

SCIENCE Year 9 Curriculum End Points and Key Vocabulary

	Autumn Term	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Ethos Links	<p>STEM – generating electricity, insulating houses</p> <p>Sust. – renewable and non-renewable energy</p>	<p>STEM – explaining how organisms work, cell replication. Looking at the design of the microscope and how this was developed. How stem cells are used.</p> <p>STEM – using models to explain observations. How theories change over time and using experimental evidence to develop theories</p>	<p>STEM – explaining how organisms work, cell replication. Looking at the design of the microscope and how this was developed. How stem cells are used.</p> <p>STEM – using models to explain observations. How theories change over time and using experimental evidence to develop theories</p>	<p>STEM – calculations, using electricity and building circuits. Using thermistors and LDRs in alarms and designing circuits to make use of these</p> <p>Sust. Making systems more efficient</p>	<p>STEM - explaining how the body works, how tech can be used to treat coronary heart disease</p>
Working Scientifically Project – Energy (P)		<ol style="list-style-type: none"> Organisms – Cell Biology (B) Atomic Structure and the Periodic Table 	<ol style="list-style-type: none"> Organisms Cell Biology continued Matter – Atomic Structure and the Periodic Table continued 	<ol style="list-style-type: none"> Electromagnets – Electricity (P) Cell Biology continued 	<ol style="list-style-type: none"> Electromagnets – Electricity continued Organisms - Organisation
Learning End Points	<p>By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> ➤ What is meant by a system and the different energy stores ➤ The conservation of energy and the pathways through which energy is transferred 	<p>By the end of this unit students will know and understand:</p> <p><u>Cell Biology</u></p> <ul style="list-style-type: none"> ➤ The relative size of prokaryotes and eukaryotes, what organelles are present in each and their functions 	<p>By the end of this unit students will know and understand:</p> <p><u>Cell Biology</u></p> <ul style="list-style-type: none"> ➤ What chromosomes are and where they are found ➤ How cells divide using mitosis 	<p>By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> ➤ How to draw and interpret circuit diagrams using standard circuit symbols ➤ What is meant by charge, current, 	<p>By the end of this unit students will know and understand:</p> <ul style="list-style-type: none"> ➤ How cells, tissues, organs and organ systems are arranged ➤ The structure and function of the digestive system

	<ul style="list-style-type: none"> ➤ How to reduce wasted energy ➤ Where humans get their energy from, and how energy from food can be transferred from the chemical store to the thermal store ➤ The words accurate, precise, reproducible, repeatable, resolution and anomaly ➤ The errors random and systematic, the effects of these errors and how they can be reduced ➤ The equation work done = force*displacement, and can use to it calculate all three quantities. ➤ How to calculate power, energy and time using the equation $P=Et$ ➤ What is meant by efficiency and how it can be calculated and compared ➤ How to use and manipulate the equations; $E_k=0.5mv^2$, $E_p=mgh$, $E_e=0.5ke^2$ to calculate any quantity in the formula ➤ How energy is transferred from hot to cold areas, and how this happens 	<ul style="list-style-type: none"> ➤ The key parts of a light microscope, how they have developed over time and why they are important, comparing them to electron microscopes ➤ How cells are adapted to their function ➤ How and when plant and animal cells differentiate. ➤ How bacteria cells divide <p style="text-align: center;"><u>Atomic Structure and the Periodic Table</u></p> <ul style="list-style-type: none"> ➤ That atoms and elements are represented by chemical symbols, and these are found on the periodic table. ➤ What atoms, elements, compounds and molecules are. ➤ What a mixture is and how they can be separated depending on physical properties ➤ How research led to the development of the model of the atom, and the stages 	<ul style="list-style-type: none"> ➤ What stem cells are and where they are found, and the function of them in embryos, adult humans and in the meristem of plants. ➤ How stem cells can be used in medical treatments and food production and the ethical issues surrounding this. ➤ How substances move into and out of cells using diffusion, and the factors which affect the rate of this. ➤ How surfaces and organs are specialised for exchange in multicellular organisms ➤ What osmosis is and when it happens ➤ What active transport is and when it happens <p style="text-align: center;"><u>Atomic Structure and the Periodic Table</u></p> <ul style="list-style-type: none"> ➤ How the periodic table is arranged, and what formats this took in the past, as well as what led to the changes. ➤ How metals form positive ions, and non-metals form negative ions 	<p style="text-align: center;">potential difference and resistance</p> <ul style="list-style-type: none"> ➤ The relationships described by $Q = It$ and $V=IR$ ➤ The factors affecting resistance ➤ The relationships between current and potential difference in a fixed resistor, filament lamp and diode. ➤ How temperature affects resistance in a thermistor and how light intensity affected resistance in an LDR, and applications of them ➤ Current, potential difference and resistance in series and parallel circuits. ➤ The current, potential difference and frequency of mains electricity in the UK ➤ The difference between AC and DC ➤ The key components of a 3 pin plug ➤ How to use the equations $P=VI$ and $P=I^2R$, calculating power, current, potential difference and resistance 	<ul style="list-style-type: none"> ➤ What enzymes are, how they work and what they are used for, and factors affecting enzymes, including carbohydrases, amylase, proteases and lipases, the products of digestion and what they are used for ➤ The role of bile in digestion ➤ The structure of the heart and lungs, including adaptations ➤ The three different types of blood vessel and how their structure relates to function ➤ The composition of blood and the function and adaptation of each component ➤ The causes of coronary heart disease and how this can be treated ➤ Causes of ill health (communicable and non-communicable disease and lifestyle factors) and how different
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<p>Key Vocabulary</p>	<p>Energy Dissipate Efficiency Power Kinetic energy Elastic potential Accurate Precise Specific heat capacity</p>	<p>Diffusion Osmosis Active transport Stem cell Differentiation Prokaryote Eukaryote</p>	<p>Element Atom Ion Mixture Periodic Table Proton Neutron Electron Nucleus Transition metal</p>	<p>Current Potential difference Resistance Charge Electric field Thermistor Work done Coulomb Component Frequency Power National grid</p>	<p>Enzyme Artery Vein Capillary Plasma Communicable Immune system Cancer Mesophyll Xylem Phloem Meristem Stomata</p>