**Curriculum map Learning Domain: Science Year Level: 8**

Energy Evolution

Chemistry – matter

Body Systems and Cells

Dinosaurs and mining – The Rock Cycle

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| **Broad curriculum Content**  *Comes from VELS or AusVELS introduction to the standards*  In Level 8, students are introduced to cells as microscopic structures that explain macroscopic properties of living systems. They link form and function at a cellular level and explore the organisation of body systems in terms of flows of matter between interdependent organs. Similarly, they explore changes in matter at a particle level, and distinguish between chemical and physical change. They begin to classify different forms of energy, and describe the role of energy in causing change in systems, including the role of heat and kinetic energy in the rock cycle. Students use experimentation to isolate relationships between components in systems and explain these relationships through increasingly complex representations. They make predictions and propose explanations, drawing on evidence to support their views. |

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| **Term: 1** |
| **Topic: Energy Evolution** |
| **Timeframe**  **Term 1 (7 weeks, including common assessment task for 2 weeks)** |
| **Big Ideas**  *lifelong learning; relevant to all stages of life*  Energy is never lost or gained only converted |
| **Enduring Understandings**  *what understandings about the big ideas are desired*  Students will understand that…   * **We need to live in balance with our environment** * **Renewable Energy Resources are ever increasing in our society** * **Our past helps us understand our future** * **No resource is everlasting** * **The earth is constantly changing** |
| **Standards addressed**  *Refer to VELS /AusVELS*  They identify different forms of energy and describe how energy transfers and transformations cause change in simple systems. |
| **Essential Questions**  *provocative to foster inquiry, understanding and transfer of learning*   * What is energy? * How is energy “made” into a usable resource? * What is the difference between renewable and non-renewable resources? * What information do we need to make to informed decisions as energy consumers? * How is energy converted between energy forms? |
| **Key Skills Knowledge and Understandings**  Students will be able to:   * Use diagrams to illustrate changes between different forms of energy * Explain the difference between kinetic and potential energy * List the cause and effects of different forms of energy * investigate different forms of energy in terms of the effects they cause, such as gravitational potential causing objects to fall and heat energy transferred between materials that have a different temperature   Students will know:   * The conservation of energy law * How to identify changes of energy * The difference between renewable and non-renewable energy   Students will understand:   * that heat energy is often produced as a by-product of energy transfer, such as brakes on a car and light globes * gravitational potential energy causes objects to fall * heat energy is transferred between materials that have a different temperature * kinetic energy is the energy possessed by moving bodies |
| **Assessment:** *(based on an expectation that feedback loops exist for students to receive information from teachers in order to move them from one level to higher levels)*  **Formative:**   * Establishing prior knowledge – Wordle/Brainstorm * anticipating and clarifying misconceptions – Reviewing homework and classroom discussions * mini performances of understanding to provide opportunities to try new learning and use a variety of skills – Practical investigations, homework and class activities * collaborative work – Practical work and group activities * peer/self feedback – reflection, homework, vocabulary building * teacher to student feedback – corrected work, verbal feedback * student to teacher feedback – reflection, what did we do well, what did I learn, test results   **Summative assessment:**   * [Inquiry Research Project: “Renewable Energy”](file:///D:\Users\DAK\Documents\SCIENCE\8%20Science\Year%208%20Energy\Renewable%20Energy%20Assignment.docx) |
| **Term: 2** |
| **Topic: Chemistry** |
| **Timeframe**  9 weeks: Must be completed one week before the report are due |
| **Big Ideas**  *lifelong learning; relevant to all stages of life*  Everything is made up of atoms (particles) |
| **Enduring Understandings**  *what understandings about the big ideas are desired*  Students will understand that…   * Everything is made up of particles and they behave differently depending on how much energy they have. * Symbols and formulae make it easier to communicate what is happening in a chemical reaction and in compounds * Everything is a chemical and an atom * Chemicals react differently depending on their properties. We can use these properties to our benefit. |
| **Standards addressed**  *Refer to VELS /AusVELS*  Students compare physical and chemical changes and use the particle model to explain and predict the properties and behaviours of substances. |
| **Essential Questions**  *provocative to foster inquiry, understanding and transfer of learning*   * What is an atom, an element and a compound? * What happens when a chemical reaction occurs? * How chemical compounds help clean the kitchen? * What chemical changes occur when you bake a cake? * How do atoms keep us alive? * How do we know what properties a chemical will have? – temp, weight, state of matter, reactivity |
| **Key Skills and Understandings**  Students will be able to:   * Use the particle model to show the states of matter * Model the arrangement of particles in solids, liquids and gases * Investigate simple reactions such as combining elements to make a compound * Make observations that provide evidence that a chemical change has taken place * Perform chemical reactions safely * Model the arrangement of particles in elements and compounds   Students will know:   * That solids, liquids and gases are linked by changes in energy * That chemical and physical changes can be identified by observations * that elements and simple compounds can be represented by symbols and formulas * elements can be located on the periodic table   Students will understand:   * why a model for the structure of matter is needed * how we can use a model of the arrangement of particles in solids, liquids and gases to explain observed phenomenon * the energy of particles is linked to temperature changes * modelling the arrangement of particles in elements and compounds * identifying the differences between chemical and physical changes * identifying evidence that a chemical change has taken place * recognising that the chemical properties of a substance, for example its flammability and ability to corrode, will affect its use |
| **Assessment:** *(based on an expectation that feedback loops exist for students to receive information from teachers in order to move them from one level to higher levels)*  Formative:   * Establishing prior knowledge – Brainstorming, post box activity * anticipating and clarifying misconceptions – Reviewing homework and classroom discussions * mini performances of understanding to provide opportunities to try new learning and use a variety of skills – Practical investigations, homework and class activities * collaborative work – Practical work and group activities * peer/self feedback – reflection, homework, vocabulary building * teacher to student feedback – corrected work, verbal feedback * student to teacher feedback – reflection, what did we do well, what did I learn, test results   **Summative assessment:**   * Practical report * Tiered Assessment based on Essential questions and keys skills and knowledge   Level C –Apply the information to real life experiences  Level B – Analyse data and real life situations  Level A- Create experiments based on the topic and analyse the results to create meaning  **(CAT to be developed)** |
| **Term: 3** |
| **Topic: Biological Science – “Body Systems: Cells to Organs to Systems”** |
| **Timeframe**  **10 weeks: 5 weeks for Cells and 5 weeks for Body Systems** |
| **Big Ideas**  *lifelong learning; relevant to all stages of life*  Body Systems. |
| **Enduring Understandings**  *what understandings about the big ideas are desired*  Students will understand that…   * The body is made up of building blocks called cells that each do specialised jobs to make our bodies work * There are similarities and difference between species dependent on their individual needs * Cells work together to form organs and body systems * Choices made can affect an individual’s health and wellbeing * Disease can be spread and can be treated based on the infectious agent |
| **Standards addressed**  *Refer to VELS /AusVELS*  Students analyse the relationship between structure and function at cell, organ and body system levels. |
| **Essential Questions**  *provocative to foster inquiry, understanding and transfer of learning*   * What does a healthy body need to survive and thrive? * What does an unhealthy body look like? * How are we different from plants? * What is the role and function of cells? * What is the structure of different systems in a body? * What tools can we use to examine different cells and identify their properties? * What terminology would we need to use when accessing health treatment? |
| **Key Skills and Understandings**  **Students will be able to:**   * examine a variety of cells using a light microscope, by digital technology or by viewing a simulation * Recall structures within cells and describe their function - organelles * distinguish plant cells from animal cells * identify structures within cells in a practical situation and describing their function * identify the organs and overall function of a system of a multicellular organism in supporting the life processes – digestive system and circulatory system * describe the structure of each organ in a system and relate its function to the overall function of the system – specialised cells within the organ * recall the function of organs in a body system   **Students will know that :**   * organisms can be single celled or multicellular * Cells divide exponentially * The organs in one body system * The structure and function of specialised cells involved in a system   **Students will understand that:**   * some organisms consist of a single cell and the reasons for that * comparisons can be made of similar systems in different organisms such as a part of the digestive systems in herbivores and carnivores * specialised cells and tissues are specific to the function they perform in the organ they are found in |
| **Assessment:** *(based on an expectation that feedback loops exist for students to receive information from teachers in order to move them from one level to higher levels)*  **Formative:**   * Establishing prior knowledge – Brainstorming, outline of a person, world * anticipating and clarifying misconceptions – Reviewing homework and classroom discussions * mini performances of understanding to provide opportunities to try new learning and use a variety of skills – Practical investigations, homework and class activities * collaborative work – Practical work and group activities * peer/self feedback – reflection, homework, vocabulary building * teacher to student feedback – corrected work, verbal feedback * student to teacher feedback – reflection, what did we do well, what did I learn, test results   **Summative assessment:**   * Practical report: * Common assessment task: [Test](file:///D:\Users\DAK\Documents\SCIENCE\8%20Science\Year%208%20Biol\Tests%20for%20Year%208%20Biology\Test%202013%20Biology%20Year%208.docx) which has been designed at three levels of complexity |
| **Term: 4** |
| **Topic: Dinosaurs and mining** |
| **Timeframe**  **8 weeks** |
| **Big Ideas**  *lifelong learning; relevant to all stages of life*  Continuity and Change |
| **Enduring Understandings**  *what understandings about the big ideas are desired*   * We can learn about our past through rocks * Our past helps us understand our future * No resource is everlasting * The earth is constantly changing * Fossils are found only in sedimentary rock * Some minerals are expensive because they are rare and hard to get out of the ground * Mining is a growth industry |
| **Standards addressed**  *Refer to VELS /AusVELS*  Students compare processes of rock formation, including the time scales involved. |
| **Essential Questions**  *provocative to foster inquiry, understanding and transfer of learning*   * How do we use our resources responsibly? * What are the three different types of rocks? * How are minerals made and destroyed? * How are rocks identified? – The Moh Scale etc * How do we study rocks to get a better understanding of the Earth’s timescale? * What is a Palaeontologist? * How do Palaeontologists determine what a dinosaur looks and behaves like? |
| **Key Skills and Understandings**  **Students will be able to:**   * represent the stages in the formation of igneous, metamorphic and sedimentary rocks, including indications of timescales involved – rock cycle * identify a range of common rock types using a key based on observable physical and chemical properties * create a Claymation or animation video to demonstrate knowledge   **Students will know:**   * that rocks are a collection of different minerals * rocks are igneous, metamorphic or sedimentary * the rock cycle and the changes that occur to rocks with heat, pressure and weathering * some rocks and minerals, such as ores, provide valuable resources * Dinosaurs and fossils are only found in sedimentary rock   **Students understand:**   * the role of forces and energy in the formation of different types of rocks and minerals * the links between the rock cycle, mining and palaeontology |
| **Assessment:** *(based on an expectation that feedback loops exist for students to receive information from teachers in order to move them from one level to higher levels)*  **Formative:**   * Establishing prior knowledge – Quiz (Game Show style) * anticipating and clarifying misconceptions – Reviewing homework and classroom discussions * mini performances of understanding to provide opportunities to try new learning and use a variety of skills – Practical investigations, homework and class activities * collaborative work – Practical work and group activities * peer/self feedback – reflection, homework, vocabulary building * teacher to student feedback – corrected work, verbal feedback * student to teacher feedback – reflection, what did we do well, what did I learn, test results   **Summative assessment:**   * Practical report – “Rock Candy” * [Research Assignment: “Animation of a dinosaur” – Claymation/ stop motion capture](file:///D:\Users\DAK\Documents\SCIENCE\8%20Science\Earth%20Science%20-%20Dinosaurs\My%20Dinosaur%20Presentation.docx) |