**Alcester Academy Curriculum Planning:** Key Stage 3

| Department: *Science* | | | | | | Year Group: *7* |
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| Term | Topic/Subject | Assessment Objectives and Knowledge<br><br>(include differentiation) | Skills<br><br>(include differentiation) | Literacy, Numeracy (including wider reading) | Personal Development (SMSC, British Values, Careers, Healthy Living, Citizenship<br>Equality and Diversity, Preparation for next stages) | AFL/Summative Assessment |
| Autumn | Introduction to science | Understand the basic rules of a lab<br>Identify hazard warning labels<br>Identify standard equipment<br>Be able to work safely<br>To be able measure amounts of substance using a variety of equipment | Light and use a Bunsen burner<br>Recognise equipment and use it correctly<br>Convert standard units | Writing out a detailed method on how to safely light and use a Bunsen burner.<br>Counting and measuring<br>Reading scales | Students will finish this topic with an ability to identify hazard symbols that are present, not only in a lab, but in everyday household products.<br>Students will develop their ability to work both collaboratively and individually.<br>Students will be able to recognise and use pieces of scientific equipment necessary for the next stages in their learning. | The Bunsen burner assessment. |
| Autumn | Cells | Be able to identify the different parts of a microscope.<br>Be able to safely and effectively use a microscope and prepare a slide.<br>Understand the names and roles of different sub cellular structures within an animal and plant cell.<br>Compare types of cell<br>Be able to describe the adaptations and organelles of the unicellular | Use a microscope<br>Prepare an onion cell slide<br>Comparing types of cells<br>Draw accurate scientific diagrams | Microscope through the ages reading assessment.<br>Potential links to wider reading on cancerous cells.<br>Robert Hooke reading comprehension.<br>Calculating magnification<br>Converting between | Students will be able to recognise and use pieces of scientific equipment necessary for the next stages in their learning.<br>Students will develop their ability to work both collaboratively and individually. | Microscope through the ages reading assessment.<br><br>End of term test |

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| | | organisms euglena and amoeba.<br>Describe the organisation from cells to organ systems.<br>To describe what is meant by diffusion and describe how this occurs in using a leaf and lungs as examples.<br>To describe the roles of particular specialised animal and plant cells. | | units of measurement | | |
| Autumn | Particles And changing state | Be able to draw particle diagrams of solids, liquid and gases.<br>Describe the differences in properties between the three states of matter in structure, movement and energy<br>Describe what causes pressure and the affect that changing volume and temperature has on pressure.<br>Describe how diffusion occurs and describe how some factors influence diffusion.<br>Identify the changes of state<br>Describe and explain different changes of state in terms of energy. | Carrying out practical activities in a safe and accurate manner.<br>Draw accurate scientific diagrams to represent SLG | Diffusion assessment.<br>Plotting graphs of substances changing states.<br>Use boiling point and melting point data to identify the state of a substance | Students will develop their ability to work both collaboratively and individually. | Diffusion assessment.<br><br>End of term test |
| Spring | Elements and compounds | Be able to state what an atom, element and compound are.<br>Recognise key chemical symbols of elements and find them using a periodic table.<br>Compare the properties of different elements.<br>Explain why a compound has different properties to the elements in it.<br>Write word equations to show reactions<br>Be able to write the chemical names for some simple compounds.<br>Write and interpret chemical formulae. | Use a periodic table for basic information on element names and symbols.<br>Observe and record properties of substances.<br>Carry out a scientific enquiry to test predictions safely then compare properties of magnesium and magnesium oxide (iron, sulphur and iron sulphide) | Using scientific terminology<br>Appreciation of scale/size (atoms)<br>Chemical formula relative number (proportion and ratios)<br>Reading comprehension on lego models (Collins) | Safely working with others<br>Fundamental knowledge for all chemistry modules<br>Understanding of historical context of science and universal language used for symbols | Burning magnesium in air – explanation of observations of the reaction, applying knowledge of elements and compounds and the particle model.<br><br>End of term test |
| Spring | Sound | Describe the different types of wave, transverse and longitudinal, and their | Measure the speed of sound. | Measurement and calculation of speed of | Use of ultrasound in medicine and sonar. Use | Ear structure assessment – |

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| | | features.<br>Describe what happens when waves hit a barrier and superpose.<br>Describe how sound is produced and travels.<br>Explain why the speed of sound is different in different materials.<br>Contrast the speed of sound and the speed of light.<br>Describe the link between loudness and amplitude, frequency and pitch.<br>State the range of human hearing and describe how it differs from the range of hearing in animals.<br>Describe how the ear works and how your hearing can be damaged.<br>Describe what ultrasound is and some of its uses.<br>Describe what ultrasound is and some of its uses. | Draw and label wave diagrams.<br>Interpret wave diagrams and recognise how an oscilloscope can be used to show sound. | sound.<br>Conversion of units<br>Interpreting graphs showing hearing ranges<br>Reading comprehension about stethoscope<br><br>Wider reading around hearing loss and treatment | of echolocation to identify bat species.<br>Safe levels of sound and hearing problems caused by loud music leading to safety regulations. | identify parts of the ear,<br>describe how sound are heard and how hearing loss can occur. |
| Spring | Light | Identify materials as opaque, transparent and translucent<br>Identify objects as luminous and non-luminous<br>Describe what happens when light interacts with materials.<br>State the speed of light.<br>Explain how images are formed in a plane mirror.<br>Use the law of reflection<br>Explain the difference between specular reflection and diffuse scattering.<br>Describe and explain what happens when light is refracted.<br>Describe what happens when light travels through a lens.<br>Describe how the eye works.<br>Describe how a simple camera forms an image.<br>Explain what happens when light passes through a prism. | Using appropriate equipment to produce ray diagrams and measure angles of incidence, reflection and refraction<br>Using formula | Measurement of angles<br>Using simple formula<br>Reading comprehension laser light<br>Wider reading around sight issues and treatment | Safely working with others<br>Appreciation of visual problems, colour blindness and their impact on individuals<br>Explaining natural phenomena such as rainbows | Literacy – lighthouses<br><br>End of term test |

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| | | Describe how primary colours add to make secondary colours.<br>Explain how filters and coloured materials subtract light. | | | | |
| Spring | Structures and function of body systems | Define and state examples of tissues, organs and organ systems.<br>Explain the hierarchy of organisation in a multicellular organism.<br>Describe the structure of the gas exchange system.<br>Describe how parts of the gas exchange system are adapted to their function.<br>Describe the processes of inhaling and exhaling.<br>Describe how a bell jar can be used to model what happens during breathing.<br>Explain how to measure lung volume.<br>Describe the structure of the skeleton.<br>Describe the functions of the skeletal system.<br>Describe the role of the joints in movement.<br>Describe how antagonistic muscles cause movement. | | | | Mini Exampro test |
| Summer | Reproduction | Identify the changes that happen at puberty<br>Describe the main structures in the male and female reproductive systems.<br>Describe the function of the main structures in the male and female reproductive systems.<br>Describe the structure and function of gametes.<br>Describe the processes of fertilisation.<br>Identify how twins are formed<br>Describe what happens during gestation.<br>Describe what happens during birth.<br>State what the menstrual cycle is.<br>Describe the main stages in the menstrual cycle. | Extract information from text to describe structures and functions of the key parts of the reproductive systems in a table.<br><br>Use appropriate techniques to dissect a flower into its main parts. | Timeline to order stages of the menstrual cycle.<br>Order of magnitude when looking at foetal growth | Discussion of adolescence and puberty and the changes that happen.<br>Healthy body image and idea of everyone being different<br>Many of ideas below are often raised by students in questions….<br>Ideas of gender<br>Methods of contraception.<br>Healthy relationships and the legality of sexual intercourse .<br>What is IVF<br>Premature birth and complications of birth including still births | Describe the journey of a sperm cell from production in the testes to fertilising an egg cell. |

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| | | Identify the main structures of a flower.<br>Describe the process of pollination.<br>Describe the differences between wind-pollinated and insect-pollinated plants.<br>Describe the process of fertilisation in plants.<br>Describe how seeds and fruits are formed.<br>State the ways seeds can be dispersed.<br>Describe how a seed is adapted to its method of dispersal | | | Types of cancer eg cervical | |
| | Separation Techniques | Describe particle arrangements in mixtures.<br>Explain how to identify pure substances.<br>Describe solutions using key words.<br>Use the particle model to explain dissolving.<br>Explain what a saturated solution is.<br>Explain the meaning of solubility.<br>Explain how filtration works.<br>Describe how to filter a mixture and how the filtrate and residue are found<br>Explain how to use evaporation to separate mixtures.<br>Explain how distillation works.<br>Explain how chromatography separates mixtures.<br>Analyse chromatograms to identify substances in mixtures.<br>Explain how a chromatogram can be used to identify a suspect's pen. | Select appropriate separation techniques for different mixtures<br>Plan an investigation to compare solubility with temperature, considering variables<br>Label a diagram of apparatus used for filtration to show where the filtrate and residue are found<br>Analyse chromatograms to identify substances in mixtures. | Use data to predict how much solute is dissolved in a solution or the mass of a solution.<br>Draw suitable graphs<br>Reading comprehension Ghandi and the salt act | | Write a method describing how to separate salt from a mixture of rock salt.<br><br>End of year test |