

Due Date	Friday, 11 th September 2026
Name	



Y11 Triple T1 W2 - B4 Ecosystems

Keyword	Definition
ecosystem	all of the living organisms and physical conditions in an area
community	the living organisms within an ecosystem
habitat	the place in which an organism lives
population	the total number of organisms of a species in an area
producers	organisms that can make their own food by photosynthesis
consumers	organisms that cannot make their own food; they have to eat other organisms to gain energy
decomposers	consumers that gain energy by feeding on dead or decaying material
biotic factor	a living factor, e.g. the presence of animal/plant species
abiotic factor	a non-living factor, e.g. rainfall or temperature

Comprehension Question

1. In the food chain below identify:

carrot → rabbit → fox

a. The producer:

b. A consumer:

2. There are foxes, rabbits, and carrots in the ecosystem. What is being described?

.....

3. There are 15 mice in the same area. What is being described about the mice?

.....

4. Why are plants always at the start of food chains?

.....

5. State an abiotic factor that changes over the course of 24 hours, other than temperature.

.....

Look, Cover, Write, Check

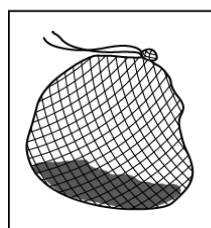
Keyword	Definition
habitat	
community	
	all of the living organisms and physical conditions in an area
abiotic factor	
	organisms that can make their own food by photosynthesis
	the total number of organisms of a species in an area
	consumers that gain energy by feeding on dead or decaying material
	a living factor, e.g. the presence of animal/plant species
consumers	

Application Questions

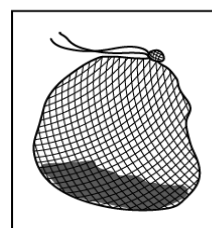
Some students did an experiment to see how quickly leaves decay. They put some leaves into three different bags, **A**, **B** and **C**.

Each bag was made of material that had different size holes. The bags are going to be buried in the soil. Different organisms have different roles in breaking down the leaves.

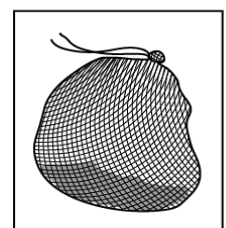
- Bacteria and fungi which are less than 0.005 mm wide.
- Woodlice which are about 4 mm wide.
- Earthworms which are about 7 mm wide.



bag **A**
holes 8 mm wide



bag **B**
holes 5 mm wide



bag **C**
holes 1 mm wide

Complete this table.

Organism	Role in breaking down the leaves	Can the organism get into bag A?	Can the organism get into bag B?	Can the organism get into bag C?
bacteria		yes	yes	
fungi	decomposers	yes	yes	yes
earthworms	detritivores	yes		no
woodlice		yes		no

Due Date:	Friday, 18 th September 2026
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Y11 Triple Chemistry T1 W3 – Monitoring Chemical Reactions

concentration (g/dm ³)	A measure of how crowded together particles are. Found by dividing the mass of a solute (g) by the volume of solvent (dm ³)
moles (mol)	The amount of a substance. Found by dividing the mass (g) by the relative atomic/formula mass, M _r (g/mol)
concentration (mol/dm ³)	A measure of how crowded together particles are. Found by dividing the number of moles of solute (mol) by the volume of solvent (dm ³)
decimetre cubed (dm ³)	A unit of volume equal to 1000cm ³ To convert from cm ³ to dm ³ you divide by 1000
titration	A method where a neutralisation reaction is carried out in order to find an unknown concentration or volume of an acid or alkali
phenolphthalein	A single point indicator which is pink in alkali solutions and colourless in acidic solutions
molar gas volume (dm ³ /mol)	One mole of any gas will have a volume of 24 dm ³ at standard room temperature (25°C) and pressure (1 atm)
theoretical yield	The maximum possible mass of product that could form in a reaction
% yield	The proportion of the theoretical yield actually obtained in a reaction. % yield = (actual yield ÷ theoretical yield) x 100
atom economy	The proportion of atoms in reactants that end up in the desired product Atom economy (%) = (M _r of desired product ÷ sum of all products M _r) x 100
by-product	A substance formed in addition to the desired product which may or may not be useful

Comprehension Questions

- What will be the volume of 0.2 moles of carbon dioxide be at room temperature and pressure?
- If a student adds phenolphthalein to a solution of sodium hydroxide, what colour will it turn?
- Convert 25cm³ into decimetres cubed.
- If a student wanted to find the concentration of an acid, what type of method would they use?
- An engineer calculates that 4 tonnes of iron ore should produce 3.8 tonnes of steel. The steel plant reports to him that they make 3.6 tonnes of steel from 4 tonnes of iron ore.
 - Which value is the actual yield?
 - Which value is the theoretical yield?
- Scientist A dissolves 5g of salt in 0.5dm³ of water. Scientist B dissolves 8g of salt in 0.9dm³ of water.
Explain which scientist has made the most concentrated solution.

Look, Cover, Write, Check

decimetre cubed (dm ³)	
	The amount of a substance. Found by dividing the mass (g) by the relative atomic/formula mass, M_r (g/mol)
by-product	
	The proportion of the theoretical yield actually obtained in a reaction. $\% \text{ yield} = (\text{actual yield} \div \text{theoretical yield}) \times 100$
	A method where a neutralisation reaction is carried out in order to find an unknown concentration or volume of an acid or alkali
	A measure of how crowded together particles are. Found by dividing the mass of a solute (g) by the volume of solvent (dm ³)
	One mole of any gas will have a volume of 24dm ³ at standard room temperature (25°C) and pressure (1 atm)
theoretical yield	
% yield	A measure of how crowded together particles are. Found by dividing the number of moles of solute (mol) by the volume of solvent (dm ³)
	The proportion of atoms in reactants that end up in the desired product $\text{Atom economy (\%)} = (M_r \text{ of desired product} \div \text{sum of all products } M_r) \times 100$
phenolphthalein	

Exam Qs

1. 60.0 kg of aluminium oxide produces a maximum of 31.8 kg of aluminium.
In an extraction process only 28.4 kg of aluminium is produced from 60.0 kg of aluminium oxide.

Calculate the percentage yield. Give your answer to 3 significant figures.

2. Calculate the percentage atom economy for the production of silver iodide in this reaction.

The equation for the reaction is: $\text{AgNO}_3(\text{aq}) + \text{NaI}(\text{aq}) \rightarrow \text{AgI}(\text{s}) + \text{NaNO}_3(\text{aq})$

Give your answer to 3 significant figures.

Relative formula masses (M_r): $\text{AgNO}_3 = 170$ $\text{NaI} = 150$ $\text{AgI} = 235$ $\text{NaNO}_3 = 85$

3. Calculate the minimum mass of zinc that needs to be added to 0.500 g of iodine so that the iodine fully reacts.

The equation for the reaction is: $\text{Zn} + \text{I}_2 \rightarrow \text{ZnI}_2$

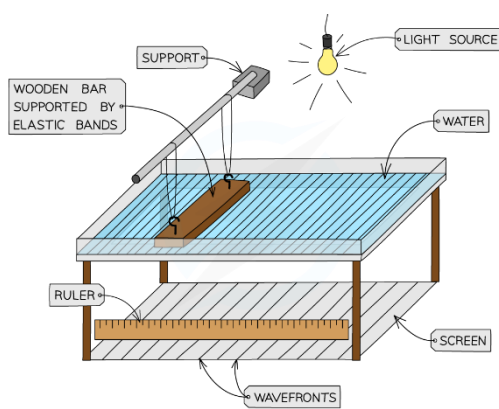
Relative atomic masses (M_r): $\text{Zn} = 65$ $\text{I} = 127$

Due Date	Friday, 25 th September 2026
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Y11 Triple T1 W4 – P5 Ripple Tank PAG

Keyword	Definition
Amplitude	The maximum disturbance of a wave from its undisturbed position
Wavelength	The distance between two identical points on a wave
Frequency	The number of waves produced by a source each second
Transverse	A wave that moves in a direction at right angles to the way in which the particles are vibrating
Longitudinal	Have compression and rarefactions with the vibrations in the same direction as the direction of travel
Refraction	Process by which a wave changes speed and sometimes direction upon entering a denser or less dense medium
Reflection	Where a wave bounces off a surface returning into the same medium from which it emerged



Comprehension Question

1. A wave has a frequency of 15 Hz, what does this mean?

.....

2. How can you measure the length of a wave on a ripple tank?

.....

3. A light wave has oscillations 90° to the energy transmission Which type of wave is it an example of?

.....

Look, Cover, Write, Check

Keyword	Definition
	The maximum disturbance of a wave from its undisturbed position
Wavelength	
	The number of waves produced by a source each second
	A wave that moves in a direction at right angles to the way in which the particles are vibrating
	Have compression and rarefactions with the vibrations in the same direction as the direction of travel
	Process by which a wave changes speed and sometimes direction upon entering a denser or less dense medium
Reflection	

Application Questions

A teacher uses water waves in a ripple tank to demonstrate **transverse** waves. She makes measurements of the water waves.

The frequency of the water waves is 0.5 Hz.

- i. Calculate the number of water waves produced in 5 seconds.

- ii. The teacher **increases** the frequency of the water waves. Describe what happens to the speed **and** the wavelength of the water waves.

.....

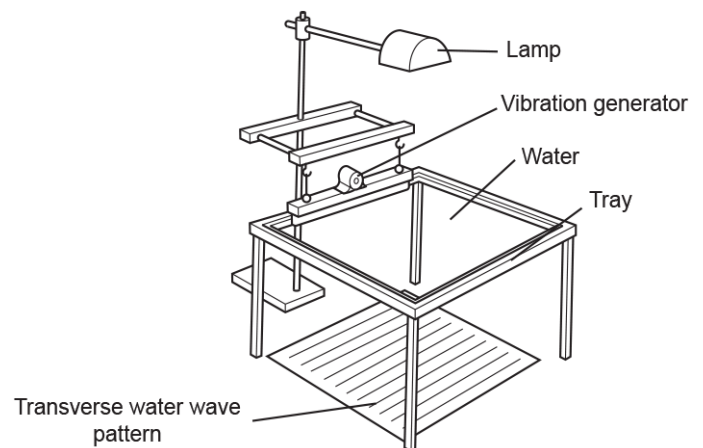
.....

- iii. A student tries to describe water waves in the sea.

‘The water waves move up and down. The water particles move all the way across the surface of the sea. This means that water moves in the direction of the waves.’ Part of his explanation is **incorrect**. Write an improved and correct description about water waves in the sea.

.....

.....



[2]



Due Date	Friday, 2 nd October 2026
Name	

Y11 Triple T1 W5 – B5 Genetics

Keyword	Definition
Phenotype	The appearance of an organism
Genotype	The combination of alleles present in an organism
Genome	The entire genetic material of an organism
Chromosome	A strand of DNA containing genes
Genes	A section of DNA which codes for a characteristic
Alleles	Different versions of the same gene
Dominant allele	A version of a gene whose characteristic is always expressed if present in the genotype
Recessive Allele	A version of a gene whose characteristic is only expressed if two copies are present in the genotype
Homozygous	When an organism has two copies of the same allele
Heterozygous	When an organism has different alleles of a gene

Comprehension Question

Blue eyes is a homozygous allele, where both need to be expressed to be shown. What type of allele is this?

.....

If someone carries the allele for a recessive disease but does not express the gene, are they homozygous or heterozygous? Why?

.....

Why is the genotype not always the same as someone's phenotype?

.....

.....

Where do we look to see someone's genetic traits?

.....

Look, Cover, Write, Check

Keyword	Definition
	The appearance of an organism
Genotype	
Genome	
	A strand of DNA containing genes
Genes	
	Different versions of the same gene
	A version of a gene whose characteristic is always expressed if present in the genotype
Recessive Allele	
Homozygous	
Heterozygous	

Application Questions

Wolfram's Syndrome is a genetic disorder. It is caused by a recessive allele (n). In people with Wolfram's syndrome, a protein does not function correctly.

Explain how a change in an allele can stop a protein functioning correctly.

.....

.....

.....

Club thumb is an inherited condition. It is caused by a **dominant** allele (T). Janice has normal thumbs. The father is heterozygous.

What is the probability of the baby having club thumbs? Explain your answer.

.....

.....

Due Date:	Friday, 19 th October 2026
Name:	

Y11 Triple Chemistry T1 W6 – Controlling Chemical Reactions

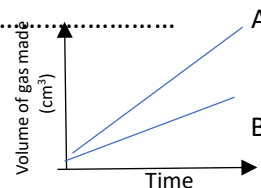
rate of reaction (g/s) or (cm ³ /s) or (1/s)	A measure of how quickly either products are made or reactants are used up in a chemical reaction
gradient	Steepness – a steeper gradient shows a faster rate of reaction
precipitate	An insoluble, solid product made in a reaction between two solutions
successful collision	A collision between particles which results in a chemical change
frequency	How often something occurs
temperature	The average kinetic energy of particles in a substance
concentration	A measure of how crowded together particles in solutions are
pressure	A measure of how crowded together particles in gases are
surface area	A measure of how many particles in a solid are exposed/available for a collision
surface area to volume ratio	Shows that as pieces of material get smaller, the surface area to volume ratio increases
catalyst	A substance which lowers the activation energy required for a reaction to occur meaning more particles have enough energy to react
enzyme	A biological catalyst

Comprehension Questions

During a chemical reaction between two colourless solutions, a yellow solid was made. What word would be used to describe this yellow solid?

.....

Which line on the graph shows a lower rate of reaction?



.....

Why does a substance have a higher temperature as a gas than as a liquid?

.....

If you grind pieces of chalk into a powder, how has the surface area to volume ratio changed?

.....

A scientist added a transition metal called manganese to a chemical reaction to try and speed it up. What did the scientist think the manganese might act as?

.....

During a chemical reaction, 15cm³ of hydrogen gas is collected in a gas syringe in 20 seconds.

Calculate the average rate of the chemical reaction.

.....

50 particles of a new substance were made during a chemical reaction which involved 6000 collisions between reactant particles. How many of these collisions were successful?

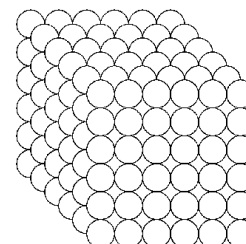
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Look, Cover, Write, Check

	A measure of how many particles in a solid are exposed/available for a collision
temperature	
	A substance which lowers the activation energy required for a reaction to occur meaning more particles have enough energy to react
	A collision between particles which results in a chemical change
frequency	
	Steepness – a steeper gradient shows a faster rate of reaction
pressure	
enzyme	
	An insoluble, solid product made in a reaction between two solutions
	Shows that as pieces of material get smaller, the surface area to volume ratio increases
rate of reaction (g/s) or (cm ³ /s) or (1/s)	
	A measure of how crowded together particles in solutions are

Exam Qs

Q1. The diagram represents the particles in a piece of reactive metal. The piece of reactive metal is added to dilute hydrochloric acid.



- (a) (i) Explain which particle will probably react first. Choose from: (tick one option)

- a particle inside the piece;
- a particle at the centre of a face;
- a particle on one of the corners.

Because.....(2)

- (b) (i) State **two** ways to speed up the reaction by changing the hydrochloric acid. In each case explain in terms of particles why the reaction is faster.

1.
.....
.....(2)

2.....
.....(2)

- (ii) What change can you make to the piece of solid to speed up the reaction? Explain in terms of the particles why the reaction is able to speed up.

.....
.....(2)

Due Date	Friday, 16 th October 2026
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Y11 Triple T1 W7 – P5 The Ear

Keyword	Definition
Longitudinal	Have compression and rarefactions with the vibrations in the same direction as the direction of travel
Vacuum	An area with not matter
Sound wave	Longitudinal waves, travel at 330m/s
Refraction	Process by which a wave changes speed and sometimes direction upon entering a denser or less dense medium
Reflection	Where a wave bounces off a surface returning into the same medium from which it emerged
Ultrasound	Have a frequency higher than the upper limit for human hearing above 20,000 Hz
Sonar	High- frequency sound waves that can be used to detect objects in deep water and to measure water depth
Cochlea	Spiral cavity of the inner ear, produces nerve impulses in response to sound vibrations
Pinna	The part of the ear that is outside of the head

Comprehension Question

What do you call a reflected sound wave?

.....

Why can sound not travel through a vacuum?

.....

What part of the ear is adapted to funnel sound waves to the ear drum?

.....

Where does the cochlea transmit the sound waves to?

.....

Look, Cover, Write, Check

Keyword	Definition
Longitudinal	
Vacuum	
	Longitudinal waves, travel at 330m/s
	Process by which a wave changes speed and sometimes direction upon entering a denser or less dense medium
Reflection	
Ultrasound	
Sonar	
	Spiral cavity of the inner ear, produces nerve impulses in response to sound vibrations
Pinna	

Application Questions

Rene's research shows that

‘The average person has a hearing range from 20 Hz up to 20 000 Hz.’

Rene tests the hearing range of a group of people. Look at the data she collects.

Person	Lower frequency limit of hearing in Hz	Upper frequency limit of hearing in Hz	Frequency range of hearing in Hz
Jane	22	19000	18978
Alec	19	20000	19981
Dionne	24	20100	
Niamh	16	19800	19784
Evangelos	15	20000	19985
average	19.2		19760.8

Rene has not completed her table.

Which person has the largest frequency **range** of hearing?

.....

.....

Explain your answer using a calculation.

.....

Calculate the average upper frequency limit of hearing for this group of people.

answer Hz

Rene's original research shows a lower frequency limit of human hearing of 20 Hz. The data she collects shows an average lower frequency limit of 19.2 Hz. Suggest reasons for this difference.

.....

Due Date	Friday, 6 th November 2026
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Y11 Triple T2 W1 – B5 Evolution

Keyword	Definition
Evolution	The gradual change of a species over time
Natural selection	A mutation in the DNA that causes variation, meaning that the organism is more likely to survive and reproduce
Speciation	When the populations become extremely varied and successful interbreeding cannot happen anymore
Variation	Difference between organisms
Genetic variation	Caused by genetic material inherited from parents
Environmental Variation	Caused by the environment in which you live
Mutation	A change in the sequence of DNA bases
Species	Organisms that can reproduce to make fertile offspring

Comprehension Question

Describe how natural selection caused the artic hare to have white fur

.....

.....

.....

After speciation, we have two new species, why are they not the same species?

.....

What causes variation within organisms?

.....

How does the variation occur?

.....

Why does evolution not happen quickly in a couple of generations?

.....

Look, Cover, Write, Check

Keyword	Definition
Evolution	
Natural selection	
Speciation	
	Difference between organisms
	Caused by genetic material inherited from parents
	Caused by the environment in which you live
	A change in the sequence of DNA bases
Species	

Application Questions

Natural selection can help explain how species evolve.

When Charles Darwin suggested his ideas about evolution by natural selection, some people were against his theory.

Explain why.

.....

.....

Natural selection is now widely accepted as a theory about evolution.

Explain why.

.....

.....

Over long periods of time groups of organisms can change to become new species.

What is the name biologists give to this change?

.....

If populations of organisms become isolated, new species are more likely to develop. Explain why.

.....

.....

Due Date:	Friday, 13 th November 2026
Name:	

Y11 Triple Chemistry T2 W2 – Reversible Reactions

reversible	a chemical reaction where the products which are made can turn back into the reactants
$\rightleftharpoons$	the symbol for a reversible reaction
closed system	a system where energy can enter or leave but substances cannot
dynamic equilibrium	when a reversible reaction has the forward and backward reactions at the same rate and the concentration of reactants and products are constant
le Chatelier's principle	when a change is made to a system at equilibrium, the position of equilibrium moves to counteract the change that was made
exothermic	a chemical reaction which transfers heat energy to the surroundings
endothermic	a chemical reaction which transfers heat energy from the surroundings
yield	the amount of something being produced
rate	how quickly something happens e.g. a chemical reaction
compromise conditions	a compromise between having a faster reaction but having a reduction in product yield by adjusting temperature and/or pressure

Comprehension Questions

1. What can happen to the products in a reversible reaction?
2. How is the reversible reaction symbol different to the normal chemical reaction symbol? →
3. How could a thermometer show that energy is leaving a closed system even though no substances are escaping?
4. In a reversible reaction which has reached dynamic equilibrium, the rate of the forward reaction is measured as 3.5 mol/s. What will the rate of the backward reaction be?
5. In a reversible reaction which has reached dynamic equilibrium, the concentration of products is measured at 5 mol/dm³. What will the concentration of products be 30 seconds later?
6. If you heat up a system at dynamic equilibrium the position of the equilibrium will move to favour either the forward or backward reaction. What effect will this change in equilibrium position have on the system?
7. If you decrease the pressure of a system at dynamic equilibrium the position of the equilibrium will move to favour either the forward or backward reaction. What effect will this change in equilibrium position have on the system?
8. 300g of a metal was added to some acid. The reaction should have produced 380g of salt but the scientist was only able to separate 350g from the reaction mixture. What was the yield of the experiment?

Look, Cover, Write, Check

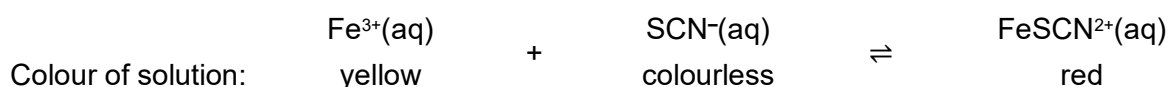
	a chemical reaction which transfers heat energy from the surroundings
	a compromise between having a faster reaction but having a reduction in product yield by adjusting temperature and/or pressure
closed system	
rate	
	when a change is made to a system at equilibrium, the position of equilibrium moves to counteract the change that was made
$\rightleftharpoons$	
	when a reversible reaction has the forward and backward reactions at the same rate and the concentration of reactants and products are constant
	a chemical reaction where the products which are made can turn back into the reactants
	a chemical reaction which transfers heat energy to the surroundings
yield	

Exam Qs

This question is about a reversible reaction.

The reaction between solutions of iron(III) ions (Fe^{3+}) and thiocyanate ions (SCN^-) is reversible.

The ionic equation for the reaction is:



The colour of the equilibrium mixture is orange at room temperature.

- a) A few drops of a colourless solution containing a high concentration of thiocyanate ions (SCN^-) are added to the orange equilibrium mixture.

Explain the why the mixture becomes redder.

- b) When a test tube containing the orange equilibrium mixture is placed in a hot water bath, the mixture becomes more yellow.

Explain what this shows about the energy change for the forward reaction.

Due Date	Friday, 20 th November 2026
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Y11 Triple T2 W3 – P5 Lenses

Keyword	Definition
Convex lens	Thicker in the middle, parallel light rays that enter converge used to correct longsightedness
Concave lens	Lens is thinner in the middle; this causes the parallel lines to diverge. Used to correct short-sightedness
Refracted	Process by which a wave changes speed and sometimes direction upon entering a denser or less dense medium
Converge	Move towards each other
Principal Focus	Also known as the focal point. The focus of a lens where light rays appear to converge or diverge from
Focal Length	The distance between the centre of the lens and the focal point
Diverge	When a light ray splits up or spreads out
Short Sightedness	Cannot see distant objects clearly, but they can see things that are close to them. The eye refracts the light and brings it to focus before the retina
Long Sightedness	Can see distant objects clearly, but they cannot see clearly see nearby objects. The eye refracts the light and brings it to focus past the retina

Comprehension Question

In a convex lens the light rays converge to a point as they enter. What is this point known as?

.....

Why can a convex lens be used to correct long sightedness?

.....

Why does the light rays change direction when they enter a lens?

.....

What do you call the distance between the pupil (lens) and the retina?

.....

Look, Cover, Write, Check

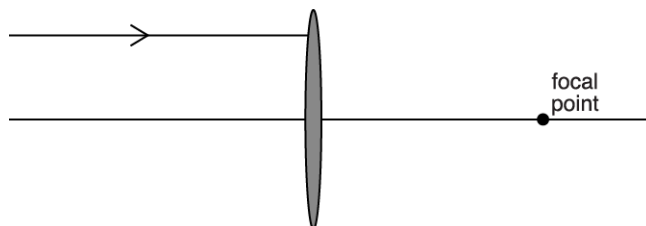
Keyword	Definition
Convex lens	
Concave lens	
	Process by which a wave changes speed and sometimes direction upon entering a denser or less dense medium
Converge	
Principal Focus	
	The distance between the centre of the lens and the focal point
	When a light ray splits up or spreads out
Short Sightedness	
	Can see distant objects clearly, but they cannot see clearly see nearby objects. The eye refracts the light, and brings it to focus past the retina.

Application Questions

Chantal experiments with converging lenses.

- Write down another name for a converging lens.
- Complete the path of the light ray after it goes through the converging lens.

[1]



[1]

Harry uses two different convex lenses. One is thick and the other is thin.



How does the thickness affect the focal length of the lens?

.....

.....

Due Date	Friday, 4 th December 2026
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Y11 Triple T2 W4 – B6 Sampling

Keyword	Definition
Random	Occurring without a pattern; unpredictable; where each item has an equal probability of being selected
Transect	A line created, for instance with a tape measure, along which sampling occurs
Mean	The mean is calculated by adding all of the data and dividing by the number of items of data
Median	The median is the value of the middle item of data when all the data is arranged in order
Mode	The mode is the item which occurs most often
Pitfall trap	A sampling technique used to trap small invertebrate animals living on the soil surface or in leaf litter
Pooter	A device used in ecological sampling to collect small insects
Quadrat	A square frame of known area used for sampling abundance and distribution of slow or non-moving organisms

Comprehension Question

What two pieces of equipment are needed for a line transect?

.....

Why do we sample randomly?

.....

Why are quadrats not used for faster moving animals?

.....

What are the different sampling techniques we can use for these animals?

.....

Calculate the median, mode and mean of the following numbers: 5, 6, 4, 5, 5.5, 6.9, 5.7

Mean:.....

Median:.....

Mode:.....

Look, Cover, Write, Check

Keyword	Definition
Random	
Transect	
	The mean is calculated by adding all of the data and dividing by the number of items of data
	The median is the value of the middle item of data when all the data is arranged in order
Mode	
	A sampling technique used to trap small invertebrate animals living on the soil surface or in leaf litter
Pooter	
Quadrat	

Application Questions

The rock pocket mouse is a small grey coloured mouse that lives in Mexico.



These mice are the main food for owls. Rattlesnakes also feed on these mice. The mice get most of their food from grass plants.

Scientists want to construct a pyramid of biomass for this food web. They first need to estimate how many organisms there are in the area.

They decide to do this using sampling.

- i. Describe how the scientists would sample an area and ensure that the sample was not biased

.....
.....

- ii. To estimate grass cover and the number of animals, they use a quadrat. Why do scientists use sampling when studying the organisms living in a habitat? Identify the limitations of this method and potential improvements that could be made to ensure that the estimated population size of plants and animals closely matches the actual value.

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.....
.....

Due Date:	Friday, 11 th December 2026
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Y11 Triple Chemistry T2 W5 – Extracting Metals from the Earth

reactivity series	a list of metals in order of reactivity which also features hydrogen and carbon (both non-metals) as useful reference points
ore	a rock containing metal compounds
extraction	the removal of the metal element from the compounds found in the ore
electrolysis	the method used to extract metals which are more reactive than carbon and for purifying metals
reduction with carbon	the method used to extract metals which are less reactive than carbon (process also known as smelting)
blast furnace	a large furnace used in the reduction of iron oxide with carbon
cryolite	an aluminium compound which is melted and has aluminium oxide dissolved in it for the electrolysis process saving energy
native	a term which describes metals less reactive than hydrogen which can be found as elements and don't need extracting
low grade ore	rock containing a small percentage of metal compounds
bioleaching	a method of extracting metal compounds from low grade ores using bacteria
phytoextraction	a method of extracting metal compounds from low grade ores using plants

Comprehension Questions

1. Why don't we find elements such as potassium or magnesium as pure metals in the ground?
2. Why wouldn't you use electrolysis to extract iron from iron ore?
3. Why wouldn't you use reduction with carbon to extract aluminium from aluminium ore?
4. What term could be used to describe relatively unreactive metals such as silver, gold and platinum?
5. What method of extraction would you use for sodium and why?
6. A mixture of cryolite and aluminium oxide has a melting point around 950°C whereas pure aluminium oxide melts at over 2000°C. How does the dissolving of Al_2O_3 in cryolite save energy in the electrolysis process?
7. What is the main similarity between bioleaching and phytoextraction?
8. What is the main difference between bioleaching and phytoextraction?

Look, Cover, Write, Check

extraction	
	a term which describes metals less reactive than hydrogen which can be found as elements and don't need extracting
low grade ore	
bioleaching	
	the method used to extract metals which are less reactive than carbon (process also known as smelting)
	a method of extracting metal compounds from low grade ores using plants
	an aluminium compound which is melted and has aluminium oxide dissolved in it for the electrolysis process saving energy
blast furnace	
	the method used to extract metals which are more reactive than carbon and for purifying metals
	a list of metals in order of reactivity which also features hydrogen and carbon (both non-metals) as useful reference points
ore	

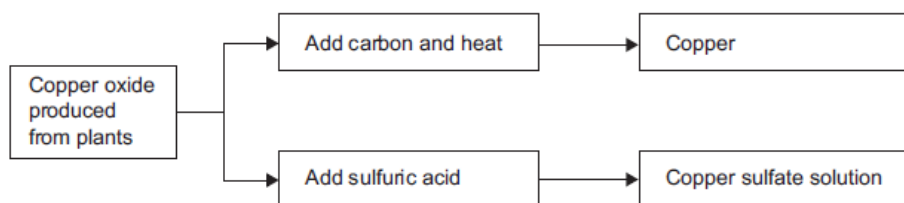
Exam Qs

Where copper ore has been mined there are areas of land that contain very low percentages of copper compounds.

One way to extract the copper is to grow plants on the land. The plants absorb copper compounds through their roots. The plants are burned to produce copper oxide.

The copper oxide produced from plants can be reacted to produce copper or copper sulfate solution, as shown in **Figure 1** below.

Figure 1



- (a) (i) Complete the sentence.

Using plants to extract metals is called _____. (1)

- (b) Copper is produced from copper sulfate solution by displacement using scrap iron or by electrolysis.

- (i) Give **two** reasons why **scrap** iron is used to displace copper.

Due Date	Friday, 18 th December 2026
Name	



Y11 Triple T2 W6 – P6 Decay

Keyword	Definition
Isotopes	Atoms of the same element with different nuclear mass caused by differing numbers of neutrons
Alpha	A weakly penetrating, highly ionising particle consisting of 2 protons and 2 neutrons
Beta	A medium penetrating, medium ionising particle consisting of a high-speed electron
Gamma	A highly penetrating, weakly ionising electromagnetic wave
Ionising	Where atoms become ions by losing or gaining electrons
Half-life	The time taken for the radioactive substance to decrease by half
Contamination	When radioactive material is inside or on an object
Irradiation	When an object has been exposed to radiation
Nuclear Fusion	The joining of two smaller atomic nuclei to produce a larger nucleus
Nuclear Fission	The splitting of a large nucleus to produce two smaller ones. Two or three neutrons are also released in the process

Comprehension Question

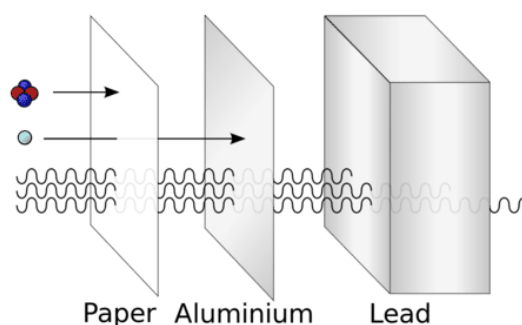
What is the name of the process when four hydrogen nuclei become a helium nucleus?

.....

Why does nuclear fission cause a chain reaction?

.....

Complete the labels:



Why is contamination with a radioactive material worse than being irradiated?

.....

.....

Look, Cover, Write, Check

Keyword	Definition
Isotopes	
	A weakly penetrating, highly ionising particle consisting of 2 protons and 2 neutrons
Beta	
	A highly penetrating, weakly ionising electromagnetic wave
Ionising	
Half-life	
Contamination	
	When an object has been exposed to radiation
Nuclear Fusion	
Nuclear Fission	

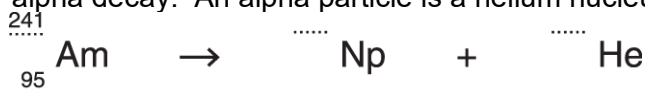
Application Questions

Radium-226, $^{226}_{88}\text{Ra}$, decays to become radon-222, $^{222}_{86}\text{Rn}$. What is emitted when a nucleus of radium-226 decays?

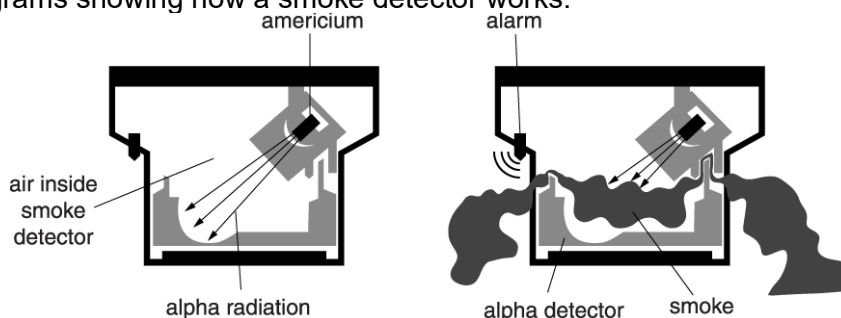
- A. a beta particle
- B. an alpha particle
- C. four neutrons
- D. four protons

Radioactive americium (Am) is used in smoke alarms.

- i. Complete the equation for alpha decay. An alpha particle is a helium nucleus.



- ii. Here are two diagrams showing how a smoke detector works.



Use the diagrams to describe how a smoke detector works.

.....

Due Date:	Friday, 8 th January 2027
Name:	

Y11 Triple Chemistry T3 W1 – Using Materials

life cycle assessment	a 'cradle to the grave' analysis of the environmental impact of a manufactured product
raw materials	the substances taken from the Earth's crust, the atmosphere, or organisms, which are used to manufacture products
feedstock	a term used for raw materials which are to be used in manufacturing
disposal	the process of getting rid of something, usually waste
recycling	converting waste into usable material
landfill site	a place where waste is buried underground
alloy	a mixture containing a metal and at least one other substance (which may also be metal)
corrosion	the destruction of a metal by oxidation or chemical action
ceramics	hard, brittle materials made by heating and cooling clay or by making glass from sand and limestone
composites	materials made from two or more materials with contrasting properties
polymer	a large molecule made from many smaller substances called monomers
ductile	able to be stretched into wires
malleable	able to be reshaped without breaking (opposite of brittle)
metals	ductile and malleable substances which are good conductors of electricity

Comprehension Questions

1. What would be the main source of oxygen if it is being used as a raw material in a process?
2. Which method of disposal, from the table, is preferred in life cycle assessments?
3. Where do waste materials that cannot be recycled end up being disposed in?
4. Stainless steel is iron with around 1% carbon and 12% chromium mixed into it. What word describes stainless steel?
5. What is rusting a type of?
6. Reinforced concrete is made of steel bars with concrete poured around them. What type of material is reinforced concrete?
7. Toilets are made out of clay which is placed in a hot oven to bake and then coated in a glaze to make them waterproof. What type of material are toilets made from?
8. Why is electrical wiring a common use of copper?
9. Nylon is a material made by reacting two types of small molecules together leading to them joining into a long chain. What type of substance is nylon?

Look, Cover, Write, Check

ductile	
landfill site	
malleable	
	ductile and malleable substances which are good conductors of electricity
	the substances taken from the Earth's crust, the atmosphere, or organisms, which are used to manufacture products
	a 'cradle to the grave' analysis of the environmental impact of a manufactured product
	a mixture containing a metal and at least one other substance (which may also be metal)
corrosion	
	a term used for raw materials which are to be used in manufacturing
	materials made from two or more materials with contrasting properties
	a large molecule made from many smaller substances called monomers
disposal	
	hard, brittle materials made by heating and cooling clay or by making glass from sand and limestone
recycling	

Exam Qs A scientist was asked to find the best concrete mixture to use so that railway sleepers would not break easily. The scientist tested models made using different percentages of cement and sand:

Concrete mixture in %			Total mass added to break the model sleeper in kg				
Cement	Sand	Crushed rock	Test 1	Test 2	Test 3	Test 4	Mean
10	70	20	1.2	1.1	1.3	1.2	1.2
20	60	20	3.0	2.6	2.5	2.4	
30	50	20	3.5	3.3	3.3	3.3	3.3
40	40	20	3.9	3.8	4.0	3.3	3.9

- (a) Calculate the mean total mass added to break the model sleeper that has 20 % cement by volume. Ignore any anomalous results.

Mean = _____ kg

- (b) State **one** conclusion that the scientist could make from these results.

- (c) What type of material is the concrete? _____