Due Date:	**Friday, 15th September 2023**
Student Number:	
Name:	

Y11 Combined T1 W2 – Working Scientifically

Question	Answer
What is the definition of accurate?	Close to the true value.
What is the definition of reliable (sometimes called precise)?	Consistent with one another: this means they have a small range.
What is the definition of valid?	The investigation is appropriate to answer the question: only one variable is changed.
What is the definition of repeatable?	One person can use the same method and equipment to obtain similar results.
What is the definition of reproducible?	Someone else can repeat the experiment and obtain similar results.
What is the cause of a systematic error?	A problem with the method. All results are affected in the same way.
What is the cause of a random error?	Each result is effected differently: it can be an error reading the scale or human reaction time.
What is the cause of a zero error?	A lack of calibration (setting the equipment to zero before use). All results are affected in the same way.
What is an independent variable?	What you change/investigate in the investigation.
What is a control variable?	The control variables are what you keep the same.

Look, Cover, Write, Check

Question	Answer
What is an independent variable?	
What is the definition of repeatable?	
What is the cause of a systematic error?	
What is the definition of reliable (sometimes called precise)?	
What is a control variable?	
What is the definition of accurate?	
What is the cause of a zero error?	
What is the definition of reproducible?	
What is the definition of valid?	
What is the cause of a random error?	

Look, Cover, Write, Check

Question	Answer
	The control variables are what you keep the same.
What is the definition of repeatable?	
What is the cause of a random error?	
	Reproducible means that someone else can repeat the experiment and obtain similar results.
	Valid means the investigation is appropriate to answer the question: only one variable is changed.
What is an independent variable?	
	Results which are reliable are consistent with one another: this means they have a small range.
	A zero error is caused by a lack of calibration (setting the equipment to zero before use). All results are affected in the same way.
What is the cause of a systematic error?	
What is the definition of accurate?	

Q1. A student investigated the rate of the reaction between magnesium and hydrochloric acid.

The student measured the volume of hydrogen gas produced.

(a) How could the student collect and measure the volume of gas produced?

_____

_____

(1)

(b) At the start of the investigation the volume of gas was 0 cm^3

The student took readings at 20-second intervals

Readings for the volume of gas were 24 cm^3, 44 cm^3, 59 cm^3, 70 cm^3, 76 cm^3 and 79 cm^3

Draw a results table for the investigation.

Include the student's results in the table.

(3)

Due Date:	**Friday, 22nd September 2023**
Student Number:	
Name:	

Y11 Combined T1 W3 - B3 Hormones

Question	Answer
What are hormones?	Chemical messengers
How are hormones transported around the body?	Through the bloodstream.
What is homeostasis?	Keeping the internal conditions of the body constant.
What is the menstrual cycle?	A monthly cycle during which a woman's body gets ready for pregnancy.
What are the four menstrual hormones?	FSH, LH, Oestrogen and Progesterone.
Where are the menstrual hormone made?	FSH and LH are made in the pituitary gland. Oestrogen and progesterone are made in the ovaries.
What does FSH do?	FSH causes an egg to mature.
What does oestrogen do?	Oestrogen causes the lining of the uterus to build up.
What does LH do?	When LH levels reach a peak in the middle of the cycle, ovulation is triggered.
What does progesterone do?	Progesterone maintains the uterus lining.

Look, Cover, Write, Check

Question	Answer
How are hormones transported around the body?	
What is homeostasis?	
What does FSH do?	
What are hormones?	
What are the four menstrual hormones?	
What does oestrogen do?	
Where are the menstrual hormone made?	
What does progesterone do?	
What is the menstrual cycle?	
What does LH do?	

Look, Cover, Write, Check

Question	Answer
	Chemical messengers
	Through the bloodstream.
What is homeostasis?	
	A monthly cycle during which a woman's body gets ready for pregnancy.
What are the four menstrual hormones?	
Where are the menstrual hormone made?	
	It travels to the ovaries and causes an egg to mature.
	It causes the lining of the uterus to build up.
What does LH do?	
What does progesterone do?	

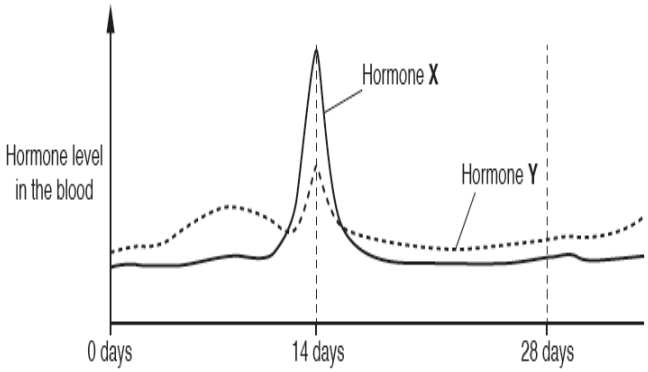
1.

i. Two hormones released by the pituitary gland are involved in controlling the menstrual cycle.

Write down the names of these **two** hormones.

_____ **and** _____ **[1]**

ii. The graph shows the levels of these two hormones during the menstrual cycle.



Use the graph to explain how these two hormones work together to cause ovulation.

_____

_____

_____ **[2]**

Due Date:	**Friday, 29th September 2023**
Student Number:	
Name:	

Y11 Combined T1 W4 B3 - Maintaining Internal Environments

Question	Answer
What does ‘optimum’ mean?	The best conditions.
What is the optimum human body temperature?	37ºC (degrees Celsius)
How does your body respond when you become too hot?	Body hairs lie flat, sweat glands secrete sweat and vasodilation (blood vessels widen).
How does your body respond when you become too cold?	Body hairs rise, sweat glands stop secreting sweat, shivering begins and vasoconstriction (blood vessels become narrower).
What hormone is released when blood glucose is too high?	Insulin is released from the pancreas to lower blood glucose concentration back to optimum.
What hormone is released when blood glucose is too low?	Glucagon is released from the pancreas to increase blood glucose concentration back to optimum.
How does insulin work?	It travels to the liver and turns glucose into glycogen.
What is type 1 diabetes?	A condition caused by an inability to produce insulin.
What is type 2 diabetes?	A condition caused when a person’s is unable to produce enough insulin or their body cells cannot respond to the insulin.
How is type 1 diabetes managed?	Insulin injections.

Look, Cover, Write, Check

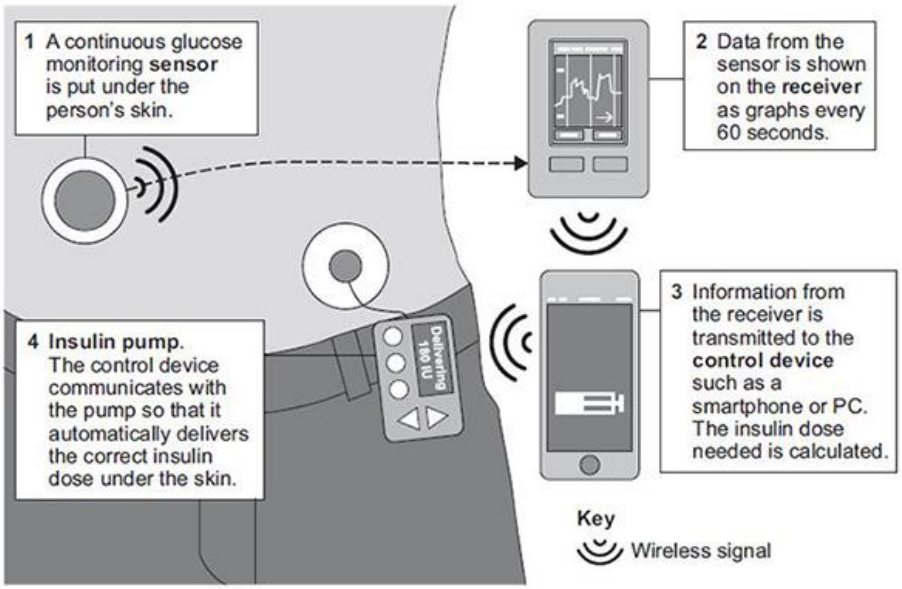
Question	Answer
How does your body respond when you become too hot?	
What is type 1 diabetes?	
What does ‘optimum’ mean?	
How does your body respond when you become too cold?	
How is type 1 diabetes managed?	
What hormone is released when blood glucose is too low?	
How does insulin work?	
What is the optimum human body temperature?	
What hormone is released when blood glucose is too high?	
What is type 2 diabetes?	

Look, Cover, Write, Check

Question	Answer
	Body hairs rise, sweat glands stop secreting sweat, shivering begins and vasoconstriction (blood vessels become narrower).
What hormone is released when blood glucose is too high?	
	The best conditions.
What is the optimum human body temperature?	
	Glucagon is released from the pancreas to increase blood glucose concentration back to optimum.
How does insulin work?	
	Insulin injections.
	A condition caused by an inability to produce insulin.
How does your body respond when you become too hot?	
	A condition caused when a person's is unable to produce enough insulin or their body cells cannot respond to the insulin.

A woman with type 1 diabetes has an artificial pancreas. The woman eats a meal high in sugar. The meal causes her blood glucose level to rise.

Use information from the diagram above to describe what happens to bring the blood glucose level of the woman back to normal.



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_____

_____

_____

_____

_____

(4)

Due Date:	**Friday, 6th October 2023**
Student Number:	
Name:	

Y11 Combined T1 W5 C3 - Introducing Chemical Reactions

Question	Answer
What are the rules for writing the formulae of elements?	Each element starts with a capital letter, with any other letters being lower case. E.g. Na or Br
What is a diatomic molecule?	A molecule containing 2 atoms e.g. Cl_2.
What does the 'molecular formula' show you?	The numbers of atoms of each element in a molecule or the ratio of atoms in an ionic compound.
What are the 4 different states and the corresponding state symbols?	Solid (s), liquid (l), gas (g) and aqueous (aq)
What is a mole?	The amount of a substance that contains the same number of particles ($6.02x10^{23}$) as there are atoms in 12g of carbon-12 (^{12}C).
How many particles in 1 mole?	$6.02x10^{23}$
What is an exothermic reaction?	A reaction in which thermal energy is released into the surroundings, increasing the temperature of the surroundings.
What is an endothermic reaction?	A reaction in which thermal energy is absorbed (taken in) from the surroundings, decreasing the temperature of the surroundings.
What is the general word equation for combustion?	Fuel + oxygen → carbon dioxide + water
Define 'activation energy'	The minimum amount of energy required to start a reaction by breaking the bonds in the reactants.

Look, Cover, Write, Check

Question	Answer
Define 'activation energy'	
What are the rules for writing the formulae of elements?	
What is an exothermic reaction?	
What are the 4 different states and the corresponding state symbols?	
What is a mole?	
What is an endothermic reaction?	
What does the 'molecular formula' show you?	
How many particles in 1 mole?	
What is the general word equation for combustion?	
What is a diatomic molecule?	

Look, Cover, Write, Check

Question	Answer
What are the rules for writing the formulae of elements?	
What is a mole?	
	The numbers of atoms of each element in a molecule or the ratio of atoms in an ionic compound.
What are the 4 different states and the corresponding state symbols?	
	6.02×10^{23}
What is an exothermic reaction?	
	A reaction in which thermal energy is absorbed (taken in) from the surroundings, into the reaction, decreasing the temperature of the surroundings.
What is the general word equation for combustion?	
	A molecule containing 2 atoms e.g. Cl_2.
Define 'activation energy'	

1. Magnesium carbonate, $MgCO_3$, reacts with dilute hydrochloric acid, HCl.

Magnesium chloride, $MgCl_2$, water and carbon dioxide are made.

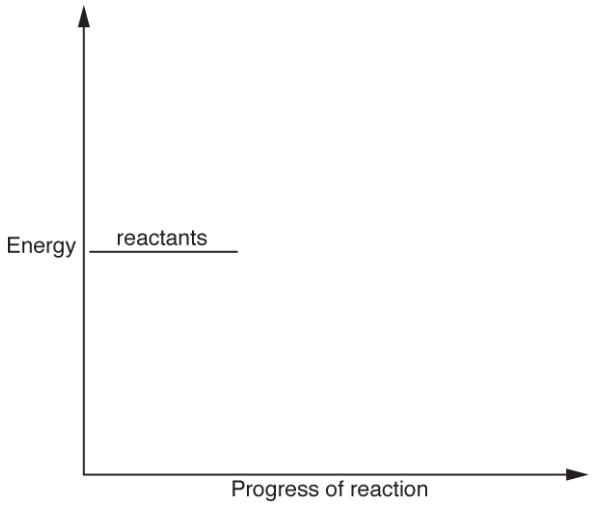
Write the **balanced symbol equation** for the reaction.

_____ **[2]**

2. Draw a labelled reaction profile for an **endothermic** reaction.

Use the following labels on your reaction profile:

- products
- energy change
- activation energy.



[4]

Due Date:	**Friday, 13th October 2023**
Student Number:	
Name:	

Y11 Combined T1 W6 C3 - Types of Chemical Reactions

Question	Answer
How can you detect the change in a pH of a solution?	Using universal indicator and a pH scale or a pH meter
What happens during oxidation?	Oxidation is the gain of oxygen or loss of electrons (OIL RIG)
Write the formula for each acid: hydrochloric, sulphuric and nitric	Hydrochloric acid: HCl Sulfuric acid: H_2SO_4 Nitric acid: HNO_3
What is a base?	A substance (usually a metal oxide or metal hydroxide) that neutralises an acid.
What ions are present in an alkaline solution?	OH^- ions (hydroxide ions)
Write the general equation for neutralisation.	Acid + base → salt + water
Write the ionic equation for neutralisation.	$H^+ + OH^- \rightarrow H_2O$
What happens to ions in a strong acid?	They fully ionise in water giving a high concentration of hydrogen ions and a low pH.
What happens to the pH as the concentration of H^+ ions increases?	As the concentration of H^+ ions increases by a factor of 10 the pH decreases by 1.

Look, Cover, Write, Check

Question	Answer
What happens during oxidation?	
Write the formula for each acid: hydrochloric, sulphuric and nitric	
What is a base?	
What ions are present in an alkaline solution?	
	Acid + base → salt + water
Write the ionic equation for neutralisation.	
What happens to ions in a strong acid?	
	As the concentration of H+ ions increases by a factor of 10 the pH decreases by 1.

Look, Cover, Write, Check

Question	Answer
How can you detect the change in a pH of a solution?	
What happens during oxidation?	
Write the formula for each acid: hydrochloric, sulphuric and nitric	
What is a base?	
What ions are present in an alkaline solution?	
Write the general equation for neutralisation.	
Write the ionic equation for neutralisation.	
What happens to ions in a strong acid?	
What happens to the concentration of pH as the concentration of H+ ions increases?	

1(a). A student reacts an acid with a metal carbonate. Complete the **word equation** for the reaction.

Acid + Metal Carbonate → _____ + _____ + _____ **[1]**

(b). The student uses universal indicator in his experiment. Why did the student use universal indicator?

_____

_____ **[1]**

(c). An acid has a pH of 3. The hydrogen ion concentration of the acid is 1×10^{-3} mol / dm^3.

A different acid has a pH of 1. What is the hydrogen ion concentration of this acid?

Answer = _____ (mol / dm^3) **[1]**

2. Which of these is the best explanation of what is meant by a strong acid?

A. There is a large amount of acid and a small amount of water.
B. There is a small amount of acid and a large amount of water.
C. The acid is completely ionised in solution in water.
D. The acid is partially ionised in solution in water.

Your answer ☐

[1]

Due Date:	**Friday, 20th October 2023**
Student Number:	
Name:	

Y11 Combined T1 W7 – P2 Newton's Laws

Question	Answer
What is Newton's first law?	An object remains is the same state of motion unless a resultant force acts on it.
What state of motions would an object have if the resultant force is zero?	Stationary or moving at a constant velocity
What is Newton's second law?	Force = mass x acceleration
What is Newton's third law?	When objects interact, they exert equal and opposite forces on each other.
What are contact forces?	Forces exerted between two objects when they are touching.
What are non-contact forces?	The push or pull between objects that are not physically touching when they interact.
What are the force pairs that occur when pushing a pram?	The person pushes the pram forwards, the pram pushes the person backwards.
What are the force pairs that occur between a satellite in orbit and the Earth?	The Earth pulls the satellite, and the satellite pulls the Earth.
What forces are acting on a skydiver?	Weight and air resistance
What is terminal velocity?	The maximum speed of an object, reached when the forces moving the object are balanced by frictional forces.

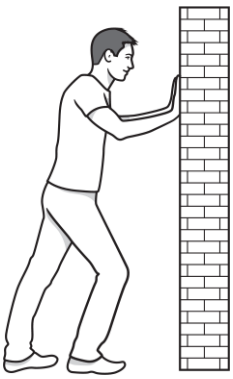
Look, Cover, Write, Check

Question	Answer
What are contact forces?	
What are non-contact forces?	
What is Newton's second law?	
What are the force pairs that occur when pushing a pram?	
What is Newton's third law?	
What forces are acting on a skydiver?	
What is terminal velocity?	
What is Newton's first law?	
What are the force pairs that occur between a satellite in orbit and the Earth?	
What state of motions would an object have if the resultant force is zero?	

Look, Cover, Write, Check

Question	Answer
	An object remains is the same state of motion unless a resultant force acts on it.
What state of motions would an object have if the resultant force is zero?	
	Force = mass x acceleration
	When objects interact, they exert equal and opposite forces on each other.
What are contact forces?	
What are non-contact forces?	
	The person pushes the pram forwards, the pram pushes the person backwards.
What are the force pairs that occur between a satellite in orbit and the Earth?	
	Weight and air resistance
	The maximum speed of an object, reached when the forces moving the object are balanced by frictional forces.

1. A man stands next to a wall. He exerts a force on the wall by pushing against the wall with both hands. His feet remain in the same place



Which statement is correct?

A Force of wall on man = 0.
B Force of wall on man < Force of man on wall.
C Force of wall on man = Force of man on wall.
D Force of wall on man > Force of man on wall.

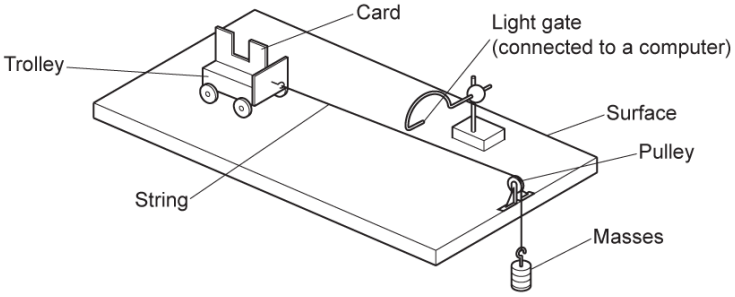
Your answer ☐

2. Which statement describes Newton's **third** law?

A Action and reaction are equal, opposite and act on the same object.
B Action and reaction are equal, opposite and act on separate objects.
C The rate of change of momentum is equal and opposite to resultant force.
D The rate of change of momentum is proportional to resultant force.

Your answer ☐

3. Student **A** does an experiment to find out if force is related to acceleration. She hangs a 400 g mass over the pulley.



How can she work out the accelerating force on the trolley?

Use an equation to help explain your answer.

_____

_____

Due Date:	**Friday, 10th November 2023**
Student Number:	
Name:	

Y11 Combined T2 W1 P3 - Static & Charge

Question	Answer
What is the difference between an insulator and a conductor?	An insulator is something that doesn't transfer electricity or heat, while a conductor does.
Describe the charge of protons, electrons and neutrons.	Protons have a positive charge, electrons have a negative charge and neutrons have a zero charge.
Describe how static electricity is generated.	When two insulators are rubbed together, friction causes electrons to transfer from one insulator to the other.
How are objects discharged?	The charged insulator needs to touch a conductor, which allows the electrons to flow through causing a spark.
What is current?	The rate of flow of charge.
What are the units of current?	Amps (A)
What is the difference between conventional current and electron flow?	The electricity in conventional current travels from the positive terminal of the battery to the negative terminal. Electron flow travels from the negative terminal to the positive terminal.
What equation relates charge and current?	Charge = Current x Time
What are the units of charge?	Coulombs (C)
What are the conditions needed for current to flow?	• A cell/battery, • a complete circuit.

Look, Cover, Write, Check

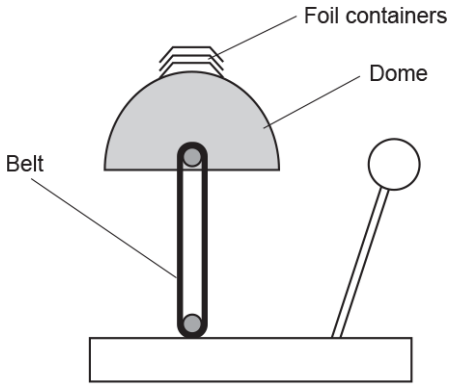
Question	Answer
What is the difference between an insulator and a conductor?	
Describe the charge of protons, electrons and neutrons.	
Describe how static electricity is generated.	
How are objects discharged?	
What is current?	
What are the units of current?	
What is the difference between conventional current and electron flow?	
What equation relates charge and current?	
What are the units of charge?	
What are the conditions needed for current to flow?	

Look, Cover, Write, Check

Question	Answer
What are the conditions needed for current to flow?	
	Amps (A)
	Protons have a positive charge, electrons have a negative charge and neutrons have a zero charge.
What is the difference between conventional current and electron flow?	
	The rate of flow of charge.
	The charged insulator needs to touch a conductor, which allows the electrons to flow through causing a spark.
What are the units of charge?	
	An insulator is something that doesn't transfer electricity or heat, while a conductor does.
Describe how static electricity is generated.	
What equation relates charge and current?	

1. A teacher demonstrates static electricity using a Van de Graaff generator.

She places 3 metal foil containers on top of the dome of the Van de Graaff generator. When the Van de Graaff generator is turned on, the foil containers fly off the dome one by one.



Explain why this happens. Use ideas about charge in your answer.

_____

_____

_____

_____

_____ **[4]**

Due Date:	**Friday, 17th November 2023**
Student Number:	
Name:	

Y11 Combined T2 W2 - P3 Resistance and Resistors

Question	Answer
What is resistance?	Resistance is a measure of **how difficult it is for current to flow through a component**.
What are the units for resistance?	**Ohms (Ω)**
How is resistance, current and potential difference related?	Potential different = Current x Resistance
What causes resistance?	The collisions of electrons with positive ions.
Describe the relationship between resistance and temperature in a thermistor.	As temperature increases resistance decreases.
Describe the relationship between resistance and light intensity in an LDR.	As light intensity increases resistance decreases.
What does LDR stand for?	Light dependent resistor
Where are LDRs used?	Street lights, screen lighting for your mobile phone
Where are thermistors used?	Thermostats / ovens
How do you find the total resistance in a series circuit?	Add up all the individual resistances in the circuit.

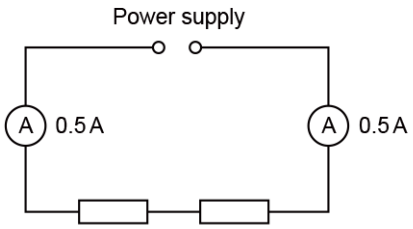
Look, Cover, Write, Check:

Question	Answer
What is resistance?	
What are the units for resistance?	
How is resistance, current and potential difference related?	
What causes resistance?	
Describe the relationship between resistance and temperature in a thermistor.	
Describe the relationship between resistance and light intensity in an LDR.	
What does LDR stand for?	
Where are thermistors used?	
Where are LDRs used?	
How do you find the total resistance in a series circuit?	

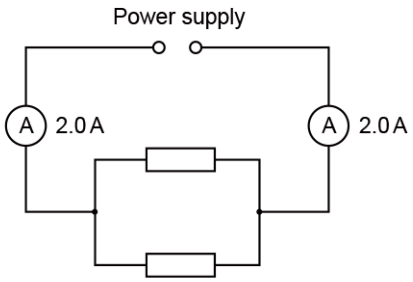
Look, Cover, Write, Check:

Question	Answer
	Resistance is a measure of how difficult it is for current to flow through a component.
	Ohms (Ω)
How is resistance, current and potential difference related?	
What causes resistance?	
Describe the relationship between resistance and temperature in a thermistor.	
Describe the relationship between resistance and light intensity in an LDR.	
	Light dependent resistor
	Thermostats / ovens
	Street lights, screen lighting for your mobile phone
How do you find the total resistance in a series circuit?	

1. * A student has a fixed voltage power supply and two identical resistors.
He sets up two different circuits **A and B** and measures the currents in each circuit.



Circuit **A**



Circuit **B**

Describe and explain the **similarities** and **differences** between circuit **A** and circuit **B**.
Use ideas about current and resistance in your answer.

_____

_____

_____

_____

_____

_____

_____

_____

_____ **[6]**

Due Date:	**Friday, 24th November 2022**
Student Number:	
Name:	

Y11 Combined T2 W3 B4 – Ecosystems

Question	Answer
Define 'ecosystem'	All the living organisms and non-living factors in an area.
What is a 'producer'?	An organism that **produces its own food** e.g. plants
What is a 'consumer'?	An organism that **eats other organisms** for energy e.g. animals
What is a 'decomposer'	An organism that **feeds on dead or decaying material** for energy e.g. bacteria or fungi.
What is a biotic factor? Give 2 examples.	A **living factor**. E.g. Number of predators, number of bacteria
What is an abiotic factor? Give 2 examples.	A **non-living factor**. E.g. soil pH and temperature.
What do animals compete for?	Food, water, space (territory), shelter, breeding partners
What do plants compete for?	Light, minerals, carbon dioxide, water, space.
What is predation?	When an animal (predator) hunts and eats another animal (prey).
What is a mutualistic relationship? Give an example.	**A mutualistic relationship is when both organisms benefit** from each other another**. E.g. Oxpecker and buffalo** – the oxpecker eats the fleas off the buffalo.
What is a parasitic relationship? Give an example.	A parasitic relationship is when **only one organism benefits** and the other organism is harmed. **E.g. Fleas living on other animals**.

Look, Cover, Write, Check

Question	Answer
What is a 'decomposer'	
What is a 'producer'?	
What is a 'consumer'?	
Define 'ecosystem'	
What do plants compete for?	
What is an abiotic factor? Give 2 examples.	
What do animals compete for?	
What is a biotic factor? Give 2 examples.	
What is a parasitic relationship? Give an example.	
What is a mutualistic relationship? Give an example.	
What is predation?	

Look, Cover, Write, Check

Question	Answer
Define 'ecosystem'	
	An organism that **produces its own food** e.g. plants
	An organism that **eats other organisms** for energy e.g. animals
What is a 'decomposer'	
What is a biotic factor? Give 2 examples.	
	A **non-living factor**. E.g. soil pH and temperature.
What do animals compete for?	
What do plants compete for?	
	When an animal (predator) hunts and eats another animal (prey).
What is a mutualistic relationship? Give an example.	
What is a parasitic relationship? Give an example.	

Describe the levels of organisation in the savannah.
Complete the missing parts of the table.

Part of savannah	Level	Description
giraffes **elephants** **zebras** **trees** **grasses** **weather** **soil** **atmosphere**	.....	The living organisms in an area, together with the non-living components of the environment.
giraffes **elephants** **zebras** **trees** **grasses**	.....	....
zebras	.....	....
zebra	organism	individual

Due Date:	**Friday, 1st December 2023**
Student Number:	
Name:	

Y11 Combined T2 W4 P3 – Electricity

Question	Answer
Define 'current'	The rate of flow of charge.
Define 'potential difference'	The difference of electrical potential (energy) between two points in a circuit.
How does current behave in a series circuit?	Current is the same at every point in a series circuit.
How does potential difference behave in a series circuit?	Potential difference is shared between the components in a series circuit.
How does current behave in a parallel circuit?	Current splits between the loops in a parallel circuit.
How does potential difference behave in a parallel circuit?	Potential difference is not shared between the loops in a parallel circuit.
What is the relationship between resistance and current?	An increase in resistance leads to a decrease in current.

Look, Cover, Write, Check

Question	Answer
Define 'current'	
Define 'potential difference'	
How does current behave in a series circuit?	
How does potential difference behave in a series circuit?	
How does current behave in a parallel circuit?	
How does potential difference behave in a parallel circuit?	
What is the relationship between resistance and current?	

Look, Cover, Write, Check

Question	Answer
Define 'current'	
Define 'potential difference'	
	Current is the same at every point in a series circuit.
	Potential difference is shared between the components in a series circuit.
How does current behave in a parallel circuit?	
	Potential difference is not shared between the loops in a parallel circuit.
	An increase in resistance leads to a decrease in current.

1. A student measures the energy transferred by an electrical heater.
Which row in the table shows the correct apparatus he used?

	To measure potential difference	To measure current	To measure time
A	Ammeter	Voltmeter	Thermometer
B	Joulemeter	Ammeter	Thermometer
C	Voltmeter	Ammeter	Stopwatch
D	Voltmeter	Joulemeter	Stopwatch

Your answer ☐ **[1]**

2 A motor uses 2 cells in series.

Each cell has a potential difference of 1.5 V.

i. Write down the total potential difference of the cells.

Answer = _____ V **[1]**

ii. The motor has a resistance of 6.0 Ω.

Calculate the current in the circuit when the motor is in use.

Use the equation: Potential difference = Current × Resistance

Answer = _____ A **[3]**

Due Date:	**Friday, 8th December 2023**
Student Number:	
Name:	

Y11 Combined T2 W5 B3 - The Nervous System

Question	Answer
What do receptor cells detect?	They detect different stimuli.
What are the three main neurons called?	Sensory neurone, relay neurone and motor neurone.
What happens to a stimulus once it has been detected?	It is converted into an electrical impulse which can travel along sensory neurones to the CNS.
What are the receptors and stimuli associated with the skin organ?	Receptor cells detect pressure and temperature. The stimulus is pressure and heat.
What is a reflex action?	A reflex action is an involuntary response that bypasses the brain.
Write the pathway/order of a nervous reaction	Stimulus → Receptor cells → Sensory neurone → Brain → Motor neurone → Effector → Response
Write the pathway/order of a reflex response	Stimulus → Receptor cells → Sensory neurone → Spinal cord → Motor neurone → Effector → Response
Why is a reflex response faster than a voluntary response?	The response bypasses (misses out) the brain, so the body can respond faster.
What is the difference between a receptor and an effector?	A receptor detects the change in stimuli whereas an effector is a muscle or gland that initiates a response

Look, Cover, Write, Check

Question	Answer
What do receptor cells detect?	
	Sensory neurone, relay neurone and motor neurone.
What happens to a stimulus once it has been detected?	
What are the receptors and stimuli associated with the skin organ?	
What is a reflex action?	
Write the pathway/order of a nervous reaction	
	Stimulus → Receptor cells → Sensory neurone → Spinal cord → Motor neurone → Effector → Response
Why is a reflex response faster than a voluntary response?	
	A receptor detects the change in stimuli whereas an effector is a muscle or gland that initiates a response

Look, Cover, Write, Check

Question	Answer
What do receptor cells detect?	
What are the three main neurons called?	
What happens to a stimulus once it has been detected?	
What are the receptors and stimuli associated with the skin organ?	
What is a reflex action?	
Write the pathway/order of a nervous reaction	
Write the pathway/order of a reflex response	
Why is a reflex response faster than a voluntary response?	
What is the difference between a receptor and an effector?	

1. Benny is cooking his tea. He lifts a hot plate of food. The plate is very hot. Benny holds onto the plate until he can slowly put it down.

Benny's response to the hot plate is **not** a reflex action. Explain why his response is not a reflex action.

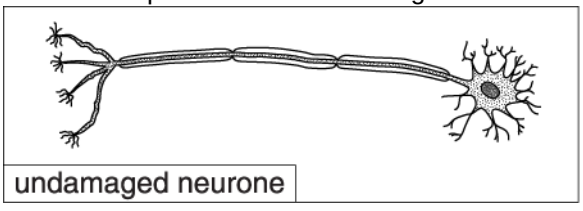
_____

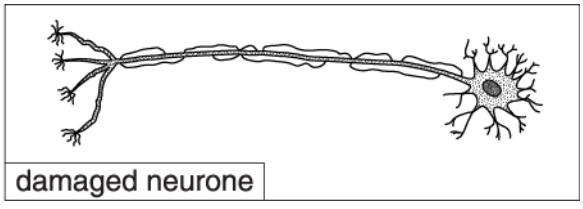
_____

_____ **[2]**

2. Sometimes motor neurones can be damaged.

Look at the pictures of an undamaged and a damaged neurone.





How would the damage affect the transmission of impulses?

Explain your answer.

_____

_____

_____ **[2]**

Due Date:	**Friday, 15th December 2023**
Student Number:	
Name:	

Y11 Combined T2 W6 C4 – Reactivity of Group 1, 7 and 0

Question	Answer
What is the name of group 1?	Alkali metals.
What is the name of group 7?	Halogens.
What makes group 1 metals reactive?	They want to **lose 1 electron** and form a full outer shell.
What makes group 7 reactive?	They want to **gain 1 electron** and form a full outer shell.
Describe the trend in reactivity of group 1.	As you go **down group 1, reactivity increases.**
Why do group 1 elements become more reactive down the group?	Atomic radii increases, the electrostatic attraction becomes weaker so it is **easier to lose an electron**.
Describe the trend in reactivity of group 7.	As you go **down group 7, reactivity decreases.**
Why do group 7 elements become less reactive down the group?	Atomic radii increases, the electrostatic attraction becomes weaker so it is **harder to gain an electron**.
What does 'inert' mean?	Unreactive
Why are group 0 inert?	They already have a full outer shell therefore they do not want to lose or gain electrons.

Look, Cover, Write, Check

Question	Answer
What is the name of group 1?	
What is the name of group 7?	
What makes group 1 metals reactive?	
What makes group 7 reactive?	
Describe the trend in reactivity of group 1.	
Why do group 1 become more reactive down the group?	
Describe the trend in reactivity of group 7.	
Why do group 7 become less reactive down the group?	
What does 'inert' mean?	
Why are group 0 inert?	

Look, Cover, Write, Check

Question	Answer
	Alkali metals.
	Halogens.
What makes group 1 metals reactive?	
Why are group 0 inert?	
	As you go down the group, reactivity increases.
Why do group 1 elements become more reactive down the group?	
	As you go down the group, reactivity decreases.
	Atomic radii increases, the electrostatic attraction becomes weaker so it is **harder to gain an electron**.
	Unreactive
What makes group 7 reactive?	

1. This question is about the elements in Group 1. Which row of the table is correct?

	Reactivity	Reason
A	decreases down the group	it is easier to form positive ions
B	decreases down the group	it is easier to form negative ions
C	increases down the group	it is easier to form positive ions
D	increases down the group	it is easier to form negative ions

Your answer ☐ **[1]**

2(a). Group 1 elements are stored under oil.

Explain why Group 1 elements are stored under oil.

_____

_____

_____ **[2]**

(b). Lithium, sodium and potassium are all Group 1 elements.

Write down the name of one **other** Group 1 element. Use the Periodic Table to help you.

_____**[1]**

Due Date:	**Friday, 22nd December 2023**
Student Number:	
Name:	

Y11 T2 W7 P4 – Radioactivity

Question	Answer
What is an isotope?	Atoms of the same element with different numbers of neutrons.
Why are some isotopes radioactive?	Some atoms are radioactive because they are unstable, usually due to too many neutrons.
What is radioactive decay?	The breakdown of a radioactive isotope by the release of alpha, beta, gamma or a neutron.
Where does radiation come from?	Radiation is released from the nucleus of the atom.
What is the structure of alpha radiation?	Alpha radiation is the same as a helium nucleus: 2 protons and 2 neutrons.
What is the structure of beta radiation?	Beta radiation is a high-speed electron.
What is the structure of gamma radiation?	Gamma is an electromagnetic wave with a very short wavelength and high frequency.
Why is radioactive decay described as random?	You cannot predict when, or which, nucleus will decay next.
What is activity?	The number of isotopes which decay per second. Measure in Becquerels (Bq).
What is the definition of half-life?	The time taken for the activity of a source to decay by half.

Look, Cover, Write, Check

Question	Answer
Where does radiation come from?	
What is activity?	
What is the structure of alpha radiation?	
Why are some isotopes radioactive?	
What is the definition of half-life?	
What is the structure of gamma radiation?	
What is the structure of beta radiation?	
What is an isotope?	
What is radioactive decay?	
Why is radioactive decay described as random?	

Look, Cover, Write, Check

Question	Answer
	The time taken for the activity of a source to decay by half.
Why are some isotopes radioactive?	
	Radiation is released from the nucleus of the atom.
What is activity?	
	Atoms of the same element with different numbers of neutrons.
	Alpha radiation is the same as a helium nucleus: 2 protons and 2 neutrons.
What is the structure of gamma radiation?	
What is radioactive decay?	
	Beta radiation is a high-speed electron.
Why is radioactive decay described as random?	

1(a). Carbon-14 can be used to date ancient objects.

An ancient object is 17 100 years old. The half-life of carbon-14 is 5700 years.

For the ancient object, what is the ratio of the original amount of carbon-14 to the amount of carbon-14 left?

Ratio = ... **[3]**

(b). This is the equation for the radioactive decay of carbon-14:

$$^{14}_{6}C \longrightarrow {}^{14}_{7}N + {}^{0}_{-1}e$$

i. Which type of radiation is emitted by carbon-14?

_____**[1]**

ii. Describe how the mass and charge of the nucleus changes when the carbon-14 decays.

Mass _____

Charge _____**[2]**

Due Date:	**Friday, 12th January 2024**
Student Number:	
Name:	

Y11 Combined T3 W1 P4 – Electromagnetic Radiation

Question	Answer
What type of waves are electromagnetic waves?	Transverse
How fast do electromagnetic waves travel in a vacuum?	300 000 000 m/s **or** 3 x 10^8 m/s (The speed of light)
Name the waves in the electromagnetic spectrum.	Radio waves, microwaves, infra-red radiation, visible light, ultra violet (UV), X-rays, gamma rays.
Which electromagnetic wave has the longest wavelength?	Radio waves
Which electromagnetic wave has the highest frequency?	Gamma rays
Which type of electromagnetic wave has the highest energy?	Gamma rays
Which type of electromagnetic wave is emitted by hot objects?	Infra-red radiation
What are gamma rays used for?	Sterilisation of medical equipment Killing cancer cells (radiotherapy)
Which electromagnetic waves are harmful? Why?	UV, X-rays, gamma rays They are ionising and can cause DNA mutations which can lead to cancer.
Which type of electromagnetic waves are used in communication?	Radio waves, microwaves and visible light

Look, Cover, Write, Check

Question	Answer
What type of waves are electromagnetic waves?	
How fast do electromagnetic waves travel in a vacuum?	
Name the waves in the electromagnetic spectrum.	
Which electromagnetic wave has the longest wavelength?	
Which electromagnetic wave has the highest frequency?	
Which type of electromagnetic wave has the highest energy?	
Which type of electromagnetic wave is emitted by hot objects?	
What are gamma rays used for?	
Which electromagnetic waves are harmful? Why?	
Which type of electromagnetic waves are used in communication?	

Look, Cover, Write, Check

Question	Answer
What type of waves are electromagnetic waves?	
How fast do electromagnetic waves travel in a vacuum?	
	Radio waves, microwaves, infra-red radiation, visible light, ultra violet (UV), X-rays, gamma rays.
	Radio waves
Which electromagnetic wave has the highest frequency?	
Which type of electromagnetic wave has the highest energy?	
Which type of electromagnetic wave is emitted by hot objects?	
	Sterilisation of medical equipment Killing cancer cells (radiotherapy)
	UV, X-rays, gamma rays They are ionising and can cause DNA mutations which can lead to cancer.
	Radio waves, microwaves and visible light

1(a). Electromagnetic waves are usually divided into seven different groups.

This diagram of the electromagnetic spectrum is incomplete.

Complete the diagram by adding the missing parts of the electromagnetic spectrum.

	microwaves	infra-red	visible light		X-rays	gamma rays

[1]

(b). Describe how X-rays and gamma rays can damage humans.

_____

_____**[1]**

(c). All waves have a **frequency.**

i. Which part of the electromagnetic spectrum has the **highest** frequency?

_____

_____**[1]**

ii. What happens to the wavelength of an electromagnetic wave as the frequency increases? Tick (✓) **one** box.

Decreases ☐

Increases ☐

Stays the same ☐

[1]