 **Bishop Rawstorne Academy – Science Curriculum Area**

**KS3 Curriculum Map- Knowledge, Skills and Assessment**

| **KS3 unit of work** | **Timing** | **Knowledge taught** | **Skills taught** | **Key Assessments and dates** |
| --- | --- | --- | --- | --- |
| Introduction to science- working scientifically | Weeks 1-5 Aug/Sept of Y7 | * Scientists can develop an idea into a question that can be investigated. Some questions can be investigated and others cannot.
* Keeping safe in a laboratory including chemical hazard symbols.
* Name laboratory equipment and be able to draw scientific diagrams.
* How to light a Bunsen burner correctly and safely.
 | * Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience.
* Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate.
* Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety.
* Present observations and data using appropriate methods, including tables and graphs.
* Evaluate data, showing awareness of potential sources of random and systematic error.
* Evaluate the reliability of methods and suggest possible improvements.
 | Online assessment using Educake on working scientifically skills (Week 5, Y7). |
| B1.1 Cells(Activate 1) | Weeks 6-9October of Y7 | * Cells as the fundamental unit of living organisms, including how to observe, interpret, and record cell structure using a light microscope.
* The functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria, and chloroplasts.
* The similarities and differences between plant and animal cells.
* The role of diffusion in the movement of materials in and between cells.
* Diffusion in liquids and gases driven by differences in concentration.
* The structural adaptations of some unicellular organisms.
 | * Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety.
* Present observations and data using appropriate methods, including tables and graphs.
* Make and record observations and measurements using a range of methods for different investigations.
 | Summative assessment- Test 1: cells & particles (week 13, Y7)Key formative assessment: Observing cells using a microscope. |
| C1.1 Particles and their behaviour(Activate 1) | Weeks 10-13) November Y7 | * The properties of the different states of matter (solid, liquid, and gas) in terms of the particle model, including gas pressure.
* The properties of the different states of matter (solid, liquid, and gas) in terms of the particle model, including gas pressure.
* Similarities and differences, including density differences, between solids, liquids, and gases.
* The differences in arrangements, in motion, and in closeness of particles explaining shape and density.
* Changes of state in terms of the particle model.
* Energy changes on changes of state (qualitative).
* Reversibility in melting, freezing, evaporation, sublimation, condensation, and dissolving.
* The differences in arrangements, in motion, and in closeness of particles explaining changes of state.
* Diffusion in terms of the particle model.

Diffusion in liquids and gases driven by differences in concentration. | * Present reasoned explanations, including explaining data in relation to predictions and hypotheses
* Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.
* Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience.

Identify independent, dependent, and control variables where appropriate. | Summative assessment - Test 1: cells & particles (week 13, Y7)Formative key assessment: Literacy task- changes of state.  |
| C1.2 Elements, atoms and compounds(Activate 1) | Weeks 14-17 December Y7 | * Differences between atoms, elements, and compounds.
* Chemical symbols and formulae for elements and compounds.
* Differences between atoms, elements, and compounds.
* A simple (Dalton) atomic model.
* Atoms and molecules as particles.
 | * Present observations and data using appropriate methods, including tables and graphs.
* Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.
* Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature.
 | Summative assessment: Test 2 Elements and forces (week 21)Formative key assessment: Literacy task- Comparing oxygen, hydrogen and water.  |
| P1.1 Forces(Activate 1) | Weeks 18-21January of Y7 | * Forces as pushes or pulls, arising from the interaction between two objects.
* Using force arrows in diagrams, adding forces in one dimension.
* Forces measured in Newtons, measurements of stretch or compression as force is changed.
* Forces: associated with deforming objects; stretching and squashing – springs.
* Force–extension linear relation; Hooke’s Law as a special case.
* Opposing forces and equilibrium: weight held by a stretched spring.
* Energy changes on deformation.
* Forces: associated with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water
* Non-contact forces: gravity forces acting at a distance on Earth and in space.
* Gravity force, weight = mass × gravitational field strength (g), on Earth g = 10 N/kg, different on other planets and stars.
* Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces.
* Forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only).
* Force change depending on direction of force and its size.

Opposing forces and equilibrium: weight held by a stretched spring or supported on a compressed surface | * Make predictions using scientific knowledge and understanding.
* Present observations and data using appropriate methods, including tables and graphs.

Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate. | Summative assessment: Test 2 Elements and forces (week 21, Y7)Formative key assessment: Investigation skills- which shape is the most streamlined? |
| C1.3 Reactions(Activate 1) | Weeks 22-25) February Y7 | * Chemical reactions as the rearrangement of atoms.
* What catalysts do.
* The difference between chemical and physical changes.
* Chemical symbols and formulae for elements and compounds.
* Chemical reactions as the rearrangement of atoms.
* Representing chemical reactions using formulae and using equations.
* Combustion, thermal decomposition, oxidation, and displacement reactions.
* Combustion, thermal decomposition, oxidation, and displacement reactions.
* Conservation of mass, changes of state, and chemical reactions.
* Representing chemical reactions using formulae and using equations.
* Combustion, thermal decomposition, oxidation, and displacement reactions.
* Conservation of material and of mass
* Exothermic and endothermic chemical reactions (qualitative).
 | * Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements.
* Present observations and data using appropriate methods, including tables and graphs.
* Evaluate data, showing awareness of potential sources of random and systematic error.

Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions. | Summative assessment: Test 3 Reactions and Sound (week 29, Y7)Formative key assessment- Literacy- scientific write up (MR CONE)- Thermal decomposition.  |
| P1.2 Sound(Activate 1) | Weeks 26-29March Y7 | * Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition.
* Using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about changes in systems.
* Sound needs a medium to travel, the speed of sound in air, in water, in solids.
* Sound produced by vibrations of objects, in loud speakers.
* Auditory range of humans and animals.
* Frequencies of sound waves, measured in hertz (Hz).
* Pressure waves transferring energy; waves transferring information for conversion to electrical signals by microphone.
* Sound produced by vibrations of objects, in loudspeakers, detected by their effects on microphone diaphragm and the ear drum.
* Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound.
* Frequencies of sound waves measured in hertz (Hz); echoes, reflection, and absorption of sound.
 | * Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.
* Present reasoned explanations, including explaining data in relation to predictions and hypotheses.
* Make predictions using scientific knowledge and understanding.

Evaluate risks | Summative assessment: Test 3 Reactions and Sound (week 29, Y7)Formative key assessment- Literacy (oracy) task- stand and speak- designing a musical instrument.  |
| P1.4 Space(Activate 1) | Weeks 30-33May Y7 | * Our Sun as a star, other stars in our galaxy, other galaxies.
* - The light year as a unit of astronomical distance.
* Gravity force, gravity forces between Earth and Moon, and between Earth and Sun (qualitative only).
* The seasons and the Earth’s tilt, day lengths at different times of year, in different hemispheres.
* Use of ray model.
 | * Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review.
* Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.
* Make predictions using scientific knowledge and understanding.
 | Summative assessment: Test 4- Space and Body systems. Week 39 year 7. |
| B1.2 Structure and function of body systems(Activate 1) | Weeks 34-39June Y7 | * The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms.
* The structure and functions of the gas exchange system in humans, including adaptations to function
* The mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume.
* The impact of exercise, asthma, and smoking on the human gas exchange system.
* The structure and functions of the human skeleton, to include support, protection, movement, and making blood cells.
* Biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles.
* The function of muscles and examples of antagonistic muscles.
 | * Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.
* Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety.
* Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements.
 | Summative assessment: Test 4- Space and Body systems (Week 39 year 7)Formative key assessment- Data analysis- ventilation. |
| B1.3 Reproduction (Activate 1) | Weeks 1-4 Y8 | * Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems.
* Reproduction in humans (as an example of a mammal), gametes, and fertilisation
* Reproduction in humans (as an example of a mammal), gestation and birth, and the effect of maternal lifestyle on the fetus through the placenta.
* Reproduction in humans (as an example of a mammal), menstrual cycle (without details of hormones).
* Reproduction in plants including flower structure, wind and insect pollination, fertilisation, including quantitative investigation of some dispersal mechanisms.
* The importance of plant reproduction through insect pollination in human food security.
* Reproduction in plants, including flower structure, seed and fruit formation.
* Reproduction in plants, including seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.
 | * Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.
* Present observations and data using appropriate methods, including tables and graphs.
* Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety.
* Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements.
* Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate.
 | Summative assessment Test 5 Reproduction and Acids and alkalis (week 8, Y8)Formative key assessment: Drawing and interpreting graphs- Gestation periods.  |
| C1.4 Acids and alkalis(Activate 1) | Weeks 5-8 Y8 | * Defining acids and alkalis in terms of neutralisation reactions.
* The pH scale for measuring acidity/alkalinity; and indicators.
* Reactions of acids with metals to produce a salt plus hydrogen.
* - Reactions of acids with alkalis to produce a salt plus water.
 | * Evaluate risks.
* Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.
* Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate.
* Present observations and data using appropriate methods, including tables and graphs.
 | Summative assessment 5 – Acids and alkalis and Reproduction (week 8, Y8)Formative key assessment: Investigation- Comparing indigestion tablets |
| C2.2 The periodic table (activate 2) | Weeks 9-12 Y9 | * The Periodic Table: metals and non-metals.
* The properties of metals and non-metals.
* The chemical properties of metal and non-metal oxides with respect to acidity.
* The Periodic Table: periods and groups.
* The principles underpinning the Mendeleev Periodic Table.
* The varying physical and chemical properties of different elements.
* How patterns in reactions can be predicted with reference to the Periodic Table.
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* How patterns in reactions can be predicted with reference to the
* The varying physical and chemical properties of different elements.
* How patterns in reactions can be predicted with reference to the Periodic Table.

  | * Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions. Apply mathematical concepts and calculate results.
* Chemistry
* Make and record observations and measurements using a range of methods for different investigations.

Evaluate risks  | Summative assessment Test 6 Period table & Light week 15 Y8Formative key assessment: Numeracy task- Group 0 elements.  |
| P1.3 Light (activate 1)   | Weeks 13-15 Y8 | * The similarities and differences between light waves and waves in matter.
* Light waves travelling through a vacuum; speed of light.
* The transmission of light through materials: absorption, diffuse scattering, and specular reflection at a surface.
* The transmission of light through materials: absorption, diffuse scattering, and specular reflection at a surface.
* Use of ray model to explain imaging in mirrors.
* Differential colour effects in absorption and diffuse reflection.
* The refraction of light and action of convex lens in focusing (qualitative); the human eye.
* Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras.
* Use of ray model to explain the pinhole camera.
* The refraction of light and action of convex lens in focusing (qualitative); the human eye.

Colour and the different frequencies of light, white light, and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.  | * Evaluate data, showing awareness of potential sources of random and systematic error.
* Use appropriate techniques and apparatus during fieldwork and laboratory work, paying attention to health and safety.
* Present and record observations using appropriate methods, including tables and graphs.
* Make predictions using scientific knowledge and understanding
 | Summative assessment Test 6 Period table & Light week 15 Y8Formative key assessment: Literacy task- Biomimicry |
| C2.2 Separation techniques (activate 2) | Weeks 16-19 Y8 | * The concept of a pure substance.
* Mixtures, including dissolving.
* The identification of pure substances.
* Mixtures, including dissolving.
* The identification of pure substances.
* Mixtures, including dissolving.

 * Simple techniques for separating mixtures: filtration, evaporation.
* Simple techniques for separating mixtures: evaporation, distillation.
* Simple techniques for separating mixtures: chromatography.

  | * Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work.
* Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions. Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate.
* Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety.
*
 | Summative assessment Test 7 week 24 Y8Formative key assessment: Literacy task- Purifying rock salt |
| P2.1 Electricity and magnetism (activate 2) | Weeks 20-24 Year 8 |  * Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects.
* The idea of electric field, forces acting across the space between objects not in contact.
* Non-contact forces: forces due to static electricity.
* Using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about changes in systems.
* Electric current, measured in amperes in circuits.
* Current as a flow of charge.
* Using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about changes in systems.
* Potential difference, measured in volts.
* Battery and bulb ratings.
* Series and parallel circuits, currents add where branches meet.
* Resistance, measured in ohms, as the ratio of potential difference (p.d.) to current.
* Differences in resistance between conducting and insulating components (quantitative).
* Magnetic poles, attraction and repulsion.
* Magnetic fields by plotting with compass, representation by field lines.
* Earth’s magnetism, compass, and navigation.
* Non-contact forces: forces between magnets.
* Using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about changes in systems.
* The magnetic effect of a current, electromagnets, D.C. motors (principles only).

  | * Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.
* Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety.
* Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate.
* Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements.
* Make predictions using scientific knowledge and understanding.

 Identify further questions arising from their results.  | Summative assessment Test 7 week 24 Y8Formative key assessment: Mathematical task- (EVRA) Resistance calculations.  |
| P2.2 Energy (activate 2)  | Weeks 25-29 Y8 | * Comparing energy values of different foods (from labels) (kJ).
* Fuels and energy resources.
* Energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change.
* Comparing the starting with the final conditions of a system and describing increases and decreases in the amounts of energy associated with movements, temperature, changes in positions in a field, in elastic distortions and in chemical compositions.
* Other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels.
* Energy changes on deformation.
* Heating and thermal equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one.
* Changes with temperature in motion and spacing of particles.
* Heating and thermal equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one, through contact (conduction); such transfers tending to reduce the temperature difference; use of insulators.
* Temperature difference between two objects leading to energy transfer from the hotter to the cooler one, through radiation.
* Domestic fuel bills, fuel use, and costs.
* Fuels and energy resources.
* Comparing power ratings of appliances in watts (W, kW).
* Comparing amounts of energy transferred (J, kJ, kWh).
* Domestic fuel bills, fuel use, and costs.
* Work done

Examples of processes that cause change with forces (work = force × distance) levers and gears reducing force by increasing distance simple machines give bigger force but at the expense of smaller movement (and vice versa): product of force and displacement unchanged.  | * Present reasoned explanations, including explaining data in relation to predictions and hypotheses.
* Make and record observations and measurements using a range of methods for different investigations. Evaluate data, showing awareness of potential sources of random and systematic error.
* Evaluate risks.
* Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.
* Make predictions using scientific knowledge and understanding
* Evaluate data, showing awareness of potential sources of random and systematic error.
*
 | Summative assessment Test 8 week 33 Y8Formative key assessment: Investigation/ method writing (MR CONE) Shiny or not shiny |
| C2.3 Metals and acids (activate 2) | Weeks 30-33 Y8 | * The order of metals and carbon in the reactivity series.
* The order of metals and carbon in the reactivity series.
* The order of metals and carbon in the reactivity series.
* Combustion, thermal decomposition, oxidation, and displacement reactions.
* The order of metals and carbon in the reactivity series.
* Make predictions using scientific knowledge and understanding.
* The order of metals and carbon in the reactivity series.
* The use of carbon in obtaining metals from metal oxides.
* Properties of ceramics (qualitative).
* Properties of polymers (qualitative).

Properties of composites  | * Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.

Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate  | Summative assessment Test 8 week 33 Y8Formative key assessment: Graph drawing and analysis- Composites |
| B2.1 Health and lifestyle (activate 2)  | Weeks 34-39 Y8 |  * Content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre, and water, and why each is needed.
* Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.
* Simple food tests for starch, simple (reducing) sugars, protein, and lipids.
* Calculations of energy requirements in a healthy daily diet.
* The consequences of imbalances in the diet, including obesity, starvation, and deficiency diseases.
* The tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts).
* Enzymes simply as biological catalysts.
* The importance of bacteria in the human digestive system.
* The effects of ‘recreational’ drugs (including substance misuse) on behaviour, health, and life processes.
* The effect of maternal lifestyle on the fetus through the placenta.
* The effects of ‘recreational’ drugs (including substance misuse) on behaviour, health, and life processes.
* The effect of maternal lifestyle on the fetus through the placenta.
 | * Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety.
* Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions. Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements.
* Present observations and data using appropriate methods, including tables and graphs.
 | Summative test 11- Healthy living & motion and pressure. (week 39)Formative key assessment: How scientific ideas develop over time- Carton of Edward Jenner’s vaccination timeline.  |
| C2.4 The Earth (activate 2)  | Weeks 1-4 Y9 Teacher B | * The composition of the Earth.
* The structure of the Earth.
* The composition of the atmosphere.
* The formation of sedimentary rocks.
* The formation of igneous and metamorphic rocks.
* The rock cycle.
* The carbon cycle.
* The production of carbon dioxide by human activity and the impact on climate.
* The production of carbon dioxide by human activity and the impact on climate.

 * Earth as a source of limited resources and the efficacy of recycling.
 | * Present observations and data using appropriate methods, including tables and graphs.
* Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.
* Make predictions using scientific knowledge and understanding. Present observations and data using appropriate methods.

Apply mathematical concepts and calculate results.  | Summative assessment Test 9 week 4 Y9Formative key assessment: Literacy task- The rock cycle story board |
| C2.3 Adaptations and inheritance (activate 2) | Weeks 1-4 Y9 Teacher A |  * The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection.
* Differences between species.
* Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.
* Differences between species.
* The variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation.
* Heredity as the process by which genetic information is transmitted from one generation to the next
* A simple model of chromosomes, genes, and DNA in heredity, including the part played by Watson, Crick, Wilkins, and Franklin in the development of the DNA model.
* How organisms affect, and are affected by, the environment
* The variation between species and between individuals of the same species, natural selection.
* Present reasoned explanations, including explaining data in relation to predictions and hypotheses.
* Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.
* The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.
 | * Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions. Present observations and data using appropriate methods, including tables and graphs.
* Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review.

Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review.  | Summative assessment Test 9 week 4 Y9Formative key assessment: Preventing extinction.  |
| B2.2 Ecosystem processes (activate 2) | Weeks 5-8 Y9 Teacher A | * The reactants in, and products of, photosynthesis, and a word summary for photosynthesis.
* The dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere.
* The adaptations of leaves for photosynthesis.
* The role of leaf stomata in gas exchange in plants.
* Plants making carbohydrates in their leaves by photosynthesis and gaining minerals, nutrients, and water from the soil via their roots.
* Undertake basic data analysis including simple statistical techniques.
* Chemosynthesis in bacteria and other organisms.
* Aerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life.
* A word summary for aerobic respiration.
* Anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life.
* The process of anaerobic respiration in humans and microorganisms, including fermentation, and a word summary for anaerobic respiration.
* The differences between aerobic and anaerobic respiration in terms of the reactants, the products formed, and the implications for the organism.
* The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops.
* How organisms affect, and are affected by, their environment, including the accumulation of toxic materials.
* The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops.

  | * Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety.
* Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements.

 * Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas.
* Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate.
* Biology
* Evaluate data, showing awareness of potential sources of random and systematic error.
* Present observations and data using appropriate methods, including tables and graphs.

Apply sampling techniques.  | Summative assessment Test 10, week 8 Y9Formative key assessment: Sampling techniques- Quadrats & transects |
| P2.3 Motion and pressure (activate 2) | Weeks 5-8 Y9 Teacher B  | * Speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time)
* The representation of a journey on a distance-time graph
* Relative motion: trains and cars passing one another
* Atmospheric pressure, decreases with increase of height as weight of air above, decreases with height.
* Pressure in liquids, increasing with depth; up thrust effects, floating and sinking.
* Pressure measured by ratio of force over area – acting normal to any surface.
* Moment as the turning effect of a force
* Particle model: atoms and molecules as particles.
* Energy in matter: changes with temperature in motion and spacing of particles.
* Simple machines give bigger force but at the expense of smaller movement (and vice versa): product of force and displacement unchanged
* The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure.
 | * Apply mathematical concepts and calculate results.
* Present observations and data using appropriate methods, including tables and graphs.
* Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature.
* Use and derive simple equations and carry out appropriate calculations.
* Undertake basic data analysis including simple statistical techniques.
* Evaluate data, showing awareness of potential sources of random and systematic error.
 | Summative assessment Test 10, week 8 Y9Formative assessment – Mathematical, Turning forces (EVRA) |