# MARINA INTERNATIONAL SCHOOL

## SCIENCE SCHEME OF WORK

### YEAR 3 - TERM 1

| WEEK | TOPIC | TOPIC DETAILS |
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| 1.1 | • Know life processes common to humans and animals include nutrition (water and food), movement, growth and reproduction | Learners have previously learned some of the characteristics of living things in Stage 1. In particular, living things:<br>• can move<br>• can grow<br>• need food<br>• can have offspring. |
| 1.2 | • Describe differences between living and non-living things using knowledge of life processes | Identify what learners can recall about the characteristics of living things with activities such as:<br>• Display three pictures – an animal, a plant and a toy vehicle. Learners discuss in pairs: Which is the odd one out? Why? What features do these things have in common? Discuss and share responses as a class. Write up a list of words to describe the odd one out each time. |
| 1.3 | • Sort living things into groups, using simple features and describe rationale for groupings | • Place learners in groups and provide each group with a set of cards containing pictures of a variety of living and non-living things. (Maximum 12 cards in a set). Without telling learners your reasoning, have them sort the pictures into two groups, e.g. things that move and things that do not move. Have learners explain why they have sorted them in that way. |
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| 2.1 | • Observe and compare objects, living things and events | Prepare a set of cards with statements about life processes on them. These should use the terms expected of a Stage 3 learner e.g. moves, grows, reproduces, needs nutrition. Provide the cards to groups of learners.<br>• Make sure that the learners understand the statements on the four cards.<br>• Learners use a Venn diagram with two intersecting circles; label the circles 'Animals' and 'Humans' and place the cards into the circles. Large hoops can be used to create the Venn diagram rather than drawing, if preferred.<br>• Discuss and agree that the four statements about life processes are all true for animals and humans.<br>• Use this to emphasise that humans are a type of animal; all the statements that apply to animals also apply to humans. |

| WEEK | TOPIC | TOPIC DETAILS |
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| 2.2 | • Make generalisations and begin to identify simple patterns in results | Watch a video clips, e.g. a robot moving and they watch a learner moving in class (could be while the video is playing). Learners compare ways in which a learner and a robot are alike. Learners then explain how they know the robot is not alive. |
| 2.3 | Continuation of lesson. | Resources:<br>• Life process statement cards, Venn diagrams or hoops.<br>• robot moving- https://youtu.be/sv35ItWLBBk |
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| 3.1 | • Observe and compare objects, living things and events | Prepare a set of cards with statements about life processes on them. These should use the terms expected of a Stage 3 learner e.g. moves, grows, reproduces, needs nutrition. Provide the cards to groups of learners.<br>• Make sure that the learners understand the statements on the four cards.<br>• Learners use a Venn diagram with two intersecting circles; label the circles 'Animals' and 'Humans' and place the cards into the circles. Large hoops can be used to create the Venn diagram rather than drawing, if preferred.<br>• Discuss and agree that the four statements about life processes are all true for animals and humans.<br>• Use this to emphasise that humans are a type of animal; all the statements that apply to animals also apply to humans. |
| 3.2 | Observe and compare objects, living things and events | Watch a video clips, e.g. a robot moving and they watch a learner moving in class (could be while the video is playing). Learners compare ways in which a learner and a robot are alike. Learners then explain how they know the robot is not alive. |
| 3.3 | Continuation of lesson. | CONTINUATION OF LESSON. |
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| 4.1 | Sort living things into groups, using simple features and describe rationale for groupings | Provide learners with pictures of different types of animals (e.g. fish, birds, mammals, insects, reptiles). |
| 4.2 | features and describe rationale for groupings | Learners can spend some time identifying the features of each living thing (e.g. feathers, scales, hair, fur, gills, fins, legs, arms, wings, beak) and decide how to sort them into groups<br><br>Ask learners to describe the animals in each group and to explain why they have chosen their groups based on the features the group has in common. |

| WEEK | TOPIC | TOPIC DETAILS |
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| 4.3 | Observe and compare objects, living things and events | Resources: Pictures of different animals to sort (including examples of fish, birds, mammals, insects and reptiles). |
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| 5.1 | Sort living things into groups, using simple features and describe rationale for groupings | 5 Sort living things into groups, using simple features and describe rationale for groupings<br><br>features and describe rationale for groupings<br><br>Observe and compare objects, living things and events Similarly, provide learners with pictures of different types of plants to sort. Learners discuss how to sort them into groups and explain their decisions. |
| 5.2 | features and describe rationale for groupings | Continuation of lesson. |
| 5.3 | Observe and compare objects, living things and events | continuation of lesson. |
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| 6.1 | ACROSS THE BOARD TEST ONE | REVISION EXERCISES. |
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| 7.1 | Know that every material has specific properties, e.g. hard, soft, shiny. | Place a block of material in a feely bag so that it cannot be seen. Learners try to identify a material simply by using the sense of touch. Ask learners how they knew what the material was. Discuss the properties of materials that can be explored by touch (e.g. hard, smooth, pliable). Are there other properties we cannot determine by touch? Discuss. |
| 7.2 | Know that every material has specific properties, e.g. hard, soft, shiny | Describe a range of properties including (but not limited to): transparency, porosity, absorbency, hardness, pliability, coarseness, heat/electrical conductivity. Learners explore a range of materials for each property; they discuss what each property 'means'. |

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| 7.3 | Know that every material has specific properties, e.g. hard, soft, shiny | Play a question game in groups. One player has a material on a card and answers questions from the group on the material's properties, e.g. Is it transparent? The card holder uses the card to answer the question. The winner is the player in the group who correctly identifies the material on the card. The winner selects a new material card.<br>Resources:<br>• Feely bag - a bag made of dark cloth which objects can be placed and learners have to use their sense of touch to determine the object.<br>• A selection of blocks of different materials.<br>• A range of materials with different properties.<br>• Cards of materials. The card has an image and a summary of the materials properties to support answering questions. Use common materials the learners will be aware of for the cards. |
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| 8.1 | Explore how some materials are magnetic, but many are not Suggest ideas, make predictions and communicate | Learners look at, and play with, a selection of magnets. Discuss where they might have seen them before and what each is used for, e.g. fridge magnets, games. Discuss why magnets are only attracted to some items. |
| 8.2 | Observe and compare objects, living things and events | Scientific Enquiry activity<br>What materials are magnetic? Learners will test different materials to see if they are magnetic or not. Provide learners with magnets and then identify materials around the classroom to test. Learners can make predictions on which of the materials are magnetic. Learners then test the materials. Record predictions and results in a table; the name of the object and ☐ or x to indicate if it is magnetic or not. Compare results to predictions. Address any misconceptions learners may have. |

| WEEK | TOPIC | TOPIC DETAILS |
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| 8.3 | Present results in drawings, bar charts and tables Draw conclusions from results and begin to use scientific knowledge to suggest explanations | The learners can make a fishing rod by attaching some string to a drinking straw and fixing a small magnet on the end of the string. Provide the learners with some 'fish' with different materials as part of them; use some magnetic and some non-magnetic materials. E.g. a fish with a paperclip, a fish with a rubber, a fish with plastic etc. Have a 'Go fishing' competition to see who can 'catch' the most fish in a given time. Discuss why only some of the fish can be picked up.<br>Give learners an object made of two or more materials, e.g. a saucepan with a wooden handle; a spoon with a plastic handle; a shoe with a rubber sole and leather upper. Learners draw the object and add labels that identify which materials have been used for the different parts and why these have been chosen. For example, a pair of scissors with metal blades and plastic handles has: blades made of metal (strong, hard and can be sharpened easily) and plastic handles (easy to shape, more comfortable to hold than metal).<br>Learners carry out a class audit of objects and their materials, and why those materials have been used.<br><br>Ask learners to look at objects in other information sources. Learners identify the materials the objects are made of and discuss why those materials have been used. This can introduce learners to uses of materials outside of their personal experience. For example: What is an aeroplane mostly made of and why? |
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| 9.1 | Discuss why materials are chosen for specific purposes on the basis of their properties Suggest ideas, make predictions and communicate these | Learners investigate which paper is the most absorbent.<br>Introduce the activity by spilling a cup of water and trying to mop it up quickly. What type of paper would do the job well? Discuss the term 'absorbency' as the ability of a material to soak up water.<br>Provide samples of different papers for investigation. Before the test, learners predict which they think will be most absorbent to least absorbent; they stick samples of each paper, in predicted order of absorbency, on a recording sheet.<br>How can we test this? Consider all reasonable suggestions from the learners (see comments). Suggestions for the method may include: dripping drops of water on a sample and waiting to see how much drips through; placing paper in a volume of water and measuring how much water soaks up; soaking a same-sized sample in identical volumes of water, wringing it out and measuring the amount of water squeezed out. Agree on a method and make sure it is a fair test. Learners test the samples and record the results. Which paper was the best? How do you know? |
| 9.2 | With help, think about collecting evidence and planning fair tests Observe and compare objects, living things and events | Present a familiar item made from a new (or different) material.<br>How could you test if this item performed better than the others? What other materials could we test absorbency for?<br>Scientific Enquiry activity<br>Learners investigate which paper is the strongest |

| WEEK | TOPIC | TOPIC DETAILS |
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| 9.3 | Measure using simple equipment and record observations in a variety of ways Present results in drawings, bar charts and tables | What type of paper will make the best paper bag? Suggest that a bag is needed to carry potatoes or vegetables. What property should the paper have to be able to do this? (It has to be strong).<br>Show the different types of paper available for testing. Label each type of paper. Learners predict which they think will be the strongest to the weakest. In groups, plan a test to find out which paper is strongest. Share ideas with the rest of the class. Agree methods and demonstrate, if necessary, how to perform the test. Discuss fair testing, i.e. same size strip of paper, same type of weight.<br>Learners carry out the test. They draw a bar chart of results and compare their predictions with what happened.<br>Which paper was the strongest? How do you know?<br>Resources:<br>• Cup of water, samples of different types of paper (e.g. writing paper, newspaper, filter paper, absorbent paper).<br>• A selection of different paper bags for testing (e.g. bread shop, carrier bags, bags for holding presents in), different types of paper, weights.<br>• Investigation planning sheets.<br>• Graph paper. |
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| 10.1 | Discuss why materials are chosen for specific purposes on the basis of their properties Suggest ideas, make predictions and communicate these | Learners investigate which material is best for keeping a drink hot.<br>Have you ever let a hot drink cool down when you are busy doing something else?<br>Demonstrate to learners how to take the temperature of different liquids using a thermometer. Learners practise using a thermometer; they can record their results.<br>Explain that the learners need to find out which material is best for keeping a drink hot. What material is the best insulator?<br>Provide each group with a small bottle to put the warm water in. Discuss how to make the test fair, e.g. same amount of water, record temperature before and after an agreed time limit, same number of layers of wrapping.<br>Give each group different materials to test; learners should wrap the material around the cup. They record the temperature before starting, and after finishing, for each material and a bottle with no covering for comparison (a control). Introduce the term 'thermal insulator' to describe something that prevents heat energy from moving; in this case the heat from the drink is prevented from moving to the air. Describe the opposite (i.e. something that allows heat to spread) as a 'thermal conductor'. Discuss, if needed, where both properties could be useful.<br>Which material was the best thermal insulator? How do you know? |

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| 10.2 | With help, think about collecting evidence and planning fair tests Observe and compare objects, living things and events | Scientific Enquiry activity<br>Learners investigate which material is best for keeping ice cold.<br>Prior to the lesson make enough ice cubes for one per learner plus a teacher one. Any shape of mould is suitable for the investigation.<br>How were things kept cool before the invention of fridges and freezers? (e.g. ice houses, marble shelves, cellars, storing things in streams).<br>Explain to the learners that each of them will be given a 'pet' ice cube to look after for the remainder of the lesson; the winner will be the learner who keeps their ice pet the longest.<br>Before giving out the ice pets ask the learners to plan what methods they might use to stop the ice from melting.<br>Is there anything we could wrap an ice cube in to stop it melting?<br>As a class discuss the observations they will make.<br>What evidence will we collect?<br>What do you think would be the worst thing to wrap the ice cube in? Explain that there will also be one ice cube that will have nothing done to prevent it from melting, as a control, the teacher will volunteer their ice pet to be the control.<br>Give each learner an ice cube in a transparent, sealable bag and allow them to use the method they planned to prevent their ice pet from melting.<br>Ask the winning learner to explain what they did to prevent their ice cube from melting. Look at the last remaining ice pets. Which materials were they wrapped in? Do the materials have anything in common? |
| 10.3 | Measure using simple equipment and record observations in a variety of ways Present results in drawings, bar charts and tables | Discuss with the learners that insulation makes it hard for energy (e.g. heat) to move from one place to another. In this ice-cube experiment, the insulation slows down heat from outside reaching the ice and increasing its temperature enough to cause the ice cube to melt<br>Resources:<br>• Thermometers, liquids e.g. water (iced, cold and hot), juice, milk, fizzy drink, plastic cups.<br>• Plastic bottles, measuring cylinders or jugs, thermometers, stopwatches, hot water, materials (e.g. fabric, cotton wool, bubble wrap, newspaper).<br>• Ice cubes in transparent sealable bags, materials (e.g. fabric, cotton wool, bubble wrap, newspaper). |
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| 11.1 | ACROSS THE BOARD TEST TWO WEEK. | REVISION EXERCISES |
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| 12.1 | Continuation of lesson. | Learners investigate which material is harder. Explain that soft materials crumble and are easily scratched. Hard materials are more difficult to scratch. Rocks are classified on the basis of hardness. Granite is a hard rock; talc and chalk are soft rocks. Show specimens of each, if available.<br>Provide a range of materials on which to carry out a scratch test to measure their hardness. Demonstrate the method to use and discuss how to ensure the test is fair. Make a class prediction for the test. Allow groups time to carry out the investigation. Provide a results table for the learners to complete.<br>Which is the hardest/softest material? How do you know? |

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| 12.2 | Continuation of lesson. | Scientific Enquiry activity<br>Learners investigate what materials are porous. Explain that 'porosity' is the ability of a material to let water through it.<br>Learners will test materials to rank them from the most to the least porous.<br>In pairs or small groups, learners talk about how they might do this. For example:<br>• Adding drops of water to samples and observing what happens to the drops.<br>• Having a material as a 'plug' in an upturned bottle, which is then filled with water; observing how much water gets through the material over a given amount of time.<br>Allow learners to try out their own ideas, if they seem reasonable.<br>Which materials are the most porous? How do we know? Could the investigation be improved?<br>Resources:<br>• Rock specimens.<br>• Wood, modelling clay, rock, metal, plastic, rubber (or sponge).<br>• Something metal to perform the scratch test, e.g. a fork.<br>• Results tables.<br>• Range of materials, bottles, water, stopwatches |
| 12.3 | Continuation of lesson. | Continuation of lesson. |
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| 13.1 | Discuss why materials are chosen for specific purposes on the basis of their properties Suggest ideas, make predictions and communicate these | Learners investigate what materials conduct electricity.<br>Set up an electric circuit with a switch and bulb. Recap Stage 2 learning from electricity. Remove the switch and talk about what else could be used to complete the circuit. Discuss how some materials have the property of being able to conduct electricity. Replace the switch with a selection of objects to see which ones can complete the circuit. Remind learners that each end of the object must touch both wires where the switch has been removed. |
| 13.2 | With help, think about collecting evidence and planning fair tests Observe and compare objects, living things and events | Give each group different objects to try, or let them choose. Each group reports their findings back to the rest of the class. List the materials that bridge the gap.<br>As a final example, ask learners to predict what will happen when the wires are put into a cup of water. Demonstrate what happens. Explain that water is a conductor.<br>Conclude that objects made of metal can complete the circuit and water can also conduct electricity; this is why we keep water away from plugs/electronics.<br>Resources:<br>• Circuitry equipment; battery, wires, switch, bulb.<br>• Range of materials e.g. different metals, pencil lead/graphite, rubber, plastic, paper, wood.<br>• Cup of water |

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| 13.3 | Measure using simple equipment and record observations in a variety of ways Present results in drawings, bar charts and tables | Lesson continues. |
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| 14.1 | Continuation of lesson. | Learners investigate the strength of different threads. Invite learners to suggest ways this could be investigated.<br>In pairs, or small groups, learners will plan and carry out their investigation. Approve their plans before they begin, making sure that their suggestion is reasonable and able to be undertaken; an investigation planning sheet will help them to do this more independently. |
| 14.2 | Continuation of lesson. | Learners predict which the strongest thread will be. They carry out the investigation and draw a bar chart using the results obtained.<br>Why are some threads stronger than others? What could you use each of the different types of thread for? |
| 14.3 | Sort materials according to their properties | In groups, learners sort materials on the basis of their properties. Learners write the materials and properties on sticky notes and use them as the basis for a Venn diagram. They try different ways of sorting, listing the different criteria they try. How many ways are there to sort and group the materials? List the properties in a table for different materials within the same group (e.g. metals) and identify what makes them all metals. Repeat for other types of materials (e.g. plastics, fabrics).<br>Resources: Range of materials with a range of properties to sort. E.g. plastic, a range of metals, paper, wood, rock samples, glass (if safe to handle). |
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| 16.1 | N/A | N/A |

# SCIENCE SCHEME OF WORK

## YEAR 3 - TERM 2

| WEEK | TOPIC | TOPIC DETAILS |
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| 1.1 | Know that plants have roots, leaves, stems and flowers | Learners have previously learned the names of parts of plants in Stage 1. Begin by seeing if they can identify roots, leaves, stems and flowers on a wide variety of plants such as:<br>• roses, tulips, lilies<br>• trees such as almond, olive, apple<br>• rice, wheat, potatoes, maize. |
| 1.2 | Know that plants have roots, leaves, stems and flowers | • Learners draw an unfamiliar example of a tree, a grass and a flowering plant. They label the roots, stem, leaves and flowers<br>• Resources: Photographs of a wide variety of plants.<br>• Pictures (internet or books) of unfamiliar trees, flowering plants and grasses. |
| 1.3 | Know that plants have roots, leaves, stems and flowers | Lesson continues. |
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| 2.1 | • Explain observations that plants need water and light to grow | In Stage 1, learners may have taken part in investigations about plants needing water and light. These can be repeated with learners having more responsibility for the design of the investigation; different groups can complete different investigations. Learners could:<br>• use plants that are as similar as possible (e.g. same species, similar height, similar appearance)<br>• describe how they can tell that both plants are growing well.<br>• decide what question to answer (e.g. Do plants need water to grow? Do plants need light to grow?) |
| 2.2 | • Suggest ideas, make predictions and communicate these | • predict what would happen if a plant was grown in the dark or not watered<br>• decide how to make a fair test by only changing one variable at a time<br>• decide what results to collect (measurements or observations)<br>• collect their results and write a report giving their conclusion. |

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| 2.3 | • With help, think about collecting evidence and planning fair tests | Learners may need support in designing a fair test. Variables to keep the same are:<br>• type of plant<br>• age of plant<br>• size of plant<br>• temperature plant is being kept in<br>• neither plant is pot bound<br>AND<br>• volume of water and frequency of watering<br>OR<br>Resources: Similar flowering plants. Water and watering can (or measuring jug).Equipment for observations or measurements (e.g. rule, digital camera). |
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| 3.1 | • Know that that plant growth is affected by temperature | Scientific Enquiry activity<br>Learners reflect on their previous scientific enquiry activity and identify what they have learned about fair tests. |
| 3.2 | • With help, think about collecting evidence and planning fair tests | In groups, learners plan an experiment that would find out if a maize plant grows differently in hot and cold places. Ask learners to consider the following questions and then write a method for their experiment:<br>• How would you change the temperature?<br>• What variables would you need to keep the same?<br>• What would you measure? |
| 3.3 | • Draw conclusions from results and begin to use scientific knowledge to suggest explanations | Continuation of lesson. |
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| 4.1 | Know that water is taken in through the roots and transported through the stem | Roots<br>Learners look at pot-bound plants and re-pot them. As a class, discuss why this will be good for the plant. Elicit the idea that the plant will be able to grow more roots and therefore take up more water. |
| 4.2 | Continuation of lesson. | Show pictures of trees grown in pots and in open ground. Learners consider why the trees grown in pots are smaller |
| 4.3 | Know that plants need healthy roots to grow. | Show learners examples of plants grown to be very small on purpose (e.g. bonsai). Ask learners to explain why people who grow bonsai trees use small pots.<br>Resources: Pot-bound specimens. Compost and new pots.<br>Pictures of trees grown in pots and in open ground.<br>Pictures of bonsai (or similar small trees) in pots. |
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| 5.1 | Know that plants need healthy stems to grow well. | Stem<br>Show a stick of celery, complete with leaves at the top:<br>• Talk about the plant parts, identifying the stem, leaves and where the flowers (if any) and roots would be.<br>• In pairs, learners talk about what roots do for the plant (take in water and anchor it in the ground).<br>• Give each pair a stick of celery that has been standing in coloured water overnight. Explain that the colour has been used so that we can see the water.<br>• Learners observe it closely, looking at the stem and leaves; they should identify that the coloured water has moved up the stem in tubes to the leaves.<br>As a demonstration, you can cut a stick of celery into cross sections and give each pair a piece of the stem. Learners use magnifying glasses to observe the dots in the cross section. 'What are these dots?' (Explain that the dots are tubes in the stem which allow the water to travel from the roots to the leaves). |
| 5.2 | Know that water is taken in through the roots and transported through the stem | Show a white flower:<br>• Talk about the plant parts, identifying the stem, leaves and where the flowers (if any) and roots would be.<br>• Show learners a second flower that has been standing in coloured water overnight.<br>• Learners observe it closely, looking at the flower.<br>• They should identify that the coloured water has moved up the stem in to the flower.<br>Learners draw, or annotate, a diagram to show that water enters a plant through the roots and then travels up the stem to the other parts of a plant. |
| 5.3 | Continuation of lesson. | Resources: Stick of celery with leaves.<br>• Celery that has been standing in coloured water (e.g. water and food colouring; blue is recommended).<br>• Magnifying glasses.<br>• White flower (e.g. carnation or lily).<br>• A similar, white flower that has been standing in coloured water (e.g. water and food colouring)<br>• Diagram of a plant. |
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| 6.1 | Know that plants need healthy roots, leaves and stems to grow well. | Leaves<br>Show learners a picture of a plant showing the roots, stem and leaves. Identify which parts of a plant are found underground and which are found above ground.<br>Elicit the idea that the parts of a plant that need light are the leaves. Explain that plants make their own food, using light as a source of energy, in their green parts (especially their leaves). |

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| 6.2 | Know that plants need healthy roots, leaves and stems to grow well. | Show learners pictures of plants that have unhealthy leaves such as:<br>• wilting leaves<br>• yellowing leaves<br>• leaves eaten by pests<br>Explain that the plant will no longer be healthy as it cannot make its own food.<br>Give learners some scenarios of damage to plants. Learners predict whether the plant will still be healthy and explain why:<br>• an animal eats all the leaves of a plant<br>• insects eat the roots of a plant<br>• a gardener moves a plant from one place to another and cuts off its roots<br>strong winds break the stem of a plant<br>Resources: Picture of a plant showing the roots, shoots and leaves. Pictures of plants with unhealthy leaves. |
| 6.3 | Know that plants need healthy roots, leaves and stems to grow well. | continuation of lesson. |
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| 7.1 | FORCES AND FRICTION Explore how forces can make objects start or stop moving | Learners choose a material and then describe in drawings/writing/words:<br>• how it can be made to move<br>• how to make it go faster or slower<br>• how to make it change direction<br>• how to make it change shape (if possible).<br>A worksheet designed for this purpose may be helpful for some learners.<br><br>Have some modelling clay and discuss why it can be used to make objects. Explain that when a force is applied it changes the shape of the object; the change occurs where the force is applied and also beyond that. Learners manipulate the clay; they describe to each other when they are applying forces and the effect it has. |
| 7.2 | Explore how forces can change the shape of objects | Learners roll a ball between them, as a class/. Discuss how they start the ball moving (pushing or pulling on it) and how they stop the ball (they block it and their hand pushes on the ball stopping it). Present diagrams of the ball with force arrows to show how forces can be applied to start and stop motion. When discussing 'stopping', highlight how one force acts in the opposite direction to the movement.<br>Resources:<br>• Range of materials (including metals, wood, paper, rock samples, modelling clay<br>• Worksheet.<br>• Modelling clay.<br>• Ball. |
| 7.3 | MID-TERM BREAK. | MID-TERM BREAK. |

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| 8.1 | Know that pushes and pulls are examples of forces and that they can be measured with forcemeters Suggest ideas, make predictions and communicate these | Describe how particular toys move using pushes and/or pulls. Write and/or draw a diagram to describe how the toys move; use the word 'push' or 'pull' and arrows to describe the direction of the push or pull. Explain that when anything begins to move it is the result of a force being applied.<br><br>A learner pushes and pulls a large box (large enough so a learner can sit in it). Discuss how it moved because a force was applied. Ask another learner to sit in the box. Ask another learner to try and push and pull the box now that the learner is inside. Was it easier or harder to push/pull the box when there was someone in it? Which push/pull required more force? Why? Explain that the heavier an object is the more force is required to move it. |
| 8.2 | Suggest ideas, make predictions and communicate these With help, think about collecting evidence and planning fair tests | Scientific Enquiry activity<br>How can we tell how big a force is?<br>Give out a variety of forcemeters to pairs (or small groups). Compare similarities and differences between them. Why might they have different markings on them? Explore how they work.<br>Demonstrate how to use a forcemeter to measure a force. Attach the forcemeter to an object and read out the force (in newtons) as you pull. This is the force required to pull this object on this surface at this speed. Hand out a few objects to each pair. Learners measure the force (in newtons) required to make each object just start to move. Discuss. Which object required the most force to start it moving? Why? Weigh the objects and link the mass of the object to the force required. |

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| 8.3 | Measure using simple equipment and record observations in a variety of ways<br>Present results in drawings, bar charts and tables | Scientific Enquiry activity<br>How can we change the distance we catapult a marshmallow?<br>Learners make marshmallow catapults; they launch marshmallows outside by flicking them from a rubber band. (Suspend the rubber band between your thumb and index finger, place a marshmallow on the band and pull/release to make the marshmallow fly through the air.)<br>Learners investigate how to change the distance the marshmallow travels. Who can send the marshmallow the furthest? How did you do it? What effect does the size of the force have? Learners predict how the size of the force affects the flight of the marshmallow. They measure the force applied, by using force meters to pull back on the elastic bands, and then compare the forces to the distances travelled. Record the results in a class table.<br>Scientific Enquiry activity<br>Investigate the force required to break a cotton thread. Show a piece of cotton thread and discuss how learners can find out the force required to break it. Have learners come up with different ways of carrying out the investigation. Discuss how they will know the size of the force applied when the thread breaks.<br>Learners carry out the investigation.<br>Spend time reflecting on their results and looking at any variation within them; discuss how there can be variation in the strength of thread that has come from the same cotton reel<br>Resources:<br>Selection of toys.<br>Large box<br>Force meters with different scales.<br>Objects of any sort (e.g. bricks, potatoes).<br>Marshmallows, elastic bands, force meters.<br>Cotton reel/thread, force meters |
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| 9.1 | Explore how forces can make objects start or stop moving<br>Explore how forces, including friction, can make objects move faster or slower or change direction | Scientific Enquiry activity<br>Make a tray of ice (large enough to slide an object on). Show learners the tray of ice; discuss the difference in the surface of the ice to the surface of a carpet, floor, wall, etc. Push an object on the ice; discuss how it moves compared to the same object pushed on the floor. Why does the object go further on ice? Explain that this has to be connected to a difference in forces (on the floor/on ice) because forces make things move or stop. Describe ‘friction’ as the force between solid objects rubbing against each other that acts against the direction of motion. Show this with a diagram. |

| WEEK | TOPIC | TOPIC DETAILS |
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| 9.2 | Suggest ideas, make predictions and communicate these With help, think about collecting evidence and planning fair tests Observe and compare objects, living things and events | Have a range of different objects available, some smooth and some rough. Learners rub pairs of objects against each other in the combinations: rough-rough, smooth-smooth, and rough-smooth. Discuss which combination took the most force and which one the least. Explain that friction acts between the objects and is a force against the force they apply. Which combination has the most friction? Why? Highlight how rough-rough has the most friction as the materials catch on each other and there is more surface to rub against. Explain that this is why people who go to icy places have spiked shoes, and why you have grips on shoes; in each case the rough surface helps to prevent slipping. |
| 9.3 | Measure using simple equipment and record observations in a variety of ways Present results in drawings, bar charts and tables Draw conclusions from results and begin to use scientific knowledge to suggest explanations | Scientific Enquiry activity<br>Learners will test the effectiveness of grip on footwear. The one with the best grip will produce the most friction when pulled over a surface. Look at the soles of the shoes the learners are wearing. Compare these with sports footwear, e.g. trainers, plimsolls. Discuss the differences in the grip on the soles of the footwear.<br>Learners make wax crayon rubbings of the patterns on the soles of footwear. They place a piece of thin paper over the footwear and rub with a wax crayon (or gently with a soft pencil) to reveal the pattern. Display the rubbings.<br>Which shoes do you think will have the best grip? Why?<br>Learners then predict the force (in newton) required to make each piece of footwear move on the surface.<br>Test footwear on a ramp (this takes greater force than testing on a flat surface). Pull the footwear up the ramp using a force meter and measure the force required to just get the footwear moving. Use footwear of similar size, with different amounts of tread on the soles. As a class, decide why good grip is important for some sport shoes. Which footwear had the best/worst grip? How do you know? Link the size of the force to the grip and remind learners that this force is just more than the force of friction which is acting against the movement.<br><br>Watch a video clip of a child on a slide in a park. What can make a difference to how fast a person travels down a slide? Is the surface of a slide smooth or rough? Explore how this relates to the friction produced when someone goes down a slide. |
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| 10.1 | MID - YEAR ASSESSMENT WEEK. | MID - YEAR ASSESSMENT WEEK. |
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| WEEK | TOPIC | TOPIC DETAILS |
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| 11.1 | Continuation of lesson. | ◻ Scientific Enquiry activity<br>What would happen if someone went down a slide sitting on a fabric mat?<br>Learners investigate which fabric reduces friction the most. One method is to place a piece of weighted-down fabric at the bottom of a ramp with a mass, and pull it up the ramp, recording the force applied with a force meter.<br>Carry out the investigation to discover which fabrics produce the highest/lowest friction. |
| 11.2 | Continuation of lesson. | ◻ Scientific Enquiry activity<br>Explain that speed is a description of how fast something moves between two points. If a ball takes 5 seconds to travel one metre, and another ball takes 10 seconds to travel the same distance, the first ball is travelling faster. Can we link the speed an object moves with the force applied to it? Will a bigger force move objects faster? Discuss how this can be investigated by setting up a start point; a finish point; a moveable object and then varying the force applied. Discuss the need to use a force meter to measure the force. |
| 11.3 | Continuation of lesson. | In pairs, learners consider the advantages and disadvantages of a world in which friction didn't exist, e.g. doors would always open easily, people and vehicles would struggle to stop! Think of examples where friction is useful or a hindrance, e.g. road surfaces are rough, the blades of ice skates make minimal contact with the ice.<br>Resources:<br>• Video clip of a child on a slide<br>• .Fabric samples, masses, ramps, rulers, force meters, recording sheets.<br>• Balls, timers, force meters. |
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| 16.1 | N/A | N/A |

# SCIENCE SCHEME OF WORK

## YEAR 3 - TERM 3

| WEEK | TOPIC | TOPIC DETAILS |
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| 1.1 | THE SENSES Explore human senses and the ways we use them to learn about our world | Check that learners can recall the five senses and name the parts of the body most associated with each one.<br>Introduce the idea that our senses allow us to detect things happening outside our body. |
| 1.2 | Collect evidence in a variety of contexts to answer questions or test ideas | Sensing forces<br>Explain that in our skin there are parts that can detect forces (e.g. pressure, stretching). We use them to find out about objects we touch.<br><br>Learners make touch detectors by attaching samples of different fabrics to small sticks (e.g. lolly sticks). |
| 1.3 | Continuation of lesson. | • Demonstrate how to use these to test the ability of different body parts to detect that they have been touched; touch the body part with the touch detector, e.g. the sole of the foot, back of the hand, forehead.<br>• In pairs, learners do the touch detection test.<br>• Discuss how well, or badly, different body parts can detect touch.<br>Resources: Fabric samples, lolly sticks, scissors, glue. |
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| 2.1 | Continuation of lesson. | ◻ Sensing food by taste and smell<br>Discuss what foods learners like to eat. Elicit the idea that different foods have different tastes. Explain that on our tongues there are parts that can detect different flavours.<br>Explore how the sense of taste interacts with sight and smell:<br>• Volunteers can eat a variety of foods blindfolded to find out if they taste different when they cannot see them.<br>• Volunteers can eat the foods while holding their nose. |

| WEEK | TOPIC | TOPIC DETAILS |
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| 2.2 | Continuation of lesson. | Use food colouring to make some food a dramatically different colour (e.g. mashed potato made to look blue). Ask volunteers to try the food and see if it tastes different.<br>Explain that our experience of food is influenced by smell, appearance and taste.<br>Resources: A selection of different foods – sweet, sour, salty or bitter, blindfolds.Mashed potato that has been coloured blue with food colouring. |
| 2.3 | Continuation of lesson. | Use food colouring to make some food a dramatically different colour (e.g. mashed potato made to look blue). Ask volunteers to try the food and see if it tastes different.<br>Explain that our experience of food is influenced by smell, appearance and taste.<br>Resources: A selection of different foods – sweet, sour, salty or bitter, blindfolds.Mashed potato that has been coloured blue with food colouring. |
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| 3.1 | ◻ Sensing light | In Stage 2, learners found out about sources of light. Reinforce that light travels into our eyes where it is then detected.<br><br>Explore the difference in vision when using one eye or two eyes:<br>• Learners practise catching a ball with both eyes open.<br>• They shut their right eye and try again.<br>• They open their right eye, shut their left eye and try again.<br>• They try again shutting both eyes. |
| 3.2 | ◻ Sensing light | Look for patterns in the results. Was there a difference when you had one or two eyes open? When was it easiest to catch the ball? What made it easier?<br>Discuss how the ability to sense/detect light can be important.<br>Resources: Soft balls (one for each pair of learners), open space for throwing and catching balls. |
| 3.3 | ◻ Sensing light | Continuation of lesson. |
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| 4.1 | ◻ Sensing sound | ◻ Sensing sound<br>Explain that sound travels from a source to our ears where it is then detected.<br>Perform some simple, everyday activities whilst learners have their eyes closed. Ask learners to guess what you are doing, e.g. turning the pages of a book, pouring water, clapping your hands.<br>Learners listen with eyes closed for a minute and then recall all the sounds they have heard. |

| WEEK | TOPIC | TOPIC DETAILS |
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| 4.2 | ◻ Sensing sound | Play a game about detecting the location of a sound source:<br>• Learners sit in a circle; one learner sits with their eyes closed, in the centre.<br>• Someone in the circle rings a bell or makes a sound.<br>• The centre person has to point in the direction they think the sound came from.<br>• Repeat the activity; this time the centre person has their eyes closed and one ear covered.<br>• Record findings and look for patterns in results. |
| 4.3 | ◻ Sensing sound | Extension activity<br>Throughout this unit learners can compare human senses to those of animals e.g. bats, sharks, owls. |
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| 5.1 | MID-TERM BREAK. | MID-TERM BREAK. |
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| 6.1 | KEEPING HEALTHY<br>Explore and research exercise and the adequate, varied diet needed to keep healthy | What can we do to be healthy? Learners discuss in pairs and share responses.<br>What makes us unhealthy? |
| 6.2 | KEEPING HEALTHY<br>Explore and research exercise and the adequate, varied diet needed to keep healthy | Learners discuss and decide what makes a healthy lifestyle: an appropriate diet, exercise, personal hygiene, keeping warm and safe etc. |
| 6.3 | KEEPING HEALTHY<br>Explore and research exercise and the adequate, varied diet needed to keep healthy | Show a film clip about someone who needs to keep healthy during a round-the-world expedition.<br>Learners watch, and list, the different ways in which she keeps healthy.<br>A visit from a health practitioner could be arranged during this unit to talk about healthy eating and lifestyles. |
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| 7.1 | Know life processes common to humans and animals include nutrition (water and food), movement, growth and reproduction | Adequate diet<br>Remind learners of the life processes. What happens if someone does not have enough of the right nutrition in what they eat and drink? |
| 7.2 | Explore and research exercise and the adequate, varied diet needed to keep healthy. | Look at the World Food Programme website for some examples of people around the world do not have sufficient food and/or water. Discuss possible reasons for this, e.g. climate, disasters. |

| WEEK | TOPIC | TOPIC DETAILS |
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| 7.3 | Know that some foods can be damaging to health, e.g. very sweet and fatty foods. | Conclude that it is vital to have enough of the right nutrition in the food water we consume; what is eaten and drunk must be appropriate for the needs of the person. |
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| 8.1 | Continuation of lesson. | ◻ Varied diet<br>Learners discussed healthy eating in Stage 1. Ask learners to make a mind map of everything they know about healthy eating.<br>Use the mind maps to identify the different types of food that we need to eat. |
| 8.2 | Continuation of lesson. | Introduce the names of some of the main food groups:<br>• carbohydrates containing starches for energy<br>• protein for growth and repair<br>• milk and dairy for vitamins and minerals<br>• fruit and vegetables for vitamins, minerals and fibre<br>• fats for fatty acids which, among other things, help absorb vitamins<br>• sugars for an immediate source of energy.<br>Learners sort examples of foods into the main food groups |
| 8.3 | Continuation of lesson. | Resources: http://www.wfp.org/photos<br>Examples of each food group, or images of food/drink from each food group. |
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| 9.1 | NAT MOCK/END OF YEAR ASSESSMENT WEEK. | NAT MOCK/END OF YEAR ASSESSMENT WEEK. |
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| 10.1 | Know life processes common to humans and animals include nutrition (water and food), movement, growth and reproduction | ◻ Learners can plan the types of food that would be suitable for different scenarios such as:<br>• for a long walk<br>• for an Olympic athlete<br>• for someone recovering from a broken leg<br>• for a person who can't eat dairy. |
| 10.2 | Explore and research exercise and the adequate, varied diet needed to keep healthy | Learners can keep a food diary for a week and analyse whether they are eating an adequate, varied diet.<br><br>Learners can use information sources to find out why eating too many fatty foods is damaging to health. |

| WEEK | TOPIC | TOPIC DETAILS |
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| 10.3 | Know that some foods can be damaging to health, e.g. very sweet and fatty foods | Learners can look at drinks labels on snack foods and compare the amounts of fat they contain.<br>Ask learners to write down two foods they like and two that they do not like. Learners label (or group) the food choices according to whether they eat it often or rarely. Then consider if these are foods that should be eaten often or rarely (i.e. are the foods healthy or more of a 'treat'). Why should some foods be more of a treat?<br><br>Resources:<br>• Secondary information sources.<br>Snack food packaging with food labels intact |
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| 11.1 | NAT PERIOD/WEEK. | NAT PERIOD/WEEK. |
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| 12.1 | Know that some foods can be damaging to health, e.g. very sweet and fatty foods | How do you look after your teeth? Encourage regular brushing, avoiding sugary foods and drinks, and visiting the dentist regularly. Explain that tooth decay is caused by plaque-forming bacteria. These bacteria feed on sugar and produce acid which causes tooth decay.<br><br>Learners use mirrors to inspect their own teeth. They count, name and look at the shapes of different types of teeth. Noting there are: incisors, canines, molars and pre-molars<br><br>Look at drinks labels on fizzy drinks and compare the amounts of sugar they contain.<br><br>Look at pictures of gum disease and tooth decay. |
| 12.2 | Explore and research exercise and the adequate, varied diet needed to keep health | Discuss why exercise is important and what types of exercise the class take part in. Make a tally chart.<br>Scientific Enquiry activity<br>Investigate the effect that exercise has on heart rate:<br>• Demonstrate to learners how to take their own pulse.<br>• Learners take their pulse at rest.<br>• They do one minute of moderate exercise (e.g. jogging on the spot).<br>• The pulse is taken again immediately after exercise.<br>• The pulse is then taken again after one, two and five minutes of rest.<br>What happens?<br>Learners draw a table of results and discuss the conclusion. |

| WEEK | TOPIC | TOPIC DETAILS |
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| 12.3 | Measure using simple equipment and record observations in a variety of ways Present results in drawings, bar charts and tables | Explain that during exercise our muscles need more blood so our hearts beat faster. Once we stop exercising the heart rate decreases again. The more fit we are, the less the heart needs to speed up and the more quickly it goes back to normal.<br><br>Resources:<br>• Stopwatches or other method to take the time.<br>• Graph paper |
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| 16.1 | N/A | N/A |