**S1 Science Learner Journey**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Learning Intention** | **Success Criteria – learners will be able to;** | **Planned Homework activities** | **Ways to Support Learning at Home** | **Assessment** |
| **Inquiry and investigative skills** | Dependant on Topic | Plan and design scientific investigations  Carry out practical activities within a variety of learning environments  Analyse, interpret and evaluate scientific findings  Present scientific findings | **N/A** | N/A | Practical Assessment in class. |
| **Passport of Skills** |
| * Please see Passport of Skills Audit |
| **Scientific analytical**  **thinking skills** | Dependant on Topic | Applies scientific thinking skills while working with unfamiliar and complex contexts.  Applies and combines knowledge and understanding from different areas of science to solve problems.  Makes use of the engineering process in practical work to design, construct a model, test and modify the design to improve the solution. | **N/A** | **N/A** | End of Unit Knowledge and Understanding Assessment.  Formative and Summative Skills Assessment. |
| **Passport of Skills** |
| * Please see Passport of Skills Audit |
|  |
| **Skills and attributes of scientifically literate citizens** | Dependant on Topic  Through research and discussion, I have contributed to evaluations of media items with regard to scientific content and ethical implications. | Demonstrates understanding of the relevance of science to their future lives and the role of science in an increasing range of careers and occupations.  Demonstrates understanding of the impact of science on society. | **N/A** | **N/A** | End of Unit Knowledge and Understanding Assessment.  Formative and Summative Skills Assessment. |
| **Passport of Skills** |
| * Please see Passport of Skills Audit |
| **What’s the Matter** | * By contributing to experiments and investigations, I can develop my understanding of models of matter and can apply this to changes of state and the energy involved as they occur in nature. * I have developed my knowledge of the Periodic Table by considering the properties and uses of a variety of elements relative to their positions. | * Describes, using particle models and diagrams, the properties of solids, liquids and gases and applies this knowledge to identify and classify unknown substances. * Applies understanding of models of matter to explain changes of state in terms of energy being gained or lost by a substance. * Knows that elements are organised in the Periodic Table by atomic number, each with its own unique symbol, and that elements with similar chemical properties are placed together in vertical groups. * Identifies and names the groups ‘alkali metals’, ‘halogens’ and ‘noble gases’ and describes their reactivity. | * States of Matter Knowledge and Understanding Exercises | * Review of class jotter * Practice using the scientific terminology | * Practical Assessment in class * End of Unit Knowledge and Understanding Assessment * Formative and Summative Skills Assessment |
| **Passport of Skills** |
| * Please see Passport of Skills Audit |
| **Microscopic Mysteries** | * Using a microscope, I have developed my understanding of the structure and variety of cells and of their functions. * I have contributed to investigations into the different types of microorganisms and can explain how their growth can be controlled. * Through research and discussion, I have contributed to evaluations of media items with regard to scientific content and ethical implications. | * Identifies the structures found in plant and animal cells and describes their functions. * Describes the main similarities and differences between plant and animal cells. * Researches and describes the structure and function of some specialised cells, for example, nerve, root hair, red blood cell, sperm and egg. * Applies knowledge from investigations to describe the essential resources that micro-organisms need to grow and reproduce, for example, food, water, warm temperature and a suitable pH. * Draws conclusions from investigations to describe how conditions and chemicals can promote and restrict growth, including temperature, antibiotics and antifungals. | * Cells Knowledge and Understanding Exercises | * Review of class jotter * Practice using the scientific terminology | * Practical Assessment in class * End of Unit Knowledge and Understanding Assessment * Formative and Summative Skills Assessment |
| **Passport of Skills** |
| * Please see Passport of Skills Audit |
| **Light and Sight** | * By exploring the refraction of light when passed through different materials, lenses and prisms, I can explain how light can be used in a variety of applications. * By exploring radiations beyond the visible, I can describe a selected application, discussing the advantages and limitations. | * Demonstrates through practical investigation how refraction can cause a change of direction of light as it passes from one material to another. * Describes the practical applications of refraction in everyday situations, for example, in corrective lenses in glasses, and in magnifying glasses and optical instruments. * Explains how a visible spectrum is produced as light passes through a prism. * Describes the electromagnetic spectrum as a family of waves including Gamma Rays, X-Rays, Ultraviolet, Visible Light, Infrared, Microwaves, Television and Radio. * Researches one application of an electromagnetic wave beyond visible in everyday life, giving advantages. | * Light Knowledge and Understanding Exercise * Electromagnetic Spectrum Knowledge and Understanding Exercise | * Review of class jotter * Practice using the scientific terminology | * Practical Assessment in class * End of Unit Knowledge and Understanding Assessment * Formative and Summative Skills Assessment |
| **Passport of Skills** |
| * Please see Passport of Skills Audit |
| **Chemical Reactions** | * Having contributed to a variety of practical activities to make and break down compounds, I can describe examples of how the properties of compounds are different from their constituent elements. * Having taken part in practical activities to compare the properties of acids and bases, I have demonstrated ways of measuring and adjusting pH and can describe the significance of pH in everyday life. * Through experimentation, I can identify indicators of chemical reactions having occurred. I can describe ways of controlling the rate of reactions and can relate my findings to the world around me. | * Investigates and describes properties of metals and non-metals, for example, appearance, conductivity of electricity, position in the Periodic Table and their uses linked to their properties. * Investigates and describes at least two examples of compounds with properties that are different from their constituent elements, for example, hydrogen explosion and electrolysis of water. * Constructs names of two-element compounds which are derived from the names of the elements, from which it is formed, with a suffix of-ide. * Constructs word equations for simple reactions, Identifies elements present from simple molecular formulae. * Identifies indicators of chemical reactions such as colour change, precipitate formation, release of gas, and/or a detectable energy change. * Finds the relationship between particle size, concentration temperature and catalysts and the rate of a reaction. * Explains how catalysts, including enzymes, can be used to speed up chemical reactions, and provides at least two everyday examples of reactions involving a catalyst. | * Chemical Reactions Knowledge and Understanding Exercises | * Review of class jotter * Practice using the scientific terminology | * Practical Assessment in class * End of Unit Knowledge and Understanding Assessment * Formative and Summative Skills Assessment |
| **Passport of Skills** |
| * Please see Passport of Skills Audit |
| **How Did We Get Here?** | * I understand the processes of fertilisation and embryonic development and can discuss possible risks to the embryo. * Through research and discussion, I have contributed to evaluations of media items with regard to scientific content and ethical implications. | * Knows that a sex cell (gamete) contains half the genetic information needed to a make a complete individual. * Explains how the nuclei of an egg and a sperm (sex cells) fuse through the process of fertilisation and how the fertilised egg divides repeatedly to form an embryo. * Identifies the main structures within the pregnant womb (for example, placenta, amniotic fluid and umbilical cord) and describes their function. * Gives examples of substances, including toxins, which can cross the placenta from the mother to the embryo and demonstrates understanding of the potential damage to the embryo. | * Reproduction Knowledge and Understanding Exercises | * Review of class jotter * Practice using the scientific terminology | * Practical Assessment in class * End of Unit Knowledge and Understanding Assessment * Formative and Summative Skills Assessment |
| **Passport of Skills** |
| Please see Passport of Skills Audit |
| **Some Like It Hot**  **IDL** | I can use my knowledge of the different ways in which heat is transferred between hot and cold objects and the thermal conductivity of materials to improve energy efficiency in buildings or other systems. | Applies knowledge from practical investigations to explain how heat is transferred by conduction, convection and radiation.  Establishes a link between heat loss in buildings and the temperature difference between the inside and outside of the building.  Applies understanding of thermal energy efficiency, conductors  and insulators to explain how materials can be used in building design to reduce heat loss, for example, in double and triple glazing.  Gives examples of how skills developed through science are used in a wide variety of jobs and careers including science, technology, engineering and mathematics (STEM) careers.  Presents research findings on the advantages and disadvantages associated with the use of renewable energy sources and their impact on society, demonstrating an informed view based on evidence. | Heat Knowledge and Understanding Exercises  **N/A** | * Review of class jotter * Practice using the scientific terminology * Discuss Learning at home | * Practical Assessment in class * End of Unit Knowledge and Understanding Assessment * Formative and Summative Skills Assessment * Formative Skills Assessment |
| **Passport of Skills** |
| Please see Passport of Skills Audit |
| By investigating renewable energy sources and taking part in practical activities to harness them, I can discuss their benefits and potential problems.  Through research and discussion, I have contributed to evaluations of media items with regard to scientific content and ethical implications. |
| **Passport of Skills** |
| Please see Passport of Skills Audit |