STOKE DAMEREL

Aspire Achieve Thrive

Half Term 5 and 6

Science

Year 10

Name: _____

Tutor: _____

Tassomai - 2 Daily Goals per week - Deadline is Friday

GREENSHAW LEARNING TRUST

Year 10 Homework Timetable

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

Tassomai - 2 Daily Goals per week

Sparx - 4 tasks of Sparx per week

Option A (EBACC)
French
Geography
History

Open B
Art
Business Studies
Catering
Computer Science
History
Health & Social Care
Music
Sport
IT

Open C
Business Studies
Childcare
Catering
Drama
Geography
Health & Social Care
Triple Science
Sport

Half Term 5 - Year 10 - Homework Plan Science

Week/Date	Homework Task	Examination Question
Week 1	Chemistry retrieval practice (one full page of answers and corrections) No copying of questions.	Answer the exam question on acids and alkalis.
Week 2	Chemistry retrieval practice (one full page of answers and corrections) No copying of questions.	Answer the exam question on relative formula mass and concentration
Week 3	Physics retrieval practice (one full page of answers and corrections) No copying of questions.	Answer the exam question on radioactivity (revision)
Week 4	Physics retrieval practice (one full page of answers and corrections) No copying of questions.	Answer the exam question on radioactive decay
Week 5	Biology retrieval practice (one full page of answers and corrections) No copying of questions.	Answer the exam question on the homeostasis
Week 6	Biology retrieval practice (one full page of answers and corrections) No copying of questions.	Answer the exam question on reproduction

Half Term 6 - Year 10 - Homework Plan Science

Week/Date	Homework Task	Examination Question
Week 1	Biology retrieval practice (one full page of answers and corrections) No copying of questions.	Answer the exam question on IVF and gene therapy
Week 2	Chemistry retrieval practice (one full page of answers and corrections) No copying of questions.	Answer the exam question on making a salt practical
Week 3	Physics retrieval practice (one full page of answers and corrections) No copying of questions.	Answer the exam question on alpha scattering experiment
Week 4	Biology retrieval practice (one full page of answers and corrections) No copying of questions.	Answer the exam question on coronary heart disease
Week 5	Chemistry retrieval practice (one full page of answers and corrections) No copying of questions.	Answer the exam question on rate of reactions
Week 6	Physics retrieval practice (one full page of answers and corrections) No copying of questions.	Answer the exam question on collision theory

Biology Knowledge Organiser Half Term 5

#	Questions	Answer
1	Name three internal conditions in the body that are controlled.	Temperature, water level, blood glucose concentration.
2	What is the definition of homeostasis?	The regulation of the internal conditions of a cell or organism to maintain optimum conditions in response to internal or external changes.
3	Why do the internal conditions of a cell or organism need to be maintained?	To maintain optimal conditions for enzyme actions and cell functions.
4	Which two types of responses are used in homeostasis?	Nervous and chemical response.
22	Which two organ systems are involved in homeostasis?	The nervous system and the endocrine system.
23	Which part of the body releases hormones?	Glands.
24	How are hormones carried around the body?	In the blood.
25	What is a hormone?	A chemical messenger that is carried in the blood and affects a target organ (or organs).
26	Which body system involved in homeostasis causes fast, short lasting responses?	The nervous system.
27	Which body system involved in homeostasis causes slow, long lasting responses?	The endocrine system.
28	Which two hormones can cause rapid responses?	Insulin and adrenaline.
29	Which hormone is involved in the 'fight or flight' response?	Adrenaline.
30	Which gland secretes several different hormones and controls and coordinates other glands?	The pituitary gland.
31	Where in the body is the pituitary gland?	The brain.
32	Which hormone does FSH (follicle stimulating hormone) stimulate the ovaries to release?	Oestrogen.
33	Which hormone stimulates the release of oestrogen from the ovaries?	FSH (follicle stimulating hormone).
34	Which gland secretes FSH (follicle stimulating hormone)?	The pituitary gland.
35	Which hormone controls blood glucose levels?	Insulin.
36	Where is insulin released from?	The pancreas.
37	What does insulin do?	Insulin causes glucose in the blood to move into cells to be turned into glycogen and stored in the liver and muscles.
38	How is excess glucose stored in the human body?	As glycogen in the liver and muscles.
39	Which two hormones interact in a negative feedback cycle to control blood glucose levels?	Insulin and glucagon.
40	Which hormone causes glycogen in the liver to be converted back into glucose?	Glucagon.
41	When is glucagon released by the pancreas?	When blood glucose levels fall below the ideal level.
42	What is the difference between glucagon and glycogen?	Glucagon is a hormone that is released when blood glucose concentrations fall below the ideal level, glycogen is a complex carbohydrate used to store excess glucose in the body.
43	Which disease is caused if your pancreas does not produce enough insulin?	Type 1 diabetes.
44	Which disease is caused if your body stops responding to insulin made by the pancreas?	Type 2 diabetes.
45	Which type of diabetes usually starts in young children and teenagers?	Type 1 diabetes.
46	Which type of diabetes is more common in older people?	Type 2 diabetes.

47	Which type of diabetes is linked to obesity and lack of exercise?	Type 2 diabetes.
48	Which type of diabetes is usually treated with insulin injections?	Type 1 diabetes.
49	Which type of diabetes is first treated with a controlled diet and exercise?	Type 2 diabetes.
50	Which hormone stimulates basal metabolic rate and has a role in growth and development?	Thyroxine.
51	Which gland releases thyroxine?	The thyroid gland.
52	Which hormone is released by the adrenal glands during times of fear or distress?	Adrenaline.
53	Which glands release adrenaline?	The adrenal glands.
54	What is the effect of adrenaline on the body?	It increases heart rate to increase the delivery of oxygen and glucose to the brain and muscles.
55	Is adrenaline or thyroxine controlled by negative feedback?	Adrenaline.
56	What is the main male reproductive hormone?	Testosterone.
57	Which gland produces testosterone in males?	The testis.
58	What does testosterone do?	It stimulates sperm production.
59	After puberty on average how often is an egg released from the ovary?	Approximately every 28 days.
60	What happens at ovulation?	An egg is released from the ovary.
61	What term refers to 'the release of an egg from the ovary'?	Ovulation.
62	Name the four hormones involved in the menstrual cycle.	FSH (follicle stimulating hormone), LH (luteinizing hormone), oestrogen, progesterone.
63	Which hormone causes an egg in the ovary to mature?	FSH (follicle stimulating hormone).
64	Which hormone stimulates the release of a mature egg from the ovary?	LH (luteinizing hormone).
65	Which hormones are involved in maintaining the uterus lining?	Progesterone and oestrogen.
66	At what point in the menstrual cycle does a woman have her period?	Day 1-5.
67	At what point in the menstrual cycle is an egg released?	Day 12-16
68	Which gland releases LH?	The pituitary gland.
69	Which gland releases oestrogen?	The ovaries.
70	What produces progesterone?	The empty follicle after ovulation.
71	What is produced by the empty follicle after ovulation?	Progesterone.
72	What is the role of progesterone?	It maintains the uterus lining and inhibits release of FSH and LH.
73	What is contraception?	A method that prevents an egg or sperm meeting or a fertilised egg implanting in the uterus.
74	Give an example of hormonal contraception.	Oral contraceptives (the pill), contraceptive implant, contraceptive patch.
75	Give an example of non-hormonal contraception.	Spermicides, barrier methods (condom, diaphragm), intrauterine devices, abstinence, surgical sterilisation.
76	What term describes chemicals that kill or disable sperm?	Spermicide.
77	Which is the main hormone used in hormonal contraceptives?	Progesterone.
78	Which hormones are in the mixed contraceptive pill?	Progesterone and low levels of oestrogen.
79	Why is progesterone used in hormonal contraceptives?	It inhibits FSH production so eggs don't mature.
80	How do contraceptive implants and patches work?	They slowly release progesterone to prevent the maturation and release of eggs

81	Which type of contraception prevents the sperm reaching an egg?	Barrier methods such as condoms and diaphragms.
82	Which method of contraception also protects against sexually transmitted diseases?	Condoms.
83	Which method of contraception prevents the implantation of an embryo.	Intrauterine devices.
84	How do intrauterine devices work?	They prevent the implantation of an embryo or slowly release progesterone.
85	Which form of contraception involves avoiding intercourse when an egg may be in the oviduct?	Abstinence

Chemistry Knowledge Organiser Half Term 5

#	Questions	Answer
1	What term describes a substance that attacks metals, stonework and skin?	Corrosive
2	What type of substance turns litmus paper red?	Acid
3	What happens in all chemical reactions?	New substances are formed.
4	What kind of reaction occurs between an acid and an alkali?	Neutralisation
5	What do you call a solution which is neither acidic nor alkaline?	Neutral
6	Give the name and formula of a common laboratory acid.	Hydrochloric acid (HCl), nitric acid (HNO3), sulfuric acid (H2SO4), etc
7	Which ion is in excess in all acid solutions?	Hydrogen ions or H+ ions
8	Which ion is in excess in all alkali solutions?	Hydroxide ions or OH– ions
9	What scale is used for measuring acidic and alkaline properties?	The pH scale
10	Name three examples of acid/alkali indicators apart from universal indicators.	Litmus, methyl orange and phenolphthalein
11	What pH values are acidic?	Below 7
12	What happens to the pH as the H+ ion concentration increases?	It decreases
13	If a solution has the same concentration of hydrogen ions as hydroxide ions, how is it described?	Neutral or pH = 7
14	What word describes a solution that contains a large amount of solute in a small volume of solvent?	Concentrated
15	How can a solution be made more dilute?	By adding solvent/water
16	What kind of reaction occurs between an acid and a base?	Neutralisation
17	What is formed when an acid reacts with a base like a metal oxide?	Salt + water
18	What acid would be used to make zinc sulfate from zinc oxide?	Sulfuric acid
19	What process can be used to separate an insoluble solid from a liquid?	Filtration
20	How can a sample of a dissolved salt be obtained from a salt solution?	Evaporation of the water
21	In general, what is the pH of an alkaline solution?	Greater than 7
22	What colour is the litmus solution in acidic solutions?	Red
23	What name is given to substances that react with acids to form a salt and water only?	Bases
24	Which salt is formed when copper oxide reacts with sulfuric acid?	Copper sulfate

25	What type of solution has a pH of 7?	Neutral
26	Name the salt produced when sodium hydroxide reacts with hydrochloric acid.	Sodium chloride
27	What name is given to substances that are soluble bases?	Alkalis
28	Name a piece of apparatus used to measure volumes of liquid.	Measuring cylinder/ pipette/ burette
29	Name the separation method used to produce crystals from a solution.	Crystallisation
30	Name the acid needed to make ammonium nitrate.	Nitric acid
31	Which acid is needed to make copper sulfate?	Sulfuric acid
32	Which base is needed to make copper sulfate?	Copper oxide

1	According to collision theory, chemical reactions can only occur...	When reacting particles collide with each other with sufficient energy.
2	How does a catalyst increase the rate of a reaction?	The catalyst lowers the activation energy by providing an alternative pathway for the reaction.
3	How does increasing the concentration of a solution increase the rate of a reaction?	There are more particles in a given volume, therefore successful collisions occur more frequently.
4	How does increasing the pressure of gases increase the rate of a reaction?	The particles are closer together, therefore successful collisions occur more frequently.
5	How does increasing the surface area of a solid cause the rate of reaction to increase?	There are more particles on the outer surface available for collisions with other reactant particles, therefore successful collisions occur more frequently.
6	How does increasing the temperature of a reaction increase the rate?	The particles will have more kinetic energy, so will move around faster. This increases the frequency of the collisions, therefore successful collisions occur more frequently.
7	If a reaction is endothermic in one direction, what is it in the other direction?	Exothermic.
8	If the concentration of a reactant in a reversible reaction is increased, what will happen to the amount of products?	More products will be produced; until equilibrium is reached.
9	What can be measured to calculate the rate of a reaction?	The mass lost in a specific amount of time / The volume of gas produced in a specific amount of time.
10	On a rate of reaction curve, how can you tell that the reaction has stopped?	The curve / line becomes horizontal.
11	On a rate of reaction curve, what does a less steep gradient tell us about a reaction?	The reaction is slower / happening at a lower rate.
12	On a rate of reaction curve, what does a steep gradient tell us about a reaction?	The reaction is fast / happening at a high rate.
13	State five factors that affect rate of reaction.	Temperature, Concentration of solution, Surface area of solids, Pressure of gases, Catalyst
14	What is the formula used to calculate the rate of a reaction?	Rate of reaction = Amount of reactant used / time OR Rate of reaction = Amount of product made / time
15	State three units which can be used for the rate of a reaction.	g/s, cm3/s, mol/s
16	Using Le Chatelier's principle, explain what will happen in the following reaction in equilibrium if we increase the concentration of the hydrogen and iodine? I2(g) + H2(g) <---> 2HI(g).	Equilibrium will shift to the right to oppose the increase in hydrogen and iodine. More HI will be produced
17	List the equipment needed to measure the volume of gas produced in a reaction.	Conical flask / test tube (to hold reactants); stopper with delivery tube; gas syringe / upturned measuring cylinder filled with water; stopwatch.
18	List the equipment needed to measure the change in mass of a reaction mixture when gas is released.	Beaker / conical flask (to hold reactants); cotton wool stopper (to allow gas to escape, but not drops of water);

		electronic balance / weighing scales; stopwatch
19	What can be said about the amount of energy being transferred in each direction in a reversible reaction at equilibrium?	Same amount of energy is transferred in both directions
20	What colour is hydrated copper sulphate?	Blue
21	What does a horizontal line on a rate of reaction graph mean?	Reaction has stopped
22	What happens in a reversible reaction between gases in an enclosed system when pressure is increased?	The equilibrium position shifts in the direction of fewer moles of gas (to oppose the increase in pressure)
23	What happens to the gradient of a line if the rate of reaction is increased?	Becomes steeper.
24	What is a catalyst?	A substance which increases the rate of reaction but is not used up during the reaction
25	What is added to anhydrous cobalt chloride to change its colour from blue to pink in a reversible reaction?	Water.
26	Write down a definition of collision theory using the following keywords: reaction, particles, reactant, energy.	For a chemical reaction to happen the reactant particles must collide with sufficient energy
27	What is the definition of concentration in chemistry?	Number of particles in a given volume

Physics Knowledge Organiser Half Term 5

#	Questions	Answer
1	Give an approximate size of the radius of an atom.	1 x 10^-10 metres
2	What are the three subatomic constituents of an atom?	Proton, Neutron, Electron
3	Where is the most mass of an atom concentrated?	In the nucleus
4	Approximately what proportion of the total radius of an atom is the radius of the nucleus?	1/10,000
5	Describe the arrangement of protons, neutrons and electrons in an atom.	Protons and neutrons are in the atom's nucleus. Electrons are in discrete energy levels around the nucleus.
6	What charge does the nucleus of an atom have? Why?	Positive charge. Nucleus contains protons & neutrons. Protons have a positive charge, neutrons have no charge.
7	What charge does a proton have?	Positive / +1
8	What charge does a neutron have?	Neutral / 0
9	What charge does an electron have?	Negative / -1
10	Give two ways that an atom's electron arrangement can be changed.	Absorbing EM radiation, emitting EM radiation
11	How does an atom's electron arrangement change when it absorbs EM radiation.	Electrons move further away from the nucleus. They move to a higher energy level.
12	How does an atom's electron arrangement change when it emits EM radiation?	Electrons move closer to the nucleus. They move to a lower energy level.
13	How does the ratio of electrons to protons in an atom result in the atom having no overall charge.	Number of protons is equal to the number of electrons. Protons and electrons have equal and opposite charges, so charge cancels.
14	What do all forms of the same element have in common?	They all have the same number of protons.
15	What is the name given to the number of protons in an atom?	Atomic number
16	What is an atom's mass number?	The total number of protons and neutrons in an atom.
17	What is an isotope of an atom?	An atom of an element that has a different number of neutrons, but the same number of protons.
18	What may lead to a scientific model being changed or replaced?	Discovery of new experimental evidence which doesn't agree with the existing theory.

19	How did the plum-pudding model describe the atom?	A ball of positive charge, with negatively charged electrons distributed evenly throughout it.
20	Prior to the discovery of the electron what was believed about the atom?	The atom was believed to be indivisible.
21	Which experiment led to the plum-pudding model being discarded?	Rutherford's alpha-scattering experiment / gold foil experiment
22	Rutherford was the first scientist to suggest the existence of the ...	Nucleus
23	What were the conclusions of the alpha-scattering experiment?	Most of the mass of the atom is concentrated at the centre in the nucleus. The nucleus is positively charged.
24	What reinforces a scientific theory?	When experimental results agree with the hypothesised theoretical calculations and theories.
25	What did James Chadwick's experiments on the atom prove?	The existence of neutrons
26	Why do unstable nuclei give out radiation?	Unstable nuclei undergo decay to become more stable. As they release radiation their stability increases.
27	What is the name of the process in which an unstable nucleus gives out radiation to become more stable?	Radioactive decay
28	Define the activity of an unstable nucleus.	Activity is the rate of decay of a source of unstable nuclei.
29	What is the unit of radioactive activity?	Becquerel (Bq)
30	What is the count rate?	The number of radioactive decays per second for a radioactive source.
31	Give an example of a detector that may be used to measure count-rate.	Geiger-Muller tube
32	State four types of nuclear radiation.	Alpha particles, Beta particles, Gamma rays, Neutrons.
33	What are the constituents of an alpha particle?	Two protons and two neutrons. It is the same as a helium nucleus.
34	What is the range of an alpha particle through air?	A few centimetres (normally in the range of 2-10cm)
35	What will stop beta radiation from passing through a point?	A thin sheet of aluminium Several metres of air
36	What will stop gamma radiation from passing through a point?	Several centimetres of lead A few metres of concrete
37	What type of radiation is most ionising?	Alpha radiation
38	What type of radiation is least ionising?	Gamma radiation
39	State any changes to mass or charge that occur due to the emission of a gamma ray?	Both mass and charge remain unchanged.
40	Describe the nature of radioactive decay	Random
41	Define the half-life of a radioactive isotope.	The time it takes for the number of unstable nuclei in a substance to halve. The time it takes for the count rate from a sample to fall to half its initial level.
42	What is radioactive contamination?	The presence of unwanted radioactive nuclei on other materials.
43	What is irradiation?	The process of exposing a material to nuclear radiation. The material does not become radioactive.
44	Why is it important for the results of studies on the effects of radiation to be published and shared with other scientists?	To allow the findings to be independently checked (peer review)
45	Give 4 sources of background radiation?	Rocks, Cosmic rays from space, Nuclear weapons testing, nuclear accidents
46	How should background radiation be dealt with in calculations?	Background count should be subtracted from any readings before calculations.
47	What is the unit used to measure radiation dosage?	Sieverts(Sv)
48	How many millisieverts are equal to 1 sievert?	1000 mV is equal to 1 sievert

49	Why might the radiation dosage that different people experience differ?	Some occupations involve working with radiation. Background radiation differs with location
50	What determines how dangerous a particular radioactive isotope is?	The half-life of the isotope.
51	What name is given to the process by which the nuclei of heavy elements split apart?	Nuclear fission
52	What is absorbed by a uranium nucleus that causes it to undergo fission?	A neutron
53	When a uranium nucleus breaks apart because of fission, what is produced?	Two smaller nuclei + 2-3 neutrons + ionising radiation.
54	True or false: nuclear fission only occurs in large, stable nuclei.	FALSE - it occurs in large, unstable nuclei
55	If the neutrons produced by each fission event go on to cause more fission events, and this process continues, what might occur?	Chain reaction
56	True or false: generating electricity via nuclear fission is unpopular because it releases carbon dioxide.	FALSE
57	Why is generating electricity via nuclear fission unpopular in some countries?	Risk of disaster if chain reaction occurs. Large building and decommissioning costs. Problems with storing radioactive waste.
58	What name is given to the process by which two smaller nuclei join together to form one larger nucleus?	Nuclear fusion
59	Which releases more energy per event: nuclear fission or nuclear fusion?	Nuclear fusion
60	Why are nuclear fusion power stations not yet in operation?	Humans have not managed to obtain high enough temperatures to carry out fusion over a long period.

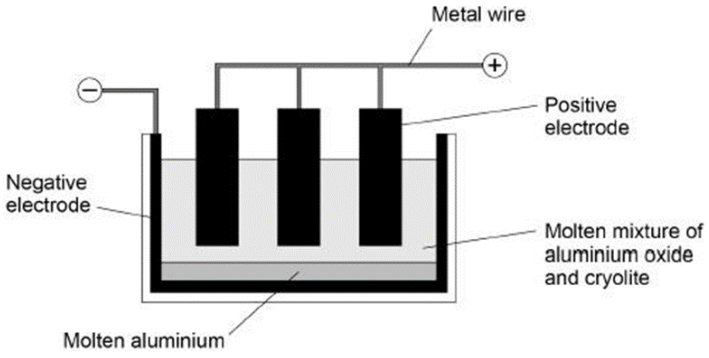
WEEK 1 Half Term 5

Fill the page with retrieval practice answers (cover the questions on your knowledge organiser and try to write them down). Mark and correct in green.

WEEK 1 Half Term 5

Answer the following questions.

Aluminium is extracted by the electrolysis of a molten mixture of aluminium oxide and cryolite.



(b) Aluminium is produced by the reduction of aluminium oxide (Al_2O_3).

What is meant by the term reduction?

_____

(1)

(c) Oxygen is formed at the positive carbon electrodes.

Explain why the positive carbon electrodes must be continually replaced.

_____

_____

_____

_____

_____

(3)

(d) A substance conducts electricity because of free moving, charged particles.

What are the free moving, charged particles in a:

- carbon electrode (made from graphite)
- molten mixture of aluminium oxide and cryolite
- metal wire?

Carbon electrode (made from graphite) _____

Molten mixture of aluminium oxide and cryolite _____

Metal wire _____ **(3)**

WEEK 2 Half Term 5

Fill the page with retrieval practice answers (cover the questions on your knowledge organiser and try to write them down). Mark and correct in green.

WEEK 2 Half Term 5

Answer the following questions.

The figure below shows a steam engine pulling a train.

(a) One type of steam engine burns coal as the fuel source.

The energy from the coal is used to accelerate a train.

Describe how the energy stores of the coal and the train change as the train accelerates.

_____

_____

_____

_____

(2)

In a different experiment…

(d) When the trolley was in the start position, the vertical height between the centre of mass of the trolley and the floor was 0.600 m

gravitational field strength = 9.8 N/kg

Calculate the gravitational potential energy of the trolley when the total mass of the trolley and masses was 2.50 kg

Use the equation:

gravitational potential energy = mass × gravitational field strength × height

_____

_____

_____

Gravitational potential energy = _____ J

(2)

WEEK 3 Half Term 5

Fill the page with retrieval practice answers (cover the questions on your knowledge organiser and try to write them down). Mark and correct in green.

Answer the following questions.

(e) Explain why heart rate needs to increase during exercise.

_____

_____

_____

_____

_____

_____

(3)

(b) Explain why the breathing rate changes when doing different activities.

_____

_____

_____

_____

_____

_____

(3)

WEEK 4 Half Term 5

Fill the page with retrieval practice answers (cover the questions on your knowledge organiser and try to write them down). Mark and correct in green.

WEEK 4 Half Term 5

Answer the following questions.

A student planned to make copper sulphate crystals from excess copper oxide and dilute sulfuric acid.

(a) Why is it necessary to add excess copper oxide?

_____

_____

(1)

(b) This is the method used for producing a salt.

1. Add 25 cm^3 of dilute sulfuric acid to a conical flask.

2. Gently warm the dilute sulfuric acid.

3. Add excess copper oxide to the dilute sulfuric acid.

4. Stir the mixture.

5. Heat to evaporate all the water from the mixture.

Suggest two improvements to the method.

Explain why each improvement is needed.

1 _____

_____

_____

_____

2 _____

_____

_____

_____

(4)

WEEK 5 Half Term 5

Fill the page with retrieval practice answers (cover the questions on your knowledge organiser and try to write them down). Mark and correct in green.

Answer the following questions.

The ‘plum pudding’ model of the atom was used by scientists in the early part of the 20th century to explain atomic structure.

An experiment, designed to investigate the ‘plum pudding’ model, involved firing alpha particles at a thin gold foil.

If the ‘plum pudding’ model was correct, then most of the alpha particles would go straight through the gold foil. A few would be deflected, but by less than 4°.

The results of the experiment were unexpected. Although most of the alpha particles did go straight through the gold foil, about 1 in every 8 000 was deflected by more than 90°.

(c) The diagram shows the paths, **A**, **B** and **C**, of three alpha particles. The total number of alpha particles deflected through each angle is also given.

(i) Using the nuclear model of the atom, explain the three paths, **A**, **B** and **C**.

A _____

_____

B _____

_____

C _____

_____

(3)

WEEK 6 Half Term 5

Fill the page with retrieval practice answers (cover the questions on your knowledge organiser and try to write them down). Mark and correct in green.

Answer the following questions.

Control of blood glucose concentration is an important aspect of homeostasis.

When the blood glucose concentration is too high the hormone insulin is released.

(a) Name the hormone released when the blood glucose concentration is too low.

_____

(1)

(b) Explain how the two hormones keep the blood glucose concentration at the correct level in a healthy human body.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(5)

HALF TERM 6

Biology Knowledge Organiser Half Term 6

Use half term 5's and add in these questions.

86	Which hormones are used in fertility treatments?	FSH and LH.
87	Why are FSH and LH used in fertility treatments?	To stimulate ovulation in women with low FSH levels.
88	Why does IVF (in vitro fertilisation) use FSH and LH?	IVF uses FSH and LH to mature the eggs that are collected for fertilisation.
89	What happens to eggs collected during IVF (in vitro fertilisation) treatment?	The eggs are fertilised using sperm from the father in the laboratory.
90	What happens to the eggs fertilised during IVF (in vitro fertilisation) treatment?	The fertilised eggs develop into embryos and 1-2 embryos are inserted into the mother's uterus.
91	Give three disadvantages of IVF (in vitro fertilisation).	It can be very emotionally and physically stressful, lead to multiple births which are a risk to both the babies and the mother, and it has a low success rate.

Chemistry Knowledge Organiser Half Term 6

#	Questions	Answer
1	According to collision theory, chemical reactions can only occur...	When reacting particles collide with each other with sufficient energy.
2	How does a catalyst increase the rate of a reaction?	The catalyst lowers the activation energy by providing an alternative pathway for the reaction.
3	How does increasing the concentration of a solution increase the rate of a reaction?	There are more particles in a given volume, therefore successful collisions occur more frequently.
4	How does increasing the pressure of gases increase the rate of a reaction?	The particles are closer together, therefore successful collisions occur more frequently.
5	How does increasing the surface area of a solid cause the rate of reaction to increase?	There are more particles on the outer surface available for collisions with other reactant particles, therefore successful collisions occur more frequently.
6	How does increasing the temperature of a reaction increase the rate?	The particles will have more kinetic energy, so will move around faster. This increases the frequency of the collisions, therefore successful collisions occur more frequently.
7	If a reaction is endothermic in one direction, what is it in the other direction?	Exothermic.
8	If the concentration of a reactant in a reversible reaction is increased, what will happen to the amount of products?	More products will be produced; until equilibrium is reached.
9	What can be measured to calculate the rate of a reaction?	The mass lost in a specific amount of time / The volume of gas produced in a specific amount of time.
10	On a rate of reaction curve, how can you tell that the reaction has stopped?	The curve / line becomes horizontal.
11	On a rate of reaction curve, what does a less steep gradient tell us about a reaction?	The reaction is slower / happening at a lower rate.
12	On a rate of reaction curve, what does a steep gradient tell us about a reaction?	The reaction is fast / happening at a high rate.
13	State five factors that affect rate of reaction.	Temperature, Concentration of solution, Surface area of solids, Pressure of gases, Catalyst
14	What is the formula used to calculate the rate of a reaction?	Rate of reaction = Amount of reactant used / time OR Rate of reaction = Amount of product made / time
15	State three units which can be used for the rate of a reaction.	g/s, cm3/s, mol/s

16	Using Le Chatelier's principle, explain what will happen in the following reaction in equilibrium if we increase the concentration of the hydrogen and iodine? $I_2(g) + H_2(g) \rightleftharpoons 2HI(g)$.	Equilibrium will shift to the right to oppose the increase in hydrogen and iodine. More HI will be produced
17	List the equipment needed to measure the volume of gas produced in a reaction.	Conical flask / test tube (to hold reactants); stopper with delivery tube; gas syringe / upturned measuring cylinder filled with water; stopwatch.
18	List the equipment needed to measure the change in mass of a reaction mixture when gas is released.	Beaker / conical flask (to hold reactants); cotton wool stopper (to allow gas to escape, but not drops of water); electronic balance / weighing scales; stopwatch
19	What can be said about the amount of energy being transferred in each direction in a reversible reaction at equilibrium?	Same amount of energy is transferred in both directions
20	What colour is hydrated copper sulphate?	Blue
21	What does a horizontal line on a rate of reaction graph mean?	Reaction has stopped
22	What happens in a reversible reaction between gases in an enclosed system when pressure is increased?	The equilibrium position shifts in the direction of fewer moles of gas (to oppose the increase in pressure)
23	What happens to the gradient of a line if the rate of reaction is increased?	Becomes steeper.
24	What is a catalyst?	A substance which increases the rate of reaction but is not used up during the reaction
25	What is added to anhydrous cobalt chloride to change its colour from blue to pink in a reversible reaction?	Water.
26	Write down a definition of collision theory using the following keywords: reaction, particles, reactant, energy.	For a chemical reaction to happen the reactant particles must collide with sufficient energy
27	What is the definition of concentration in chemistry?	Number of particles in a given volume
28	State Le Chatelier's Principle.	If a system is at equilibrium and a change is made to any of the conditions, then the equilibrium position will shift to oppose the change
29	What is meant by the term 'activation energy'?	Minimum amount of energy that particles must have to react
30	What is meant by the term equilibrium?	Forward and reverse reactions occur at the same rate; concentrations of all substances stay constant
31	What is the definition of the rate of a reaction?	Rate at which reactants are being turned into products / rate at which products are made
32	What is the name for the minimum amount of energy needed for a reaction to start?	Activation Energy
33	What is the name of a type of reaction in which the products can reform the reactants easily?	Reversible
34	What is the word for chemicals which react with each other?	Reactants
35	What conditions are required for dynamic equilibrium to be reached?	Closed system; apparatus prevents the escape of reactants and products
36	What three factors can be changed in a system at equilibrium?	Concentration of substances, temperature and pressure
37	What type of equilibrium exists when the forward and backward reactions happen at the same rate in a closed system?	Dynamic equilibrium
38	Use Le Chatelier's principle to explain what will happen if there is an increase in temperature of this reaction (the forward reaction is exothermic): $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$	More hydrogen and nitrogen will be made as the backward reaction is endothermic. Equilibrium shifts in the endothermic direction to oppose the increase in temperature.
39	What will happen to the amount of product in an endothermic reaction (going forward) at equilibrium if the temperature is decreased?	Amount of product (yield) will decrease

40	What will happen to the amount of product in an endothermic reaction (going forward) at equilibrium if the temperature is increased?	Amount of products (yield) will increase
41	What will happen to the amount of product in an exothermic reaction (going forward) at equilibrium if the temperature is increased?	Amount of products (yield) will decrease
42	What would be observed in a container where there is a reversible reaction in dynamic equilibrium?	No visible changes would be observed
43	What would happen to the position of equilibrium in a gaseous reaction if the pressure is increased?	Equilibrium would shift towards the side with the smaller number of moles of gases

Physics Knowledge Organiser Half Term 6

Use half term 5's

WEEK 1 Half Term 6

Fill the page with retrieval practice answers (cover the questions on your knowledge organiser and try to write them down). Mark and correct in green.

WEEK 1 Half Term 6

Answer the following questions.

In Vitro Fertilisation (IVF) treatment helps infertile women to become pregnant.

(a) Use words from the box to complete each sentence.

ovary	pituitary gland	sperm	uterus

The eggs are collected from the mother's _____

Each egg is fertilised by a _____ .

Each fertilised egg develops into a ball of cells called an embryo.

One or two of these embryos are inserted into the mother's _____ .

(3)

(b) The table shows the effectiveness of IVF treatment in one clinic in 2010.

Age of women in years	Under 35	35 – 37	38 – 40	Over 40
Number of IVF treatments	130.0	100.0	29.0	20.0
Average number of embryos transferred	2.6	2.8	3.3	3.6
Percentage of successful pregnancies	43.0	30.0	21.0	13.0

(i) How does the age of the women affect the average number of embryos transferred?

_____

_____

(1)

(ii) Look again at the information in the table.

Suggest **one** ethical reason why many people are against IVF treatment.

_____

_____

(1)

(Total 5 marks)

WEEK 2 Half Term 6

Fill the page with retrieval practice answers (cover the questions on your knowledge organiser and try to write them down). Mark and correct in green.

WEEK 2 Half Term 6

A student plans a method to prepare pure crystals of copper sulphate.

The student's method is:

1. Add one spatula of calcium carbonate to dilute hydrochloric acid in a beaker.
2. When the fizzing stops, heat the solution with a Bunsen burner until all the liquid is gone.

The method contains several errors and does not produce copper sulphate crystals.

Explain the improvements the student should make to the method so that pure crystals of copper sulphate are produced.

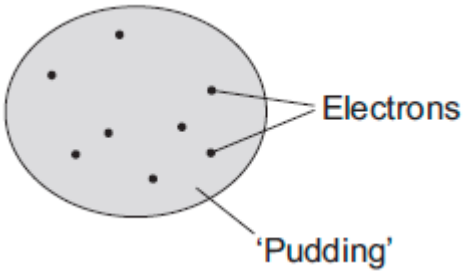
(Total 6 marks)

WEEK 3 Half Term 6

Fill the page with retrieval practice answers (cover the questions on your knowledge organiser and try to write them down). Mark and correct in green.

WEEK 3 Half Term 6

The ‘plum pudding’ model of the atom was used by scientists in the early part of the 20th century to explain atomic structure.



(a) Those scientists knew that atoms contained electrons and that the electrons had a negative charge. They also knew that an atom was electrically neutral overall.

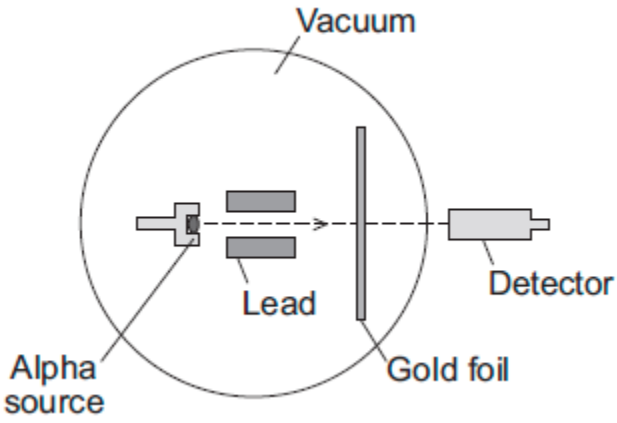
What did this allow the scientists to deduce about the ‘pudding’ part of the atom?

_____

_____

(1)

(b) An experiment, designed to investigate the ‘plum pudding’ model, involved firing alpha particles at a thin gold foil.



If the ‘plum pudding’ model was correct, then most of the alpha particles would go straight through the gold foil. A few would be deflected, but by less than 4°.

The results of the experiment were unexpected. Although most of the alpha particles did go straight through the gold foil, about 1 in every 8 000 was deflected by more than 90°.

Why did this experiment lead to a new model of the atom, called the nuclear model, replacing the ‘plum pudding’ model?

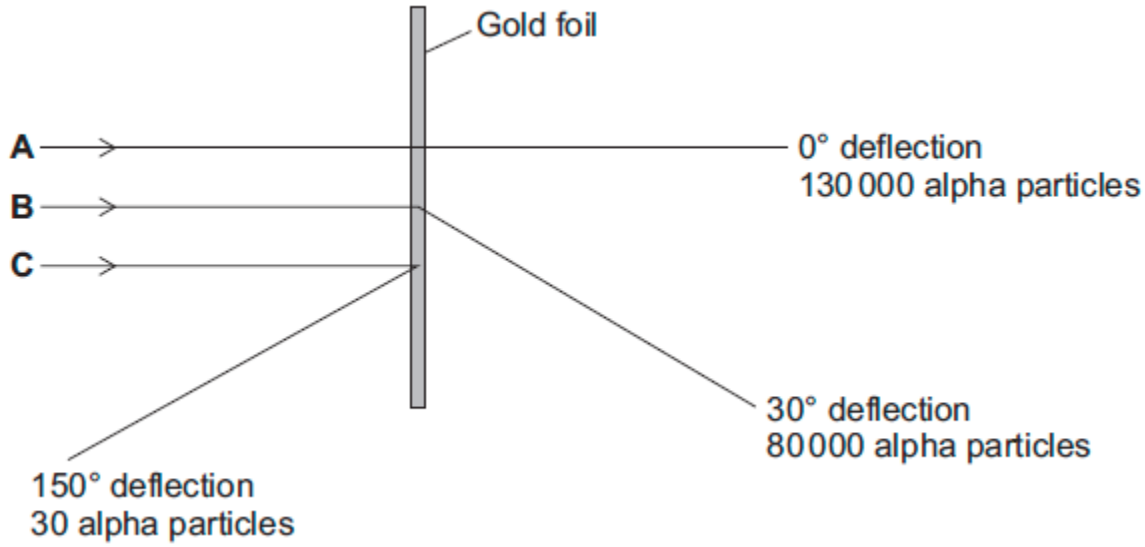
_____

_____

_____

(1)

(c) The diagram shows the paths, **A**, **B** and **C**, of three alpha particles. The total number of alpha particles deflected through each angle is also given.



(i) Using the nuclear model of the atom, explain the three paths, **A**, **B** and **C**.

A _____

_____

B _____

_____

C _____

_____

(3)

(ii) Using the nuclear model, the scientist E. Rutherford devised an equation to predict the proportion of alpha particles that would be deflected through various angles.

The results of the experiment were the same as the predictions made by Rutherford.

What was the importance of the experimental results and the predictions being the same?

_____

_____

(1)

(Total 6 marks)

WEEK 4 Half Term 6

Fill the page with retrieval practice answers (cover the questions on your knowledge organiser and try to write them down). Mark and correct in green.

Coronary heart disease (CHD) is caused when fatty material builds up in the coronary arteries.

(a) Smoking is a risk factor for CHD.

Give **one** other disease that smoking is a risk factor for.

Do **not** refer to CHD.

_____

(1)

(b) Suggest **two** lifestyle changes a person can make to reduce the risk of CHD. Do **not** refer to smoking in your answer.

1 _____

_____

2 _____

_____

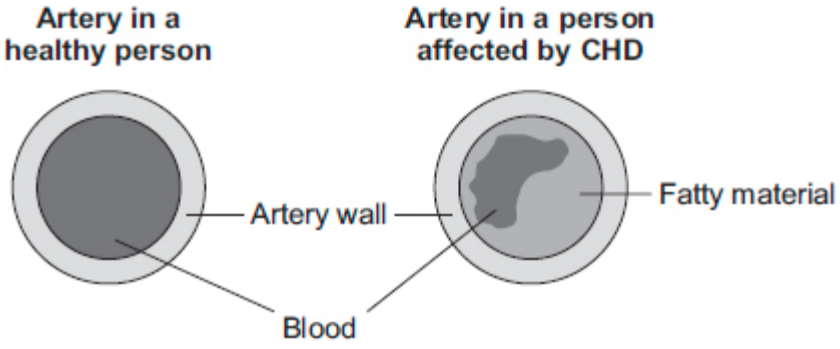
(2)

(c) The coronary arteries supply the heart muscle with blood.

Figure 2 shows two coronary arteries.

Figure 2

Figure 2



A person with CHD has a risk of having a heart attack.

A heart attack will cause the heart muscle to stop contracting.

Explain how CHD can cause a heart attack.

_____

_____

_____

_____

_____

(3)

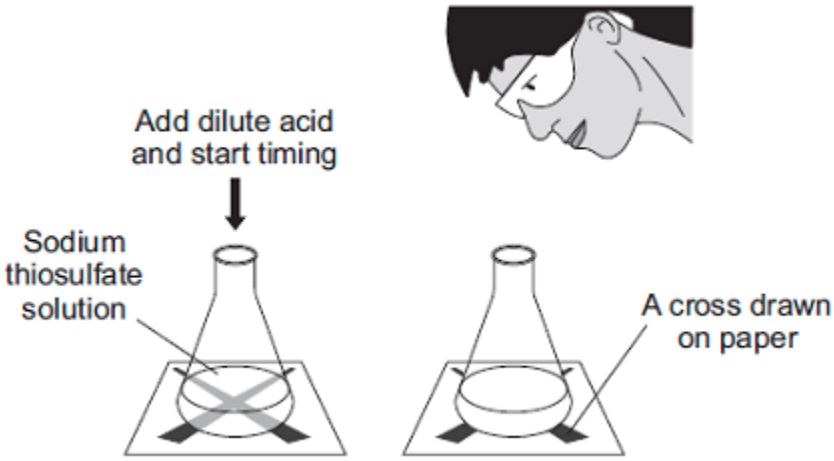
(Total 6 marks)

WEEK 5 Half Term 6

Fill the page with retrieval practice answers (cover the questions on your knowledge organiser and try to write them down). Mark and correct in green.

Sodium thiosulfate solution reacts with hydrochloric acid. As the reaction takes place the solution slowly turns cloudy.

The diagram shows a method of measuring the rate of this reaction.



A student used this method to study how changing the concentration of the sodium thiosulfate solution alters the rate of this reaction.

The student used different concentrations of sodium thiosulfate solution. All the other variables were kept the same.

The results of the experiments are shown on the graph below.

(a) (i) Draw a line of best fit on the graph.

(1)

(ii) Suggest **two** reasons why all of the points do not lie on the line of best fit.

_____

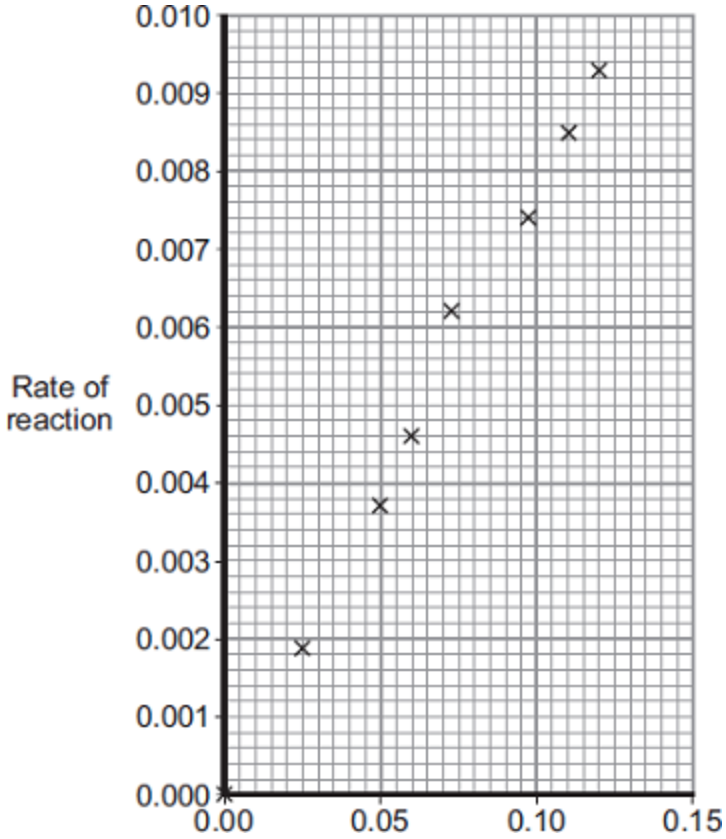
_____

_____

_____

_____

(2)



(b) (i) In a conclusion to the experiment the student stated that:

'The rate of this reaction is directly proportional to the concentration of the sodium thiosulfate.'

How does the graph support this conclusion?

_____

_____

(1)

(ii) Explain, in terms of particles, why the rate of reaction increases when the concentration of sodium thiosulfate is increased.

_____

_____

_____

_____

(2)

(Total 6 marks)

WEEK 6 Half Term 6

Fill the page with retrieval practice answers (cover the questions on your knowledge organiser and try to write them down). Mark and correct in green.

(a) A washing machine washes dirty clothes and then spins the clothes to remove some of the water.

(i) Use the correct words from the box to complete the sentence.

chemical	electrical	kinetic	sound

When the washing machine spins the clothes, _____

energy is transferred into useful _____ energy.

(2)

(ii) Name **one** type of energy the washing machine wastes when spinning the clothes.

_____

(1)

(iii) What eventually happens to all the wasted energy?

Tick **one** box.	
The wasted energy is transferred to the clothes.	
The wasted energy is transferred to the surroundings.	
The wasted energy is trapped and is re-used.	

(1)

(b) The table shows information about two different washing machines, **A** and **B**.

	Washing machine A	**Washing machine B**
Cost to buy	£269	£249
Maximum wash load	8 kg	7 kg
Energy transferred in one wash cycle	0.7 kWh	1.2 kWh
Water used in one wash cycle	48 litres	50 litres

Use the information in the table to give **one** advantage and **one** disadvantage of washing machine **A** compared with washing machine **B**.

Advantage _____

_____

Disadvantage _____

_____

(2)

(Total 6 marks)

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