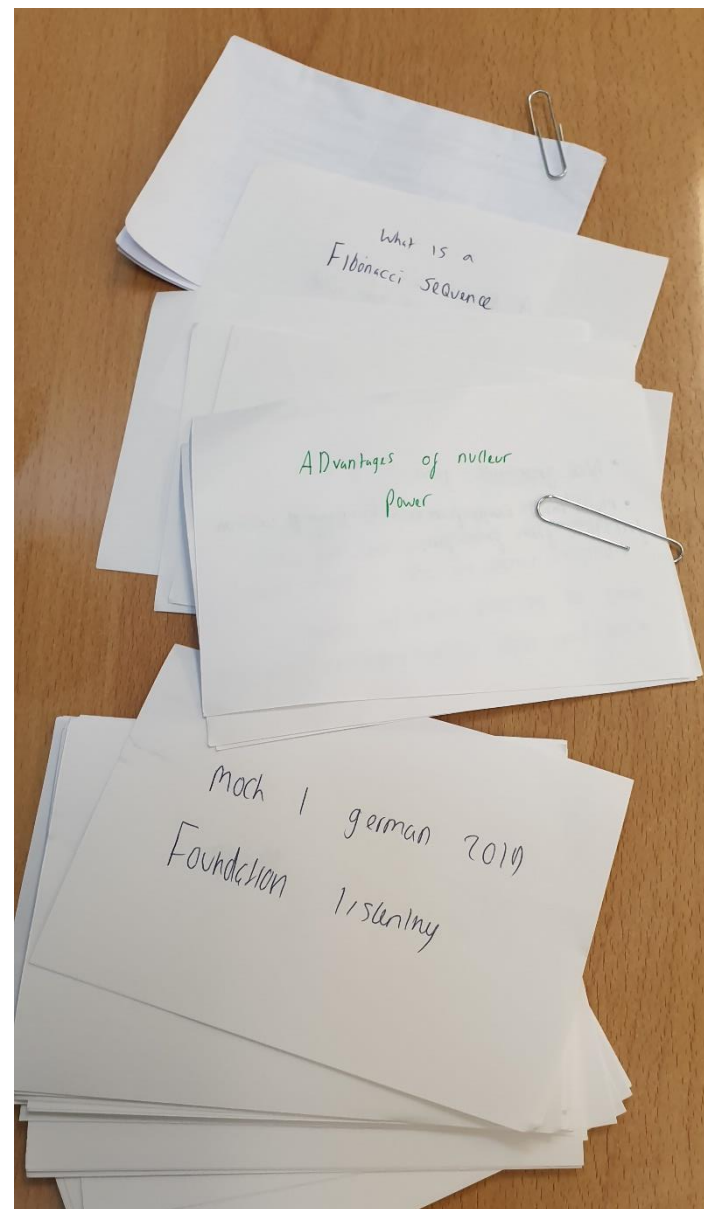
number of neutrons = mass number - atomic number

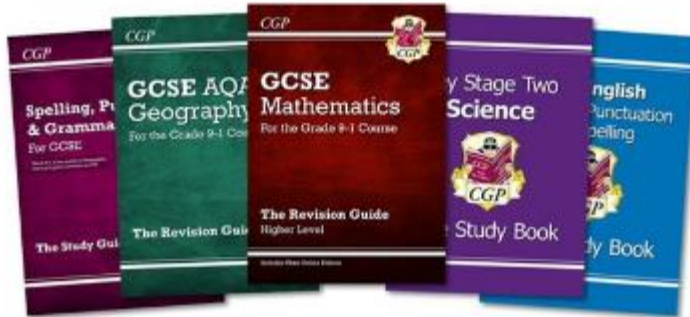
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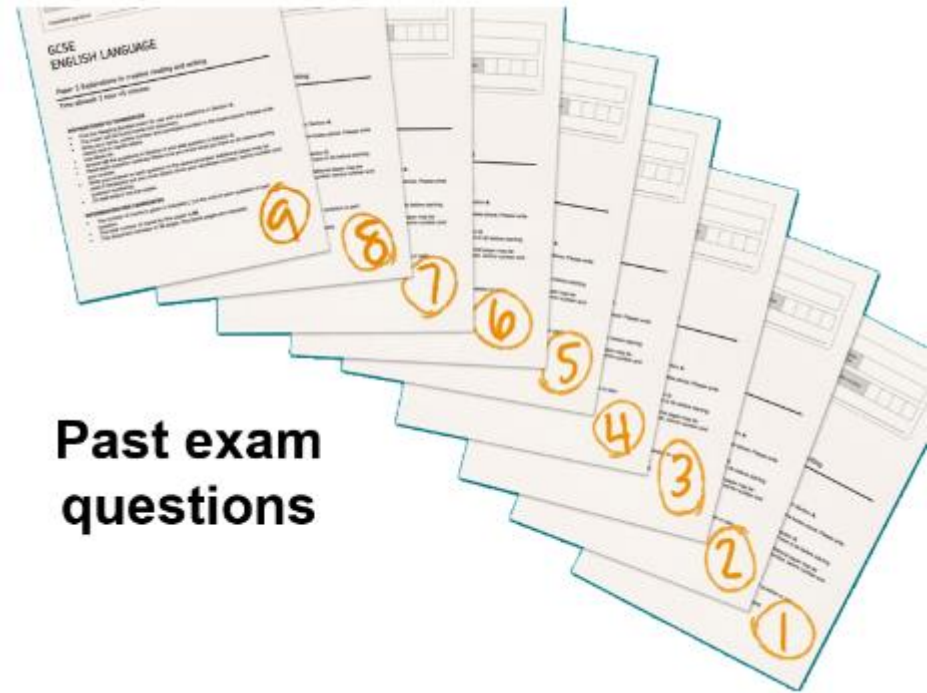
An ion is an atom or group of atoms which has lost or gained electrons





Revision guides

Full of questions



Past exam questions



Questions in your books



Websites

Questions with instant feedback



Students section > Exams & revision

In This Section

- Anti-Bullying
- Wellbeing
- Co-Curricular
- Curriculum
- Careers

→ Exams & Revision

- Learning Resource Centre
- Online Safety
- Remote Learning
- Revision Apps & Websites
- RM Unify
- The School Day
- Year 11

HOME → STUDENTS → EXAMS & REVISION

Exams & Revision

The GCSE summer exam timetable can be downloaded [here](#)

The A Level summer exam timetable can be downloaded [here](#)

Revision Help

Revision techniques

Revision is an essential part of learning and become increasingly important as you move towards your final exams in Year 11.

- How to approach your ongoing revision
- Why do we need to revise?
- Making and using flashcards
- Making and using summary sheets
- Revision websites for each subject
- Exam boards for each subject