Scott

Scott Medical and Healthcare College

Term 1 - Autumn Term

Science

Year 10

Name: _____

Tutor: _____

Care to Learn

Learn to Care

Year 10 Homework Timetable

Monday	English Task 1	Option A Task 1	Option C Task 1
Tuesday	Sparx Science	Option B Task 1	Sparx Maths
Wednesday	Sparx Maths	Science Task 1	Option C Task 2
Thursday	Option A Task 2	Sparx Science	Option B Task 2
Friday	Science Task 2	English Task 2	

Sparx Science - Reach 100% each week before Friday 4pm
Sparx Maths - Reach 100% each week before Friday 4pm

Option A
History
Geography
Spanish

Option B
Geography
Health and Social Care
Psychology

Option C
Psychology
Sports Studies
Childcare
Drama

Year 10 - Homework Plan Science

Week/Date	Homework Task 1	Homework Task 2
Week 2 DATE: 11/9/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science
Week 3 DATE: 18/9/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science
Week 4 DATE: 25/9/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science
Week 5 DATE: 2/10/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science
Week 5=6 DATE: 9/10/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science
Week 6=7 DATE: 16/10/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science
Week 8 DATE: 30/10/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science

Week 9 DATE: 6/11/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science
Week 10 DATE: 13/11/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science
Week 11 DATE: 20/11/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science
Week 12 DATE: 27/11/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science
Week 13 DATE: 4/12/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science
Week 14 DATE: 11/12/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science
Week 15 DATE: 18/12/23	Complete 1 page of retrieval quizzing RAG rate the questions Answer the questions on Sparx Science	Complete the exam question. Fill the remainder of the page with retrieval quizzing on your Red and Amber questions Answer the questions on Sparx Science

WEEK 2 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: _____

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

Date: _____

Week 2 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)

WEEK 3 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

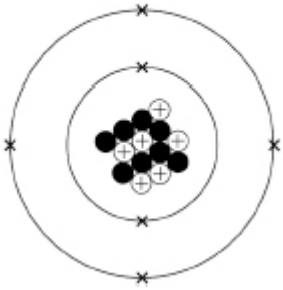
Date: _____

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

Date: _____

Week 3 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)

WEEK 4 Questions (Cover and quiz)

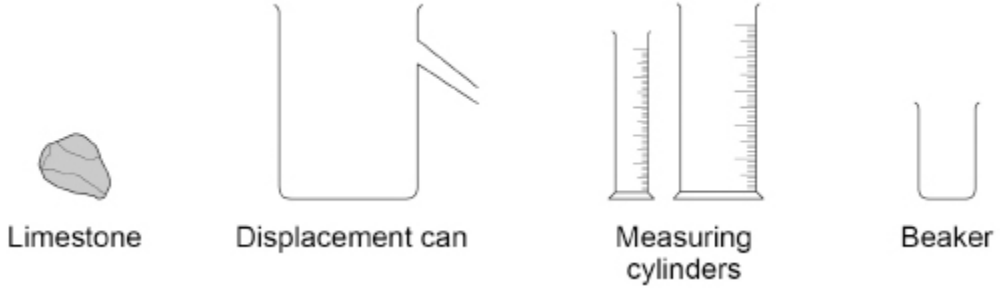
Question	Answer
What is the definition of density?	The mass per unit volume of a material.
What is the word equation linking density, mass & volume?	density = mass / volume
What is the word equation linking density, mass & volume?	ρ = m / V
What is the SI unit for mass?	kilogram
What is the SI unit for 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: _____

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

Date: _____

Week 4 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)

WEEK 5 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: _____

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

Date: _____

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

White blood cells produce antibodies. This is one way white blood cells protect us against pathogens. Give two other ways that white blood cells protect us against pathogens. (2)

Improvement Work: Give two other ways that white blood cells protect us against pathogens. (2)

WEEK 6 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: _____

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

Date: _____

Week 6 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)

WEEK 7 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: _____

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

Date: _____

Week 7 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)

WEEK 8 Questions (Cover and quiz)

Question	Answer
Define the keyword classification.	The organisation of living things into groups according to their similarities.
Who devised the traditional classification of living things into groups depending on their structure and characteristics?	Carl Linnaeus.
What are the seven groups used in Carl Linneas' classification system?	Kingdom, phylum, class, order, family, genus and species
Which two groups in the Linnaean classification system are used in the binomial naming system?	Genus and species.
What two developments lead to a change in the classification system?	Improvements in microscopes and understanding of biochemical processes.
How did the improvement of microscopes lead to new models of classification?	Evidence from internal structures became more developed.
Evidence from what type of analysis led to the development of the three-domain classification system?	Chemical analysis.
Who developed the three-domain system of classification?	Carl Woese.
What are the domains in Carl Woese's classification system?	Archaea (primitive bacteria usually living in extreme environments), Bacteria (true bacteria), Eukaryota (which includes protists, fungi, plants and animals)
What type of organisms are in the group archaea?	Primitive bacteria that usually live in extreme environments.
What type of organisms are in the group eukaryota?	Protists, fungi, plants and animals.
What do evolutionary trees show?	How scientists believe organisms are related.
What evidence is used to devise evolutionary trees?	They use current classification data for living organisms and fossil data for extinct organisms.
What is an ecosystem?	The interaction of a community of living organisms (biotic) with the non-living (abiotic) parts of their environment.
What do organisms get from their ecosystem?	A supply of materials from their surroundings and from the other living organisms there.
What do plants compete for?	Light and space, water and mineral ions from the soil.
What do animals compete for?	Food, mates and territory.
What is a community?	The different populations living in an area.
What is a population?	All the members of the same species living in an area.
What is a stable community?	A community where all the species and environmental factors are in balance so that population sizes remain fairly constant.
What do different species in a community depend on each other for?	Food, shelter, pollination, seed dispersal etc.
What keyword describes living factors in an ecosystem?	Biotic factors.
What keyword describes non-living factors in an ecosystem?	Abiotic factors.
What type of factors are light intensity, temperature, soil pH?	Abiotic factors.
What type of factors are food, new predators, new pathogens	Biotic factors.

Date: _____

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

Date: _____

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

Carl Woese developed the ‘three-domain system’ of classification. Describe the ‘three-domain system’ of classification. (3)

Improvement Work: Carl Woese developed the ‘three-domain system’ of classification. Describe the ‘three-domain system’ of classification. (3)

WEEK 9 Questions (Cover and quiz)

Question	Answer
Name a method of mining low yield ores using plants.	Phytomining
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 is bioleaching?	Uses bacteria to make a leachate that contains metal compounds.
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.
What type of ores can phytomining and bioleaching be used on?	Low-grade ores (ores with low metal concentrations)
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: _____

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

Date: _____

Week 9 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)

WEEK 10 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: _____

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

Date: _____

Week 10 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)

WEEK 11 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: _____

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

Date: _____

Week 11 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)

WEEK 12 Questions (Cover and quiz)

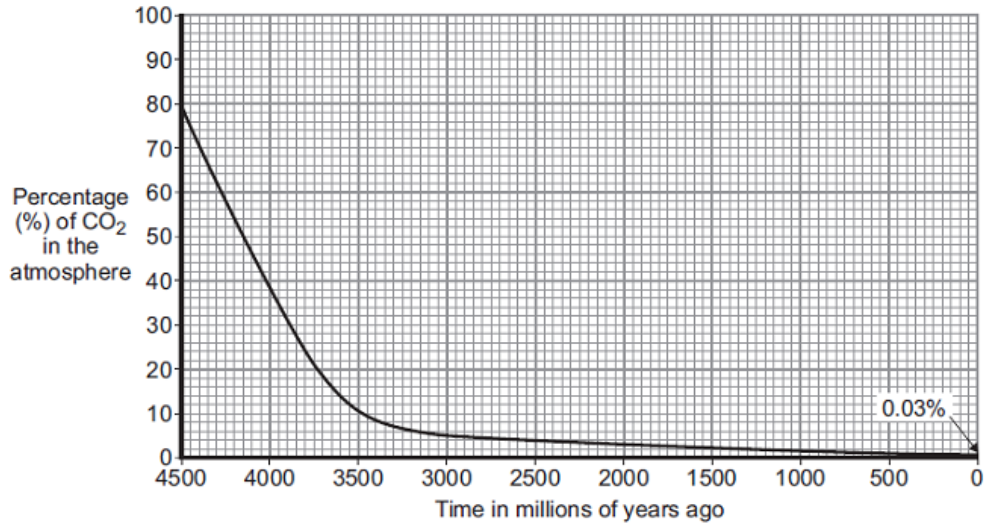
Question	Answer
Which elements are present in hydrocarbon molecules?	Carbon; hydrogen
What is the most abundant element in air?	Nitrogen/N2
Which gas reacts with hydrocarbons when they burn?	Oxygen/O2
Name one fossil fuel used in cars.	Petrol/diesel oil
Name a gas produced when carbon burns.	Carbon monoxide/carbon 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: _____

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

Date: _____

Week 12 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)

WEEK 13 Questions (Cover and quiz)

Question	Answer
What three factors determine the temperature change of a system?	Mass of substance being heated, type of material, energy inputted into the system
What is the equation used to calculate the temperature change when a substance is heated?	Energy supplied = mass x specific heat capacity x temperature change
Define specific heat capacity.	The amount of energy needed to increase the temperature of 1kg of a substance by 1 degree celsius.
What is the unit of specific heat capacity?	J/kg °C
How does the internal energy and temperature of a substance change when a change of state occurs?	Internal energy will increase/decrease temperature will remain constant
Define specific latent heat	The amount of energy needed to change the state of 1kg of a substance with no change in temperature.
State the equation for energy required to change state?	Energy absorbed = mass x specific latent heat
What is the specific latent heat of fusion?	Energy required to change 1kg of a substance for solid to liquid, without change in temperature.
What is the specific latent heat of vaporisation?	Energy required to change 1kg of a substance from liquid to gas, without change in temperature.
Describe the motion of molecules in a gas.	They are in constant random motion.
What factors affect the average kinetic energy of gas molecules?	Temperature of the substance; the higher the temperature the higher the average kinetic energy of the molecules.
What effect does increasing temperature have on the pressure of a gas when held at constant volume.	Pressure of the gas will increase as the temperature increases.
Why does pressure increase as temperature increases (at a constant volume)?	KE of molecules increases, frequency of collisions between molecule/surface increases, greater force and therefore pressure.
If gas A is at low pressure, and gas B is at high pressure, what can be said about the rate of collisions in each gas?	There are more collisions per second in gas B than in gas A. The rate of collisions is higher in B.
Describe the force that the pressure of a gas exerts on the walls of its container.	The net force acts at right angles to the container's surface. The force increases as pressure increases.
What is the unit used for pressure?	Newtons per metres squared or Pascals
What increases when you do work on a gas?	The internal energy of the gas, this can also lead to an increase of temperature.
Why does the temperature of air inside a bike pump increase when it is pumped?	Work is done on a gas when it is compressed. Doing work on a gas increases its internal energy. So KE of molecules increases. Temperature increases.
State the relationship between area, force and pressure	Pressure = force / area
Particles in which state have the highest energy?	Gas
In which state of matter are the particles closest together?	Solid
Which type of energy do particles obtain when heated?	Kinetic
How is evaporation different from boiling?	Evaporation occurs at any temperature; boiling happens only at boiling point.
What piece of equipment do you use to measure an object's mass?	Top pan balance
Name the equipment used to measure liquid volume?	Measuring cylinder
Why are gases compressible?	The particles in gases are spaced far apart, so there is space for the particles to move closer.
What is the SI unit for latent heat?	Joule per kilogram

Date: _____

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

Date: _____

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

Explain, in terms of the particles, why gases are easy to compress. (2)

Improvement Work: Explain, in terms of the particles, why gases are easy to compress. (2)

WEEK 14 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.

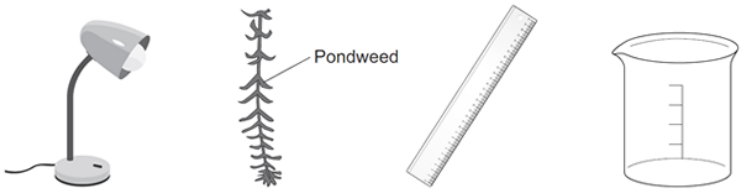
Date: _____

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

Date: _____

Week 14 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)

WEEK 15 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: _____

Week 15 Task 1 - Complete 1 page of retrieval quizzing and RAG rate the questions

Date: _____

Week 15 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)