**Unit 1 Integrated Science**

**POS Yr 7 2016 -2017**

**Unit title: What the world is made of ?**

**Key concept: Relationships Related concepts: Patterns Global concept: Scientific and Technical Innovation**

**Statement of inquiry: We observe, look for patterns and relationships in order to help us understand the natural world.**

**Inquiry Question: What are the building blocks of our world?**

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| **Week** | **Topic** | **Objectives** | **Suggested Activities** | **Assessment** |
|  1 - 5 |  Cellular organization & microscopy  | **Animal and plant cells**1. Appreciate that all living organisms are made up of cells2. Identify the basic parts of an animal and plant cell and explain their function3. Describe the organelles and explain their function in animal and plant cells4. Understand the significance of the differences in structure between animal and plant cells **Specialised cells**1. State some specialised cells2. Describe the structure and function of specialised cells **Microscopy**1. Describe who Robert Hooke was2. Label a light microscope3. Know the rules when drawing cells4. State what resolution and magnification are**Movement of Molecules – Osmosis and Diffusion**1. Define osmosis and diffusion
2. Carry out an investigation to observe osmosis and diffusion

 **Organ Systems**1. Know that cells are arranged into groups to form tissues2. Describe the different levels of organization within the human body3. Recognize tissues, organs and systems     |  Label animal and plant cells Make a model of a cell (animal cell or plant cell) Set up microscope and make slides Observe prepared slides of tissues Speed dating specialised cells  | **Formative:** Making a model cell**Criterion B:** Using a microscope**Criterion C:** Using a microscope **Criterion A:** Body Systems video **Criterion A:** Written test on microscopy, cells and systems**Optional:** Criterion D: OWE on history of the microscope. How has it changed how we view the world?   |
| **Week** | **Topic** | **Objectives** | **Suggested Activities** | **Assessment** |
|  6 - 9 |  Structure of matter& Classifying chemical elements                            | **Structure of the Atom**1. Label the structure of the atom2. Identify atomic and mass number3. Draw electron configurations**States of Matter**1. Name the three states of matter, and the state changes2. Describe and draw the arrangement of particles in each state3. Explain the amount of energy and movement in each state **Boiling Water**1. Create a risk assessment2. State the equipment and method3. Draw a graph of the results4. Describe a conclusion and evaluation **Periodic table**1. Label where metals and nonmetals are in the periodic table2. Describe where periods and groups are in the periodic table3. Recall that elements are arranged in groups with similar chemical properties4. Explain what each part of the periodic table means5. Write the symbols and electronic configuration of common elements, including the first 20 elements **Atoms, elements and compounds**1. State what an atom, element, compound and mixture are2. Describe the difference between them3. Explain the methods of separation (filtration, chromatography, distillation, crystallisation) **Chemical and physical changes**1. Identify reactants and products in a reaction2. Describe the changes that take place in a chemical and physical reaction3. Explain the difference between a chemical and physical reaction **Metals and nonmetals**1. State what property means2. Give examples of metals and nonmetals3. Describe the properties of metals and nonmetals |  Chocolate doodles experiment Periodic table card game Tom Lehrer Element song (You Tube) We are the elements song Make a model of an atom Making mixtures, solutions, suspensions Separation practical: filtration, chromatography, distillation, crystallisation     |  **Formative:** Lab report for boiling water experiment**Criterion D:** Water Purification Essay **Criterion A:** Written test on structure of matter and classifying chemical elements **Optional:** Criterion D: Design a periodic table        |
| **Week** | **Topic** | **Objectives** | **Suggested Activities** | **Assessment** |
|  10 - 13 |  Biological classification |  **Living Organisms**1. State the 7 processes of life2. Describe whether something is living or nonliving3. Compare and contrast living and nonliving organisms **Classification**1. Define the word classification2. Describe why animals are classed into groups3. Recognise the binomial system of naming organisms4. Read branching keys and dichotomous keys5. Create your own branching keys**Kingdoms**1. State the names of the kingdoms2. Know the 7 levels of classification3. Give examples of organisms in the kingdoms4. Give examples of the characteristics of the organisms in the kingdoms5. Know the main features of the five main animal classes of vertebrates (fish, amphibians, reptiles, birds, mammals) **Mimicry**1. Define the word mimic2. State some animals that use mimicry3. Explain why organisms use mimicry  |  Making a key to sort out different household of classroom objects Using keys to classify different animals Use a dichotomous key to identify cats  |  **Formative:** Poster on MRS NERG **Formative:** Presentations on a kingdom – peer assessed**Criterion A:** Written test on biological classification (SAW)  |

**Unit 2 Integrated Science**

**POS Yr 7 2016 -2017**

**Unit title: Exploration of our world and beyond**

**Key concept: Relationships Related concepts: function Global concepts: Scientific and technical innovation**

**Statement of inquiry: Understanding the nature of light and sound allows us to explore our own environment, and to discover other worlds beyond ours.**

**Inquiry question: How do we investigate our surroundings?**

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| **Week** | **Topic** | **Objectives** | **Suggested Activities** | **Assessment** |
|  1 - 5 |  Light                          | **Light**1. State the colours that make up white light2. Describe how light travels3. Explain how light travels through different objects **Reflection and Refraction**1. State what is meant by reflection and refraction2. Investigate what happens when light is shone into different objects3. Measure the angles involved in reflection and refraction**Dispersion**1. Recall that white light is made up of a spectrum of colours2. Describe how filters work3. Explain how a prism splits light into a spectrum**Convex and Concave Lenses**1. Define refraction2. Label how light changes direction in each type of lens3. Explain how a lens forms an image**The Human Eye**1. State the five senses and their functions2. Label the key parts of the eye and their function3. Describe which parts of an eye and camera are similar**Eye Damage**1. State the ways we can protect our eyes2. Describe how our eye sees an image3. Describe ways we can lose our sight (Inc. long/short sightedness) |   In a darkened room show a variety of objects - some will be seen and some will not. Simple investigation of shadows- what happens to shadow when source/object are moved  Reflection and refraction experiment Construct a pinhole camera Dissect the eye of a cow        |   **Criterion B:** Periscope construction & leaflet**Criterion C:** Periscope construction & leaflet                    |
| **Week** | **Topic** | **Objectives** | **Suggested Activities** | **Assessment** |
|  6 - 7 |  Astronomy & Waves  |  **Waves**1. Define a wave2. State the two types of wave and how they differ3. Define and label the key terms onto wave diagrams**Our Solar System**1. State the order of the planets2. Describe which planets are rocky or gaseous3. Describe some key facts about the planets **Satellites**1. State what gravity is2. Describe the effects of gravity on objects3. Explain the main uses for artificial satellites **Seasons**1. Describe how the earth orbits the sun2. Explain why we have day and night3. Explain why we have seasons  |   Slinky to show waves  | **Formative:** Create your own solar system **Formative:** Design a resort on a planet**Criterion D:** Hubble Telescope Essay  |
|  7 to 9 | Sound |  **The Human Ear**1. Label the key parts of the ear2. Describe the function of each part of the ear3. Explain what stereophonic hearing is **Sound**1. State how sound travels2. State what an oscilloscope is3. Describe how pitch and volume are measured4. Interpret wave graphs from an oscilloscope5. Describe what causes and echo6. Describe how a sound insulator works**Bell Jar**1. State what a vacuum is2. Describe why no sound can be heard in a vacuum |  Stereophonic hearing experiment Bell Jar experiment Oscilloscope demonstration Ghost oscilloscope readings Tuning forks      |  **Formative:** Design a house to suit a family with different specific needs in terms of hearing **Criterion A:** Written test – light, sound, waves, astronomy         |

**Unit 3 Integrated Science**

 **POS Yr 7 2016 -2017**

**Unit title: Sharing our planet**

**Key concept: Change Related concepts: balance, interaction Global concept: Globalization and sustainability**

**Statement of inquiry: Human activity has significantly changed the natural world for better and for worse.**

**Inquiry question: How do we take care of our planet?**

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| **Week** | **Topic** | **Objectives** | **Suggested Activities** | **Assessment** |
|  1 – 2                        | Ecology (organisms & the environment) |  **Food Webs**1. State what an ecosystem is2. Describe where ecosystems get their energy3. Draw and label your own food web4. Explain how small influences have an affect on food webs5. State what the arrows show in a food chain **Photosynthesis**1. State the word equation for photosynthesis2. Describe the limiting factors of photosynthesis3. Explain how the plants use the products of photosynthesis4. Know how to test for starch in a plant leaf **Pyramids**1. Define the word biomass2. Construct a pyramid of numbers3. Explain how energy is lost at each trophic level **Factors affecting population distribution**1. State some factors that affect distribution2. Explain how these factors affect distribution3. Create environments with hostile and optimum conditions**Acid Rain**1. State what acid rain is2. Describe what causes acid rain3. Explain problems and solutions with acid rain |  Food web posters Construct a model of a sustainable community eg Energy island or other activity              |  **Formative:** Starch test lab report                      |
| **Week** | **Topic** | **Objectives** | **Suggested Activities** | **Assessments** |
|  3 - 6 | Acids and Alkalis |  **Acids and Alkalis**1. Label where acids and alkalis are on the periodic table2. Describe how to test for an acid or alkali3. Describe how to tell the difference between an acid and alkali **Indicators**1. State what an indicator is2. Describe how to prepare each indicator3. Explain which substances are suitable to be used as an indicator **Neutralisation**1. Describe how to make a neutral solution2. State the simple word equation for neutralisation3. Explain two methods to test for a neutral solution4. Describe how neutralisation is used in real life situations **Acids and Metal Carbonates**1. Describe the reaction between acids and carbonates2. Explain how we can place elements into a reactivity series3. Give a simple word equation for the reaction between metals and carbonates4. Explain how to test for carbon dioxide |  Making natural indicators eg red cabbage Testing acidic and alkaline solutions (litmus, pH paper and UI) Common reactions of acids ( and acid rain) eg with metals, carbonates, bases etc. Neutralisation – NaOH and HCl, evaporation to get NaCl     |  **Criterion B:** Antacid experiment**Criterion C:** Antacid experiment **Criterion A:** Written test – Ecology, Acids & Alkalis (SAW)         |
| After SAW | Simple Machine**s** | **Simple Machines**1. Review forces work from year 62. Define the following terms:* Catapults
* Lever
* Wheel and axle
* Pulley
* Inclined plane
* Wedge
* Screw

3. Design a model that includes some simple machines (catapults) | Simple machine model design | **Formative:** Design a model which includes some simple machines |