Curriculum Map: Year 8 Science		
Half Term 5		
Topic	Periodic Table	Mains Electricity.
Intent	Students will learn about the development of the periodic table over time. They will look at the work of different scientists and how this work led to new discoveries about the periodic table.	This unit on Mains Electricity aims to empower students to understand the fundamental principles behind the electricity that powers their homes and everyday devices. Students will explore the journey of electrical energy from its generation to its safe and effective use. They will investigate the key concepts of voltage, current, and resistance, and how these factors interact within electrical circuits connected to the mains supply. Furthermore, students will learn about the essential safety features and considerations associated with mains electricity, developing an awareness of potential hazards and responsible usage.
Key Knowledge	• The Periodic Table • The varying physical and chemical properties of different elements • The principles underpinning the Mendeleev Periodic Table • The Periodic Table: periods and groups; metals and non-metals • How patterns in reactions can be predicted with reference to the Periodic Table • The properties of metals and non-metals	• Mains Electricity: the source of power for many appliances in homes and schools. • Voltage (potential difference): the 'push' that makes electric current flow. • Current: the rate of flow of electrical charge. • Resistance: the opposition to the flow of electric current. • The relationship between voltage, current, and resistance (Ohm's Law in a qualitative sense). • Series and parallel circuits connected to the mains supply and how components behave in each. • The function and importance of fuses as safety devices in mains circuits. • The function and importance of circuit breakers as safety devices in mains circuits. • The purpose of the earth wire in mains electricity and its role in safety. • The dangers of electricity, including electric shock and fire hazards. • Safe practices when using mains electricity and electrical appliances. • Power (energy transfer): the rate at which electrical energy is transferred in mains circuits. • The relationship between power, voltage, and current.

Retrieval Practice	• Recap atoms, elements, and compounds • Use of Do now with this unit, last unit and last year	• Recap of electricity in circuits. • Use of Do now with this unit, last unit and last year
Key Skills	• Use of the relevant scientific vocabulary compose explanations and justifications. • This historical context provides an opportunity for students to show an understanding of why and describe how scientific methods and theories develop over time.	• Use scientific vocabulary, terminology, and definitions confidently in both written and spoken work. • Graph skills. • Analysis of data.
Key Vocabulary	Atoms, elements, nucleus, protons, neutrons, electrons, mass number, atomic number, positive, negative, mass, shells, rows, periods, properties, groups, metals, nonmetals.	Mains Electricity Voltage Potential Difference Current Amperes Resistance Ohms Circuit Component Power Watts Energy Transfer Series Circuit Parallel Circuit Fuse Circuit Breaker Switch Earth Wire Live Wire Neutral Wire Appliance Electric Shock Short Circuit Overload Insulation Hazard Safety Precautions
Key Reading	BBC bitesize key stage 3 Exploring science Knowledge organiser Reading comprehension articles	BBC bitesize key stage 3 Exploring science Knowledge Organiser Reading comprehension articles
End Point	Students are competent in answering structured and longer response exam style questions.	Students are competent in answering structured and longer response exam style questions. Students can plot and analyse line graphs.
Form of Assessment	End of topic assessment with synoptic questions	End of topic assessment with synoptic questions
Enrichment Opportunities	Use of outdoor classroom. As Universities start to offer science-based workshops again Y7 will be given the opportunity to take part in trips to local Universities to gain insights into scientific courses and careers. Stem provision in school providing opportunities for workshops and outside speakers. British Science Week Link to science careers.	
Leadership Opportunities	Chances to formally present within lessons and take ownership of that process. Student examples to demonstrate good quality work. Group work within lessons where students think about how to take up a role within a group.	

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Curriculum Map: Year 7 Science			
Half Term 6			
Topic	Inheritance and Natural Selection	Respiration	Ecology
Intent	This unit on Inheritance and Natural Selection will introduce students to the fundamental mechanisms that drive the diversity of life on Earth. Students will explore how characteristics are passed from parents to offspring through genetic material, leading to variation within populations. They will then investigate the concept of natural selection, understanding how environmental pressures can favour certain traits, leading to adaptation and evolution over time.	This unit on Respiration will enable students to understand how living organisms obtain energy through the process of respiration. Students will explore both aerobic and anaerobic respiration, comparing the processes, products, and energy released. They will investigate how respiration is essential for life, supporting various activities and bodily functions. Furthermore, students will examine the factors that can affect respiration and explore examples of anaerobic respiration in different organisms and contexts.	This unit on Ecology will introduce students to the interconnectedness of living organisms and their environments. Students will explore how organisms interact with each other and their surroundings, focusing on key concepts such as food chains, food webs, and nutrient cycles. They will investigate how populations are affected by various factors, including competition, interdependence, and human impact. Ultimately, students will develop an understanding of the importance of ecological balance and the need for sustainable practices to protect our planet.
Key Knowledge	• Characteristics are passed from parents to offspring. • This passing of characteristics is called inheritance. • Inheritance involves genetic information. • Offspring often show variation in their characteristics. • Variation means there are differences between individuals in a population. • Some variation is inherited, and some is due to the environment.	• Respiration is the process by which living organisms release energy from food (glucose). • This energy is needed for all life processes (movement, growth, repair, etc.). • There are two main types of respiration: aerobic and anaerobic. • Aerobic respiration requires oxygen. • The word equation for aerobic respiration is: Glucose + Oxygen → Carbon Dioxide + Water + Energy (released). • Aerobic respiration takes place mainly in the mitochondria of cells.	• Ecology is the study of the interactions between living organisms and their environment. • An ecosystem is a community of interacting organisms and their physical environment. • An environment includes all the living (biotic) and non-living (abiotic) factors that affect an organism. • Biotic factors are the living parts of an ecosystem (e.g., plants, animals, fungi, bacteria).

	• The environment can present challenges to survival and reproduction. • Individuals with characteristics that make them better suited to their environment are more likely to survive. • These surviving individuals are also more likely to reproduce and pass on their advantageous characteristics. • This process is called natural selection. • Over many generations, natural selection can lead to populations becoming adapted to their environment. • Adaptation means a feature that helps an organism survive and reproduce in its environment. • Evolution is the change in the inherited characteristics of a population over time through natural selection. • Examples of adaptations in different animals and plants. • Understanding that evolution is a gradual process that happens over many generations. • The role of fossils in providing evidence for evolution. • How selective breeding by humans is different from natural selection.	• Aerobic respiration releases a relatively large amount of energy. • Anaerobic respiration does not require oxygen. • Anaerobic respiration releases less energy than aerobic respiration. • There are different types of anaerobic respiration, producing different waste products. • In animals, one type of anaerobic respiration produces lactic acid. • The word equation for anaerobic respiration in animals (during exercise) is: Glucose → Lactic Acid + Energy (released). • Lactic acid build-up in muscles can cause fatigue and cramps. • The body can eventually break down lactic acid when oxygen becomes available. • In yeast and some plants, another type of anaerobic respiration produces ethanol (alcohol) and carbon dioxide. • The word equation for anaerobic respiration in yeast is: Glucose → Ethanol + Carbon Dioxide + Energy (released). • Anaerobic respiration in yeast is used in brewing and baking. • Understanding the differences between aerobic and anaerobic respiration (oxygen requirement, energy released, waste products). • Knowing that organisms use aerobic respiration when sufficient oxygen is available. • Knowing that organisms may switch to anaerobic respiration when oxygen supply is limited.	• Abiotic factors are the non-living parts of an ecosystem (e.g., sunlight, water, temperature, soil). • Organisms in an ecosystem are interdependent, meaning they rely on each other for survival. • A habitat is the natural home or environment of an animal, plant, or other organism. • A population is a group of individuals of the same species living in the same area. • A community is all the different populations of organisms living together in an area. • Organisms obtain energy through feeding relationships. • A food chain shows the flow of energy from one organism to another in a linear sequence (e.g., producer → primary consumer → secondary consumer). • A producer is an organism that makes its own food, usually through photosynthesis (e.g., plants). • A consumer is an organism that obtains energy by feeding on other organisms. • Primary consumers eat producers (herbivores). • Secondary consumers eat primary consumers (carnivores or omnivores). • Tertiary consumers eat secondary consumers (carnivores) • A food web is a network of interconnected food chains in an ecosystem.

		• Examples of when anaerobic respiration might occur (e.g., during intense exercise in animals, in yeast during fermentation). • The importance of respiration for all living things.	• Decomposers (e.g., bacteria, fungi) break down dead organisms and return nutrients to the soil.
Retrieval Practice	• Recap gametes, fertilisation and reproduction.	• Recall where respiration takes place withing living cells.	• Recap photosynthesis and reproduction of plants.
Key Skills	• Use scientific vocabulary, terminology, and definitions confidently in both written and spoken work. • Using inheritance models in science to help understand more challenging concepts or processes.	• Use of the relevant scientific vocabulary compose explanations and justifications. • This historical context provides an opportunity for students to show an understanding of why and describe how scientific methods and theories develop over time.	• Use scientific vocabulary, terminology, and definitions confidently in both written and spoken work. • Graph skills. • Analysis of data.
Key Vocabulary	Inheritance Characteristics Offspring Variation Genetic Environment Survival Reproduction Natural Selection Adaptation Evolution Fossils Selective Breeding Genes Trait Population Species Generation	Respiration Aerobic Anaerobic Glucose Oxygen Carbon Dioxide Water Energy Mitochondria Lactic Acid Ethanol Yeast Fermentation Fatigue Cramps Waste Products	Ecology Ecosystem Environment Biotic Abiotic Interdependent Habitat Population Community Food Chain Food Web Producer Consumer Herbivore Carnivore Omnivore Decomposer Nutrient Cycle Competition Predator Prey Adaptation Human Impact Conservation Biodiversity
Key Reading	BBC bitesize key stage 3 Exploring science Knowledge organiser Reading comprehension articles	BBC bitesize key stage 3 Exploring science Knowledge organiser Reading comprehension articles	BBC bitesize key stage 3 Exploring science Knowledge Organiser Reading comprehension articles
End Point	Students are competent in answering structured and longer response exam style questions.	Students are competent in answering structured and longer response exam style questions.	Students are competent in answering structured and longer response exam style questions. Students can draw and interpret food chains.
Form of Assessment	Exam phrasing and individualised dirt questions	Exam phrasing and individualised dirt questions	Exam phrasing and individualised dirt questions
Enrichment Opportunities	Use of outdoor classroom. As Universities start to offer science-based workshops again Y8 will be given the opportunity to take part in trips to local Universities to gain insights into scientific courses and careers. Stem provision in school providing opportunities for workshops and outside speakers.		

	British Science Week Link to science careers.
Leadership Opportunities	Chances to formally present within lessons and take ownership of that process. Student examples to demonstrate good quality work. Group work within lessons where students think about how to take up a role within a group.