STOKE DAMEREL

Aspire Achieve Thrive

Autumn Term

Term 1

Triple Science

Year 10

Name: _____

Tutor: _____

Year 10 Homework Timetable

Monday	English Task 1	Ebacc Option A Task 1	Option C Task 1
Tuesday	Option B Task 1	Modern Britain Task 1	Science Task 1
Wednesday	Sparx Maths	Option C Task 2	Sparx Science
Thursday	Ebacc Option A Task 2	Sparx Catch Up	Option B Task 2
Friday	Modern Britain Task 2	Science Task 2	English Task 2

Sparx Science

• Complete 100% of their assigned homework each week

Sparx Maths

• Complete 100% of their assigned homework each week

Option A (EBACC)
Computer Science
French
Geography
History

Option B
Business Studies
Hospitality and Catering
Drama
Music
Geography
Health and Social Care
ICT
Media Studies
Music
Sport
Travel and Tourism

Option C
Art
Business Studies
Hospitality and Catering
Child Development
Computer Science
Drama
Photography
Science (Triple)
Sport

Half Term 1 (8 weeks) - Year 10			
Week / Date	**Homework task 1 Cornell Notes**	**Homework task 2 Exam Question**	**Homework Task 3 - Triple**
Week 1 2nd September 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.
Week 2 9th September 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.
Week 3 16th September 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.
Week 4 23rd September 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.
Week 5 30th September 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.
Week 6 7th October 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.
Week 7 14th October 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.
Week 8 21st October 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.

Half Term 2 (7 weeks) - Year 10			
Week / Date	**Homework task 1 Cornell Notes**	**Homework task 2 Exam Question**	**Homework Task 3 - Triple**
Week 9 4th November 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.
Week 10 11th November 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.
Week 11 18th November 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.
Week 12 25th November 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.
Week 13 2nd December 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.
Week 14 9th December 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.
Week 15 16th December 2024	Complete 1 page of retrieval quizzing	Complete the exam question. Fill the remainder of the page with retrieval quizzing.	Complete the exam question. Fill the remainder of the page with retrieval quizzing.

WEEK 1 Questions (Cover and quiz)

Question	Answer
What are the differences between eukaryote and prokaryote cells?	Prokaryotes do not contain a nucleus, whereas eukaryotes do. Prokaryotes have cell walls, whereas eukaryotes do not.
Name the 5 common features of a plant and animal cell	Cell membrane, Cytoplasm, nucleus, mitochondria, ribosomes
State the 3 organelles that a plant cell contains and an animal cell does not	Chloroplasts, vacuole, cell wall
What is the function of the nucleus?	Contains DNA
What is the function of the cell membrane?	To controls the movement of substances in and out of the cell
What is the function of the cytoplasm?	Contains all the organelles and is where most chemical reactions takes place
What is the function of the mitochondria?	Site of respiration where energy is released
What is the function of the ribosomes?	The site of protein synthesis, where new proteins are made
What is the function of the permanent vacuole?	Contains water and cell sap
What is the function of the chloroplasts?	Site of photosynthesis (contains chlorophyll)
What material makes up the cell walls?	Cellulose
What is a specialised cell?	A cell that has specific features or adaptations to perform a particular job
Describe how a sperm cell is adapted to carry out its function	Flagellum- for movement Many mitochondria- for respiration to release energy to swim to the egg Acrosome- to digest the egg surface
Describe how a muscle cell is adapted to carry out its function	Many mitochondria for respiration to release energy for muscle contraction
Describe how a root hair cell is adapted to carry out its function	Hairs/projections - To increase the surface area to absorb more water/nutrients No chloroplasts- not needed (doesn't photosynthesise)
Describe how a nerve cell is adapted to carry out its function	Long axon- to carry messages long distances Many dendrites to make many connections
Describe how a xylem cell is adapted to carry out its function	Dead, hollow cells that form a tube. Lignin for strength and to withstand water pressure
Describe how a phloem cell is adapted to carry out its function	Live cell, contains sieve plates to distribute sugar evenly throughout the plant
Describe how a red blood cell is adapted to carry out its function	No nucleus and a biconcave dip to carry more haemoglobin which binds to oxygen
What is cell differentiation?	When a cell becomes a specialised cell

Date: 2nd September

Week 1 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: 2nd September

Week 1 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Cells are the basic units of all forms of life. Describe four differences between a bacterial cell and a plant cell. (4)

Improvement Work: Cells are the basic units of all forms of life. Describe four differences between a bacterial cell and a plant cell. (4)

Date: 2nd September

Week 1 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

During a food poisoning outbreak, scientists identified the farm where the food came from.

The farmer had not vaccinated the farm animals against Salmonella bacteria.

(b) The food poisoning outbreak could have been prevented if the farm animals had been vaccinated.

Explain how:

- the immune systems of animals respond to a vaccination
- the immune response in farm animals prevents an outbreak of food poisoning in humans.

(4)

Improvement Work: Explain how the immune systems of animals respond to a vaccination **and** the immune response in farm animals prevents an outbreak of food poisoning in humans.

WEEK 2 Questions (Cover and quiz)

Question	Answer
What is an atom?	The smallest part of an element
What is meant by an element?	A substance made of only one type of atom
What is meant by a compound?	A substance made of two or more different atoms chemically bonded together
What is meant by a molecule?	A substance made of more than one atom chemically bonded together (can be atoms of the same type!)
What is meant by a mixture?	A substance made of more than one thing not chemically bonded together
Describe the plum pudding model of the atom.	A ball of positive charge with negative electrons studded into it
State the findings of the gold foil experiment.	That atoms have dense nucleuses with a positive charge
State the names of the three subatomic particles.	Protons, neutrons, electrons
State the masses of the subatomic particles.	Protons: 1, neutrons: 1, electrons: 0
State the relative charges of the subatomic particles	Protons: +1, neutrons: 0, electrons: -1
Describe how the subatomic particles are arranged in an atom.	Protons and neutrons in the nucleus, electrons orbiting in shells
Define the atomic number of an atom.	The number of protons in an atom
Define the mass number of an atom.	The number of protons + the number of neutrons in an atom
Describe how you would calculate the number of neutrons in an atom.	Mass number - atomic number
Explain how the electrons are arranged in atoms.	Orbiting the nucleus in shells
How many electrons can go in the first shell?	2
How many electrons can go in the second and third shells?	8
State what the groups tell you about the electrons in an atom	How many electrons in the outer shell. E.g. carbon is in group 4 so has 4 electrons in the outer shell
Explain what the periodic table tells you about the electrons in an atom	How many shells an atom has. E.g. carbon is in the second period so has two shells
Explain why Mendeleev put some elements in groups.	Because they had similar chemical properties (e.g. they reacted violently with water)
Explain why Mendeleev left gaps in his periodic table.	For elements that had not been discovered yet
What is an ion?	An atom which has lost or gained an electron
In terms of electrons, what do group 1 elements have in common?	1 electron in the outer shell
In terms of electrons, what do group 7 elements have in common?	7 electrons in the outer shell
In terms of electrons, what do group 0 elements have in common?	Full outer shell

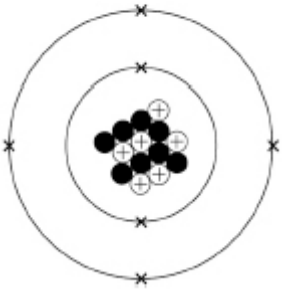
Date: 9th September

Week 2 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: 9th September

Week 2 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Figure 1



Describe the atomic structure of this carbon atom. You should include the number of electrons, neutrons and protons. (6)

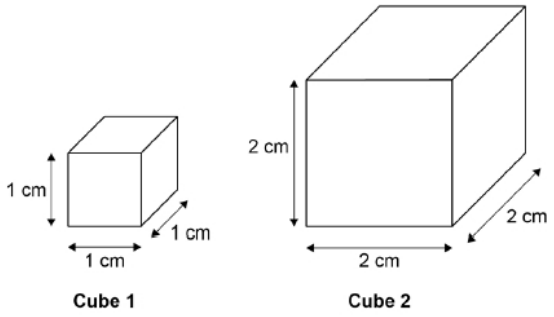
Improvement Work: Describe the atomic structure of this carbon atom. You should include the number of electrons, neutrons and protons. (6)

Date: 9th September

Week 2 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

A student used cubes of potato to investigate the effect of surface area and volume on the rate of osmosis.

The diagram shows two of the cubes of potato the student used.



The surface area to volume ratio of **cube 1** is 6:1.

(a) Calculate the total surface area of **cube 2**.

_____

Total surface area of **cube 2** = _____ cm^2

(1)

(b) Calculate the volume of **cube 2**.

_____

Volume of **cube 2** = _____ cm^3

(1)

(c) Calculate the surface area to volume ratio of **cube 2**.

Use the equation:

$$\text{surface area to volume ratio} = \frac{\text{surface area}}{\text{volume}}$$

_____

_____

Surface area to volume ratio of **cube 2** = _____ : 1

(1)

WEEK 3 Questions (Cover and quiz)

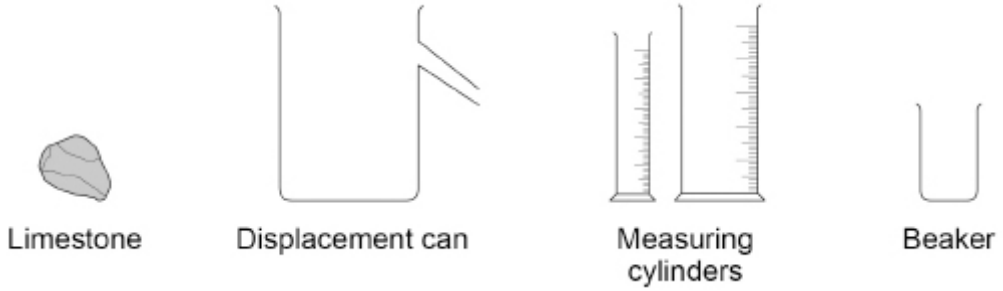
Question	Answer
What is the definition of density?	The mass per unit volume of a material.
What is the word equation linking density, mass & volume?	density = mass / volume
What is the word equation linking density, mass & volume?	ρ = m / V
What is the SI unit for mass?	kilogram
What is the SI unit for volume?	metres cubed (metre x metre x metre)
What is the SI unit for density?	kilogram per metre cubed
What equipment is used to find the volume of an irregularly shaped object?	Displacement can
How do you use a displacement can to measure volume?	Can filled with water, beaker placed under the spout of the can. The object is carefully placed into the displacement can. It forces water out of the spout, equal to its volume. The water can be measured with a measuring cylinder.
Which state of matter has the highest density of atoms?	Solid
Which state of matter has the lowest density of atoms?	Gas
Which states of matter are classes as fluids?	Liquids and gases; any which behave as a liquid.
What can you say about the particle arrangement of a solid?	Tightly packed/close together, fixed lattice, vibrate, strong bonds between particles.
What can you say about the particle arrangement of a liquid?	Close together, randomly arranged, free to move, some bonds between particles.
What can you say about the particle arrangement of a gas?	No regular arrangement, particles are far apart, can move freely, no bonds between particles.
How does a change of state differ from a chemical change?	The material can return to having its previous properties if the change is reversed.
What is sublimation?	When a solid changes into a gas without passing through a liquid state.
What is evaporation?	When a liquid changes into a gas state.
What is the opposite of evaporation?	Condensation, when a gas changes into a liquid state.
When water boils in an open pan, why does the mass of the pan of water appear to decrease?	The evaporated water escapes from the pan. However, the mass of the whole system remains constant.
What are the processes involved when a bathroom mirror mists up?	Hot water evaporates to form water vapour. The water vapour lands on the cooler mirror. The vapour condenses and returns to liquid state on the mirror's surface.
What is the internal energy of a substance?	The total energy stored by the particles. The sum of the total kinetic and potential energies that make up the system.
How does heating affect the energy of a substance?	Heating transfers energy to the substance It increases the energy of the particles that make up the substance.
What two things can heating a substance do?	Raise the temperature, change the state of the substance.

Date: 16th September

Week 3 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: 16th September

Week 3 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.



Describe a method the student could use to determine the volume of the piece of limestone. (4)

Improvement Work: Describe a method the student could use to determine the volume of the piece of limestone. (4)

Date: 16th September

Week 3 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Spiders produce a protein thread which is extremely strong compared to man-made fibres of the same diameter.

Spider's web

Explain how genes control the way the protein is made in the spider's body.

Improvement Work: Explain how genes control the way the protein is made in the spider's body. (4)

WEEK 4 Questions (Cover and quiz)

Question	Answer
What is the term for a microorganism that causes a disease?	A pathogen.
What are the four main pathogens?	Bacteria, virus, fungi and protists.
Which pathogen is a tiny single celled organism.	A protist.
Which type of pathogen is a section of DNA within a protein coat that divides by invading cells?	A virus.
How can pathogens be spread?	Direct contact, air, water, vectors.
Which group of microorganisms includes mushrooms and moulds?	Fungi.
How can you prevent the spread of disease in humans	Good hygiene, destroying vectors and vaccination
Which virus can interfere with your body's ability to fight disease?	HIV.
How does tobacco mosaic virus harm the plant?	It reduces photosynthesis and so growth.
What disease is caused by a parasite transmitted by mosquitoes?	Malaria.
What type of pathogen causes malaria?	Protist.
How is HIV spread?	Sexual contact, exchange of body fluids, sharing needles.
Which part of the body does the HIV virus attack?	The immune system.
How do viruses make you feel ill?	They reproduce rapidly and invade and damage cells.
How do bacteria make you feel ill?	They reproduce rapidly and produce toxins.
Which virus causes a mosaic pattern on the leaves of plants.	Tobacco mosaic virus.
What is an antigen?	The unique proteins on the surface of cells.
Why do you get ill when you first meet a new pathogen?	There is a delay while your body identifies which antibody is needed.
How do antibiotics cure bacterial diseases?	They destroy the bacterial pathogens inside the body.
How do white blood cells defend the body from pathogens?	They engulf them, make antitoxins and make antibodies.
How do the bronchi and trachea prevent microorganisms from entering the body?	They produce mucus to trap pathogens and contain cilia to move the mucus to the back of the throat.
Give three reasons why experimental drugs are tested on animals.	To find out how they work in a whole living organism, to gain information about possible doses, and to predict how the drugs might behave in humans.
What are high doses of an experimental drug used to test for?	To find the optimum dosage for the drug.
What are low doses of an experimental drug used to test for?	To test for possible side effects.
Why do antibiotics not work against viruses?	Viruses reproduce inside cells, so it is difficult to produce drugs that destroy the virus without damaging the cell.
What are memory cells?	White blood cells that 'remember' the right antibody used to destroy a particular pathogen.

Date: 23rd September

Week 4 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: 23rd September

Week 4 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Malaria is transmitted by mosquitoes. Male mosquitoes can be sterilised so they are infertile. The spread of malaria is reduced by releasing sterile mosquitoes into the environment. Explain how releasing sterile mosquitoes reduces the spread of malaria. (2)

Improvement Work: Explain how releasing sterile mosquitoes reduces the spread of malaria. (2)

Date: 23rd September

Week 4 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

At the end of meiosis the number of chromosomes is different from the number of chromosomes at the start of meiosis.

Explain why the change in the number of chromosomes is important. (3)

Improvement Work: Explain why the change in the number of chromosomes is important. (3)

WEEK 5 Questions (Cover and quiz)

Question	Answer
What type of ion do group 2 elements form?	2+ ions
What is a monomer?	a molecule that can be bonded to other identical molecules to form a polymer.
Describe the structure of graphene.	A single layer of graphite, formed of carbon atoms each bonded to three other carbon atoms
Describe the structure of a polymer	A polymer is composed of many simple molecules that are repeating structural units called monomers.
What is an ionic bond?	Bonding between a metal and a non metal involves transfer of electrons
What is covalent bonding?	Bonding between a nonmetal and a non metal involves sharing of electrons
Which element is both diamond and graphite made from?	Carbon
Describe the structure of diamond	Giant covalent lattice
Describe the structure of carbon dioxide.	Simple covalent molecule
Describe the structure of copper.	Giant metallic lattice with delocalised electrons.
Why is the ball and stick model not an accurate representation of the structure of an ionic compound?	Does not accurately depict the millions of ions in the lattice. The ions should touch each other/ there are no gaps between the ions
What are the large cage-like structures and tubes, based on hexagonal rings of carbon atoms called?	Fullerenes
What are the uses of fullerenes?	Fullerenes may be used for drug delivery systems in the body, in lubricants and as catalysts
What are the properties of graphite?	High melting point, soft, rubs off in layers, conducts electricity
What is the attraction between the individual molecules in a covalently bonded substance called?	Intermolecular forces
What bonding occurs between metals and non-metals?	Ionic
What type of bonding involves electron transfer?	Ionic
What type of bonding occurs if electrons are shared?	Covalent
What type of bond is an electrostatic force of attraction between positively and negatively charged ions?	Ionic bond
What happens when an ionic bond is formed?	One atom loses electrons to another atom to form oppositely charged ions that attract each other.
Why do atoms form ions?	To get a full outer shell / become more stable
Explain why group 1 elements like sodium and lithium form a 1+ ion.	They both have one electron in their outer shell and lose it to become stable.
What charge do calcium, oxide and chloride ions have?	Ca^{2+}, O^{2-} and Cl^{-}
What structure of regularly repeating ions do ionic compounds form?	Lattice structure
What is the formula of the nitrate ion?	NO^{3-}
What is the charge on the ions of elements in group 6 of the periodic table?	–2
What is the name of the ionic compound containing calcium and bromine only?	Calcium bromide
What is the name of the ionic compound containing potassium, chlorine and oxygen?	Potassium chlorate
How many more electrons does an oxygen atom need to get a complete outer shell?	2

Date: 30th September

Week 5 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: 30th September

Week 5 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Gold is a metal. Describe the structure of a metal. (3)

Improvement Work: Gold is a metal. Describe the structure of a metal. (3)

Date: 30th September

Week 5 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Meiosis produces cells that are genetically different.

Describe how meiosis produces cells that are genetically different. (2)

Improvement Work: Describe how meiosis produces cells that are genetically different. (2)

WEEK 6 Questions (Cover and quiz)

Question	Answer
What is a scalar quantity?	A quantity that only has a magnitude A quantity that isn't direction dependent
What is a vector quantity?	A quantity that has both a magnitude and direction.
How can a vector quantity be drawn and what does it show?	As an arrow, the length of the arrow represents the magnitude, the arrow points in the associated direction.
What are the two categories that all forces can be split into?	Contact forces & non-contact forces
Give three examples of contact forces.	Friction, Air resistance, Drag, Tension, Reaction
Give three examples of non-contact forces.	Gravitational forces, Electrostatic, Magnetic
Is force a vector or a scalar quantity?	Vector, it has both magnitude & direction
Give three examples of vector quantities.	Velocity, displacement, force, momentum
Give three examples of scalar quantities	Temperature, Time, Mass, Speed, Distance, Energy, Pressure
What is weight?	The force that acts on an object due to gravity and the object's mass.
What is the relationship between gravitational field strength, mass and weight?	Weight = mass x gravitational field strength
What are the units of weight?	Newtons (N)
What are the units of mass?	kilograms (kg)
What are the units of gravitational field strength?	Newtons / kilogram (N/kg)
What is the value of the gravitational field strength on the earth's surface?	9.81 N/kg
Is the gravitational field strength on the surface of the moon likely to be larger or smaller than on the earth's surface? Explain your answer.	Smaller. The Moon has lower mass than Earth's so its gravity is weaker.

Date: 7th October

Week 6 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: 7th October

Week 6 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

The person on the scales has a mass of 55 kg. Gravitational field strength = 9.8 N/kg
Calculate the weight of the person. (3)

Improvement Work: The person on the scales has a mass of 55 kg. Gravitational field strength = 9.8 N/kg. Calculate the weight of the person. (3)

Date: 7th October

Week 6 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Explain why alloys are harder than pure metals (3)

Improvement Work: Explain why alloys are harder than pure metals (3)

WEEK 7 Questions (Cover and quiz)

Question	Answer
Name five energy stores	Kinetic, Thermal, Gravitational Potential, Chemical Potential, Elastic Potential, Electrostatic, Nuclear Potential, Magnetic Potential
What are the four energy transfer pathways?	Mechanical, Heating, Electrical, Radiation
What is the law of Conservation of Energy?	Energy cannot be created or destroyed, but only transferred from one store to another or dissipated to the surroundings.
Which energy transfer pathway does Work represent?	Work represents the mechanical energy pathway.
What is the word equation for Work?	Work = Force x Distance
What is the symbol equation for Work?	W = F x d
What is the unit for Work?	Joule (J)
What is the unit for Force?	Newtons (N)
What is the unit for distance?	metres (m)
What store of energy is associated with moving objects?	Kinetic energy
What is the word equation for kinetic energy?	kinetic energy = 0.5 x mass x (speed)^2
What is the symbol equation for kinetic energy?	Ek = ½ x m x v^2
What are the units of mass?	kilograms, kg
What are the units of kinetic energy?	Joules, J
What store of energy is associated with a stretched spring?	Elastic potential energy
What is the word equation for elastic potential energy?	elastic potential energy = 0.5 x spring constant x (extension)^2
What is the symbol equation for elastic potential energy?	Ee = 1/2 x k x e^2
What are the units of spring constant?	Newtons / metre (N/m)
What are the units of extension?	metres (m)
What are the units of elastic potential energy?	Joules, J
What store of energy is associated with an object lifted above ground level?	Gravitational potential energy
What is the word equation for gravitational potential energy?	g p e = mass x gravitational field strength x height
What is the symbol equation for gravitational potential energy?	Eg = m g h
What are the units of gravitational field strength?	Newtons / kilogram (N/kg)
What are the units of gravitational potential energy?	Joules, J

Date: 14th October

Week 7 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

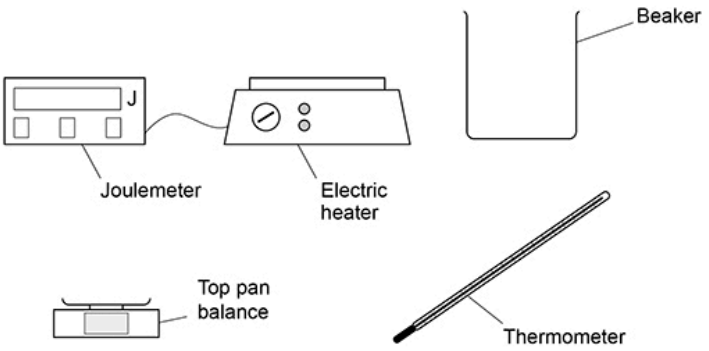
Date: 14th October

Week 7 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

A student made measurements to determine the specific heat capacity of vegetable oil.

Figure 1 shows the equipment used.

Figure 1



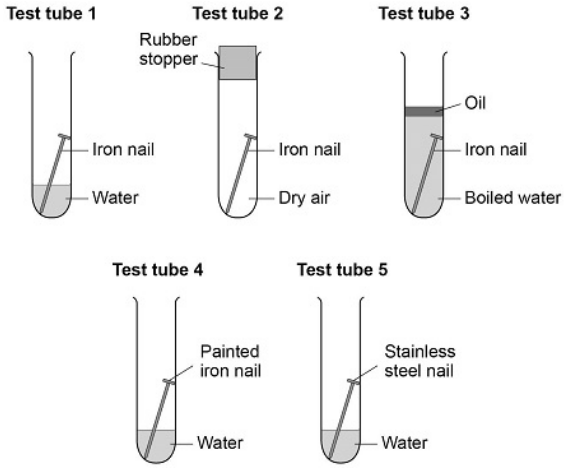
Describe how the student could use the equipment shown in Figure 1 to determine the specific heat capacity of vegetable oil. (6)

Improvement Work: Describe how the student could use the equipment shown in Figure 1 to determine the specific heat capacity of vegetable oil. (6)

Date: 14th October

Week 7 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

This question is about the corrosion of metals. The corrosion of iron is called rusting.
A student investigated the rusting of iron.
This is the method used
1. Set up the test tubes as shown in the figure below.
2. Leave the test tubes for 1 week.
3. Examine the nails for signs of rust.



Explain what would happen to the nails in each of the test tubes (5)

Improvement Work: Explain what would happen to the nails in each of the test tubes (5)

WEEK 8 Questions (Cover and quiz)

Question	Answer
Water that is safe to drink is called.	Potable
Bioleaching uses bacteria to make leachate solutions that contain metal compounds. Describe two ways the metals can be extracted from these solutions.	Displacement using scrap iron / Electrolysis
Describe two ways that humans use the Earth's natural resources.	warmth / shelter / food / transport / generating electricity
Explain what the term finite means and give an example of a finite resource.	A resource which is used up faster than it is made. Crude oil.
Give two of the points from the life cycle assessment (LCA) of a **paper** bag.	Made by pulping timber / generates a lot of waste / high energy demand for production / usually only used once / can be recycled / biodegradable.
Give two of the points from the life cycle assessment (LCA) of a **plastic** bag.	Made from material obtained from crude oil by fractional distillation, then cracking and polymerisation / High energy demand in processing / little waste / can be reused easily / can be recycled / not biodegradable
How can potable water be produced?	Filtering and sterilisation / Desalination by distillation / Desalination by reverse osmosis.
How is phytomining used to extract metals from ores?	Uses plants to absorb metal compounds from soil; the plants are harvested and burned; this produces ash that contains metal compounds.
How is most potable water in the UK produced?	Source water passed through sedimentation tanks / filtered / sterilised with chlorine
How is wastewater from houses and farming treated before being released into rivers/lakes?	Filtered to remove large particles; left to settle - Sediment / Sludge is anaerobically broken down to make methane gas / organic compounds in effluent is broken down by aerobic respiration.
What are the four stages in a life cycle assessment (LCA)?	1. Extracting and processing raw materials 2. Manufacturing and packaging 3. Use and operation during its lifetime 4. Disposal at the end of its useful life.
What areas of life cycle assessments can be easily quantified?	water usage, resources used, energy sources and production of some wastes.
What does LCA stand for?	Life Cycle Assessment
What is a life cycle assessment?	An evaluation of the environmental impact a product has over its lifetime.
What is meant by the term sustainable development?	The development that meets the needs of current generations without compromising the ability of future generations to meet their own
What needs to be removed from industrial waste water?	Organic matter and harmful chemicals.
What two methods can be used for the desalination of salty water?	Distillation / Reverse osmosis.
Why do we need to recycle some resources?	Some resources are finite and need to be conserved / less energy will be required for recycling
Why is potable water not described as pure water by scientists?	It contains dissolved substances.

Date: 21st October

Week 8 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: 21st October

Week 8 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Give two reasons why aluminium should be recycled. (2)

Improvement Work: Give two reasons why aluminium should be recycled. (2)

Date: 21st October

Week 8 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

A person with late stage HIV infection has AIDS.

Scientists have produced monoclonal antibodies for HIV.

The monoclonal antibodies can prevent a person infected with HIV developing AIDS.

(g) Describe how the monoclonal antibody for HIV can be produced. (4)

Improvement Work: Describe how the monoclonal antibody for HIV can be produced. (4)

WEEK 9 Questions (Cover and quiz)

Question	Answer
What is the definition of current?	The rate of flow of electrical charge, i.e. how much charge flows every second.
What is the relationship between charge current and time?	Q = I x t
What is the SI unit for Charge	Coulombs
What is the SI unit for current	Ampere
What is the SI unit for time	seconds
What can be said about the value of current at any point in a series circuit?	Current is the same at all points in a closed loop.
What is the equation linking potential difference, charge and energy (or work done)?	V = E / Q or V = W / Q
What is the SI unit for potential difference?	Volts
What is the SI unit for resistance?	Ohms
What equation should be used to calculate potential difference if current and resistance are known?	V = I x R
What is an ohmic conductor?	A conductor for which current and potential difference are directly proportional. Resistance remains constant as current changes.
State the condition required for resistance to remain constant, for an ohmic conductor?	Temperature must be constant
List four components for which resistance is not constant as current changes?	Filament lamp, diode, Thermistor, LDR
What happens to the resistance of a filament lamp as the temperature increases?	Resistance increases
Why does the resistance of a filament lamp increase as temperature increases?	Ions in metal have more energy, so vibrate more, causing more collisions with electrons as they flow through the metal, this leads to a greater resistance to current flow.
What is different about current flow through a diode?	The current only flows in one direction. Resistance is very high in the other direction, preventing current flow
What happens to the resistance of a thermistor as temperature increases?	The thermistor's resistance decreases.
Give two examples of when a thermistor may be used.	In a thermostat, to turn on a heater below a certain temperature. In a freezer to turn on a cooler when the temperature becomes too high.
What happens to the resistance of a LDR as light intensity decreases?	The LDR's resistance increases.

Date: 4th November

Week 9 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: 4th November

Week 9 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

The temperature of a thermistor increases. The potential difference across the component remains constant. Explain what happens to the current in the component. (2)

Improvement Work: The temperature of a thermistor increases. The potential difference across the component remains constant. Explain what happens to the current in the component. (2)

Date: 4th November

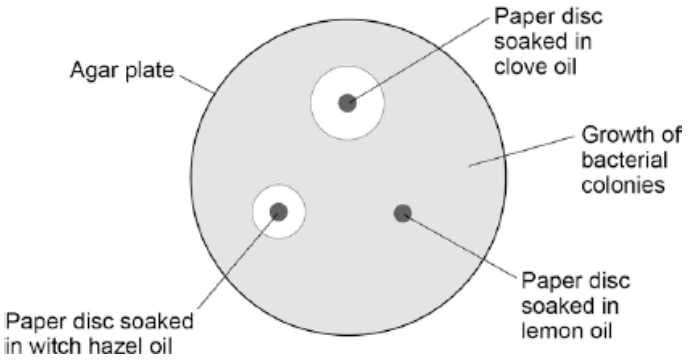
Week 9 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Witch hazel is another plant adapted for defence.

Witch hazel produces oil with antiseptic properties. The oil prevents bacteria from attacking the plant.

A student investigated how effective three different plant oils were at preventing the growth of bacteria.

Figure 2 shows the results.



Which plant oil is the most effective at preventing the growth of bacteria?

Give a reason for your answer.

Oil _____

Reason _____

_____

(2)

(c) The student tested tea tree oil using the same method.

The results showed tea tree oil was the most effective at preventing bacterial growth.

The student concluded that tea tree oil could be used to treat bacterial infections instead of antibiotics.

Give **one** reason why this is **not** a valid conclusion.

_____

_____

(1)

WEEK 10 Questions (Cover and quiz)

Question	Answer
What is meant by the efficacy of a drug?	A measure of how effective a drug is.
What is meant by the toxicity of a drug?	A measure of how toxic a drug is.
What is a placebo?	A substance that does not contain the drug.
What is a double blind trial?	A trial in which patients with the target disease are given either the new medicine or a placebo. Neither the doctor nor the patients know who has received which until the end of the trial.
What type of medication contains inactive or dead viruses to help develop immunity to a disease?	A vaccine.
Who discovered penicillin?	Alexander Fleming.
What's the difference between antibiotics and antiseptics?	Antibiotics destroy bacteria in the body, while antiseptics destroy microorganisms in the environment.
What type of drugs kill bacteria?	Antibiotics.
What do white blood cells make in response to a vaccination?	Antibodies.
What are new medical drugs tested on in preclinical trials?	Cells, tissues and live animals.
What is a common starting point for the synthesis of new drugs?	Chemicals extracted from plants.
What is introduced into your body in a vaccination?	Dead or inactive forms of the pathogen.
What are the stages involved in testing and trialling new drugs?	Drug discovery, preclinical trials, clinical trials, drug licensing.
What are new medical drugs extensively tested for?	Efficacy, toxicity and dosage.
What are new medical drugs tested on in clinical trials?	Healthy volunteers and patient volunteers.
What key word describes when a large proportion of a population is immune and the spread of a pathogen is reduced?	Herd immunity.
How does the skin prevent microorganisms from entering the body?	It acts as a barrier, produces antimicrobial secretions and is covered in a layer of microorganisms that act as an extra barrier.
How does your nose prevent microorganisms from entering the body?	It contains hair and mucus that traps pathogens.
How does the stomach prevent microorganisms from entering the body?	It produces acid.
What are antibodies?	Proteins made by white blood cells to destroy pathogens (both bacteria and viruses).
Why is an active drug often used as a placebo instead of a sugar pill?	So the patient is not deprived of treatment while taking part in the trial.
What are antibiotic resistant bacteria?	Strains of bacteria that are no longer able to be destroyed by antibiotics.
What is immunity?	The ability of your white blood cells to produce the right antibodies quickly as a result of memory cells.
What is meant by the dosage of a drug?	The quantity of the drug given.

Date: 11th November

Week 10 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: 11th November

Week 10 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Gonorrhoea is a bacterial disease. A new vaccine is being developed against gonorrhoea. Describe how a vaccine would work to prevent gonorrhoea. (4)

Improvement Work: Describe how a vaccine would work to prevent gonorrhoea. (4)

Date: 11th November

Week 10 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Describe how ceramic food plates are produced from clay. (2)

Improvement Work: Describe how ceramic food plates are produced from clay. (2)

WEEK 11 Questions (Cover and quiz)

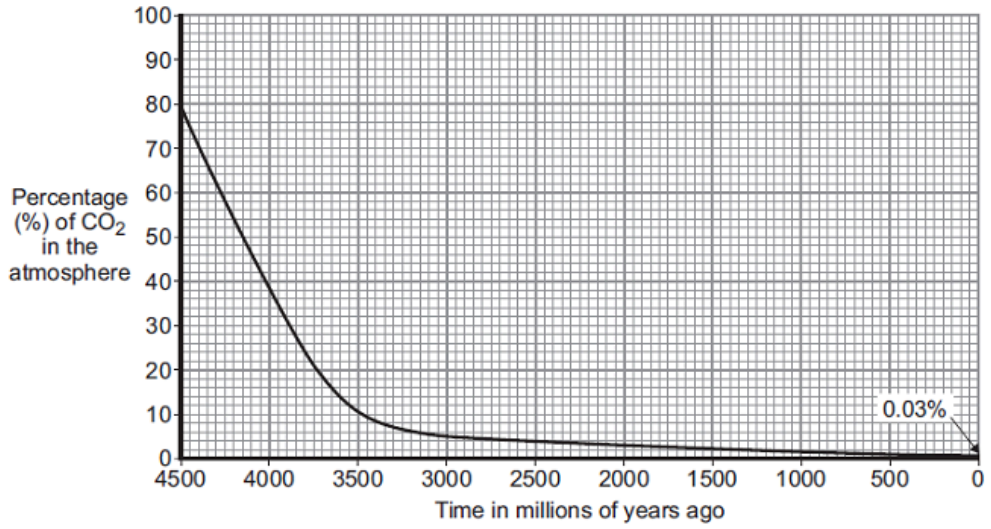
Question	Answer
Which elements are present in hydrocarbon molecules?	Carbon; hydrogen
What is the most abundant element in air?	Nitrogen/N_2
Which gas reacts with hydrocarbons when they burn?	Oxygen/O_2
Name one fossil fuel used in cars.	Petrol/diesel oil
Name a gas produced when carbon burns.	Carbon monoxide/carbon dioxide
What compound forms when hydrogen burns in air?	Water
What is the main fossil fuel in natural gas?	Methane
What is the black solid element found in soot and smoke?	Carbon
What are the products of the complete combustion of hydrocarbon fuels?	Carbon dioxide; water
Which gas is produced during incomplete combustion, but not complete combustion, of hydrocarbon fuels?	Carbon monoxide
What solid element is produced during the incomplete combustion of hydrocarbon fuels?	Carbon
Name the gas formed when acids react with metals.	Hydrogen
Name the gas formed when acids react with calcium carbonate.	Carbon dioxide
Which common compound of carbon and oxygen is thought to have been an abundant gas in Earth's early atmosphere?	Carbon dioxide
What are the names of the Earth's two nearest neighbouring planets?	Venus and Mars
Name the biological process that increases oxygen levels and reduces carbon dioxide levels in the atmosphere.	Photosynthesis
What geological feature of a planet's surface can give out large amounts of hot gas?	Volcano
Name the physical process that describes changing a vapour into liquid.	Condensation
What type of reaction occurs when a metal gains oxygen?	Oxidation
How old do scientists think the Earth is: 4.5 billion years, 4.5 million years or 450000 years?	4.5 billion years
What sort of rocks are formed from layers of deposited material?	Sedimentary rocks
Which gaseous element forms most of the Earth's atmosphere today?	Nitrogen
Titan is an icy moon of Saturn. What is ice made of?	Water
Where were the gases that formed the Earth's early atmosphere released from?	Volcanoes
What two compounds are thought to have formed most of the Earth's early atmosphere?	Water, carbon dioxide
What is the chemical test for carbon dioxide?	Turns limewater milky/cloudy

Date: 18th November

Week 11 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: 18th November

Week 11 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.



Use information from Graph 1 to answer these questions.

Describe how the percentage of carbon dioxide has changed in the last 4500 million years. (2)
Give two reasons why the percentage of carbon dioxide has changed. (2)

Improvement Work: Describe how the percentage of carbon dioxide has changed in the last 4500 million years. (2) Give two reasons why the percentage of carbon dioxide has changed. (2)

Date: 18th November

Week 11 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

This question is about titanium dioxide (TiO_2).

(a) Self-cleaning windows are coated with a layer of nanoparticles of titanium dioxide.

Titanium dioxide:

- helps sunlight break down dirt particles
- attracts water, so dirt is washed away by rain.

Nanoparticles of titanium dioxide are used instead of fine particles of titanium dioxide for coating self-cleaning windows.

Suggest **two** reasons why. (2)

Improvement Work: Suggest two reasons why. (2)

WEEK 12 Questions (Cover and quiz)

Question	Answer
What element forms most of the Earth's atmosphere today?	Nitrogen
Which element that makes up about 21% of the atmosphere of Earth today was not thought to be present in the atmosphere 4.5 billion years ago?	Oxygen
As the Earth evolved, chemical reactions with what element are thought to have slowed the release of oxygen to the atmosphere?	Iron
What gas given out by volcanoes is thought to have condensed to form oceans?	Water vapour
What factor has caused changes in Earth's atmosphere but is not found on Venus or Mars?	Life
What is the chemical test for oxygen?	Relights a glowing splint
Why did the formation of the Earth's early oceans cause a decrease in atmospheric carbon dioxide concentrations?	The carbon dioxide dissolved in the water
What do some sea creatures use dissolved carbon dioxide to help them do?	Form shells
What sort of chemical compound are shells made from: an oxide, a carbonate or a chloride?	Carbonate
What is the formula for calcium carbonate?	$CaCO_3$
What process in plants and algae causes a reduction of atmospheric carbon dioxide concentrations?	Photosynthesis
Photosynthesis affects the concentrations of two gases in the atmosphere – carbon dioxide, and what other gas?	Oxygen
Give the name of some of the earliest photosynthetic microorganisms.	Cyanobacteria/algae
Certain gases in the atmosphere keep the Earth warm. What is this effect called?	Greenhouse effect
Name three greenhouse gases.	Methane, carbon dioxide, water vapour,
Energy is transferred from the Sun by what?	(infrared/ electromagnetic) radiation/ waves/ light
The warm Earth emits what type of (electromagnetic) waves?	Long wavelength Infrared
In an atmosphere containing greenhouse gases, what happens to some of the infrared waves that the Earth emits?	Absorbed (and re-emitted in all directions)
Why do modern thermometers give better quality evidence than those from the 18th century?	Thermometers are now more accurate/ have a better resolution
What word (beginning with c) describes the way in which two variables appear to be linked because they show similar patterns of change?	Correlation
What term is used to describe the changes to average weather conditions around the world?	Climate change
Evidence for carbon dioxide variations over the last 800 000 years comes from Antarctica. In what form is this evidence?	Ice cores
What type of human activity has mainly increased the level of greenhouse gases since 1750?	Burning fossil fuels
The acidity of the oceans is increasing due to more carbon dioxide dissolving in the water. What is this doing to the pH of the oceans?	Decreasing it/making it more acidic

Date: 25th November

Week 12 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: 25th November

Week 12 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Explain how greenhouse gases cause global warming. (4)

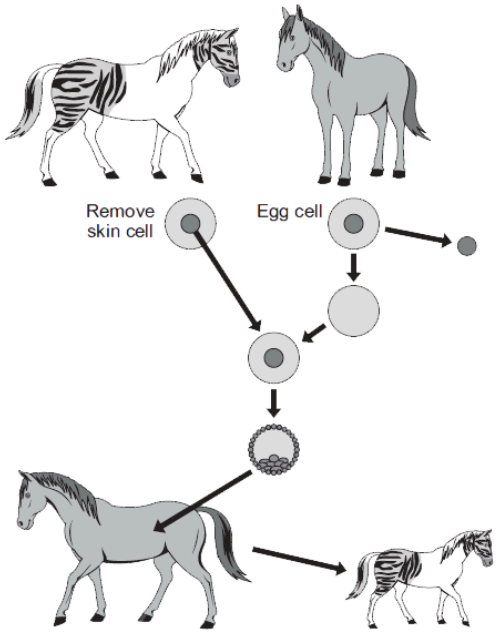
Improvement Work: Explain how greenhouse gases cause global warming. (4)

Date: 25th November

Week 12 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Zorses are **not** able to breed.
Scientists could produce more zorses from this zorse by adult cell cloning.

The diagram shows how the scientists might clone a zorse.



Use information from the diagram and your own knowledge to describe how adult cell cloning could be used to clone a zorse. (6)

Improvement Work: Use information from the diagram and your own knowledge to describe how adult cell cloning could be used to clone a zorse. (6)

WEEK 13 Questions (Cover and quiz)

Question	Answer
How many hours each day do plants respire?	24 hours.
Write the balanced symbol equation for photosynthesis	$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$
How does carbon dioxide concentration affect photosynthesis?	As carbon dioxide levels increase the rate of photosynthesis increases.
How does light intensity affect photosynthesis?	As light level increases the rate of photosynthesis increases.
If starch is present what colour does iodine turn?	Blue-black.
What is the chemical formula for glucose?	$C_6H_{12}O_6$
Write the word equation for photosynthesis	Carbon dioxide + Water → Glucose + Oxygen
What are the reactants of photosynthesis?	Carbon dioxide and Water.
What substance causes plants to be green?	Chlorophyll.
What type of reaction is photosynthesis?	Endothermic.
Plants often use lipids as an energy store for seeds, why do seeds need this?	For respiration as the plant germinates before it can photosynthesise.
Why do leaves have veins?	For water to be brought to the cells via the Xylem and products of photosynthesis to be removed via the phloem.
What are the products of photosynthesis?	Glucose and Oxygen.
What product of photosynthesis do plants use to respire?	Glucose.
Where do plants that live in nitrate-poor soil (e.g. Venus flytraps or sundews) get their nutrients from?	Insects they catch.
Name the four limiting factors for photosynthesis	Light intensity / Temperature / Carbon dioxide concentration / chlorophyll levels in the leaves.
What is the limiting factor for photosynthesis at night?	Light levels.
During photosynthesis energy is transferred from the environment to the chloroplast by?	Light.
What is the main energy store in plants?	Starch.
How does temperature affect photosynthesis?	The rate of photosynthesis increases as the temperature reaches about 37°C. Above 40°C the rate of photosynthesis decreases rapidly.
Why do leaves contain chlorophyll in chloroplasts?	To absorb light for photosynthesis.
Why do leaves have air spaces?	To allow carbon dioxide to diffuse into the cells and oxygen out of the cells.
Why are most leaves thin?	To decrease the distance gases need to diffuse.
Why are most leaves broad	To increase the surface areas for light to fall on.
Why do leaves have guard cells?	To open and close the stomata in order to regulate gas exchange.
When is starch used in plants?	When it is dark or low light levels starch is converted back to glucose.

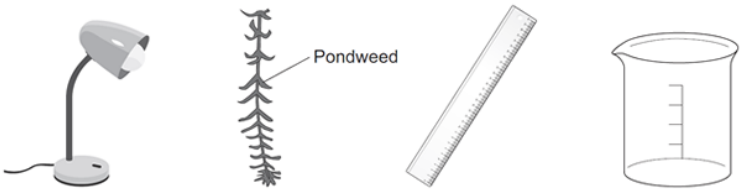
Date: 2nd December

Week 13 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: 2nd December

Week 13 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

How would you investigate the effect of light intensity on the rate of photosynthesis?
The image below shows some of the apparatus you might use. (6)



You should include details of how you would set up the apparatus and the materials you would use, the measurements you would make and how you could make this a fair test.

Improvement Work: How would you investigate the effect of light intensity on the rate of photosynthesis? (6)

Date: 2nd December

Week 13 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Organisms can be produced by asexual reproduction and by sexual reproduction.

(a) Give **two** differences between asexual reproduction and sexual reproduction.

1. _____

_____

2. _____

_____

(2)

(b) Adult cell cloning is a type of asexual reproduction.

Explain why.

_____

_____

_____

_____

(2)

Improvement Work:

WEEK 14 Questions (Cover and quiz)

Question	Answer
In paper chromatography which phase is the paper?	Stationary phase
Is mineral water chemically pure?	No (contains dissolved substances)
What does Rf stand for?	Retention factor
What is the mobile phase in a chromatography experiment?	The solvent.
What is a pure substance?	A single element or compound, not mixed with any other substance
What is an impure substance?	A mixture of elements and /or compounds
What is chromatography?	Patterns of spots made by substances tested by chromatography
What is chromatography?	A technique where mixtures can be separated and identified based on their interactions with a mobile phase (solvent) and a stationary phase (chromatography paper)
How can chromatography be used to determine if a compound is pure or not?	A pure substance will produce one spot on the chromatogram
How can melting point be used to determine if a compound is pure or not?	A pure substance will have a small melting point range
What is the distance the solvent travels up the stationary phase called?	Solvent front
What is the process where small amounts of dissolved substances are separated by running a solvent along a material such as absorbent paper?	Chromatography
Which substance is purest? A melts between 123-125°C; B melts between 112-119°C	A is the purer substance
Why are mixtures much easier to separate than compounds?	Substances in mixtures are not chemically bonded
What is the formula used to calculate Rf values?	Rf = distance travelled by substance / distance travelled by solvent

Date: 9th December

Week 14 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: 9th December

Week 14 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Plan a chromatography experiment to investigate the colours in an ink. (6)

Improvement Work: Plan a chromatography experiment to investigate the colours in an ink. (6)

Date: 9th December

Week 14 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing on your Red and Amber questions.

Sulfur dioxide is a gas at room temperature. The bonding in sulfur dioxide is covalent.

Explain, in terms of its structure and bonding, why sulfur dioxide has a low boiling point. (3)

Improvement Work: Explain, in terms of its structure and bonding, why sulfur dioxide has a low boiling point. (3)

WEEK 15 Questions (cover and quiz) - Atomic Structure

Question	Answer
Give an approximate size of the radius of an atom.	1 x 10^{-10} metres
What are the three subatomic constituents of an atom?	Proton, Neutron, Electron
Where is the most mass of an atom concentrated?	In the nucleus
Approximately what proportion of the total radius of an atom is the radius of the nucleus?	1/10,000
Describe the arrangement of protons, neutrons and electrons in an atom.	Protons and neutrons are in the atom's nucleus. Electrons are in discrete energy levels around the nucleus.
What charge does the nucleus of an atom have? Why?	Positive charge. Nucleus contains protons & neutrons. Protons have a positive charge, neutrons have no charge.
What charge does a proton have?	Positive / +1
What charge does a neutron have?	Neutral / 0
What charge does an electron have?	Negative / -1
Give two ways that an atom's electron arrangement can be changed.	Absorbing EM radiation, emitting EM radiation
How does an atom's electron arrangement change when it absorbs EM radiation.	Electrons move further away from the nucleus. They move to a higher energy level.
How does an atom's electron arrangement change when it emits EM radiation?	Electrons move closer to the nucleus. They move to a lower energy level.
How does the ratio of electrons to protons in an atom result in the atom having no overall charge.	Number of protons is equal to the number of electrons. Protons and electrons have equal and opposite charges, so charge cancels.
What do all forms of the same element have in common?	They all have the same number of protons.
What is the name given to the number of protons in an atom?	Atomic number
What is an atom's mass number?	The total number of protons and neutrons in an atom.
What is an isotope of an atom?	An atom of an element that has a different number of neutrons, but the same number of protons.
What may lead to a scientific model being changed or replaced?	Discovery of new experimental evidence which doesn't agree with the existing theory.
How did the plum-pudding model describe the atom?	A ball of positive charge, with negatively charged electrons distributed evenly throughout it.
Prior to the discovery of the electron what was believed about the atom?	The atom was believed to be indivisible.
Which experiment led to the plum-pudding model being discarded?	Rutherford's alpha-scattering experiment / gold foil experiment
Rutherford was the first scientist to suggest the existence of the ...	Nucleus
What were the conclusions of the alpha-scattering experiment?	Most of the mass of the atom is concentrated at the centre in the nucleus. The nucleus is positively charged.
What reinforces a scientific theory?	When experimental results agree with the hypothesised theoretical calculations and theories.
What did James Chadwick's experiments on the atom prove?	The existence of neutrons

Date: 16th December

Week 15 Task 1 - 1 Page of retrieval quizzing - do not use full sentences

Date: 16th December

Week 15 Task 2 - Complete the exam question then fill the remainder of the page with retrieval quizzing. Use full sentences for the exam question, but not the quiz.

Describe the model now used for the structure of an atom.

In your answer you should:

- give details of the individual particles that make up an atom
- include the relative masses and relative charges of these particles.

Do not include a diagram in your answer. (6)

Improvement Work: Describe the model now used for the structure of an atom. (6)

Date: 16th December

Week 15 Task 3 - Complete the exam question then fill the remainder of the page with retrieval quizzing. Use full sentences for the exam question, but not the quiz.

Aluminium is a metal. Describe how metals conduct electricity. Answer in terms of electrons. (3)

Improvement Work: Aluminium is a metal. Describe how metals conduct electricity. Answer in terms of electrons. (3)

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