

Name _____



My Level 3 S2 Learning Intentions

Unit: Chemical Reactions, Acids & Alkalis

| What I Need to Do for Level 3 | Can I Do It? ☺ ☹ |
|---|----------------------------|
| Know that indicators, such as universal indicator, are chemicals which produce different colours when placed in acid and alkali/bases. | |
| Investigate and describe the colour changes of indicators when added to acid/bases. | |
| Investigate and describe the pH of some everyday substances. | |
| Identify substances as acidic (pH of less than 7), alkaline/basic (pH greater than 7) or neutral (equal to 7). | |
| Investigate and describe what happens to the pH when an acid is added to an alkali/basic. | |
| Identify indicators of chemical reactions such as colour change, precipitate formation, release of gas, and/or a detectable energy change. | |
| Find the relationship between particle size, concentration temperature and catalysts and the rate of a reaction. | |
| Explain how catalysts, including enzymes, can be used to speed up chemical reactions, and provide at least two everyday examples of reactions involving a catalyst. | |

Unit: DNA & Reproduction

| What I Need to Do for Level 3 | Can I Do It? ☺ ☹ |
|---|----------------------------|
| Know that DNA is found in the nucleus of most cells and that it contains the instructions for the development and function of living things (genetic code). | |
| Describe a gene as a piece of DNA which controls specific characteristics in an individual and demonstrate understanding that every individual has a unique combination of genes. | |
| Describe DNA profiling as a way of using technology to analyse DNA to see a unique pattern for an individual and give examples of practical applications (paternity tests and forensics). | |
| Present reasoned arguments on the ethical implications of collection, processing, storage and ownership of genetic information or DNA profiles. | |
| Know that a sex cell (gamete) contains half the genetic information needed to make a complete individual. | |
| Explain 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. | |
| Identify the main structures within the pregnant womb (for example, placenta, amniotic fluid and umbilical cord) and describe their function. | |
| Give examples of substances, including toxins, which can cross the placenta from the mother to the embryo and demonstrate understanding of the potential damage to the embryo. | |

Unit: Forces

| What I Need to Do for Level 3 | Can I Do It? ☺ ☹ |
|---|----------------------------|
| Draw on findings from investigations to explain how lubrication, streamlining and other methods can be used to reduce friction, reducing the energy lost and improving efficiency. | |
| Know that weight is a force caused by the Earth's (or other planet's) gravitational pull on an object, measured in newtons (N), and uses the formula $W = mg$ to calculate weight. | |
| Predict the effects on the weight of an object due to the gravitational field strength in different positions in the universe, for example, at different altitudes on Earth, on different planets and in deep space. | |
| Present a reasoned argument on the likelihood of life existing elsewhere in the universe including factors such as: the distance of planets from their stars, the number of stars in the universe and the availability of liquid water, nutrients and energy. | |
| | |

Unit: The Periodic Table

| What I Need to Do for Level 3 | Can I Do It? ☺ ☹ |
|--|---------------------|
| Investigate and describe properties of metals and non-metals, for example, appearance, conductivity of electricity, position in the Periodic Table and their uses linked to their properties. | |
| Know 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. | |
| Identify and name the groups 'alkali metals', 'halogens' and 'noble gases' and describe their reactivity. | |
| Investigate and describe at least two examples of compounds with properties that are different from their constituent elements, for example, hydrogen explosion and electrolysis of water. | |
| Construct names of two-element compounds which are derived from the names of the elements, from which it is formed, with a suffix of-ide. | |
| Construct word equations for simple reactions, for example, carbon reacting with oxygen: carbon + oxygen \longrightarrow carbon dioxide. | |
| Identify elements present from simple molecular formulae. | |
| Give examples of pure substances and mixtures from everyday life. | |

Unit: Biotechnology

| What I Need to Do for Level 3 | Can I Do It? ☺ ☹ |
|--|----------------------------|
| Apply 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. | |
| Draw conclusions from investigations to describe how conditions and chemicals can promote and restrict growth, including temperature, antibiotics and antifungals. | |
| Describe how microbes (for example, bacteria and viruses) can cause disease and infection and how barriers to infection provide a first line of defence, for example, skin, mucus and stomach acids. | |
| Describe how the immune system protects the body against disease if the first line of defence is breached, for example, through the action of white blood cells and production of antibodies. | |
| Apply knowledge of body defence mechanisms to explain how vaccinations can protect individuals and populations from disease. | |
| | |

Unit: Enlightened

| What I Need to Do for Level 3 | Can I Do It? ☺ ☹ |
|--|----------------------------|
| Demonstrate through practical investigation how refraction can cause a change of direction of light as it passes from one material to another. | |
| Describe the practical applications of refraction in everyday situations, for example, in corrective lenses in glasses, and in magnifying glasses and optical instruments. | |
| Explain how a visible spectrum is produced as light passes through a prism. | |
| Describe the electromagnetic spectrum as a family of waves including Gamma Rays, X-Rays, Ultraviolet, Visible Light, Infrared, Microwaves, Television and Radio. | |
| Research at least one application of an electromagnetic wave beyond the visible in everyday life, giving advantages and limitations of that application. | |
| | |

Independent Research

| What I Need to Do for Level 3 | Can I Do It? ☺ ☹ |
|--|---------------------|
| Collaborate with others to research how scientists, and those who use science in their jobs, have contributed to the development of scientific ideas. | |
| Communicate findings in a suitable way to give an example of how scientists contribute to innovative research and development. | |
| Give 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. | |
| Demonstrate understanding of bias and separates fact from opinion taking into account a range of reasons for bias. | |
| Analyse the scientific content in media items and discuss the ethical implications of the scientific issue being explored. | |
| Research the formation, characteristics and uses of at least two common minerals, for example, quartz or gypsum. | |
| Present research findings on the advantages and disadvantages associated with the use of renewable energy sources and their impact on society. | |
| Interpret data and information to establish a link between the use of fertilisers and plant yield and nutrient levels in the soil. | |
| Research an agricultural method, for example, chemical fertilisers, herbicides, pesticides, organic methods, genetic modification (GM) and biological control and evaluate their impact on food production | |

