Sheldon School
BE KIND | BE BRAVE | BE THE BEST YOU

Curriculum Plan *Subject*

Sheldon School
BE KIND | BE BRAVE | BE THE BEST YOU

Year 8	**Golden Treads:** State the big ideas that will be taught across the year (Threshold concepts) Substances and properties, forces and motion, the cellular basis of life, chemical reactions, light waves, earth in space, dynamic earth, variation adaptions and evolution.				**Enrichment:** What is offered through the year to support learning in the classroom?		**Review and evaluation:** Give date for review of the curriculum July 2024
	Topics	**Assessment**	**Substantive Knowledge**	**Disciplinary Knowledge**	**Misconceptions**	**Key Vocabulary**	**Knowledge tracking**
Term 1	**Scientific Skills** **Earth's resources** **Cells to organ systems** **Heating and cooling**	Practical assessment - Scientific skills	**Scientific Skills** lab safety, using scientific equipment, carrying out a scientific experiment, data presentation and analysis. **Earth's resources** what's in a rock, inside earth, making rocks by heating, physical weathering and erosion **Cells to organ systems** Supplying cells to the human circulatory, digestive and gas exchange systems **Heating and cooling** temperature, heating and cooling, thermal conduction and thermal store of energy and convection	**Scientific Skills** Assessed practical – planning and carrying out scientific investigation **Earth's resources** Salol practical – investigating igneous rocks **Cells to organ systems** Lung Capacity practical Adaptations of the digestive system practical – investigating villi **Heating and cooling** Conduction practical – investigating conductors Heat loss practical – investigating insulators	**Earth's resources** - Earth's mantle is semi-liquid - The Earth's crust is very dense and denser than the mantle - It is colder inside the Earth - All rocks are more or less the same. - The Earth's crust and tectonic plates are interchangeable terms. - Deserts are always hot - Geologic time can be described using hundreds of years ago - The Earth has always been pretty much the way it is now. - The Earth is as old as the oldest rocks found on its surface; 3.8 billion years old. - All rocks and planets were formed at the same time **Cells to organs** - Respiration is synonymous with breathing. - Cells are flat and very thin - Students are unsure about the hierarchy of atoms, molecules and cells. **Heating and cooling** - Ice cannot change temperature - All liquids boil at 100C and freeze at 0C. - Heat is not energy. - Temperature is a property of a particular material or object	**Scientific Skills** Reproducible (yellow highlight = key word already covered) Accurate Resolution Variable **Earth's resources** atmosphere igneous rock metamorphic rock sedimentary rock **Cells to organ systems** Alveoli Villi diffusion **Heating and cooling** conduction convection insulator radiation	Year 7 Properties and materials Year 7 particle model Year 7 Substances and mixtures Year 8 Understanding chemical reactions Year 9 Quantitative chemistry Year 9 Understanding chemical reactions Year 9 Acids and Alkalis

Curriculum Plan *Subject*

Sheldon School
BE KIND | BE BRAVE | BE THE BEST YOU

					(metal is naturally colder than plastic). - The temperature of an object depends on its size. - Boiling is the maximum temperature a substance can reach. - Heat only travels upward/rises. - Objects which readily become warm (conductors of heat) do not readily become cold.		
Term 2	**Elements and compounds** **Chemical change** **Moving by force**		**Elements and compounds** atoms and molecules, symbols and formulae **Chemical change** rearrangement of atoms, formation of new substances **Moving by force** describing speed, motion graphs, changing motion and drag	**Elements and compounds** Observation of chemical changes – reacting Sulfur and Iron **Chemical change** Reactions practical – identifying physical and chemical reactions Combustion practical – investigating burning of different alcohols **Moving by force** Speed practical – speed of car on ramp investigation Streamlining practical – investigating car streamlining Drag practical – designing parachutes	**Elements and compounds** - an element is a substance made from one atom - chemical changes are the same as physical changes - atoms possess the same properties as the substance - - When things dissolve, they disappear - Materials can only exhibit properties of one state of matter. - Melting and dissolving are confused. - There is not empty space between molecules - Particles in a liquid are further apart than in a solid - Gases are not matter because most are invisible. - Particles are not conserved during a chemical change. - Formation of a new substance with new properties is not rearranging existing atoms **Chemical Change** - an element is a substance made from one atom - chemical changes are the same as physical changes - atoms possess the same properties as the substance - - When things dissolve, they disappear	**Elements and compounds** atom compound evaporation mixture **Chemical change** combustion compound **Moving by force** Friction Resultant air resistance	KS2 temperature Year 7 Cells and structure Year 7 Cells and organ systems Year 8 - Variation Year 9 energy stores Year 9 Biodiversity Year 7 Properties and materials Year 7 particle model Year 7 substances and mixtures Year 7 forces/energy stores Year 8 elements and compounds Year8/9 understanding chemical reactions

Curriculum Plan *Subject*

Sheldon School
BE KIND | BE BRAVE | BE THE BEST YOU

					- Materials can only exhibit properties of one state of matter. - Melting and dissolving are confused. - There is not empty space between molecules - Particles in a liquid are further apart than in a solid - Gases are not matter because most are invisible. - Particles are not conserved during a chemical change. - Formation of a new substance with new properties is not rearranging existing atoms **Moving by Force** - The distance an object travels and its displacement are always the same. - An objects speed is the same as its velocity. - If an object is accelerating, then the object is speeding up. - Acceleration always occurs in the same direction, as an object is moving. - If an object is at rest, no forces are acting on the object. - Force is a property of an object. An object has force, and when it runs out of force it stops moving. - Large objects exert a greater force than small objects .		
Term 3	**Variation** **Understanding chemical reactions**	Combined end of topic test – forces and elements/compounds	**Variation** differences within species, changes in species over time - fossil evidence **Understanding chemical reactions**	**Variation** Variation practical- investigating variation and diversity amongst humans **Understanding chemical reactions**	**Variation** - Plants are dependent on humans (e.g. watering, planting seeds) - Plants cannot defend themselves against herbivores	**Variation** competition variation Extinction **Understanding chemical reactions**	Year 7 reproduction Year 7 Properties and materials Year 7 particle model

			representing reactions, conservation of mass, reactivity, displacement	Word equations practical – using chemical experiments to write word equations Conservation of mass and state change practical – reaction of magnesium and oxygen Reactivity series practical 1 – Reactivity of metals in acid Reactivity series practical 2 – displacement reactions	- Organisms higher in a food web, eat anything or everything that is lower in the food web. - Carnivores have more energy or power than herbivores do. - Carnivores are big or ferocious, or both. Herbivores are small and passive.- Predator and prey populations are similar in size - Predator population does not affect prey population - Ecosystems change little over time - Characteristics are developed by individuals in response to the needs of the individual. - Energy accumulates in an ecosystem so that a top predator has all the energy from the organisms below it. - Carnivores can exist in a plant free world if their prey reproduces enough. **Understanding chemical reactions** - - an element is a substance made from one atom - chemical changes are the same as physical changes - atoms possess the same properties as the substance - - When things dissolve, they disappear - Materials can only exhibit properties of one state of matter. - Melting and dissolving are confused. - There is not empty space between molecules - Particles in a liquid are further apart than in a solid - Gases are not matter because most are invisible. - Particles are not conserved during a chemical change.	compound displactment reactivity	Year 7 substances and mixtures Year 8 elements and compounds Year8/9 understanding chemical reactions Year 9 biodiversity

Curriculum Plan *Subject*

Sheldon School
BE KIND | BE BRAVE | BE THE BEST YOU

					- Formation of a new substance with new properties is not rearranging existing atoms		
Term 4	**Making images** **Interdependence of organisms**		**Making images** the ray model of light to explain images, the passive eye model of vision and refraction lenses **Interdependence of organisms** food chains and food webs, interdependence within ecosystems Classification and identifying organism	**Making images** Reflection practical – using mirrors to explain reflection Refraction practical – using rayboxes and prisms to investigate refraction and display ray diagrams Convex and concave practical – investigating lenses and use in issues with vision/magnification **Interdependence of organisms** Sampling practical – using quadrats for biological sampling	**Making Images** - An object is seen whenever tight shines on it, with no recognition that light must move between the object and the observer's eye. - The mirror image of an object is located on the surface of the mirror. The image is often thought of as a picture on a flat or curved surface. - Light is reflected away from shiny surfaces, but light is not reflected from other surfaces. - Light always passes straight through transparent material (without changing direction). - When an object is viewed through a transparent material, the object is seen exactly where it is located. - Colours appearing on soap films and oil slicks are reflections of rainbows. - When a wave moves, particles move along with the wave from the point of transmission to the point of reception. - Colour is a property of an object, and colour is not affected by the eye-brain system or other receiving system. **Interdependence** - Only large land mammals are animals.	**Making images** absorb angle of incidence angle of reflection refraction lens **Interdependence of organisms** Predator Producer Habitat quadrat	

Curriculum Plan *Subject*

Sheldon School
BE KIND | BE BRAVE | BE THE BEST YOU

					- Whales, jellyfish, and starfish are all fish. - Behaviour and habitat are criteria for classification. - Food is anything useful taken into the body including: water, minerals, carbon dioxide (plants), and sunlight		
Term 5	**Earth's chemistry** **Simple circuits**		**Earth's chemistry** Air quality, explaining evaporation, water cycle processes **Simple circuits** making circuits, electric current, voltage and static electricity	**Earth's chemistry** Weathering practical – effects of acid rain on rocks **Simple circuits** Current practical – series circuits and measuring current Potential difference practical – series circuits and measuring potential difference Parallel circuits practical – parallel circuits and measuring current and potential difference	**Earth's chemistry** - oxygen is the most abundant gas in air - the air has always had the same composition of gases - Fossil fuels have been around since the origins of Earth and are not connected to organic life or photosynthesis. - Human activities alone are what cause the greenhouse effect. - Global warming is caused by the ozone hole, which was created by chemicals like hair spray. - Climate is simply long-term weather and therefore can't really be predicted. - The atmosphere is large and small amounts of carbon dioxide or a few degrees of	**Earth's chemistry** atmosphere condensation Climate change combustion pollution **Simple circuits** current electromagnet iparallel potential difference resistance	Year 7 light Year 7 cells and organ systems Year 7 reproduction Year 7 health and lifestyle Year 9 health and disease Year 9 waves

Curriculum Plan *Subject*

Sheldon School
BE KIND | BE BRAVE | BE THE BEST YOU

					temperature change can't make much difference. - Carbon is destroyed when fossil fuels are burned. **Simple circuits** - you only need one wire to make a circuit with a battery and a bulb - current is 'used up' as it flows round the circuit - current starts from one end of a battery and flows through each component of a circuit in turn, until it gets back to the other end of a battery - Mains sockets have current inside them - waiting to get out - Voltage flows through components - All bulbs have the same resistance - It is current that flows in an electrical circuit. Energy is a substance that exists independently All forms of energy are the same		
Term 6	**Health and disease** **Forces**		**Health and disease** good and ill health, disease **Forces** Energy Stores and Transfers Conservation of Energy	**Health and disease** Bone density practical – using straws to model bone density and strength **Forces** Ball Bearing down a Ramp	**Health and Disease** - All germs/bacteria (microbes) are harmful - You always catch an infection from a dirty environment or hospital - the fitter a person is the higher their heart rate. - health is only talking about physical health - mental health is not part of overall health	**Health and disease** addiction balanced diet deficiency stimulant **Forces** **Energy store** Conservation Transferred Thermal	Year 8 elements and compounds Year 7 energy stores Year 9 electricity

Curriculum Plan *Subject*

Sheldon School
BE KIND | BE BRAVE | BE THE BEST YOU

					- mental health is only negative - one particular disease can lead to other diseases		**Prior Learning Forces:** KS2 **Future Learning Forces:** Year 8 Term 2+3