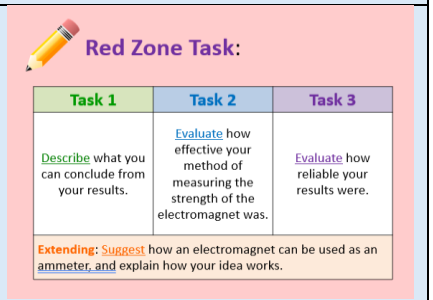
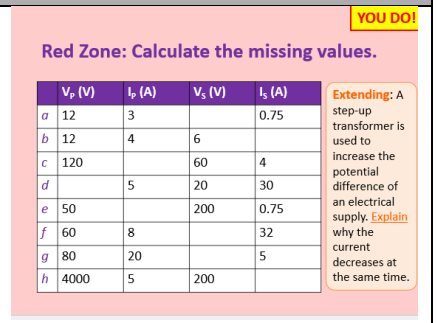
Learning Intention	Vocab	Concept	Retrieval	Success Criteria	Hinge Questions for this lesson	Red Zone
Week 9 Lesson 1 Inset Day						
Week 9 Lesson 2 How do we stay safe with electricity? L18 fuses and circuit breakers.pptx	Insulation, Fuse, Earth Wire, Hazard	Electricity and Electromagnetism	Water and metal conduct electricity and can cause electric shocks. Safety devices like fuses and circuit breakers prevent damage and injury.	1. Explain the difference in function between the live and the neutral mains input wires. 2. Explain the function of an earth wire and of fuses or circuit breakers in ensuring safety. 3. Explain why switches and fuses should be connected in the live wire of a domestic circuit. 4. Recall the potential differences between the live, neutral and earth mains wires. 5. Explain the dangers of providing any connection between the live wire and earth	What does a fuse do? A. stores charge B. Increase voltage C. Breaks circuit when current is too high	Compare and contrast circuit breakers and fuses as safety devices. (4 marks)
Week 9 Lesson 3 What are magnets and what do their forces look like? Magnets and fields EMI.pptx	Poles, Field lines, Attraction, Repulsion	Electricity and Electromagnetism	Understanding that some materials (like iron) are magnetic, Knowing that forces can act at a distance	1. Recall when magnets attract and repel. 2. Explain the difference between permanent and induced magnets 3. Describe the uses of permanent and temporary magnets.	If you put two magnets near each other and they immediately push away from one another, what does this tell you about the poles and the force? A) The poles facing each other are different (North	Describe how a student could show that the paper clips are induced magnets. A student wants to determine the shape of the magnetic field for a large area around a magnet. Describe how the student should

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			(e.g., gravity, electrostatic)	4. Describe the shape and direction and strength of the magnetic field around bar magnets and for a uniform field. 5. Use plotting compasses to show the shape and direction of the field of a magnet and the Earth's magnetic field 6. Explain how the behaviour of a magnetic compass is related to evidence that the core of the Earth must be magnetic	and South) and the force is attractive. B) The poles facing each other are the same (e.g., North and North) and the force is repulsive. C) The magnets have run out of energy and can no longer pull together.	carry out an investigation using just one plotting compass.
Week 9 Lesson 4 What are electromagnets and how do we change their strength? Electromagnetism power point EMI.pptx	Current, Coil, Iron core, Turns	Electricity and Electromagnetism	Basic idea of electric current and circuits, Familiarity with the concept of coils and how they carry current	1. Describe how current can be used to make an electromagnet. 2. Describe the effect of altering the size and direction of the current. 3. Recall the effect of the size of the current and the distance from the conductor. 4. Explain how the fields interact in a solenoid and the effect of this on the field.	Which of these will make an electromagnet stronger? A) Using a shorter piece of wire. B) Adding more turns to the coil of wire. C) Turning off the electricity.	

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Week 10 Lesson 1 **PAZ Assessment period (Revision lesson)** **Marked piece 1**						
Week 10 Lesson 2 **PAZ Assessment period (Revision lesson)**						
Week 10 Lesson 3 **PAZ Assessment period (Revision lesson)**						
Week 10 Lesson 4 **PAZ Assessment period (Revision lesson)**						
Week 11 Lesson 1 **PAZ Assessment period (Revision lesson)**						
Week 11 Lesson 2 **PAZ Assessment period (Revision lesson)**						
Week 11 Lesson 3 **PAZ Assessment period (Revision lesson)**						
Week 11 Lesson 4 **PAZ Assessment period (Revision lesson)**						
Week 12 Lesson 1 **Responsive Curriculum**						
Week 12 Lesson 2 **How do magnetic forces work? (H)** **Magnetic forces (Higher tier only) EMI.pptx**	**Interaction, Field strength, Direction, Force**	**Electricity and Electromagnetism**	**Knowledge of vector quantities (direction and magnitude), Understanding of magnetic field diagrams**	**1. Describe how currents and magnetic fields interact.** **2. Explain how magnetic forces occur.** **3. Use Flemming's left hand rule.** **4. Use the equation:** **$F = B \times I \times l$**	**A wire carrying a current is placed between two magnetic poles. If the wire is placed exactly parallel to the magnetic field lines, what happens to the magnetic force acting on the wire?** **A) The force is at its**	**The apparatus shown here is placed on a balance. The wire is held so that it cannot move. Explain how the reading on the balance changes when the current is switched on.**

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			and how field lines behave		**maximum because the wire is aligned with the field.** **B) The force is zero because the wire must be at an angle to the field lines to experience a force.** **C) The force is reversed because parallel wires cause the magnetic poles to swap.**	
Week 12 Lesson 3 Why are transformers used in the national grid? Transformers power point EMI.pptx	Efficiency, Voltage, Transmission, Power loss	Electricity and Electromagnetism	Awareness of energy loss in transmission over long distances, Understanding of alternating current (AC) and its role in power systems	1. Describe and explain how electrical energy is transferred in the national grid. 2. Explain where and why step-up and step-down transformers are used.	Why does the National Grid use a step-up transformer to increase the voltage to 400,000V before sending electricity through long-distance cables? A) Higher voltage makes the electricity travel much faster through the wires. B) Increasing the voltage lowers the current, which prevents the wires from getting too hot and wasting energy. C) It is safer to have very high voltage in the cables in case they are hit by lightning.	The first public power station was built in the centre of New York. It used generators to supply direct current at 110 V. The cables had to go underground, and they could only supply nearby shops and offices. The electricity was mainly used for electric light. The development of alternating current generators led to major changes in the way electricity is transmitted and used. Compare the modern National Grid system with the early system in New York.

Learning Intention	Vocab	Concept	Retrieval	Success Criteria	Hinge Questions for this lesson	Red Zone
Week 12 Lesson 4 Inset Day						
Week 13 Lesson 1 Inset Day						
Week 13 Lesson 2 How do transformers work? **Transformers and energy EMI.pptx**	Coils, Induction, Primary, Secondary	Electricity and Electromagnetism	Knowing how electromagnetic induction works, Understanding the structure of coils and how voltage changes with turns	Use the power equation (for transformers with 100% efficiency): Vp × Ip = Vs × Is	How does the energy get from the first coil of wire to the second coil in a transformer? A) The electricity flows through the iron core to reach the second coil. B) A changing magnetic field carries the energy across. C) The two coils of wire are tied together so the sparks can jump.	
Week 13 Lesson 3 What is photosynthesis? 1. CB6a-Photosynthesis EMI.pptx	Chlorophyll, Glucose, Sunlight, Carbon dioxide	Biological Molecules and Processes	- Plants make their own food - Sunlight provides energy for life processes	1. Describe photosynthetic organisms as the main producers of food and therefore biomass. 2. Describe photosynthesis in plants and algae as an endothermic reaction that uses light energy to react carbon dioxide and water to produce glucose and oxygen 3. Describe the structure and function of the stomata.	Which statement correctly describes photosynthesis? A. Plants convert glucose and oxygen into carbon dioxide and water. B. Plants absorb glucose from the soil and use it to make oxygen. C. Plants use light energy to convert carbon dioxide and water into glucose and oxygen. D. Plants use light to break down minerals into glucose.	6 MQ: Explain how the adaptations of the stomata help its function.

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					Correct answer: C	
Week 13 Lesson 4 What are the factors that affect photosynthesis? Factors affecting photosynthesis.pptx	Light, Temperature, Carbon dioxide, Rate	Biological Molecules and Processes	- Photosynthesis needs light, carbon dioxide, and water - Temperature influences biological reaction	1. Explain the effect of temperature, light intensity and carbon dioxide concentration on the rate of photosynthesis. **2. Explain the interactions of temperature, light intensity and carbon dioxide concentration in limiting the rate of photosynthesis. (HT)** **3. Explain how the rate of photosynthesis is directly proportional to light intensity and inversely proportional to the distance from a light source, including the use of the inverse square law calculation. (HT)**	Which factor will NOT directly affect the rate of photosynthesis? A. Light intensity B. Carbon dioxide concentration C. Temperature D. Amount of chlorophyll in animal cells Correct answer: D	6 MQ: A farmer wants to increase his crop yield in the greenhouse. How would you advise him to do this?
Week 14 Lesson 1 **Responsive Curriculum**						
Week 14 Lesson 2 Core practical: Investigating the effect of light	rate, photosynthesis, pondweed,	Biological Molecules and Processes	- Photosynthesis produces oxygen - Practical	To investigate the effect of light intensity on the rate of photosynthesis.	Why do we place the lamp at different distances from the pondweed? A. To change the temperature of the water	Analysis of experiment

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intensity on the rate of photosynthesis. (1 of 2 lessons) Core-Practical CB6-Light-Intensity-and-Photosynthesis EMI.pptx	light intensity		experiments require control of variables		B. To change the light intensity reaching the plant C. To increase the amount of carbon dioxide in the water D. To make the plant release more minerals Correct answer: B	
Week 14 Lesson 3 Core practical: Investigating the effect of light intensity on the rate of photosynthesis. (2 of 2 lessons) Core-Practical CB6-Light-Intensity-and-Photosynthesis lesson 2 EMI.pptx	rate, photosynthesis, pondweed, light intensity	Biological Molecules and Processes	- Photosynthesis produces oxygen - Practical experiments require control of variables	To investigate the effect of light intensity on the rate of photosynthesis.	Why do we place the lamp at different distances from the pondweed? A. To change the temperature of the water B. To change the light intensity reaching the plant C. To increase the amount of carbon dioxide in the water D. To make the plant release more minerals Correct answer: B	Analysis of experiment
Week 14 Lesson 4 How do plants absorb water and minerals?	Roots, Osmosis, Active transport, Soil	Biological Molecules and Processes Cells and Systems	- Roots take in substances from soil - Water moves through osmosis;	1. Explain how substances are transported into and out of cells, including by diffusion, osmosis and active transport. 2. Explain how the structure	How do plants take in water and mineral ions? A. Through root hair cells by osmosis and active transport	6MQ: Explain how the adaptations of the root hair cell help it to absorb water efficiently.

Learning Intention	Vocab	Concept	Retrieval	Success Criteria	Hinge Questions for this lesson	Red Zone
3. CB6c-Absorbing-Water-and-Mineral-Ions EMI.pptx			minerals by active transport	of the root hair cells is adapted to absorb water and mineral ions	B: Through stomata by diffusion C. Through leaves by transpiration D. Through xylem by respiration Correct answer: A	
Week 15 Lesson 1 How do water and minerals move around plants? 4. CB6d-Transpiration-and-Translocation EMI .pptx 6 Marker assessed piece 2	Xylem, Transpiration , Vessels, Flow	Biological Molecules and Processes Cells and Systems	- Plants have transport systems (xylem and phloem) - Water evaporates from leaves (transpiration)	1. Explain how the structures of the xylem and phloem are adapted to their function in the plant. 2. Describe how water and mineral ions are transported through the plant by transpiration, including the structure and function of the stomata. 3. Describe how sucrose is transported around the plant by translocation. 4. Explain the effect of environmental factors on the rate of water uptake by a plant, to include light intensity, air movement and temperature. 5. Demonstrate an understanding of rate	Which statement is TRUE about transport in plants? A. Water and minerals move in the phloem. B. Glucose moves in the xylem. C. Water moves up the plant in the xylem. D. Minerals move from leaves to roots in the phloem. Correct answer: C	6MQ: Compare transpiration and translocation.

Learning Intention	Vocab	Concept	Retrieval	Success Criteria	Hinge Questions for this lesson	Red Zone
				calculations for transpiration		
Week 15 Lesson 2 What is an ecosystem? Ecosystems EMI.pptx	Community, Habitat, Interaction, Environment	Ecosystems and Environmental Interactions	- Living things interact with their environment - Organisms have roles (e.g., producers, consumers)	1. State what is meant by the ecological terms community, population and habitat. 2. Give examples of an ecosystem, a community, a population and a habitat. 3. Describe the organisation of the components of an ecosystem (including populations, communities, habitats and abiotic factors). 4. Describe how the interdependence of organisms in an ecosystem allows their survival. 5. Explain how to estimate population size, including the use of quadrats.	Which option best describes an ecosystem? A. A group of the same species living together B. A community of organisms and the abiotic factors that affect them C. A habitat where only plants live D. A food chain with producers and consumers Correct answer: B	You have to design an animal thinking about all the adaptations that it has for its particular habitat.
Week 15 Lesson 3 How do abiotic factors affect ecosystems? Abiotic & Biotic HPA EMI.pptx	Temperature, Light, Water, Soil	Ecosystems and Environmental Interactions	- Non-living factors like light and temperature influence life - Organisms	1. Give examples of abiotic factors. 2. Explain how communities are affected by abiotic factors (temperature, light, water, pollutants). 3. Explain how to investigate	Which abiotic factor could directly reduce plant growth? A. Number of predators B. Disease spread C. Soil pH D. Competition for food	A woodland area shows these changes over one week: Fewer fungi More fast-growing grasses A drop in insect numbers Identify TWO abiotic factors that

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			adapt to their surroundings	the effect of abiotic factors on the distribution of organisms using belt transects.	Correct Answer : C	could have changed, and explain how each one could cause ONE of the changes above.
Week 15 Lesson 4 How do biotic factors affect ecosystems? Ecosystems & Materials Cycles – Biotic Factors.pptx	Predators, Competition, Disease, Food	Ecosystems and Environmental Interactions	- Living things compete for resources - Predators and prey affect population size	1. Give examples of biotic factors. 2. Describe how competition can affect communities. 3. Describe how predation can affect communities. 4. Explain how predator-prey cycles affect communities. 5. Explain how the structure of a community can affect biodiversity.	Which biotic factor could cause a decrease in a rabbit population? A. Temperature drop B. Soil moisture C. Light intensity D. Increased predator numbers Correct answer: D	A grassland community has changed over the past year: Rabbit numbers have fallen Fox numbers have risen slightly Two plant species have disappeared One fast-growing weed species now dominates the area Using biotic factors only, explain why these changes might have happened.