

Teacher's Notes

Worksheet No.	Specific Instructional Objective(s)	Process Skills	Related Topic(s) Covered	Suggested Lesson Lead-in / Follow-up + Remarks
Topic: Living and Non-living Things				
1.	This worksheet examines the interaction of living things in a controlled environment so as to determine their survival chances.	<ul style="list-style-type: none"> • predicting • inferring • analysing 	<ul style="list-style-type: none"> • Plants • Animals 	
2.	This worksheet tasks students to derive information from a line graph to answer questions about the growth of a living thing.	<ul style="list-style-type: none"> • observing • communicating • predicting 		
Topic: Plants				
3.	This worksheet tasks students to analyse the common characteristics of some plants listed in a table.	<ul style="list-style-type: none"> • observing • communicating • inferring • comparing 		<ul style="list-style-type: none"> • Teachers may explain to students how to read, compare and obtain information from a table.
4.	The first question tracks the number of flowers on a plant over a certain period. The second question tasks students to classify some plants into flowering and non-flowering plants.	<ul style="list-style-type: none"> • observing • analysing • communicating • classifying 		<ul style="list-style-type: none"> • Note that the pine tree belongs to the group called conifers which do not produce flowers.
Topic: Animals				
5.	By observing the change in the number of leaves and flies in a tank with an animal inside, students have to answer some questions regarding the animal's feeding habits and how it survives.	<ul style="list-style-type: none"> • observing • analysing • predicting • inferring 	<ul style="list-style-type: none"> • Plants 	
6.	This worksheet is about the classification of animals and the characteristics of some groups of animals.	<ul style="list-style-type: none"> • classification • analysing • communicating • evaluating 		
Topic: Fungi and Bacteria				
7.	The first question examines the necessary conditions for the growth of bread mould. The second question is about decomposition of food.	<ul style="list-style-type: none"> • analysing • inferring 		<ul style="list-style-type: none"> • Note that fresh food exposed to air, water (moisture) and warmth becomes bad due to the growth of bacteria which breaks down the food.
8.	This worksheet examines how fresh milk exposed to the external environment at room temperature can go bad, as opposed to a sealed packet of UHT milk.	<ul style="list-style-type: none"> • analysing • inferring • predicting • formulating hypothesis 		
9.	The first question examines how the use of a drying agent removes moisture in the air and inhibits the growth of microorganisms. The second question highlights how a slice of cake in a sealed jar will not become mouldy due to a lack of air.	<ul style="list-style-type: none"> • inferring • predicting 		



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Topic: Materials				
10.	This worksheet examines the absorbency of different materials.	<ul style="list-style-type: none"> observing inferring evaluating analysing 		<ul style="list-style-type: none"> Note that a material which is unable to absorb any liquid is known as waterproof.
11.	The first question examines the relative transparency of different materials by shining a light on it. The question examines the different materials used to make a television set.	<ul style="list-style-type: none"> analysing inferring comparing 		<ul style="list-style-type: none"> Teachers may discuss why some materials are not suitable to be made into certain household items.
12.	This worksheet is about an experiment to test the strength of a material.	<ul style="list-style-type: none"> using apparatus / equipment analysing inferring 		<ul style="list-style-type: none"> Teachers may emphasize to students the difference between the strength and hardness of a material.
13.	Students have to study the physical properties of materials based on given information from a table and a flow chart.	<ul style="list-style-type: none"> inferring interpreting analysing of data comparing classifying 	-	<ul style="list-style-type: none"> Teachers can highlight the different types of natural and man-made materials as well as their physical properties. Teachers can also ask students to do a simple classification of materials prior to the lesson.
Topic: Life Cycles				
14.	This worksheet requires students to analyse the data given and, compare and classify the animals based on their number of life stages.	<ul style="list-style-type: none"> inferring interpreting analysing of data comparing classifying 	-	<ul style="list-style-type: none"> Besides the common life cycles taught in the textbooks, teachers can introduce to students other various types of animals with different number of life cycle stages. Teachers can then highlight the differences between a three-stage life cycle and a four-stage life cycle.
15.	This worksheet aims to raise the awareness that only flowering plants can reproduce from seeds.	<ul style="list-style-type: none"> observing communicating inferring 	<ul style="list-style-type: none"> Classification of plants Plant systems 	<ul style="list-style-type: none"> Teachers may also talk about the reproduction methods of non-flowering plants, e.g. ferns.
16.	This worksheet tasks students to compare a caterpillar and a wriggler.	<ul style="list-style-type: none"> communicating observing comparing inferring 		<ul style="list-style-type: none"> Teachers should point out to students that some creatures may be harmful to humans at one stage during their life cycle but useful to humans at another stage.
17.	This first part of the worksheet examines the stages of growth of a bean plant and deals with plant nutrition before the first real leaves appear. The second part of the worksheet looks at the effects of overcrowding on plant growth.	<ul style="list-style-type: none"> analysing comparing inferring 	<ul style="list-style-type: none"> Plants Life cycle of a plant 	<ul style="list-style-type: none"> Note that this worksheet overlaps with the topics on plants and life cycle of a plant.
Topic: Matter and Its Three States				
18.	This worksheet requires students to have the prior knowledge of the properties of matter before attempting the questions.	<ul style="list-style-type: none"> observing analysing comparing classifying 	-	<ul style="list-style-type: none"> Teachers should highlight the characteristics of the different states of matter.
19.	The worksheet requires the students to analyse the given data about matter in a table and a flow chart.	<ul style="list-style-type: none"> inferring analysing of data comparing classifying 	-	<ul style="list-style-type: none"> Teachers should recapitulate to students that matter is anything that has mass and occupies space. Students must be encouraged to explore matter in their surroundings and question what they find.

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20.	This worksheet deals with finding the volume of a regular-shaped and irregularly-shaped object as well as how an object which absorbs water may make the result of finding the volume inaccurate.	<ul style="list-style-type: none"> observing communicating predicting evaluating 	• Simple mathematics	• Teachers may plan a laboratory lesson where students mould plasticine and find the volume of their figurines. This activity helps students to learn how to find the volume of an irregularly-shaped object, as well as how to read the volume of a liquid in a measuring cylinder.
21.	This worksheet examines the process of mixing two gases.	<ul style="list-style-type: none"> using apparatus / equipment inferring predicting 		<ul style="list-style-type: none"> Teachers should explain to students that gas particles are able to move quickly and freely throughout their container, so two gases placed together will mix evenly. Teachers may also elaborate on the uses of oxygen (for breathing / burning) and when it is produced (during photosynthesis).
22.	The first part of the worksheet deals with the speed of gases. The second part of the worksheet deals with the relative mass of a gas as compared to air and how this affects floatation.	<ul style="list-style-type: none"> using apparatus / equipment observing analysing inferring 		• Teachers may mention to students that the heavier a gas, the slower its speed. They can also point out to students that the balloons that they blow themselves cannot float like those bought from a store because the latter are usually filled with helium, a gas that is lighter than air.
Topic: Reproduction in Plants and Humans				
23.	This worksheet deals with the reproduction of various plants and how pollination of plants is aided by animals like birds.	<ul style="list-style-type: none"> observing interpreting 	-	• Teachers may want to emphasize to students that besides sexual reproduction, plants can also reproduce asexually. Different types of plants (e.g. pineapple, bird's nest fern, hibiscus) could be brought into the discussion and classified into a diagram for use on the science board.
24.	The first question requires students to analyse the flow chart to understand the reproduction methods of the animals. It also tasks students to understand the different stages in the process of fertilization. The second question focuses on the reproduction method of a potato. Students must analyse the two graphs to understand the relationship between the mass of a piece of potato and the height of the new potato plant.	<ul style="list-style-type: none"> observing communicating comparing analysing 	-	• Using the flow chart given in question 1, teachers may encourage students to provide examples of animals that fit in each of the four exit points, A, B, C and D.
25.	This worksheet looks at the two types of pollination of plants and the factors needed for plants to grow.	<ul style="list-style-type: none"> observing interpreting 	-	• Teachers can revise with students the reproduction cycle of plants by summarizing the key points of each stage in the cycle.
26.	This worksheet tasks students to study pictures of a sperm and an egg and answer related questions.	<ul style="list-style-type: none"> observing inferring 	-	• Students may require a further explanation of part (g).
27.	This worksheet focuses on the subject of seed dispersal.	<ul style="list-style-type: none"> comparing inferring analysing communicating 	-	• Teachers may initiate a discussion on the subsequent behaviour / motion of seeds scattered by different methods and where the seeds tend to land and grow.
28.	This worksheet compares the reproductive systems of a plant and an animal.	<ul style="list-style-type: none"> communicating evaluating 	-	• Teachers may draw parallels between the reproductive organs of a plant and an animal, e.g. pollen grains are the plant equivalent of sperms since both are male parts which are deposited into the female to bring about fertilization.
Topic: Water, Changes of State and the Water Cycle				
29.	The first question requires students to identify the following processes: condensation, evaporation, freezing and melting. The second question requires students to compare the difference between evaporation and condensation. In the third question, students are required to determine the types of variables that affect the rate of evaporation.	<ul style="list-style-type: none"> observing analysing comparing 	• Matter and its three states	• Teachers can revise with students the processes involving water. A simple comparison chart between the two processes could be done to reinforce students' learning.

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30.	This worksheet tasks students to identify the factors that affect evaporation. In addition, they are required to identify the constant and variable as well as draw conclusion in an experiment.	<ul style="list-style-type: none"> comparing interpreting identifying 	• Matter and its three states	• Teachers can conduct the experiment in question 1 on evaporation using three pieces of handkerchiefs and get students to observe the result.
31.	The first question in the worksheet requires students to list down the processes in the water cycle. The second question deals with the constant and variable in the experiment on the rate of evaporation of water. In the third question, the results of water expanding when it becomes ice is explored.	<ul style="list-style-type: none"> communicating predicting analysing 	• Matter and its three states	• Teachers can revise with students on the skills that are taught during science practical lesson. (i.e. revise terms such as variables, hypothesis, relationship)
32.	The first question tasks students to analyse the information in a table to understand the rate of evaporation of water in several containers. The second question tasks students to identify certain parts of the heating curve and explain the processes that are taking place. The third question requires students to state reasons about the importance of the water cycle.	<ul style="list-style-type: none"> communicating comparing 	• Matter and its three states	• Teachers may revise with students on the processes involving water using the graph in question 2 as a reference point.
33.	The first question tasks students to explain why condensation occurs in two different set-ups. The second question requires students to determine heat loss and heat gain when a spoon is placed on a cube of ice that is left on table.	<ul style="list-style-type: none"> analysing communicating predicting 	• Matter and its three states	• A demonstration of question 2 on condensation should be done together with the students. A thorough explanation and understanding about this process should be done.
34.	The first question in the worksheet requires students to analyse the data from the graph on water being heated over a period of time. The second question tasks students to identify the processes in a flow chart. The third question requires students to identify the changes in state of water in an activity or event.	<ul style="list-style-type: none"> analysing data interpreting predicting 	• Matter and its three states	• Teachers should provide opportunities for students to discuss and give examples on situations and activities which would result in changes in state of water. At the same time, teachers can also get students to identify heat loss and heat gain in each of the situation or activity mentioned by them.
35.	This worksheet deals with the experiment to obtain pure water from seawater. Students also get to revise the changes of state of water.	<ul style="list-style-type: none"> observing analysing inferring 	-	• Teachers may demonstrate the experiment in class.
36.	The first part of the worksheet deals with the similarities and differences between boiling and evaporation. The second part of the worksheet examines the relationship between the rate of melting and the exposed surface area.	<ul style="list-style-type: none"> observing inferring classifying communicating 	-	• Teachers should emphasize to students that despite the same change of state involved, boiling and evaporation are not the same thing.
37.	The first question in this worksheet is about evaporation and condensation. The second question deals with the relationship between the type of fabric and the rate of evaporation.	<ul style="list-style-type: none"> observing analysing inferring 	-	• Teachers should point out to students that there is water present in most fruit as in the case of the experiment conducted in question 1.
Topic: Our Body Systems				
38.	This worksheet requires students to explain their understanding on the functions of different organs in their body.	<ul style="list-style-type: none"> observing analysing communicating inferring 	-	• Teachers can revise with students the human digestive system by highlighting the functions of the various organs.

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39.	Students have to show their understanding on the functions of different bones and muscles.	<ul style="list-style-type: none"> classifying inferring analysing of data 	-	<ul style="list-style-type: none"> Teacher can revise with students the skeletal and muscular system by highlighting the functions of various bones. The use of models would be helpful when carrying out the explanation on this topic.
40.	This worksheet examines the process of digestion starting in the mouth where starch is partially digested into sugar. It also touches on how long the entire process of digestion usually takes.	<ul style="list-style-type: none"> predicting inferring 		<ul style="list-style-type: none"> Teachers may allow students to conduct the experiment stated in the worksheet to realize first-hand that starch is converted into sugar in the mouth.
41.	This worksheet examines how different types of food are digested in different parts of the digestive system.	<ul style="list-style-type: none"> analysing inferring communicating 		<ul style="list-style-type: none"> Teachers may discuss the benefits of consuming vegetables, emphasizing on their high fibre content.
Topic: Plant Systems				
42.	This worksheet deals with the function of the fruit and the process of germination.	<ul style="list-style-type: none"> inferring predicting 	<ul style="list-style-type: none"> Classification of plants 	<ul style="list-style-type: none"> Teachers may discuss about fruit and how they can be classified, e.g. edible / inedible, one seed / many seeds, smooth skin / rough skin etc. so as to introduce students to the diversity of fruit.
43.	The first part of the worksheet deals with the underground storage roots of some plants. The second part of the worksheet allows students to make inferences about the movement of water through a plant.	<ul style="list-style-type: none"> observing using apparatus / equipment inferring predicting 		<ul style="list-style-type: none"> Teachers may do a demonstration of the experiment in question 2.
44.	This worksheet examines the stomata and its functions.	<ul style="list-style-type: none"> observing using apparatus / equipment inferring analysing predicting 	<ul style="list-style-type: none"> Photosynthesis and respiration 	<ul style="list-style-type: none"> Teachers may elaborate on the stomata and the gases that enter and exit from them during gaseous exchange.
Topic: Air and the Respiratory System				
45.	This worksheet requires students to make comparisons between inhaled and exhaled air and to draw a conclusion based on a given situation.	<ul style="list-style-type: none"> comparing interpreting analysing of data 	-	<ul style="list-style-type: none"> Teachers can use PE lesson as a lead-in prior to the science lesson introducing inhaled and exhaled air. Teachers can get students to inhale and exhale and from there, get them to observe and make comparisons on the activity done.
46.	The first question looks at how the force of breath may affect the distance travelled by a cone when it is hit by a rolling ball. The second question examines the components of air, namely those found in inhaled air and exhaled air. The experiment shown in the third question seeks to find out the effect of light on some seaweed when a lamp is placed at different distances.	<ul style="list-style-type: none"> comparing interpreting identifying 	-	<ul style="list-style-type: none"> Teachers may revise with students on the topic of photosynthesis and the importance of plants to all living things.
47.	Questions 1 and 2 require students to identify variables and draw conclusions based on given experiments. Students are required to make a comparison between photosynthesis and respiration in question 3.	<ul style="list-style-type: none"> comparing interpreting identifying 	-	<ul style="list-style-type: none"> Teachers should take the opportunity to discuss about carbon dioxide and the experiment needed to conduct to test for its presence. Students could test out if carbon dioxide is present in exhaled air by using a straw and blowing into a container of limewater. They should also understand that most carbon dioxide is mixed with other gases in the air but it still reacts to limewater. Students can leave an open container of limewater on a table for a week and see its results.

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48.	This worksheet examines the respiratory system and the gases involved during breathing.	<ul style="list-style-type: none"> observing communicating inferring 	<ul style="list-style-type: none"> The respiratory system 	<ul style="list-style-type: none"> Teachers may make use of this worksheet to talk about the composition of inhaled air as compared to exhaled air.
49.	The first part of the worksheet tasks students to answer questions based on a laboratory model of the respiratory system. The second part of the worksheet tests students on the process of respiration.	<ul style="list-style-type: none"> observing analysing inferring 	-	<ul style="list-style-type: none"> Teachers should point out to students the differences between breathing and respiration.
50.	This worksheet examines the effect of different coloured lights on the rate of photosynthesis.	<ul style="list-style-type: none"> observing analysing inferring 	-	<ul style="list-style-type: none"> Teachers may initiate a discussion about the concept of colours and the colour wheel. Note: White light is a mixture of all other colours.
Topic: The Circulatory System				
51.	The worksheet requires students to make comparisons between plant and human carrying tubes and draw conclusions based on a given scenario.	<ul style="list-style-type: none"> comparing interpreting identifying 	<ul style="list-style-type: none"> Plants 	<ul style="list-style-type: none"> Teachers may revise with students on the functions of various parts of plants and the process, photosynthesis. Teachers may also ask students to do a simple concept map of the plant transport system and the human circulatory system to show the difference between the two.
52.	This worksheet tasks students to answer questions based on a table showing a human's pulse rate at different ages.	<ul style="list-style-type: none"> analysing communicating predicting 	-	<ul style="list-style-type: none"> Teachers can relate the lesson to Health Education on factors affecting pulse rate as a tuning-in activity.
53.	The first question gets students to think about how some living things take in air. The second question requires students to explain why a person's breathing will increase due to exercising. The third question requires students to interpret the data from a line graph to determine the type of activities that an individual is engaged in and to draw conclusion from the data.	<ul style="list-style-type: none"> analysing communicating predicting 	<ul style="list-style-type: none"> Classification of living things 	<ul style="list-style-type: none"> Teachers can tap on students' prior knowledge by discussing with them the rate of breathing and asking them if the heartbeat increases when they are exercising.
54.	The first question requires students to identify the variables and constant in an experiment and to support their answers with a valid explanation. The second question is about a part of the circulatory system of plants. The third question is about the workings of the human circulatory system when one exercises.	<ul style="list-style-type: none"> analysing communicating predicting 	-	<ul style="list-style-type: none"> Teacher can revise with students on how to identify the variable and the constant. Teachers can also reinforce the importance of having only one variable in the experiment.
55.	The first part of the worksheet tasks students to answer questions based on a graph showing a person's pulse rate as he engages in an activity. The second question is about the function of the heart and the consequences of having a hole in the heart.	<ul style="list-style-type: none"> communicating analysing inferring 	-	<ul style="list-style-type: none"> Teachers may initiate a discussion of heart ailments, including a hole in the heart, blocked arteries etc. and their causes and effects. Health Education may come into the picture with a discussion on how a healthy diet can prevent certain types of heart disease.
56.	The first part of the question is a comparison of inhaled and exhaled air while the rest of the parts consists of miscellaneous questions regarding the respiratory and circulatory systems.	<ul style="list-style-type: none"> communicating analysing inferring 	-	<ul style="list-style-type: none"> Teachers should point out to students the inter-connectedness of the respiratory and circulatory systems for the smooth functioning of the body.

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Topic: Cells				
57.	The first question requires students to make a comparison between two plant cells. The second question requires students to understand the growth of cells.	<ul style="list-style-type: none"> observing interpreting analysing of data 	-	<ul style="list-style-type: none"> Teachers can revise with students on the functions of various parts of plant and animal cells. A simple comparison table of both cells can be drawn up to reinforce students' learning.
58.	The first two questions require students to understand how different cells function and to make a comparison among them. The third question examines the process of cell division.	<ul style="list-style-type: none"> observing communicating 	-	<ul style="list-style-type: none"> Teachers can show students a few samples of cells gathered from their cheek, saliva and skin. Get students to see the cells using a microscope and make comparisons. They can even cite reasons for their claims.
59.	The worksheet requires students to label parts of the cells and to make comparisons between animal and plant cells.	<ul style="list-style-type: none"> identifying communicating comparing 	-	<ul style="list-style-type: none"> Teacher can revise with students the topic by going through the parts of the cell and compare the differences between animal and plant cells.
60.	The first question tasks students to plot a graph based on a set of given data. The second question requires students to observe three different animal cells and to compare them.	<ul style="list-style-type: none"> identifying analysing communicating 	-	<ul style="list-style-type: none"> Teacher can revise with students the skills on graph plotting that they have learned in Math.
61.	This worksheet examines the effect of plant cells in two different environments, one with a high water concentration and one with a low water concentration.	<ul style="list-style-type: none"> comparing observing evaluating communicating formulating hypotheses 	-	<ul style="list-style-type: none"> Teachers should explain that water moves from a region of higher water concentration to a region of lower water concentration through the semi-permeable membrane of the potato cell.
62.	This worksheet examines the effect of having a cell wall as well as respiration in cells.	<ul style="list-style-type: none"> inferring predicting communicating 	- Respiration	<ul style="list-style-type: none"> Teachers should emphasize to students that cells are living things and like all living things, respiration is vital to their survival.
Topic: Electricity				
63.	The first and second questions task students to explain how an electrical system works and the ways to conserve electricity. The third question tasks students to design an electrical circuit correctly.	<ul style="list-style-type: none"> interpreting communicating generating possibilities 	-	<ul style="list-style-type: none"> Teachers can recapitulate with students on the electric components and how circuits are drawn by providing them exercises to practise.
64.	In the first question, students are required to find solutions to make a bulb in a given circuit brighter. The second question deals with how switches work in a circuit. The third question examines the mistakes made in constructing an electrical circuit.	<ul style="list-style-type: none"> interpreting communicating generating possibilities 	-	<ul style="list-style-type: none"> Teachers may want to recapitulate with students that a circuit must be closed so that electricity can flow. Ample practice should be provided to students to experiment with making circuits. Students would realize that to construct a circuit, two things are always needed: a power supply and a wire. Additional components are the bulb and a switch.
65.	The first question requires students to draw a simple circuit using symbols. Students have to analyse the information in the table to determine if the length of a wire affected the brightness of the bulb in the second question. Students are also required to state the sources of electricity and necessary precautions when using electricity in the third question.	<ul style="list-style-type: none"> interpreting communicating generating possibilities 	-	<ul style="list-style-type: none"> Teachers can demonstrate to students question 2 in the worksheet. Students must understand that when the length of the wire increases, the resistance increases because the current has more wire to travel through which leads to more opposition to the flow of charge.

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66.	The first part of this worksheet examines the difference between a series and a parallel arrangement. The second part of this worksheet tests students on their concept of a short circuit.	<ul style="list-style-type: none"> observing analysing communicating predicting 	-	<ul style="list-style-type: none"> Teachers should explain to students that electricity is 'lazy' and will choose the easiest path to travel (i.e. one without 'obstacles' such as a bulb) within a circuit.
67.	This worksheet is about household electricity consumption and the calculation of the electricity bill.	<ul style="list-style-type: none"> observing analysing communicating 	-	<ul style="list-style-type: none"> Teachers may initiate a discussion on how a household's electricity bill is calculated in Singapore as well as bring up the topic of conservation of electricity.
68.	This worksheet examines the process of electroplating.	<ul style="list-style-type: none"> observing analysing inferring 	-	<ul style="list-style-type: none"> Teachers may conduct a demonstration of electroplating using a copper sheet and a coin if feasible.
69.	The first part of the worksheet examines the concept and limitations of a two-way switch. The second part of the worksheet examines the differences in function of a series and a parallel circuit.	<ul style="list-style-type: none"> observing analysing communicating 	-	<ul style="list-style-type: none"> Teachers may introduce to students the concept of the two-way switch and its applications.
Topic: Magnets				
70.	The first question tasks students to suggest ways to increase the strength of an electromagnet and to draw a diagram to depict how this could be done. The second question deals with the types of materials that are attracted to magnets. The third question deals with how to make a magnet.	<ul style="list-style-type: none"> generating possibilities analysing 	-	<ul style="list-style-type: none"> Demonstrations of the three questions may be conducted in class.
71.	This worksheet requires students to understand the difference in behaviour between magnetic and non-magnetic materials when they come into contact with a magnet. In the second question, students need to analyse the data from the table to determine the strength of the magnetism of magnets. The third question requires students to understand the characteristics of objects based on a flow chart.	<ul style="list-style-type: none"> generating possibilities interpreting 	-	<ul style="list-style-type: none"> Teachers can recapitulate with students on the skills of prediction and how to support their claims with evidences. Teachers can help students recall prior knowledge by doing the experiment in question 1 and highlight the reason why the paperclip can remain suspended when certain materials are placed in between the magnet and paperclip.
72.	Students need to provide explanations on a given scenario in questions 1 and 2. In the third question, students are required to write the procedure for an experiment clearly.	<ul style="list-style-type: none"> interpreting analysing of data inferring generating possibilities 	-	<ul style="list-style-type: none"> Teachers should revise with students on writing factual descriptions using scientific terms. Students should also be given ample practice on how to write proper instructions for experiments.
73.	The first question is about magnetic repulsion. The second question tasks students to give the polarities of some magnets that have been arranged in a certain way. The third question is about magnetizing an iron nail using the single-stroke method.	<ul style="list-style-type: none"> observing inferring analysing 	-	<ul style="list-style-type: none"> Teachers may allow students a hands-on session with magnetizing iron nails using the single-stroke and double-stroke methods. Challenge students to find out the polarity of magnets by putting two induced iron-nail magnets together or by using a plotting compass.
74.	The first question examines a magnet used in a conveyor belt sorting system. The second question involves identifying if some hanging spheres are magnets, or made of a magnetic or non-magnetic materials based on their interactions with one another.	<ul style="list-style-type: none"> observing analysing formulating hypotheses 	-	
75.	This worksheet examines the magnetic field patterns between interacting bar magnets.	<ul style="list-style-type: none"> observing analysing 	-	<ul style="list-style-type: none"> Although magnetic field patterns are not included in the syllabus, this worksheet has been intended as an enrichment activity that would aid students in understanding how magnets work.

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Topic: Forces				
76.	The worksheet allows students to identify the various types of forces at work and provide opportunities to apply their understanding on forces.	<ul style="list-style-type: none"> analysing communicating 	-	<ul style="list-style-type: none"> Students can create a parachute as shown in question 2 and find out what other factors determine the time taken for it to reach the ground. Other factors include the weight of the person, the wind speed, the parachute size, etc. Teachers should explain that since the toy bear is attached to the parachute, when it begins to fall air fills up in the canopy and resists free fall. There are two forces: one is acting upwards while the other force is acting downwards (gravity). Since gravity is stronger, the parachute is attracted downwards and will float down slowly.
77.	In the first question, students have to plot a graph based on the data given and to predict from the results. In the second question, students are required to make a prediction on the amount of elasticity in relation to the size of the rubber band. In the third question, students are tasked to find out the effect on a vehicle's ability to stop quickly based on the condition of the road (dry or wet ground).	<ul style="list-style-type: none"> analysing data communicating predicting 	-	<ul style="list-style-type: none"> Teachers may demonstrate setting up an experiment on how to measure the extension of the spring using a spring, weights, cellophane tape, card, scissors and rulers. Teachers should get students to brainstorm how to record their findings accurately (that is, making a repeat reading and averaging the results.) Students should be taught how to organize results and draw the graph.
78.	The first question tasks students to predict what should be done to make the waterwheel spin slower in the experiment. The second question examines the cause of an object's reaction to another in an experiment. The third question is about the forces that are acting on a ball that has been kicked by a child.	<ul style="list-style-type: none"> predicting communicating analysing 	-	<ul style="list-style-type: none"> Teachers should recapitulate with students the characteristics of magnets by carrying out experiments and discussing about them.
79.	The first part of the worksheet examines the behaviours of a spring when a load is attached to it. In the second and third questions, students should be able to identify the variables in a given experiment and predict the outcome should one of the variables changes.	<ul style="list-style-type: none"> predicting communicating analysing data interpreting 	• Heat	<ul style="list-style-type: none"> Teacher can revise with the students on the skills that are taught during a science practical lesson. (that is, revise terms such as variables, hypothesis, relationship)
80.	The first question requires students to describe and explain the proper procedures of a given experiment. In the second question, students are required to explain how friction affects our daily life.	<ul style="list-style-type: none"> inferring communicating 	• Magnet	<ul style="list-style-type: none"> Teachers should allow students to test out the ability of a paperclip to float in mid-air. Two factors affect whether a magnet can attract a magnetic material from a distance: the strength of the magnet and how far away the magnet is placed from the magnetic material.
81.	This worksheet covers the effect of force exerted by air as applied to the suction cup and blowing up a balloon. The reason why an object is able to float in the air is also dealt with.	<ul style="list-style-type: none"> communicating inferring analysing predicting 	• Matter (air)	<ul style="list-style-type: none"> A demonstration of how a suction cup works may help students to understand the concept of air pressure (although this term need not be used).
82.	This worksheet requires students to interpret a bar graph and a line graph so as to answer some related questions about the elastic spring force and how it varies according to the mass hung from a spring.	<ul style="list-style-type: none"> observing communicating analysing evaluating 	-	<ul style="list-style-type: none"> Students should be reminded about the difference between the <u>length</u> of a spring and the <u>extension</u> of a spring. The elastic limit (beyond which the spring loses its elastic property) should be pointed out to students. They should understand that all springs will reach their elastic limit if the load is too heavy and the spring gets out of shape (deformed). However, the maximum mass a spring can take before reaching its elastic limit depends on the spring itself.
83.	Students are tasked to identify some magnets and magnetic materials by reading a flow chart and a table.	<ul style="list-style-type: none"> communicating analysing 	-	<ul style="list-style-type: none"> Some students may need help in interpreting the table in question 2.

Worksheet No.	Specific Instructional Objective(s)	Process Skills	Related Topic(s) Covered	Suggested Lesson Lead-in / Follow-up + Remarks
Topic: Factors of an Environment				
84.	The first part of the worksheet examines the population of crows in relation to the number of trees in the forest over a period of time. In the second part of the worksheet, students need to analyse the data given in the table to determine the type of leaves eaten by stick insects. For the third part of the worksheet, students have to interpret the graph to track the changes in an animal population and answer related questions.	<ul style="list-style-type: none"> analysing data interpreting 	<ul style="list-style-type: none"> Web of life 	<ul style="list-style-type: none"> Teachers can revise with students that every living organism is dependent on each other for survival in the ecosystem. Provide examples or recent news that have been reported to show how dependent organisms are on one another and how the ecosystem is upset when a species of organisms is killed / dead.
85.	The first question tasks students to suggest ways to get rid of caterpillars. The second question requires students to list out factors that affect the population in a community. The third question tasks students to interpret and analyse data from a given table, make predictions, and apply their understanding on the environment.	<ul style="list-style-type: none"> analysing data interpreting 	<ul style="list-style-type: none"> Web of life 	<ul style="list-style-type: none"> Teachers can revise with students on food chains and discuss how organisms affect each other in the ecosystem.
86.	Students have to interpret a line graph to discern how the change in the line patterns represent changes in the area of land covered by plants.	<ul style="list-style-type: none"> observing communicating inferring 	-	<ul style="list-style-type: none"> Teachers may initiate a discussion on how the introduction of animals affected the plant populations in this question as well as in other scenarios. While animals may decrease the plant population by feeding on them, animals can also have a positive impact on plant growth, e.g. ladybugs eat aphids which feed on leaves, or the droppings of animals act as fertilizers to enhance plant growth.
87.	This worksheet examines the necessary conditions for the survival of plants and animals.	<ul style="list-style-type: none"> observing communicating evaluating inferring using apparatus / equipment 	<ul style="list-style-type: none"> Photosynthesis and respiration 	<ul style="list-style-type: none"> Teachers may initiate a discussion on gaseous exchange between plants and animals and how photosynthesis helps to purify the air.
Topic: Food Chains and Food Webs				
88.	The first question requires students to make a simple food chain. The second question requires students to provide reasons on how one organism affects another organism / organisms.	<ul style="list-style-type: none"> analysing interpreting communicating 	<ul style="list-style-type: none"> The environment 	<ul style="list-style-type: none"> Teachers should discuss with students the flow of matter and energy, and the interdependence of life by focusing on food chains and food webs. Students must remember that the food that all kinds of animals take can be traced back to plants and that the sun is the ultimate source of energy because it is needed for all organisms to stay alive and grow.
89.	This worksheet aims to help students to appreciate the necessary conditions required for the survival of organisms.	<ul style="list-style-type: none"> observing analysing communicating inferring 	<ul style="list-style-type: none"> The environment 	<ul style="list-style-type: none"> Teachers can initiate a discussion about the interrelationship between herbivores, carnivores and omnivores within a community as well as how fluctuations in the population of any one group can affect the whole community.
Topic: Adaptations				
90.	The first question requires students to state a difference between two given claws. The second question requires students to explain why birds are important to flowers. The third question deals with the adaptation of leaves in a given habitat.	<ul style="list-style-type: none"> interpreting comparing observing 	-	<ul style="list-style-type: none"> Teachers can provide a few plants samples (e.g. cactus and grass) for students to compare and discuss on their structures that are important for their survival.



Worksheet No.	Specific Instructional Objective(s)	Process Skills	Related Topic(s) Covered	Suggested Lesson Lead-in / Follow-up + Remarks
91.	The first question tasks students to compare the structural differences between two types of plants. The second question requires students to explain how the crab and frog survive in their environments.	<ul style="list-style-type: none"> interpreting comparing 	-	<ul style="list-style-type: none"> A discussion on the importance of how and what animals and plants do or have in order to adapt.
92.	This worksheet deals with the adaptations that plants and animals have in order to survive in their respective habitats.	<ul style="list-style-type: none"> interpreting comparing analysing 	-	<ul style="list-style-type: none"> Teachers should take the opportunity to further students' curiosity and understanding of the different adaptations that plants have in order to survive in their respective habitats (swamps, tropical rainforest, desert, in the sea, etc). Some examples that could be discussed are the sagebrush, rabbitbrush, grass, water hyacinth and mangrove plant.
93.	Students have to classify animals using a given dichotomous key and draw a classification tree diagram.	<ul style="list-style-type: none"> classifying inferring communicating 	<ul style="list-style-type: none"> Classification of animals 	<ul style="list-style-type: none"> Students should be introduced to a dichotomous key and learn how to interpret it. Stress to students that a dichotomous key is simply a method of classifying organisms by dividing them into two separate groups at each stage. Teachers may link this lesson to adaptation of animals to live on land and in water.
94.	This worksheet covers the adaptations of the beaks and feet of birds to suit their habitats and feeding habits as well as the role birds can play in pollination.	<ul style="list-style-type: none"> observing comparing communicating inferring formulating hypotheses 	<ul style="list-style-type: none"> Reproduction in plants 	<ul style="list-style-type: none"> Teachers may initiate a discussion on all the structural / behavioural adaptations of different types of birds, including flightless birds and those living in extreme climatic conditions, e.g. the penguin.
Topic: Man's Impact on the Environment				
95.	The first question tasks students to explain the effect of deforestation. The second question requires students to suggest ways to get rid of young mosquitoes without cutting down a tree.	<ul style="list-style-type: none"> generating possibilities 	-	<ul style="list-style-type: none"> Teachers can assign students to do a project on the topic of deforestation. Besides learning about the history of deforestation, students should be able to discuss about the causes and effects of deforestation. Research on statistics and up-to-date newspaper cuttings could be done so that students could also practise on drawing graphs and learning to analyse them.
96.	The first question requires students to analyse a line graph and answer the questions relating to the predators and prey in the community. The second question requires students to suggest ways to reduce air pollution. Students are able to choose a material that can be used to replace plastic to make a shopping bag, and explain why they had chosen the material.	<ul style="list-style-type: none"> generating possibilities comparing 	<ul style="list-style-type: none"> Web of life 	<ul style="list-style-type: none"> Teachers should use the line graph in question 1 to discuss with students the close relationship between predator and prey. In a predator-prey relationship in an ecosystem, there should be a greater number of prey as compared to predators. Also, it should be noted that if given that no other factors affect both the predator and prey in question, the two of them rise and fall at regular intervals from each other with a small time lapse.
97.	This worksheet requires students to state examples of human activities that have a negative impact on earth.	<ul style="list-style-type: none"> interpreting generating possibilities analysing 	-	<ul style="list-style-type: none"> Teachers can discuss with students the consequences of human activities that could bring harm to the environment.
98.	This worksheet examines the positive and negative impacts that would affect us and our environment with the current use of science and technology.	<ul style="list-style-type: none"> interpreting generating analysing possibilities 	-	<ul style="list-style-type: none"> Finding out more about Genetic Modification (GM) food will help students understand why it came about and the differences between genetic modifications versus conventional breeding. It would also benefit students to find out about GM food like the tomato (fruit ripening altered), corn (herbicide tolerance) and papaya (Papaya Ringspot Virus resistant).

Worksheet No.	Specific Instructional Objective(s)	Process Skills	Related Topic(s) Covered	Suggested Lesson Lead-in / Follow-up + Remarks
99.	This worksheet examines the role of trees in maintaining the balance in the water cycle and the gaseous exchange cycle. It also touches on the effects of deforestation.	<ul style="list-style-type: none"> analysing communicating evaluating 	<ul style="list-style-type: none"> Photosynthesis and respiration The water cycle 	<ul style="list-style-type: none"> Teachers may revise with students the topics on water cycle and transpiration.
100.	This worksheet looks at the use of pesticides on vegetable farms, their effectiveness, necessity and dangers of overuse.	<ul style="list-style-type: none"> analysing drawing conclusions 	-	<ul style="list-style-type: none"> Teachers may initiate a discussion on organic farming and its greater acceptance in today's world.
Topic: Light and Shadows				
101.	The first two questions in this worksheet require students to understand the properties of light: it reflects off surfaces and it travels in straight lines. The third part of the worksheet ties in with sound using light. Students find out how to make reflected light move faster by using sound.	<ul style="list-style-type: none"> observing analysing inferring 	-	<ul style="list-style-type: none"> Teachers may point out to students that they are able to see things because they reflect light into their eyes. Students should also be given the opportunity to explore other properties of light and how it behaves under various circumstances.
102.	The first question in this worksheet requires students to understand the formation of shadows when the position of an object is changed. The second question in this worksheet requires students to understand why light rays bend when they pass through air and enter a different medium like water.	<ul style="list-style-type: none"> generating possibilities analysing 	-	<ul style="list-style-type: none"> Teachers should allow students to experiment with different objects to find out how many shadows could be formed from an object when its position is changed. Teachers should also conduct the experiment shown in part 2 of the worksheet so that students can understand that light travels faster in air than when it goes through a denser substance such as glass or water.
103.	This worksheet deals with identifying the length and position of a shadow to tell the time of day. It also deals with the reflection of light on the surfaces of objects.	<ul style="list-style-type: none"> interpreting analysing of data inferring 	-	<ul style="list-style-type: none"> Teachers could tell students about how people used to tell time using shadows long ago as an introduction to the lesson before following up with an experiment using a stick, a measuring ruler and chalk on a sunny day to mark out the length of the shadow of the stick.
104.	The first question tasks students to explain how the periscope works. The second question tasks students to explain how light can be used to light a match. The third question deals with how well we can see through the different types of objects.	<ul style="list-style-type: none"> classifying generating possibilities 	-	<ul style="list-style-type: none"> Students should be encouraged to make their own periscope and understand that the mirrors must be positioned at 45° angle so that light is reflected away at the same angle. Under the supervision of teachers, students can attempt to start a fire using a magnifying glass. Students must understand that the magnifying glass works to focus the rays of the sun on a single point of light. A demonstration of the different types of objects which are transparent, translucent and opaque should be used to drive the point home.
105.	The first question of the worksheet reinforces the concept that light travels in straight lines. The second question of the worksheet deals with how well a person can see through different types of objects.	<ul style="list-style-type: none"> using apparatus / equipment communicating inferring formulating hypothesis 		<ul style="list-style-type: none"> Teachers may carry out the experiment shown in the second question.
106.	This worksheet deals with images of words as seen in a mirror.	<ul style="list-style-type: none"> observing analysing predicting 		<ul style="list-style-type: none"> Teachers should point out to students the characteristics of images formed in a plane mirror. The image is: <ul style="list-style-type: none"> - the same size as the object - upright - laterally inverted - the same distance behind the mirror as the object is in front of the mirror

Worksheet No.	Specific Instructional Objective(s)	Process Skills	Related Topic(s) Covered	Suggested Lesson Lead-in / Follow-up + Remarks
Topic: Heat and Temperature				
107.	Students are required to understand the principle that heat travels from a hotter place to a cooler place. The second question requires students to generate their own instructions for a given experiment in a systematic manner. The third question requires students to understand how heat can affect daily life activities.	<ul style="list-style-type: none"> observing analysing inferring generating possibilities 	-	<ul style="list-style-type: none"> Teachers should go through with students on how to write proper instructions for experiments.
108.	The first question in the worksheet requires students to plot a graph after analysing the given information about the transferring of hot water from container to container. The other questions require students to predict and provide explanation about heat gain and heat loss.	<ul style="list-style-type: none"> generating possibilities interpreting 	-	<ul style="list-style-type: none"> Teachers can go through with students on the skills of prediction and how they support their claim with evidences. Teachers can also explain the behaviour of heat.
109.	The first question in the worksheet requires students to draw a conclusion about what happened to an inflated balloon when it is left in the freezer. The second question deals with the effects of heat on solids. The third question tasks students to find out which material can conduct heat best. The last question requires students to interpret and analyse the graph about the temperature of water over a period of time.	<ul style="list-style-type: none"> interpreting analysing of data inferring 	• Matter and its three states	<ul style="list-style-type: none"> Teachers can refer to the topic on graphs and tables from the Mathematics syllabus to practise or enhance students' understanding. Teachers should also explain how heat travels and how it works in our daily life.
110.	The worksheet requires students to understand the concept of heat and its effects.	<ul style="list-style-type: none"> classifying generating possibilities analysing 	-	<ul style="list-style-type: none"> An experiment can be conducted in the laboratory using question 2 in the worksheet. Students, however, must ensure that the lighted candle is not left unattended. Teacher should reiterate the point that the candle flame produces a current of hot air which rises, therefore, making the spiral rotate.
111.	This worksheet illustrates to students the fact that our skin is not an accurate judge of temperature, as well as how the number of people at a place can affect the amount of heat present.	<ul style="list-style-type: none"> creative problem-solving formulating hypothesis 		<ul style="list-style-type: none"> Teachers may ask students to conduct the experiment of dipping one hand in hot water and the other hand in cold water. Finally, get the students to place both hands in tap water to illustrate the idea behind the question. Also, point out to students that people give out heat when they exhale. (Ask students to place their hands in front of their mouths and breathe out.)
112.	This worksheet examines how different materials conduct heat to different extents.	<ul style="list-style-type: none"> analysing using apparatus / equipment inferring predicting formulating hypotheses 	• Materials	<ul style="list-style-type: none"> Teachers may discuss about which materials are good conductors of heat and which are not. Point out to the class that good conductors of heat are also good conductors of electricity.
Topic: Energy and its Forms, Uses and Sources				
113.	This worksheet tasks students to do some simple conversion, applying their understanding on kinetic and potential energy.	<ul style="list-style-type: none"> analysing communicating 	-	<ul style="list-style-type: none"> Teachers can provide a few examples (e.g. dropping a ball from a certain height or rolling a ball down the ramp) for the students to further understand on kinetic energy and potential energy.

Worksheet No.	Specific Instructional Objective(s)	Process Skills	Related Topic(s) Covered	Suggested Lesson Lead-in / Follow-up + Remarks
114.	This worksheet requires students to state the main source of energy, provide examples of energy conversion and state the advantages of hydroelectricity.	<ul style="list-style-type: none"> analysing communicating predicting 	-	<ul style="list-style-type: none"> Teachers can discuss with students about the advantages as well as disadvantages of hydroelectricity. Answers can be recorded in a table and placed in the science corner of the classroom. Teachers can also elaborate on other various ways to produce electricity and make comparisons.
115.	The first question in the worksheet requires students to explain how potential energy works in a toy aeroplane. In the second question, students are required to label the type of energy and explain their choice in the answers.	<ul style="list-style-type: none"> predicting communicating 	-	<ul style="list-style-type: none"> Teachers may revise with students on the different types of energy and conversions. Teachers should provide a few examples for students to practise on.
116.	The first part of the worksheet requires students to provide both written and visual presentation of an experiment based on the items given. Students are tasked to identify the relationship between two variables in an experiment for the second question.	<ul style="list-style-type: none"> predicting communicating analysing 	• Heat	<ul style="list-style-type: none"> Teachers may discuss with students the different methods of heat transfer, particularly conduction. The other two methods are convection and radiation. Students are encouraged to do additional research into one of the types of heat transfer and give a brief presentation about their results. They can also be asked to describe all three types of heat transfer in various situations.
117.	The worksheet requires students to provide a reason to explain the inaccuracy in an experiment. It also requires students to identify the relationship between height and kinetic energy.	<ul style="list-style-type: none"> analysing communicating 	-	<ul style="list-style-type: none"> An experiment can be set up as shown in the worksheet. Students are encouraged to find out how to increase the power provided by the water. Students should be able to communicate their findings that the water is released from a height because it has potential energy and this power helps to drive machines inside a building or factory. The wheel spins faster because gravity aids the falling water, pushing the wheel round at a higher speed.
118.	This worksheet deals in detail with the working principles of a hydroelectric power station and the energy changes that take place there.	<ul style="list-style-type: none"> observing communicating inferring generating possibilities analysing 	-	<ul style="list-style-type: none"> Teachers may initiate a detailed discussion of a hydroelectric power generator and its advantages / disadvantages.
119.	This worksheet examines the relationship between the gravitational potential energy and the kinetic energy during a periodic motion (swing) and looping around a circular track (roller coaster).	<ul style="list-style-type: none"> observing communicating analysing evaluating 	-	<ul style="list-style-type: none"> Teachers may initiate a discussion of common playground and amusement park equipment which work on scientific principles.
120.	This worksheet helps students to appreciate the concept that a free falling body accelerates (i.e. increases its speed) during its fall. It can be used to help students appreciate the fact that the greater the height an object is released from, the greater the final speed of the object before it hits the ground. Hence, the object will exert a greater force on impact with the ground.	<ul style="list-style-type: none"> investigation formulating hypotheses communicating analysing 	• Gravitational potential energy and kinetic energy	<ul style="list-style-type: none"> Students may conduct a similar experiment using plasticine balls. Teachers should draw students' attention to the relationship between the speed of the falling object, the height through which the object falls and the force it exerts upon impact with the ground. (Consider an ideal case of a vacuum.) The fact that the air in the atmosphere slows down a falling object (air resistance) can be introduced.