STOKE DAMEREL

Aspire Achieve Thrive

Cycle 4

Science

Year 10

Name: _____

Tutor: _____

Year 10 Homework Timetable

Monday	Bedrock Learning	Ebacc Option D	Option C	Modern Britain
Tuesday	English	Tassomai	Option B	Option A
Wednesday	Hegarty	Science	Modern Britain	Option C
Thursday	Ebacc Option D	Tassomai	Bedrock Learning	Option B
Friday	Hegarty	Science	English	Option A

Tassomai - 2 Daily Goals per week
Hegarty - 4 tasks of Hegarty per week

Block A	Block B	Block C	Block D
Art	Business Studies	Art	French
Dance	Child Development	Business Studies	Geography
Drama	Catering	Geography	History
Media Studies	Computer Science	Health & Social Care	
Music	Drama	History	
Photography	Health & Social Care	Catering	
	IT	Photography	
	Media Studies	Sport	
	Sociology	Travel & Tourism	
	Sport		

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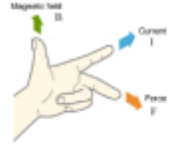
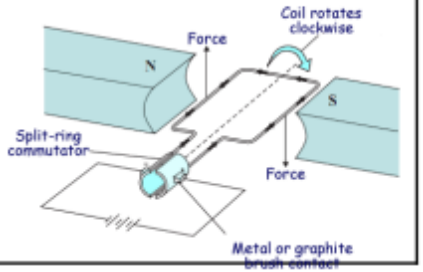
GREENSHAW LEARNING TRUST

Year 10 - Homework Plan Science

Week/Date	Homework Task	Examination Question
Week 1 25th April	**Cornell Notes** Current in series and parallel circuits	During long periods of vigorous exercise, the body respires anaerobically. Explain the changes that happen in the body during and after vigorous exercise. (6)
Week 2 2nd May	**Revision Cards** Magnetism	Answer the exam questions on circuits.
Week 3 9th May	**Cornell Notes** Potential difference in series and parallel circuits	An electromagnet is a solenoid. Explain why it is better to use an electromagnet rather than a permanent magnet in a scrapyard. You should include a comparison of the properties of electromagnets and permanent magnets in your answer. (4)
Week 4 16th May	**Revision Cards** Hormones and their glands/functions	The number of cases of Type 2 diabetes in the UK is increasing rapidly. Describe how insulin and glucagon help control the blood sugar concentration in a healthy person. (6)
Week 5 23rd May	**Cornell Notes** Control of blood glucose concentration	Answer the exam question comparing contraceptives.

Week 6 30th May	**Revision Cards** Neutralisation reactions	Explain the improvements the student should make to the method so that pure crystals of copper sulfate are produced. (6)
Week 7 6th June	**Revision** (any method)	
Week 8 13th June	**Revision** (any method)	
Week 9 20th June	**Plug the gap**	

Cycle 4 Physics Year 10 Knowledge Organiser Week 1 and 2		
Keyword	**Definition**	**Key Ideas**
Current	The rate of flow of electric charge. Symbol I, unit amps (A).	• A current in a circuit is a flow of electrons. It flows from negative to positive because electrons are attracted to the positive terminal. • Resistance pushes against the current. The higher the resistance the lower the current will be. • A resistor is a component designed to add resistance to a circuit. • When resistors are added in series you must add up the values to calculate the total resistance. • When resistors are added in parallel it is easier for the current to flow because there are multiple routes. This means that the resistance in the circuit decreases. • A fuse works by heating up and snapping if the current is too high. This disconnects the circuit. • Current is the same at any point in a series circuit. • Current splits at a junction in a parallel circuit. • The current in the branches adds up to the current from the cell. • Potential difference is equal in all branches of a parallel circuit. The potential difference is shared between the components on a branch. We can compare the power of appliances by comparing the rate at which they transfer energy or do work: the more powerful the appliance, the more work it will do each second. A more powerful appliance will also require more energy every second to operate. Power is measured in Watt (W) and 1 W = 1 J transferred every second.
Resistance	Ratio of the potential difference across an electrical component to the current through the component; symbol R, unit ohms (Ω).	
Power	The rate at which energy is transferred or the rate at which work is done; an energy transfer of 1 J/s is equal to a power of 1 W.	
Parallel circuit	A circuit in which there is more than one path for the current to follow.	
Series circuit	A type of circuit with only one loop of wire.	
Ampere (A)	The unit for current. Can be shortened to amp.	
Ammeter	A meter used to measure current.	
Voltage	See potential difference.	
Voltmeter	Meter used to measure potential difference (or voltage).	
Volt (V)	The unit for potential difference (or voltage).	When a straight wire with a current passing through it is placed between the poles of a magnet, the two magnetic fields combine. This makes the resultant magnetic field stronger in one area and weaker in another. This produces the motor effect. Electromagnets are made of a wire wound around a magnetic core (e.g. iron). The coil of wire is known as a solenoid. More turns of the coil and a higher current increase the strength of the magnet. <u>Motor effect (HT)</u> Fleming's left hand rule can tell us the direction of a force during the motor effect. The direction can be reversed by changing the direction of the electric current. The **F**irst finger shows **F**ield, The se**C**ond finger shows **C**urrent The thu**M**b shows **M**ovement. If a coil of wire is used, the force on each side will be in opposite directions. This causes the coil to spin around. This spinning can be used to drive a motor.  
Charge	Measured in Coulombs. Calculated by current x time	
Ohm (Ω)	The unit for measuring electrical resistance.	
Resistance	A measurement of how difficult it is for electricity to flow through something.	
Diode	A component that lets electric current flow through it in one direction only.	
Light-dependent resistor (LDR)	A resistor whose resistance gets lower when light shines on it.	
Light-emitting diode (LED)	A diode that emits light when current flows through it.	
Magnetic field	The field of magnetic force around a magnet. The field is strongest closest to the poles.	
Induced magnet	A magnet that is only magnetic when inside the magnetic field of another magnet.	

Cycle 4 BIOLOGY Year 10 Knowledge Organiser Week 3 and 4		
Keyword	**Definition**	**Key Ideas**
Homeostasis	The maintenance of a constant internal environment.	The endocrine system secretes hormones into the bloodstream from glands throughout the body. Hormones produce an effect on specific target organs in the body. A **hormone** is a chemical substance, produced by a **gland** and carried in the bloodstream, which alters the activity of specific **target organs**. **Glucose** is needed by cells for **respiration**. It is important that the concentration of glucose in the blood is maintained at a constant level and controlled carefully. **Insulin** is a hormone - produced by the **pancreas** - that regulates glucose concentrations in the blood. If the blood glucose concentration is too high, the pancreas produces the hormone insulin that causes glucose to move from the blood into the cells. In liver and muscle cells excess glucose is converted to **glycogen** for storage, and will be used at a later date. **Diabetes** is a condition where the blood **glucose** levels remain too high. It can be treated by injecting **insulin**. The extra insulin causes the liver to convert glucose into **glycogen**, which reduces the blood glucose level. There are two types of diabetes - type 1 and type 2. Type 1 diabetes is a disorder in which the pancreas fails to produce enough insulin. This can be detected from an early age. It is characterised by uncontrolled high blood glucose levels and it can be controlled by injecting insulin. In type 2 diabetes the person's body cells no longer respond to insulin produced by the pancreas. It is more common in older people. There is a correlation between rising levels of **obesity** in the general population and increasing levels of type 2 diabetes.
Hormones	Chemical messenger produced in glands and carried by the blood to specific organs in the body.	
Endocrine	The system of glands in the body that secrete hormone directly into the blood	
Glucose	A simple sugar used by cells for respiration.	
Pancreas	Large gland located in the abdomen near the stomach which produces digestive enzymes and the hormone insulin.	
Diabetes	A serious disease in which the body is unable to regulate blood sugar.	
Glycogen	The storage form of glucose in animal cells.	
Glucagon	A hormone formed in the pancreas which helps with the breakdown of glycogen to glucose in the liver.	
Progesterone	Sex hormone produced by the ovaries and placenta.	During puberty, reproductive hormones cause secondary sex characteristics to develop: **Testosterone**, produced by the testes, is the main male reproductive hormone and it stimulates sperm production. **Oestrogen**, produced by the ovaries, is the main female reproductive hormone. At puberty, eggs begin to mature and one is released approximately every 28 days. This is ovulation. The **menstrual cycle** is a recurring process which takes around 28 days. During the process, the lining of the **uterus** is prepared for pregnancy. If implantation of the fertilised egg into the uterus lining does not happen, the lining is then shed. This is known as **menstruation**. Human **fertility** is controlled by **hormones**, so fertility can be controlled using hormonal forms of contraception. The oral contraceptive, which is known as the pill, contains **oestrogen** or **progesterone**. These hormones inhibit the production of **FSH**, and eggs cannot mature. Fertility can also be controlled without hormones. Intrauterine devices (IUD) also known as a coil, prevent the implantation of an embryo or release of a hormone. If a couple are having difficulty conceiving a child because there are issues with the quality of the man's sperm, or a woman has blocked oviducts, then **IVF** can be used. **Selective breeding** or artificial selection is when humans breed plants and animals to obtain desirable characteristics. Humans have bred food crops from wild plants and domesticated animals for thousands of years. **Genetic engineering** is also called **genetic modification** or GM. It involves modifying the **genome** of an **organism** by introducing a **gene** from another organism to result in a desired characteristic.
Oestrogen	A female sex hormone produced in the ovaries, which is responsible for puberty in girls and the regulation of the menstrual cycle.	
Menstruation	Also called a 'period'. The loss of blood and tissue from the lining of the uterus through the vagina during the menstrual cycle.	
Contraception	A variety of methods used to prevent pregnancy.	
Intrauterine device	A contraceptive device fitted inside the uterus that physically prevents the implantation of fertilized egg .	
IVF	The letters stand for 'in vitro fertilisation'. This involves bringing the sperm and the egg together to create an embryo, which is placed into the woman's womb to increase the chance of giving birth.	
Gene therapy	the introduction of normal genes into cells in place of missing or defective ones in order to correct genetic disorders.	
Selective breeding	involves choosing parents with particular characteristics to breed together and produce offspring with more desirable characteristics	
Genetic engineering	the deliberate modification of the characteristics of an organism by manipulating its genetic material on a subcellular level.	

Cycle 4 Chemistry Year 10 Knowledge Organiser Week 5 and 6

Keyword	Definition
Acid	Substances that produce hydrogen ions (H^+) in aqueous solutions.
Universal indicator	A substance that has different colours, depending upon the pH of the solution it is in.
Crystallisation	The process of producing crystals from a solution by evaporating the solvent.
Soluble	A substance that can dissolve in a liquid.
Salt	The substance formed when the hydrogen ion in an acid is replaced by a metal ion
Neutralisation	A reaction which happens between an acid and a base to form a salt and water.
pH	The scale used to measure if a solution is an acid, an alkali or neutral.
Strong Acid	An acid which completely ionises in water.
Weak Acid	An acid which does not completely ionise in water
Alkali	Compounds which dissolve in water releasing hydroxide ions (OH^-)
Hydroxide ions	An ion which contains hydrogen and oxygen and has a negative charge, OH-.
Base	Reacts with acid to form a salt. Some dissolve in water to form alkalis.
Excess	A substance is in excess if there is more than enough of it to react with another reactant
Half equation	An equation, involving ions and electrons, that describes the process happening at an electrode.
Exothermic	Reaction in which energy is given out to the surroundings.
Filtration	Method used to separate an insoluble solid from a liquid using a physical barrier such as paper.
Dissociation	The breaking up of a molecule into ions when dissolved in water.

Key Ideas

When an acid is neutralised, it produces salt and water. It is called neutralisation as the products formed are neutral, meaning they have a pH of 7.
The pH scales allows us to measure the if solution is an acid (pH below 7), neutral (pH of 7) or alkali (pH above 7). To measure pH an indicator could be used, such as universal indicator which shows different colours for different pH values: Red, orange and yellow show a range of acid pH values, green is neutral and blue and purple show the range of alkali values.

Acids can be neutralised by bases and alkalis.
An acidic solution contains H+ ions, and alkalis contain OH^- ions. The general equation for neutralisation is:

Acid + base →Salt + water.
The formation of water is shown by $H^+ + OH^- \rightarrow H_2O$.

When acids react with metals, the products are a salt and hydrogen. In general:
Acid + metal → salt + hydrogen

A soluble salt can be prepared by reacting an acid with a suitable insoluble reactant including: a metal, a metal oxide, a metal hydroxide or a metal carbonate

To make a soluble salt from an acid and an insoluble reactant:

1. Add the insoluble base to acid in a beaker until it is in excess.
2. Filter the mixture in the beaker to remove the excess solid.
3. Heat the solution in an evaporating dish over a water bath. Stop heating when small crystals start to appear around the edge of the evaporating basin.
4. Leave the saturated solution at room temperature for a day or two. This gives time for large crystals to form.

Acids can be considered to be weak or strong. This is not the same as their concentration. When an acid is in water, it will split into ions, this is known as ionisation. If the acid completely ionises, it is a strong acid. If it does not complete ionise it is a weak acid. Examples of strong acids include hydrochloric acid, sulphuric acid and nitric acid. Examples of weak acids include ethanoic acid, citric acid and carbonic acid
Strong acids completely dissociate into ions in solution. For example, hydrochloric acid is a strong acid. It ionises completely to form hydrogen ions and chloride ions:
HCl(aq) → H+(aq) + Cl-(aq) (HIGHER TIER)

WEEK 1

Date…….

During long periods of vigorous exercise the body respires anaerobically.

Explain the changes that happen in the body during **and** after vigorous exercise.

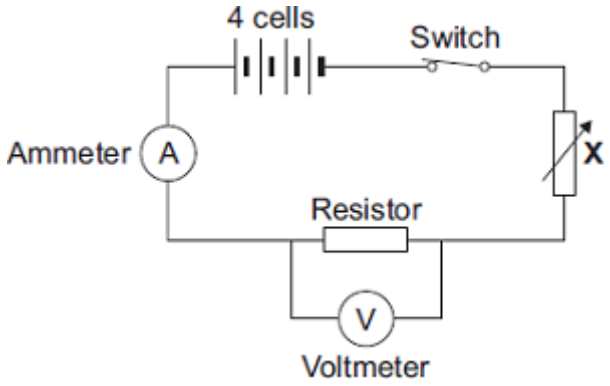
(6)

Answer:-

WEEK 2

Date…….

The diagram shows the circuit that a student used to investigate how the current through a resistor depends on the potential difference across the resistor.



(i) Each cell provides a potential difference of 1.5 volts.

What is the total potential difference provided by the four cells in the circuit?

_____

Total potential difference = _____ volts

(1)

(ii) The student uses the component labelled **X** to change the potential difference across the resistor.

What is component **X**?

Draw a ring around your answer.

light-dependent resistor **thermistor** **variable resistor**

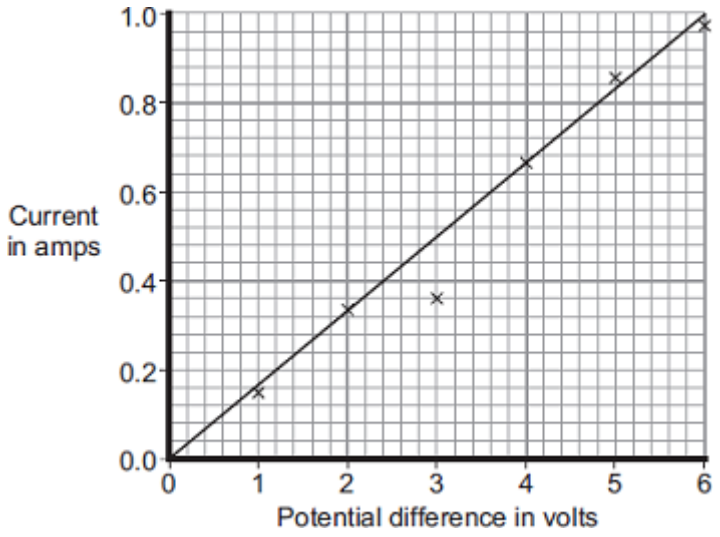
(1)

(iii) Name a component connected in parallel with the resistor.

_____

(1)

(b) The results obtained by the student have been plotted on a graph.



(i) One of the results is anomalous.

Draw a ring around the anomalous result.

(1)

(ii) Which **one** of the following is the most likely cause of the anomalous result?

Put a tick (✓) in the box next to your answer.

The student misread the ammeter. ☐

The resistance of the resistor changed. ☐

The voltmeter had a zero error. ☐

(1)

(iii) What was the interval between the potential difference values obtained by the student?

_____

_____

(1)

(c) Describe the relationship between the potential difference across the resistor and the current through the resistor.

_____

_____

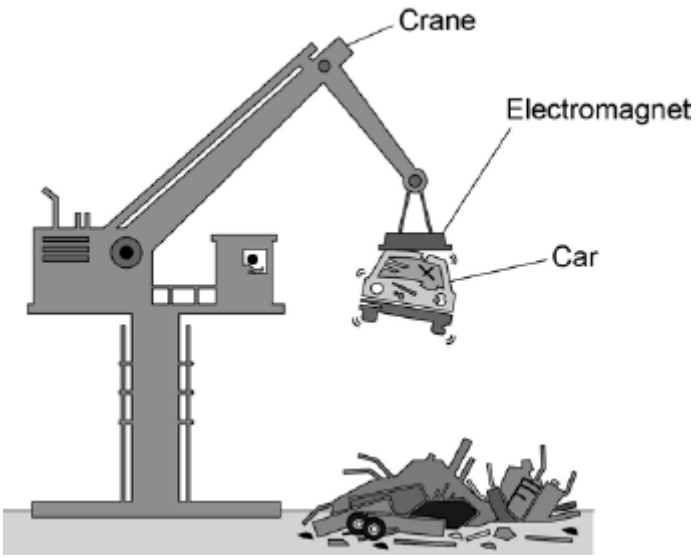
(1)

WEEK 3

Date…….

(c) **Figure 2** shows an electromagnet being used to lift a car in a scrapyard.

Figure 2



An electromagnet is a solenoid.

Explain why it is better to use an electromagnet rather than a permanent magnet in a scrapyard.

You should include a comparison of the properties of electromagnets and permanent magnets in your answer.

(4)

Answer:-

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WEEK 4

Date…….

The number of cases of Type 2 diabetes in the UK is increasing rapidly.

(a) Describe how insulin and glucagon help control the blood sugar concentration in a healthy person.

(6)

Answer:-

WEEK 5

Date…….

(c) The table below shows information about three methods of contraception.

	Condom	**Oral contraceptive**	**Hormone skin patch**
Percentage (%) effectiveness	98.0	99.7	99.8
How contraception is obtained	From shops or sexual health clinic	From doctor or sexual health clinic	
Possible side effects	No serious side effects	Headaches, nausea, high blood pressure	Headaches, nausea, blood clots

Evaluate the use of these contraceptive methods.

(6)

Answer:-

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WEEK 6

Date…….

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

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 sulfate crystals.

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

(Total 6 marks)

Answer:-

STEP 2: CREATE CUES

What: Reduce your notes to just the essentials.

What: Immediately after class, discussion, or reading session.

How:

- **Jot down key ideas, important words and phrases**
- **Create questions that might appear on an exam**
- **Reducing your notes to the most important ideas and concepts improves recall. Creating questions that may appear on an exam gets you thinking about how the information might be applied and improves your performance on the exam.**

Why: Spend at least ten minutes every week reviewing all of your previous notes. Reflect on the material and ask yourself questions based on what you've recorded in the Cue area. Cover the note-taking area with a piece of paper. Can you answer them?

STEP 1: RECORD YOUR NOTES

What: Record all keywords, ideas, important dates, people, places, diagrams and formulas from the lesson. Create a new page for each topic discussed.

When: During class lecture, discussion, or reading session.

How:

- **Use bullet points, abbreviated phrases, and pictures**
- **Avoid full sentences and paragraphs**
- **Leave space between points to add more information later**

Why: Important ideas must be recorded in a way that is meaningful to you.

STEP 3: SUMMARISE & REVIEW

What: Summarise the main ideas from the lesson.
What: At the end of the class lecture, discussion, or reading session.
How: In complete sentences, write down the conclusions that can be made from the information in your notes.
Why: Summarising the information after it's learned improves long-term retention.

Date / / **Topic** **WEEK 1**

Questions	Notes

Summary

Date / / **Topic**

Questions	Notes

Summary

Date / / **Topic**

WEEK 3

Questions	Notes

Summary

Date / / **Topic**

Questions	Notes

Summary

Date / / **Topic** **WEEK 5**

Questions	Notes

Summary

Date / / **Topic**

Questions	Notes

Summary

Revision Page

Revision Page

Revision Page

Revision Page

Revision Page

Revision Page

Revision Page

Revision Page

Revision Page

Revision Card on Magnetism	Answers
1. Which direction do magnetic field lines go in? 2. How can you tell where the magnetic field is strongest? 3. Give an example of a combination of poles that repel. 4. Give an example of a combination of poles that attract. 5. State how to find the magnetic field using plotting compasses. 6. State how to find the magnetic field using iron filings.	

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Revision Card on Hormones and glands	Answers
1. For the following hormones, state their gland and function: a. Insulin b. Glucagon c. Testosterone d. Thyroxine e. Oestrogen f. Progesterone g. Adrenaline	

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Revision Card on Neutralisation reactions	Answers
1. Write the standard equation for a reaction between a metal and an acid. 2. Write the standard equation for a reaction between a metal oxide and an acid. 3. Write the standard equation for a reaction between a metal hydroxide and an acid. 4. Write the standard equation for a reaction between a metal carbonate and an acid. 5. State which type of salt is made with each acid: a. Hydrochloric acid b. Nitric acid c. Sulphuric acid	