Year 10

Key Knowledge Questions and Answers

B1 Cells

	Question	Answer
1	What type of cell are plant and animal cells?	Eukaryotic
2	Name three differences between prokaryotic and eukaryotic cells	Prokaryotic have no nucleus, smaller cell, unicellular
3	What is an example of a prokaryotic cell?	Bacteria
4	What three organelles do plant cells contain that animal cells don't?	Cell wall, vacuole, chloroplasts
5	What is the function of the cell membrane?	To control entry and exit to a cell
6	What is the function of the nucleus?	To hold the DNA/control cell activity
7	What is the function of the mitochondria?	The site of respiration
8	What is the function of the ribosomes?	The site of protein synthesis
9	What is the function of the chloroplasts?	The site of photosynthesis
10	What is the function of the cell wall?	To provide structure/support to the cell
11	What are the two focus wheels on a light microscope called?	Coarse and fine focus
12	Why do we not place the objective lens all the way down to the stage?	To prevent damage to the microscope
13	How can we make cells more visible on a slide?	Stain the cells
14	What is resolution?	The fine detail of an image (the difference between two points)
15	What are the two equations to calculate magnification?	Magnification = eyepiece x objective lens, Magnification = image size / actual size
16	What term describes the change from stem cell to specialised cell?	Differentiation
17	What does the term specialised mean?	To have a specific job or function
18	Name a type of specialised cell in humans, and their adaptation	Sperm - streamlined head, tail for swimming, mitochondria, enzymes to break down egg. Muscle cell - lots of mitochondria, good blood supply. Nerve cells - fat insulation, long and thin to transfer electrical impulses
19	Name a type of specialised cell in plants, and their adaptation.	Root hair cells - long and thin for surface area, no chloroplasts as no sunlight, mitochondria for active transport.
20	Where is DNA kept in the cell?	Nucleus
21	What is a gene?	A section of DNA
22	How many chromosomes does the average human body cell have?	46 chromosomes (23 pairs)
23	What is the purpose of mitosis?	Growth and repair
24	Describe the stages of cell division.	Chromosomes and organelles duplicate, cell membrane elongates, cytoplasm separates, cell divides into two identical daughter cells
25	What is a stem cell?	An undifferentiated cell (no specific function)
26	Name the three places stem cells are found	Meristem in plants, bone marrow, embryos
27	What could stem cells be used to treat?	Parkinsons, paralysis, heart disease, diabetes
28	Name some disadvantages of stem cell therapy.	expensive, could result in embryoes being destroyed, limited success
29	Define diffusion	Movement of particles from a high to low concentration, down a concentration gradient

30	Name four factors that affect the speed of diffusion.	Concentration of particles, diffusion distance, temperature, surface area
31	Name an adaptation of the alveoli	Large surface area, good blood supply, moist, thin walls
32	What substances will move through the body by diffusion?	carbon dioxide, oxygen
33	Define osmosis.	movement of water down a concentration gradient, across a semi-permeable membrane
34	Define concentration.	the number of particles in a volume
35	Will water move into or out of a cell with a higher solute concentration than the solution it is in?	out of the cell
36	What happens to a human cell when too much water leaves via osmosis?	it shrivels
37	What happens to a human cell when too much water enters via osmosis?	it bursts
38	What happens to a plant cell when too much water enters via osmosis?	it becomes turgid
39	Define active transport.	movement of particles against the concentration gradient, which requires energy
40	Where do cells get the energy required for active transport.	released through respiration
41	Name two substances that travel via active transport.	glucose, mineral ions

Self-assess:

	Question	Answer
1	What type of cell are plant and animal cells?	
2	Name three differences between prokaryotic and eukaryotic cells	
3	What is an example of a prokaryotic cell?	
4	What three organelles do plant cells contain that animal cells don't?	
5	What is the function of the cell membrane?	
6	What is the function of the nucleus?	
7	What is the function of the mitochondria?	
8	What is the function of the ribosomes?	
9	What is the function of the chloroplasts?	
10	What is the function of the cell wall?	
11	What are the two focus wheels on a light microscope called?	
12	Why do we not place the objective lens all the way down to the stage?	
13	How can we make cells more visible on a slide?	
14	What is resolution?	
15	What are the two equations to calculate magnification?	
16	What term describes the change from stem cell to specialised cell?	
17	What does the term specialised mean?	
18	Name a type of specialised cell in humans, and their adaptation	
19	Name a type of specialised cell in plants, and their adaptation.	
20	Where is DNA kept in the cell?	
21	What is a gene?	
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23	What is the purpose of mitosis?	
24	Describe the stages of cell division.	
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28	Name some disadvantages of stem cell therapy.	
29	Define diffusion	
30	Name four factors that affect the speed of diffusion.	
31	Name an adaptation of the alveoli	
32	What substances will move through the body by diffusion?	
33	Define osmosis.	
34	Define concentration.	
35	Will water move into or out of a cell with a higher solute concentration than the solution it is in?	
36	What happens to a human cell when too much water leaves via osmosis?	
37	What happens to a human cell when too much water enters via osmosis?	
38	What happens to a plant cell when too much water enters via osmosis?	
39	Define active transport.	
40	Where do cells get the energy required for active transport.	
41	Name two substances that travel via active transport.	

B2 Organisation

	Question	Answer
1	Name the five levels of organisation from smallest to biggest	Cells, tissues, organs, organ systems, organism
2	What is the name of a group of cells with similar structures and functions?	A tissue
3	What is the name of a group of tissues working together to perform a specific function?	An organ
4	What is the function of the liver in digestion?	Produces bile which neutralises stomach acid and emulsifies fats
5	What is the function of saliva in digestion?	Contains amylase to break down starch
6	Describe the function of amylase	To break down starch into glucose
7	Where is amylase produced?	Salivary glands, pancreas and small intestine
8	Describe the function of protease	To break proteins down into amino acids
9	Where are proteases produced?	Stomach, pancreas and small intestine
10	Describe the function of lipases	To break down lipids into fatty acids and glycerol
11	Where are lipases produced?	Pancreas and small intestine
12	What are 2 factors that affect the rate of activity of an enzyme?	Temperature and pH
13	Describe the effect of temperature on enzyme activity	As temperature increases, so does rate of enzyme activity up until a certain temperature when the enzyme becomes denatured and the rate rapidly decreases
14	What do we call it when the shape of the enzymes active site has irreversibly changed shape?	Denatured
15	Which reagent is used to test for starch and what colour change would you see with a positive result?	Iodine solution will change from orange to blue/black if starch is present
16	Which reagent is used to test for sugars and what colour change would you see with a positive result?	Benedict's will change from blue to brick red if sugars are present
17	Which reagent is used to test for proteins and what colour change would you see with a positive result?	Biuret will change from blue to purple if proteins are present
18	Which reagent is used to test for lipids and what colour change would you see with a positive result?	Ethanol will change from colourless to a milky white emulsion if lipids are present
19	Name the 4 components of the blood	Plasma, red blood cells, white blood cells, platelets
20	What is the function of the platelets?	Forms blood clots
21	Describe 3 adaptations of a red blood cell	No nucleus, contains haemoglobin and a bi-concave disc shape
22	Which blood vessels carry blood away from the heart?	Arteries
23	Why do veins have valves?	To prevent the backflow of blood
24	Why is the walls of the capillary one cell thick?	To provide a short diffusion distance
25	Through which vessel does deoxygenated blood enter the heart?	Vena cava
26	Through which vessel does oxygenated blood enter the heart?	Pulmonary vein
27	Through which vessel does oxygenated blood leave the heart to be pumped round the body?	Aorta
28	What does the palisade mesophyll layer have lots of chloroplasts for?	For photosynthesis
29	Why does the spongy mesophyll have air spaces?	Increases the surface area so that gases can diffuse quickly

30	What is the function of guard cells?	Control the opening and closing of the stomata
31	Through which structures do gases diffuse into and out of the leaf?	Stomata
32	What is the function of the xylem?	Transports water and mineral ions up the plant
33	What is the function of the phloem?	Transports sugar up and down the plant
34	What is the name for the movement of water from the roots to the leaves through the xylem?	Transpiration stream
35	Name 4 factors which affect the rate of transpiration	Temperature, light intensity, humidity and wind intensity
36	What effect does increasing the temperature have on the rate of transpiration?	Increase the rate of transpiration
37	What effect does increasing the humidity have on the rate of transpiration?	Decreases the rate of transpiration

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1	Name the five levels of organisation from smallest to biggest	
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4	What is the function of the liver in digestion?	
5	What is the function of saliva in digestion?	
6	Describe the function of amylase	
7	Where is amylase produced?	
8	Describe the function of protease	
9	Where are proteases produced?	
10	Describe the function of lipases	
11	Where are lipases produced?	
12	What are 2 factors that affect the rate of activity of an enzyme?	
13	Describe the effect of temperature on enzyme activity	
14	What do we call it when the shape of the enzymes active site has irreversibly changed shape?	
15	Which reagent is used to test for starch and what colour change would you see with a positive result?	
16	Which reagent is used to test for sugars and what colour change would you see with a positive result?	
17	Which reagent is used to test for proteins and what colour change would you see with a positive result?	
18	Which reagent is used to test for lipids and what colour change would you see with a positive result?	
19	Name the 4 components of the blood	
20	What is the function of the platelets?	
21	Describe 3 adaptations of a red blood cell	
22	Which blood vessels carry blood away from the heart?	
23	Why do veins have valves?	
24	Why is the walls of the capillary one cell thick?	
25	Through which vessel does deoxygenated blood enter the heart?	

26	Through which vessel does oxygenated blood enter the heart?	
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28	What does the palisade mesophyll layer have lots of chloroplasts for?	
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30	What is the function of guard cells?	
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33	What is the function of the phloem?	
34	What is the name for the movement of water from the roots to the leaves through the xylem?	
35	Name 4 factors which affect the rate of transpiration	
36	What effect does increasing the temperature have on the rate of transpiration?	
37	What effect does increasing the humidity have on the rate of transpiration?	

B3 Communicable disease – Infectious and control

Question	Answer
Define a pathogen	Microorganism that causes infectious disease
What are the 4 types of pathogens?	Bacteria, viruses, protists and fungi
Pathogenic bacteria release toxins once they are in our blood stream. What effect does this have on tissues?	They damage tissues and make us feel ill
Which type of pathogen lives and reproduces inside cells and therefore causes cell damage?	Viruses
Give 3 ways in which diseases are spread	Direct contact, water or air
What is a communicable disease?	A disease that is transmitted from one organism to another
Which type of pathogen causes rose black spot?	Fungi
How can rose black spot be treated?	By using fungicides and removing and destroying affected leaves
Which type of pathogen causes malaria?	Protist
Give 2 ways in which the spread of malaria is controlled	Using mosquito nets, prevent mosquitos from breeding
Measles is caused by which type of pathogen?	Virus
Give 2 symptoms of measles	Fever and a red skin rash
How is measles spread?	Inhalation of droplets (coughing and sneezing)
How is HIV spread?	Sexual contact or exchange of body fluids
Antiretroviral drugs can be used to treat which disease?	HIV
Tobacco mosaic virus causes discolouration of the plant's leaves. Why does this affect the rate of photosynthesis?	Decreases the rate of photosynthesis and therefore the plant doesn't grow as much
Give 4 symptoms of salmonella food poisoning	Fever, stomach cramps, vomiting and diarrhoea
Give 2 symptoms of gonorrhoea	Pain when urinating and thick yellow/green discharge from the penis or vagina
How can the spread of gonorrhoea be reduced?	By using a condom
How is gonorrhoea treated?	Treated with antibiotics
What is the disease called where layers of fatty material build up inside the coronary arteries which causes them to narrow?	Coronary heart disease
What is the role of stents in treating CHD?	Keep coronary arteries open
What is the role of statins in treating CHD?	Reduce blood cholesterol levels which slows down the rate of fatty material deposit
Define cancer	Uncontrolled cell division
Which type of tumour is contained in one area and doesn't invade other parts of the body?	Benign
Which type of tumour invades neighbouring tissues and spreads to different parts of the body?	Malignant
Give the 3 ways in which white blood cells help to defend against a pathogen	Phagocytosis, antibody production and antitoxin production
How does vaccination protect against a specific pathogen?	Produces antibodies against that particular pathogen
How does the immune system respond when body is exposed to the same pathogen after vaccination?	White blood cells rapidly produce the correct antibody
Which type of pathogen do antibiotics kill?	Bacteria
Penicillin is an example of which type of drug?	Antibiotics
What happens in the pre-clinical stage of a drug trial?	Drug is tested on cells, tissues and live animals

What is the name of the fake medicine given to patients as part of a clinical trial?	Placebo

Self-Assess:

Question	Answer
Define a pathogen	
What are the 4 types of pathogens?	
Pathogenic bacteria release toxins once they are in our blood stream. What effect does this have on tissues?	
Which type of pathogen lives and reproduces inside cells and therefore causes cell damage?	
Give 3 ways in which diseases are spread	
What is a communicable disease?	
Which type of pathogen causes rose black spot?	
How can rose black spot be treated?	
Which type of pathogen causes malaria?	
Give 2 ways in which the spread of malaria is controlled	
Measles is caused by which type of pathogen?	
Give 2 symptoms of measles	
How is measles spread?	
How is HIV spread?	
Antiretroviral drugs can be used to treat which disease?	
Tobacco mosaic virus causes discolouration of the plant's leaves. Why does this affect the rate of photosynthesis?	
Give 4 symptoms of salmonella food poisoning	
Give 2 symptoms of gonorrhoea	
How can the spread of gonorrhoea be reduced?	
How is gonorrhoea treated?	
What is the disease called where layers of fatty material build up inside the coronary arteries which causes them to narrow?	
What is the role of stents in treating CHD?	
What is the role of statins in treating CHD?	
Define cancer	
Which type of tumour is contained in one area and doesn't invade other parts of the body?	
Which type of tumour invades neighbouring tissues and spreads to different parts of the body?	
Give the 3 ways in which white blood cells help to defend against a pathogen	
How does vaccination protect against a specific pathogen?	
How does the immune system respond when body is exposed to the same pathogen after vaccination?	
Which type of pathogen do antibiotics kill?	
Penicillin is an example of which type of drug?	
What happens in the pre-clinical stage of a drug trial?	
What is the name of the fake medicine given to patients as part of a clinical trial?	

B4 Bioenergetics

Question	Answer
What are the reactants in photosynthesis?	Carbon dioxide and water
What are the products in photosynthesis?	Glucose and oxygen
True or false - photosynthesis is an exothermic reaction	False - it is an endothermic reaction
Plants absorb nitrate ions from the soil by active transport. Which biological molecule are nitrates needed to form?	Proteins
Give 3 ways in which the glucose used in photosynthesis is used	Used for respiration, used to produced cellulose and converted into starch for storage
Give 4 factors which affect the rate of photosynthesis	Temperature, light intensity, carbon dioxide concentration and amount of chlorophyll
What happens to the rate of photosynthesis as the light intensity increases?	Rate of photosynthesis increases
What happens to the rate of photosynthesis as the carbon dioxide concentration increases?	Rate of photosynthesis increases
Why does increasing the temperature increase the rate of photosynthesis?	As the molecules have more kinetic energy and so are more likely to collide with each other for the reaction to occur
Why does a too high temperature lead to a decrease in the rate of photosynthesis?	As photosynthesis is controlled by enzymes. Too high temperatures will denature the enzymes so they can no longer catalyse the reaction
What is the purpose of respiration?	To release energy
What are the 2 types of respiration?	Aerobic and anaerobic
Which type of respiration requires oxygen?	Aerobic respiration
What are the reactants in aerobic respiration?	Glucose and oxygen
What are the products in aerobic respiration?	Carbon dioxide and water
What is the reactant in anaerobic respiration in muscles?	Glucose
What is the product of anaerobic respiration in muscles?	Lactic acid
Which type of respiration releases more energy?	Aerobic respiration
What is the reactant of anaerobic respiration in plant and yeast cells?	Glucose
What are the products of anaerobic respiration in plant and yeast cells?	Ethanol and carbon dioxide
Fermentation refers to anaerobic respiration in which type of cell?	Yeast cells
Give 2 uses of the fermentation process	Manufacture of bread and alcoholic drinks
Why does the heart rate and breathing rate increase during exercise?	To supply the muscles with more oxygenated blood
Which substance builds up if not enough oxygen is supplied to the contracting muscles?	Lactic acid
Give 2 symptoms of the build-up of lactic acid in muscles.	Muscle cramps and muscle fatigue
What is the sum of all the reactions in a cell or body called?	Metabolism
Name the type of reaction when 3 fatty acid molecules join with a glycerol molecule.	Metabolism

Self-Assess:

Question	Answer
What are the reactants in photosynthesis?	
What are the products in photosynthesis?	
True or false - photosynthesis is an exothermic reaction	
Plants absorb nitrate ions from the soil by active transport. Which biological molecule are nitrates needed to form?	
Give 3 ways in which the glucose used in photosynthesis is used	
Give 4 factors which affect the rate of photosynthesis	
What happens to the rate of photosynthesis as the light intensity increases?	
What happens to the rate of photosynthesis as the carbon dioxide concentration increases?	
Why does increasing the temperature increase the rate of photosynthesis?	
Why does a too high temperature lead to a decrease in the rate of photosynthesis?	
What is the purpose of respiration?	
What are the 2 types of respiration?	
Which type of respiration requires oxygen?	
What are the reactants in aerobic respiration?	
What are the products in aerobic respiration?	
What is the reactant in anaerobic respiration in muscles?	
What is the product of anaerobic respiration in muscles?	
Which type of respiration releases more energy?	
What is the reactant of anaerobic respiration in plant and yeast cells?	
What are the products of anaerobic respiration in plant and yeast cells?	
Fermentation refers to anaerobic respiration in which type of cell?	
Give 2 uses of the fermentation process	
Why does the heart rate and breathing rate increase during exercise?	
Which substance builds up if not enough oxygen is supplied to the contracting muscles?	
Give 2 symptoms of the build-up of lactic acid in muscles.	
What is the sum of all the reactions in a cell or body called?	
Name the type of reaction when 3 fatty acid molecules join with a glycerol molecule.	

Chemistry C1 Atoms and The Periodic Table

	Question	Answer
1	Define the term atom.	The smallest part of an element that can exist.
2	Define the term element.	A substance that is made of one type of atom only.
3	Define the term compound.	A substance made of two or more elements chemically combined.
4	Define the term mixture.	Two or more elements or compounds together but not chemically combined.
5	Explain the difference between a compound and a mixture.	Compound is where 2 or more different elements are chemically bonded whereas a mixture is where 2 or more different elements/compounds are not chemically bonded
6	State the 3 sub-atomic particles in an atom.	3 subatomic particles are the proton, neutron and electron.
7	State the relative masses of the 3 sub-atomic particles.	Protons: 1 Neutrons: 1 Electrons: very small.
8	State the relative charges of the 3 sub-atomic particles.	Protons: +1 Neutrons: 0 Electrons: -1
9	What 2 sub-atomic particles are found in the nucleus of an atom?	2 sub-atomic particles found in the nucleus are protons and neutrons.
10	What does the atomic number tell you about an atom?	The atomic number tells you the numbers of protons an atom has.
11	What does the mass number tell you about an atom?	The mass the number is the sum of protons + neutrons.
12	How do you calculate the number of neutrons in an atom?	Neutrons = mass number - atomic number.
13	Explain why all atoms have no overall charge.	Protons are positive and electrons are negative. Atoms have equal numbers of protons and electrons. So, the charges sum to zero.
14	Define the term isotope.	Atoms of the same element with different numbers of neutrons.
15	Give the word for the percentage of atoms in a sample that are a particular isotope.	Word for the percentage of atoms in sample is the "abundance".
16	What is meant by relative atomic mass (RAM)?	RAM is the average mass of the isotopes of an element, considering their relative abundances.
17	State the maximum number of electrons that can go in the inner shell.	Inner shell can hold a maximum of 2 electrons.
18	State the maximum number of electrons that can go on the second shell.	Second shell can hold a minimum of 8 electrons.
19	Give the electronic configuration of Helium.	Electronic configuration of Helium is: 2.
20	Give the electronic configuration of Lithium.	Electronic configuration of Lithium is: 2,1.
21	Give the electronic configuration of Chlorine.	Electronic configuration of Chlorine is: 2,8,7.
22	Give the electronic configuration of Potassium.	Electronic configuration of Potassium is: 2,8,8,1.
23	Name the four scientists that helped develop the atom in chronological (time) order.	Dalton, Thompson (plum pudding), Rutherford (nuclear), Chadwick (Neutron).
24	Describe at least two features of the Dalton model of the atom.	Atoms are indivisible. Atoms are spherical. Atoms contain no charged particles. Mass is spread out across the atom.
25	Describe at least two features of the plum pudding model of the atom.	Positive charge is spread out across the atom. Mass is spread out across the atom. Atoms have no empty space. Negative electrons are embedded in the atom.

26	Name two characteristics of atoms proved by the gold foil experiment.	The mass of an atom is concentrated in a nucleus. The nucleus has a positive charge
27	Describe at least two features of the nuclear model of the atom.	Atoms have a positive nucleus. Mass is concentrated in the nucleus. Electrons orbit the nucleus. Atoms are mostly empty space.
28	Describe at least two features of the Bohr model of the atom.	Electrons orbit the nucleus at specific distances. Atoms have a positive nucleus. Mass is concentrated in the nucleus. Atoms are mostly empty space
29	State what Chadwick discovered.	Chadwick discovered the neutron when experimenting with isotopes.
30	Identify the different models of the atom.	A - Dalton B - Bohr C - Plum pudding D - Nuclear
31	Give the two ways in which elements are ordered in the modern Periodic Table.	First by their atomic number, then in groups based on their properties.
32	What does the group number tell you about an atom of that element?	How many electrons an atom has in the outer shell.
33	What does the period number tell you about an atom of that element	How many energy shells an atom has.
34	State the name of group 1 elements.	Group 1 elements are called "Alkali Metals".
35	State the name of group 7 elements.	Group 7 elements are called "Halogens".
36	State the name of group 0 elements.	Group 0 elements are called "Noble Gases".
37	Before Mendeleev, describe how scientists ordered the elements.	By their atomic weights.
38	Explain why Mendeleev put some elements in groups and changed the weight-based order.	To group the elements based on their properties.
39	Explain why Mendeleev left gaps in his Periodic Table.	For elements that had not been discovered yet.
40	Explain why Mendeleev's Periodic Table was eventually accepted by other scientists.	Elements were discovered which filled the gaps and matched the properties he predicted.
41	Where are metals located on the periodic table?	Metals are located on the left-hand side of the staircase on the periodic table.
42	Where are non-metals located on the periodic table?	Non-metals are located on the right-hand side of the staircase on the periodic table.
43	What type of ions do metals form during chemical reactions?	During a chemical reaction, metals form + charged ions.
44	What type of ions do non-metals form during chemical reactions?	During a chemical reaction, non-metals form - charged ions.
45	What are some key physical properties of metals?	High melting and boiling point, good electrical and thermal conductor, malleable, ductile, shiny.
46	What are some key physical properties of non-metals?	Low melting and boiling point, poor electrical and thermal conductor, brittle, dull.
47	Explain why metals are a good conductor of electricity and thermal energy.	Metals are good conductors of electricity and thermal energy because they contain delocalised electrons that are free to move, so can carry the charge throughout the substance.
48	What are the elements in Group 0 of the periodic table called?	Group 0 elements are called "Noble Gases".
49	How many electrons do noble gases have in their outer shell?	Atoms of group 0 elements have a full outer shell of electrons.
50	Explain why noble gases are unreactive.	Noble gases are unreactive because they have a full outer shell of electrons.

51	What does the term "inert" mean?	Inert refers to a substance that is chemically unreactive under normal conditions.
52	Describe the trend in boiling point in group 0 elements.	In noble gases, the boiling point increases as you go down the group.
53	What are the elements in Group 1 of the periodic table called?	Group 1 elements are called "Alkali Metals".
54	How many electrons do alkali metals have in their outer shell?	Alkali metals have 1 electron on their outer shell.
55	What similar chemical property do Alkali metals have?	A similar chemical property Alkali metals have is that they are all highly reactive in water.
56	Describe the trend in reactivity of the Alkali metals.	Reactivity increases as you move down the group.
57	Explain the trend in reactivity of Alkali metals.	As you move down the group, the atoms have more energy shells meaning there is more shielding between the outer shell electron and nucleus, so the attraction is weaker therefore the electron is more easily lost.
58	Describe the trends in melting and boiling point of Alkali metals.	As you move down the group, melting and boiling point decreases.
59	What are the elements in Group 7 of the periodic table called?	Group 7 elements are called "Halogens".
60	How many electrons are on the outer shell of Halogens?	Halogens have 7 electrons on their outer shell.
61	What similar chemical property do all Halogens have?	When Halogens chemically react, they all form a salt.
62	What type of molecule do halogens form?	Halogens have 7 electrons on their outer shell.
63	Describe the trend in reactivity of Halogens?	As you move down the Halogens group, reactivity decreases.
64	Explain the trend in reactivity of Halogens.	As you move down the group, the atoms have more energy shells meaning there is more shielding between the outer shell electron and nucleus, so the attraction is weaker therefore the electron is less easily gained.
65	Describe the trend in melting and boiling point of Halogens.	As you move down the Halogens group, melting and boiling point increases.

Self-Assess:

	Question	Answer
1	Define the term atom.	
2	Define the term element.	
3	Define the term compound.	
4	Define the term mixture.	
5	Explain the difference between a compound and a mixture.	
6	State the 3 sub-atomic particles in an atom.	
7	State the relative masses of the 3 sub-atomic particles.	
8	State the relative charges of the 3 sub-atomic particles.	
9	What 2 sub-atomic particles are found in the nucleus of an atom?	
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18	State the maximum number of electrons that can go on the second shell.	
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20	Give the electronic configuration of Lithium.	
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22	Give the electronic configuration of Potassium.	
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27	Describe at least two features of the nuclear model of the atom.	

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41	Where are metals located on the periodic table?	
42	Where are non-metals located on the periodic table?	
43	What type of ions do metals form during chemical reactions?	
44	What type of ions do non-metals form during chemical reactions?	
45	What are some key physical properties of metals?	
46	What are some key physical properties of non-metals?	
47	Explain why metals are a good conductor of electricity and thermal energy.	
48	What are the elements in Group 0 of the periodic table called?	
49	How many electrons do noble gases have in their outer shell?	
50	Explain why noble gases are unreactive.	
51	What does the term "inert" mean?	
52	Describe the trend in boiling point in group 0 elements.	
53	What are the elements in Group 1 of the periodic table called?	
54	How many electrons do alkali metals have in their outer shell?	

55	What similar chemical property do Alkali metals have?	
56	Describe the trend in reactivity of the Alkali metals.	
57	Explain the trend in reactivity of Alkali metals.	
58	Describe the trends in melting and boiling point of Alkali metals.	
59	What are the elements in Group 7 of the periodic table called?	
60	How many electrons are on the outer shell of Halogens?	
61	What similar chemical property do all Halogens have?	
62	What type of molecule do halogens form?	
63	Describe the trend in reactivity of Halogens?	
64	Explain the trend in reactivity of Halogens.	
65	Describe the trend in melting and boiling point of Halogens.	

C2 Bonding

	Question	Answer
1	What are electrons which are free to move throughout a metal structure called?	Delocalised electrons
2	An atom that has lost or gained electrons is called what?	Ions
3	Name the force that holds oppositely charged ions together	Electrostatic forces of attraction
4	What are 4 properties of pure metals?	Malleable, high melting and boiling points, good conductors of thermal energy, good conductors of electricity
5	Explain why pure metals are malleable	Layers of metal ions can slide over each other easily
6	Explain why metals have high melting and boiling points	Electrostatic force of attraction between positive metal ions and negative delocalised electrons are strong and lots of energy is needed to overcome
7	Why are metals good conductors of electricity and thermal energy?	Delocalised electrons which are free to move throughout the structure
8	What is an alloy?	Metals combined with one or more other elements
9	Explain why allows are harder than pure metals	Different sized atoms disturb the layers, preventing them from sliding over each other
10	Metals and non-metals form which type of bond?	Ionic
11	What happens in terms of electrons in ionic bonding?	Electrons are transferred
12	Metal atoms lose electrons to become what type of ion?	Positively charged ion
13	Non-metal atoms gain electrons to become what type of ion?	Negatively charged ion
14	Describe the structure of a giant ionic lattice	Alternating positive and negative ions held together by strong electrostatic forces of attraction
15	Why do ionic substances have high melting points?	Electrostatic force of attraction between positive and negative ions is strong and requires lots of energy to overcome
16	Why don't ionic substances conduct electricity when solid?	Ions are fixed in positive so cannot move and there are no delocalised electrons
17	When can ionic substances conduct electricity?	When molten or aqueous
18	Why do ionic substances only conduct electricity when they are molten or aqueous?	Ions are free to move and carry charge
19	Which types of atoms form covalent bonds between them?	Non-metal + non-metal
20	Polymers are very large molecules which contain which type of bond between the atoms?	Covalent bonds
21	What happens in terms of electrons in covalent bonding?	Electrons are shared
22	Why do most covalent substances do not conduct electricity?	They do not have delocalised electrons or charged ions
23	Why do giant covalent substances have high melting points?	Lots of energy is needed to break the strong covalent bonds between the atoms
24	Why do small covalent molecules have low melting points?	Only a small amount of energy is needed to overcome the weak intermolecular forces between the molecules
25	Diamond, graphite and graphene are all made up of which type of atom?	Carbon atoms
26	Why can graphite conduct electricity?	Graphite has delocalised electrons which are able to move throughout the structure and carry charge

27	Why is graphite soft?	Layers of atoms are not bonded so the layers are able to slide over each other
28	What is one layer of graphite called?	Graphene
29	What is a hollow cage of carbon atoms arranged as a sphere called?	Fullerene
30	What is a hollow cylinder of carbon atoms called?	Nanotube
31	If the forces between particles are high, what will their melting and boiling points be like?	High melting and boiling points

Self-Assess:

	Question	Answer
1	What are electrons which are free to move throughout a metal structure called?	
2	An atom that has lost or gained electrons is called what?	
3	Name the force that holds oppositely charged ions together	
4	What are 4 properties of pure metals?	
5	Explain why pure metals are malleable	
6	Explain why metals have high melting and boiling points	
7	Why are metals good conductors of electricity and thermal energy?	
8	What is an alloy?	
9	Explain why allows are harder than pure metals	
10	Metals and non-metals form which type of bond?	
11	What happens in terms of electrons in ionic bonding?	
12	Metal atoms lose electrons to become what type of ion?	
13	Non-metal atoms gain electrons to become what type of ion?	
14	Describe the structure of a giant ionic lattice	
15	Why do ionic substances have high melting points?	
16	Why don't ionic substances conduct electricity when solid?	
17	When can ionic substances conduct electricity?	
18	Why do ionic substances only conduct electricity when they are molten or aqueous?	
19	Which types of atoms form covalent bonds between them?	
20	Polymers are very large molecules which contain which type of bond between the atoms?	
21	What happens in terms of electrons in covalent bonding?	
22	Why do most covalent substances not conduct electricity?	
23	Why do giant covalent substances have high melting points?	
24	Why do small covalent molecules have low melting points?	

25	Diamond, graphite and graphene are all made up of which type of atom?	
26	Why can graphite conduct electricity?	
27	Why is graphite soft?	
28	What is one layer of graphite called?	
29	What is a hollow cage of carbon atoms arranged as a sphere called?	
30	What is a hollow cylinder of carbon atoms called?	
31	If the forces between particles are high, what will their melting and boiling points be like?	

C3 Quantitative Chemistry

Question	Answer
What is conservation of mass?	The mass of the products equals the mass of the reactants
How do you calculate relative formula mass?	Add the mass number (top number) of the elements together
How do you calculate percentage by mass in a compound?	Mass of element/Mr of compound x 100
How can you tell when a symbol equation is balanced?	The number of atoms of each element is the same on both sides of the equation
What is the unit for concentration?	g/dm3
A reaction take place on a scale. The mass appears to go up. What is likely the reason for this?	A gas is a reactant
A reaction takes place on a scale. The mass appears to go down. What is the likely reason for this?	A gas is a product
How do we calculate percentage uncertainty?	(uncertainty / value) x100
How do we calculate concentration if we know the mass of substance and the volume of water?	Mass / volume
What is the unit of volume used in concentration?	dm3
What does Avogadro's number tell us?	The number of particles in one mole of substance
What formula links the number of moles the mass and the Mr?	Mass = Mr x moles
What do we call a reactant that will run out first?	Limiting reactant
What do we call a reactant will not run out first?	Excess reactant

Self-Assess:

Question	Answer
What is conservation of mass?	
How do you calculate relative formula mass?	
How do you calculate percentage by mass in a compound?	
How can you tell when a symbol equation is balanced?	
What is the unit for concentration?	
A reaction take place on a scale. The mass appears to go up. What is likely the reason for this?	
A reaction takes place on a scale. The mass appears to go down. What is the likely reason for this?	
How do we calculate percentage uncertainty?	
How do we calculate concentration if we know the mass of substance and the volume of water?	
What is the unit of volume used in concentration?	
What does Avogadro's number tell us?	
What formula links the number of moles the mass and the Mr?	
What do we call a reactant that will run out first?	
What do we call a reactant will not run out first?	

C4 Chemical Changes

	Question	Answer
1	What is formed when oxygen is added to a metal?	Metal oxide
2	What is the name of the type of reaction when oxygen is gained?	Oxidation
3	What is the name of the type of reaction when oxygen is lost?	Reduction
4	Why are gold and silver found naturally as elements in the Earth?	As they are unreactive
5	How are metals which are less reactive than carbon extracted?	Reduction with carbon
6	Reacting metals with acids or water can put them in order of...?	Reactivity
7	Which gas is given off when a metal reacts with water or an acid?	Hydrogen
8	How do you test for the presence of hydrogen gas?	Squeaky pop test - gas "pops" with a lit splint
9	Define displacement	A more reactive metal takes the place of a less reactive metal from a compound
10	What are the products when a metal reacts with an acid?	Salt + hydrogen
11	What type of salt is made when hydrochloric acid is used?	Chloride
12	What type of salt is made when nitric acid is used?	Nitrate
13	What type of salt is made when sulfuric acid is used?	Sulphate
14	What are the products when a metal carbonate reacts with an acid?	Salt + carbon dioxide + water
15	What are the products when an acid reacts with an alkali?	Salt + water
16	Acids and alkalis reacting together are an example of which type of reaction?	Neutralisation
17	Why is the acid heated up before adding the metal oxide?	To speed up the rate of reaction
18	Why is the copper oxide added in excess?	To ensure all the hydrochloric acid has reacted
19	Why is the copper sulphate solution filtered?	To remove the insoluble excess copper oxide
20	Which ions do all acids release in solution?	H+ (hydrogen ions)
21	Which ions do all alkalis release in solution?	OH- (hydroxide ions)
22	What is the pH range for acids?	0-6
23	What is the pH range for alkalis?	8-14
24	What is the pH for a neutral solution?	7
25	Which colours will universal indicator turn when added to an acid?	Red, orange or yellow
26	Which colour will universal indicator go when added to a neutral substance?	Green
27	Which colours will universal indicator go when added to an alkali?	Blue or purple
28	What is the state symbol for an aqueous solution?	(aq)
29	What is the positive electrode called?	Anode
30	What is the negative electrode called?	Cathode
31	What mnemonic can be used to remember the names of the electrodes?	PANIC

32	Why can electrolysis only happen when ionic compounds are molten or aqueous?	As the ions are free to move
33	Which electrode will positively charged ions move towards?	Cathode (negative electrode)
34	What is the name given to liquids and solutions which can conduct electricity?	Electrolyte
35	What happens to the ions once they have moved to the electrodes?	They gain or lose electrons
36	Why is electrolysis an expensive process?	As large amounts of energy are required to melt the compounds and to produce the electrical current
37	Why is cryolite used in the extraction of aluminium from aluminium oxide?	To reduce the melting point of aluminium oxide so less energy has to be used
38	Why does the carbon electrode have to be continually replaced in the electrolysis of aluminium oxide?	As oxygen is produced at the electrode which reacts with the carbon electrode to produce carbon dioxide. The electrode wears out over time.
39	When is electrolysis used to extract metals?	When the metal is more reactive than carbon
40	What is produced at the cathode if the metal (in aqueous solution) is more reactive than hydrogen?	Hydrogen
41	What is produced at the anode if halide ions (in aqueous solution) are not present?	Oxygen

Self-assess:

	Question	Answer
1	What is formed when oxygen is added to a metal?	
2	What is the name of the type of reaction when oxygen is gained?	
3	What is the name of the type of reaction when oxygen is lost?	
4	Why are gold and silver found naturally as elements in the Earth?	
5	How are metals which are less reactive than carbon extracted?	
6	Reacting metals with acids or water can put them in order of…?	
7	Which gas is given off when a metal reacts with water or an acid?	
8	How do you test for the presence of hydrogen gas?	
9	Define displacement	
10	What are the products when a metal reacts with an acid?	
11	What type of salt is made when hydrochloric acid is used?	
12	What type of salt is made when nitric acid is used?	
13	What type of salt is made when sulfuric acid is used?	
14	What are the products when a metal carbonate reacts with an acid?	
15	What are the products when an acid reacts with an alkali?	
16	Acids and alkalis reacting together are an example of which type of reaction?	
17	Why is the acid heated up before adding the metal oxide?	
18	Why is the copper oxide added in excess?	
19	Why is the copper sulphate solution filtered?	
20	Which ions do all acids release in solution?	
21	Which ions do all alkalis release in solution?	
22	What is the pH range for acids?	
23	What is the pH range for alkalis?	
24	What is the pH for a neutral solution?	
25	Which colours will universal indicator turn when added to an acid?	
26	Which colour will universal indicator go when added to a neutral substance?	
27	Which colours will universal indicator go when added to an alkali?	
28	What is the state symbol for an aqueous solution?	
29	What is the positive electrode called?	
30	What is the negative electrode called?	
31	What mnemonic can be used to remember the names of the electrodes?	

32	Why can electrolysis only happen when ionic compounds are molten or aqueous?	
33	Which electrode will positively charged ions move towards?	
34	What is the name given to liquids and solutions which can conduct electricity?	
35	What happens to the ions once they have moved to the electrodes?	
36	Why is electrolysis an expensive process?	
37	Why is cryolite used in the extraction of aluminium from aluminium oxide?	
38	Why does the carbon electrode have to be continually replaced in the electrolysis of aluminium oxide?	
39	When is electrolysis used to extract metals?	
40	What is produced at the cathode if the metal (in aqueous solution) is more reactive than hydrogen?	
41	What is produced at the anode if halide ions (in aqueous solution) are not present?	

C5 Energy Changes

	Question	Answer
1	What is the name of the type of reaction that transfers energy to the surroundings so that the temperature of the surroundings increases?	Exothermic
2	What is the name of the type of reaction that takes in energy from the surroundings and so the temperature of the surroundings decreases?	Endothermic
3	Give 2 everyday uses of exothermic reactions	Hand warmers and self-heating cans
4	Thermal decomposition is an example of which type of reaction?	Endothermic reaction
5	Define activation energy.	Minimum amount of energy needed for a reaction to occur
6	True or false - energy needs to be supplied to break bonds in a chemical reaction	True
7	When is energy released in a chemical reaction?	When bonds in the products are formed
8	In which type of reaction is the energy released from forming new bonds greater than the energy needed to break existing bonds?	Exothermic reactions
9	In which type of reaction is the energy needed to break existing bonds greater than the energy released from forming new bonds?	Endothermic reactions

Self-Assess:

	Question	Answer
1	What is the name of the type of reaction that transfers energy to the surroundings so that the temperature of the surroundings increases?	Exothermic
2	What is the name of the type of reaction that takes in energy from the surroundings and so the temperature of the surroundings decreases?	Endothermic
3	Give 2 everyday uses of exothermic reactions	Hand warmers and self-heating cans
4	Thermal decomposition is an example of which type of reaction?	Endothermic reaction
5	Define activation energy.	Minimum amount of energy needed for a reaction to occur
6	True or false - energy needs to be supplied to break bonds in a chemical reaction	True
7	When is energy released in a chemical reaction?	When bonds in the products are formed
8	In which type of reaction is the energy released from forming new bonds greater than the energy needed to break existing bonds?	Exothermic reactions
9	In which type of reaction is the energy needed to break existing bonds greater than the energy released from forming new bonds?	Endothermic reactions

P1 Energy

	Question	Answer
1	What is the unit for energy?	Joules
2	Name the eight energy stores	Thermal, kinetic, elastic potential, gravitational potential, chemical, electrostatic, magnetic, nuclear
3	Which type of energy store is associated with batteries, fuel and muscles?	Chemical store
4	Which type of energy store is associated with movement?	Kinetic store
5	Which type of energy store is associated with an object that has been stretched?	Elastic potential store
6	Which type of energy store is associated with heat?	Thermal store
7	Name the four ways in which energy can be transferred	Heating, waves, electric current and mechanically (by forces)
8	Describe the energy transfer when a moving car slows down	Energy is transferred mechanically from the kinetic store of the car to the thermal store of the brakes
9	Describe the energy transfer when an electric kettle is used to heat water	Electric current in the kettle transfers energy to the heating element's thermal store. Energy is transferred by heating to the thermal store of water.
10	Describe the energy transfer when a ball is fired using an elastic band	Energy is transferred mechanically from the elastic store of the elastic band to the kinetic store of the band
11	Describe the energy transfer when a battery powered toy car is used	Energy is transferred electrically from chemial store of the battery to kinetic store of the toy car
12	Describe the energy transfer when a falling apple hits the ground	Energy is is transferred from the kinetic store of the apple and dissipated to the thermal store of the surroundings by sound waves
13	What is the unit for power?	Watts
14	What is the unit for work done?	Joules
15	Define power	Rate at which energy is transferred or the rate at which work is done
16	What are the 2 equations used for calculating power?	Power = energy transferred/time or Power = work done/time
17	What are the 2 equations used for calculating efficiency?	Efficiency = useful power output/useful power input or Efficiency = useful output energy transfer/total input energy transfer
18	What is the unit for speed?	m/s
19	What is the unit for mass?	kg
20	What is the equation for calculating kinetic energy?	
21	What is the equation used to calculate gravitational potential energy?	g.p.e = mass x gravitational field strength x height
22	What is the unit for spring constant?	N/m
23	Define specific heat capacity	Amount of energy required to raise the temperature of one kilogram of substance by one degree Celsius
24	What does a material's thermal conductivity tell you?	How well it conducts heat
25	Which materials have a low thermal conductivity?	Thermal insulators
26	Which factors affect the rate of heat loss from a building?	Thickness of walls and roof, thermal conductivity of walls and temperature difference between the 2 sides of the wall/roof
27	What is a non-renewable energy resource?	One that isn't replenished as it is used

28	What is a renewable energy resource?	One that can be replenished as it is used
29	What are the 3 fossil fuels?	Coal, oil and natural gas
30	What are the main advantages of using fossil fuels as an energy resource?	It is reliable and there is enough to meet the current demand
31	What are the main disadvantages of using fossil fuels as an energy resource?	They will eventually run out and they release carbon dioxide
32	Which environmental effect does carbon dioxide release contribute to?	Climate change and global warming

Self-Assess:

	Question	Answer
1	What is the unit for energy?	
2	Name the eight energy stores	
3	Which type of energy store is associated with batteries, fuel and muscles?	
4	Which type of energy store is associated with movement?	
5	Which type of energy store is associated with an object that has been stretched?	
6	Which type of energy store is associated with heat?	
7	Name the four ways in which energy can be transferred	
8	Describe the energy transfer when a moving car slows down	
9	Describe the energy transfer when an electric kettle is used to heat water	
10	Describe the energy transfer when a ball is fired using an elastic band	
11	Describe the energy transfer when a battery powered toy car is used	
12	Describe the energy transfer when a falling apple hits the ground	
13	What is the unit for power?	
14	What is the unit for work done?	
15	Define power	
16	What are the 2 equations used for calculating power?	
17	What are the 2 equations used for calculating efficiency?	
18	What is the unit for speed?	
19	What is the unit for mass?	
20	What is the equation for calculating kinetic energy?	
21	What is the equation used to calculate gravitational potential energy?	
22	What is the unit for spring constant?	
23	Define specific heat capacity	
24	What does a material's thermal conductivity tell you?	
25	Which materials have a low thermal conductivity?	
26	Which factors affect the rate of heat loss from a building?	
27	What is a non-renewable energy resource?	
28	What is a renewable energy resource?	
29	What are the 3 fossil fuels?	

30	What are the main advantages of using fossil fuels as an energy resource?	
31	What are the main disadvantages of using fossil fuels as an energy resource?	
32	Which environmental effect does carbon dioxide release contribute to?	

P2 Electricity

	Question	Answer
1	What is the flow of electrical charge called?	Current
2	What is the equation which links current, time and charge flow?	Charge flow = current x time
3	What is the unit for charge?	C (Coulombs)
4	What is the unit for current?	A (Amperes)
5	Name the piece of apparatus which measures the current in a circuit	Ammeter
6	How easy it is for charge to flow around a circuit is called what?	Resistance
7	Give 4 factors which increase the resistance of a wire	Increasing the temperature of the wire, decreasing the width of the wire, increasing the length of the wire and changing the material of the wire
8	Why does increasing the temperature increase the resistance of a wire?	As the electrons collide with the metal ions more frequently
9	Why does decreasing the width of the wire increase the resistance of the wire?	As there are fewer paths for electrons to flow down
10	What is potential difference also known as?	Voltage
11	What piece of equipment is used to measure the potential difference in a circuit?	Voltmeter
12	What is the unit for potential difference?	Volts
13	What effect does increasing the potential difference of a battery have on the current?	Increases the current
14	What is the unit for resistance?	Ohms
15	What effect does increasing the resistance in a circuit have on the current?	Decrease the current
16	What is the equation which links current, resistance and potential difference?	Potential difference = current x resistance
17	How must the ammeter be connected?	In series
18	How must the voltmeter be connected?	In parallel
19	Name the component which is designed to have a specific resistance	Fixed resistor
20	What is the purpose of a resistor?	To control the flow of current in a circuit
21	Why is it important that a resistor is kept at a constant temperature?	As if it overheats then the resistance may change
22	True or false - in a series circuit there is more than one pathway for charge to flow	False - only a single pathway
23	What is the effect on a series circuit when a component breaks?	The circuit stops working as the current can't flow
24	In which type of electrical circuit is the current the same everywhere in the circuit?	Series circuit
25	How do you calculate the overall resistance in a series circuit?	Add up the individual resistances of the components
26	True or false - the potential difference across identical components in a circuit is the same	True
27	How does the resistance of a component affect the share of potential difference across it?	The greater the resistance of the component, the larger the share of potential difference across it
28	True or false - in a parallel circuit there is more than one pathway for charge to flow	True

29	What happens to a parallel circuit if one of the components breaks?	Nothing - the rest of the circuit still works
30	What happens to the current in a parallel circuit if all the components are identical?	Current splits equally
31	What happens to the current in a parallel circuit if the components are not identical?	More current flows through the component with the least resistance
32	Why does adding components in parallel circuits reduce the total resistance?	More pathways make it easier for the current to flow
33	Which components work with the current flowing in either direction?	Filament lamp and fixed resistor
34	Which component I-V characteristic can be described as directly proportional?	Fixed resistor
35	Which components resistance changes as it gets hotter?	Filament lamp
36	Which component has a threshold voltage below which it does not work?	Diode
37	What is the name of the component whose resistance depends on the intensity of light falling on its surface?	Light dependent resistor (LDR)
38	What happens to the resistance of an LDR as light intensity increases?	Resistance decreases
39	What is the name of the component whose resistance depends on the temperature?	Thermistor
40	What happens to the resistance of a thermistor as the temperature decreases?	Resistance increases
41	State the equation that links potential difference, current and power	Power = potential different x current
42	What is the unit for power?	Watts
43	What is the frequency of the domestic electricity supply in the UK?	50Hz
44	What is the potential difference of the domestic electricity supply in the UK?	230V
45	Which type of current has a constant potential difference and a constant current?	DC
46	What type of current has a changing potential difference and changing current?	AC
47	Which colour is the earth wire in a plug?	Green and yellow stripes
48	What is the purpose of the earth wire?	Safety wire to prevent the appliance becoming live
49	Which colour is the neutral wire in a plug?	Blue
50	What is the purpose of the neutral wire?	Completes the circuit
51	What is the colour of the live wire in a plug?	Brown
52	What is the purpose of the live wire?	Carries the alternating potential difference from the supply to the appliance
53	What is the purpose of a fuse in the plug?	Melts if the current gets too large
54	Which structures are included in the National Grid?	Power lines, pylons and transformers
55	What does a step-up transformer do?	Increases the voltage and decreases the current
56	What does a step-down transformer do?	Decreases the voltage and increases the current

57	Why do we use a step-up transformer before sending electricity through the power lines?	To reduce energy losses due to heating
58	Why do we use a step-down transformer before sending the electricity to our homes?	To reduce the voltage to a safe level

P3 Particle Theory

	Question	Answer
1	Name the three states of matter.	solid, liquid, gas
2	What is the change of state from liquid to gas called?	evaporating
3	What change of state is freezing?	liquid to solid
4	What is the change from solid to liquid called?	melting
5	What change of state is condensing?	solid to liquid
6	What is the equation for density?	density = mass / volume
7	What state of matter is the densest?	solid
8	How could I find the volume of a regular shaped object?	length x width x height
9	What equipment could I use to find the volume of an irregular shaped object?	Measuring cylinder, eureka can
10	Name the equipment I use to measure the mass of an object.	Mass balance
11	What is the specific heat capacity of an object?	Energy needed to increase the temperature of 1kg of a substance by 1 OC
12	Name the unit for energy.	Joules
13	What symbol do we use to show a change? (e.g. the temperature change)	Delta
14	What is the equation for specific heat capacity?	Energy change = mass x specific heat capacity x temperature change
15	Define internal energy.	Sum of kinetic and thermal energy in a substance
16	What two things can happen when particles gain energy?	Temperature increase, change of state
17	Define specific latent heat.	Energy required to change the state of a substance
18	What change of state is associated with fusion?	Freezing or melting
19	What change of state is associated with vaporisation?	Evaporating or condensing
20	Write the equation for specific latent heat.	Thermal energy = mass x specific latent heat
21	What is increasing when we increase the temperature of particles?	Kinetic energy
22	Define pressure.	Force exerted over an area
23	Name two ways we can increase pressure.	Increase temperature, Decrease volume

Self-Assess:

	Question	Answer
1	Name the three states of matter.	
2	What is the change of state from liquid to gas called?	
3	What change of state is freezing?	
4	What is the change from solid to liquid called?	
5	What change of state is condensing?	
6	What is the equation for density?	
7	What state of matter is the densest?	
8	How could I find the volume of a regular shaped object?	
9	What equipment could I use to find the volume of an irregular shaped object?	
10	Name the equipment I use to measure the mass of an object.	
11	What is the specific heat capacity of an object?	
12	Name the unit for energy.	
13	What symbol do we use to show a change? (e.g. the temperature change)	
14	What is the equation for specific heat capacity?	
15	Define internal energy.	
16	What two things can happen when particles gain energy?	
17	Define specific latent heat.	
18	What change of state is associated with fusion?	
19	What change of state is associated with vaporisation?	
20	Write the equation for specific latent heat.	
21	What is increasing when we increase the temperature of particles?	
22	Define pressure.	
23	Name two ways we can increase pressure.	

P4 Atomic Structure and Radiation

	Question	Answer
1	What is the radius of an atom?	1 x 10-10m
2	Give 2 things which can change the electron arrangement of an atom.	Absorption of electromagnetic radiation or emission of electromagnetic radiation
3	What is it called when a nucleus gives out radiation as it changes to become more stable?	Radioactive decay
4	True or false - radioactive decay is a random process.	True
5	What is the unit for radioactive activity?	Bq - becquerel
6	Define count rate.	Number of decays recorded each second
7	Which type of radiation is the same as a helium nucleus?	Alpha
8	What does an alpha particle consist of?	2 protons and 2 neutrons
9	What does a beta particle consist of?	An electron
10	Which type of radiation is an electromagnetic wave?	Gamma
11	Which type of radiation has the highest ionising power?	Alpha
12	Which type of radiation is stopped by paper?	Alpha
13	What is beta radiation stopped by?	5mm sheet of metal (aluminium)
14	What is gamma radiation stopped by?	Thick lead sheet or concrete
15	Alpha, beta and gamma radiation all ionise substances as they pass through. What does ionisation do to living cells?	Kills or damages the cell
16	Define the half-life of a radioactive isotope	Time it takes for half the nuclei to decay
17	What is the unwanted presence of materials containing radioactive atoms on other materials called?	Contamination
18	What is irradiation?	Exposure to the radiation (alpha or beta particles or gamma rays)
19	True or false - being exposed to radiation makes you radioactive	False
20	Name 2 safety precautions to protect against contamination?	Handle source using gloves and tongs, use breathing apparatus
21	Name 3 safety precautions to protect against irradiation	Lead/concrete shields, limit time of exposure and badges to keep an eye on the dose received

Self-Assess:

	Question	Answer
1	What is the radius of an atom?	
2	Give 2 things which can change the electron arrangement of an atom.	
3	What is it called when a nucleus gives out radiation as it changes to become more stable?	
4	True or false - radioactive decay is a random process.	
5	What is the unit for radioactive activity?	
6	Define count rate.	
7	Which type of radiation is the same as a helium nucleus?	
8	What does an alpha particle consist of?	
9	What does a beta particle consist of?	
10	Which type of radiation is an electromagnetic wave?	
11	Which type of radiation has the highest ionising power?	
12	Which type of radiation is stopped by paper?	
13	What is beta radiation stopped by?	
14	What is gamma radiation stopped by?	
15	Alpha, beta and gamma radiation all ionise substances as they pass through. What does ionisation do to living cells?	
16	Define the half-life of a radioactive isotope	
17	What is the unwanted presence of materials containing radioactive atoms on other materials called?	
18	What is irradiation?	
19	True or false - being exposed to radiation makes you radioactive	
20	Name 2 safety precautions to protect against contamination?	
21	Name 3 safety precautions to protect against irradiation	