Science Form 1
YEARLY PLAN

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2013

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2013 YEARLY PLAN FOR SCIENCE FORM 1

WEEK	LEARNING AREA/ LEARNING OBJECTIVES	LEARNING OUTCOMES	LEARNING ACTIVITIES	SCIENCE PROCESS/ THINKING SKILLS	SCIENTIFIC ATTITUDES & NOBLE VALUES
1	**Orientation**	**Program for Form 1 students**	**(PERMATA HATI)**		
2	**Theme : Introducing Science** **Learning Area :** **1.0 Introduction To Science** 1.1 Understanding that science is part of everyday life	A student is able to: • List what he sees a round him that is related to science • Explain the importance of science in everyday life • Name some careers in science such as: a. Science teachers b. Doctors c. Engineers	Describe examples of natural phenomena that students see around them: a. Growth of human from a baby to an adult; b. Fall of a ball to the ground; c. Melting of ice. Discuss the uses and benefits of science in everyday life.	Collecting data Relating Communicating Observing	Having an interest an curiosity towards the environment Being objective Daring to try Being thankful to God
3	1.2 Understanding the steps in scientific investigation	A student is able to: • State the steps in scientific investigation/ experiments; • Carry out a scientific investigation	Carry out a scientific investigation/ experiment; e.g 'To find out what affect the number of times the pendulum swings back and forth (oscillations) during a given time' Students can be asked to report on their investigations to the class. Students emphasize the steps they have taken; what they have changed; what they have kept the same and what they have measured.	All thinking skills	Being cooperative Being confident and independent Having critical and analytical thinking Being objective Being honest and being accurate in recording and validating data Being diligent and persevering Being systematic

2013 YEARLY PLAN FOR SCIENCE FORM 1

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4	1.3 Knowing physical quantities and their units	A student is able to: • State physical quantities; length, mass, time, temperature and electrical current; • State the S.I units and the corresponding symbols for these physical quantities; • State the symbols and values of prefixes for units of length and mass: mili-, centi-, and kilo-; • Identify and use appropriate prefixes in the measurement of length and mass	Identify physical quantities (length, mass, time, temperature and electric current), their values and units found on product descriptions. Find words with the prefixes used in measurements such as kilo-, centi-, and mili-. Find the symbols used for these units of measurement. Find the value of these prefixes.	Collecting data Interpreting data Relating Communicating Observing	Being cooperative Being confident and independent Having critical and analytical thinking Being objective Being honest and being accurate in recording and validating data Being diligent and persevering Being systematic
5	1.4 Understanding the use of measuring tools	A student is able to: • Choose the right tool and measure length in the context of an experiment; • Estimate area of regular and irregular shapes using graph paper in the context of an experiment; • Choose the right tool and measure the volume of liquid in the context of an experiment; • Choose the right tool to measure the body temperature and temperature of a liquid;	Measure the length of straight lines, curves and the diameter of objects using rulers, thread and calipers. Estimate the area of regular and irregular shapes using graph paper. Measure volume of liquids using measuring cylinder, pipette and burette. Determine the volume of regular and irregular solids using the water displacement method.	Collecting data Interpreting data Relating Communicating Observing	Being cooperative Being confident and independent Having critical and analytical thinking Being objective Being honest and being accurate in recording and validating data Being diligent and persevering Being systematic

2013 YEARLY PLAN FOR SCIENCE FORM 1

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6-7	1.4 Understanding the use of measuring tools	• Determine the volume of solids using water displacement method in the context of an experiment.	Measure the body temperature and temperature of water. Discuss the right choice of tool in making measurements. Apply the above measurement skills in the context of experiments.	Observing Collecting data Relating Visualizing Measuring and using numbers Communicating	Cooperative Daring to try Being respectful and well-mannered Being flexible and open-minded Honesty in recording and validating data
8	1.5 Understanding the concept of mass	A student is able to: • Determine the weight of an object; • Explain the concept of weight; • Explain the concept of mass; • Determine the mass of an object; • Explain the difference between mass and weight; • Apply the use of spring and beam/ lever balance in the context of an experiment.	Find the weights of different objects using a spring balance. Discuss weight as the pull of earth (gravitational force) on an object. Discuss mass as quantity of matter. Find the mass of different objects using bam/ lever balance or lever balance. Discuss the difference between mass and weight. Apply the skills of using spring balance and beam/ lever balance in the context of an experiment.	Observing Classifying Relating Comparing and contrasting Measuring and using numbers	Having an interest and curiosity Thinking rationally Daring to try Being confident and independent Being honest and being accurate in recording and validating data

2013 YEARLY PLAN FOR SCIENCE FORM 1

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9	1.6 Realizing the importance of standard units in everyday life	A student is able to: • Give examples of problems that may arise if standard units are not used.	Discuss the various units of measurements e.g unit s of length (feet, yard, chain, mile, meter, kilometer), units for weight (pound, ounce, kati, tahil, gram, kilogram). Act out a scene to show the problem caused by not using standard units e.g buying things at the market. Discuss the advantages and disadvantages of using different units of measurement. The students will be: a. Determining 'what I want to find out' (identifying the problem); b. Making a smart guess (forming a hypothesis); c. Planning how to test the hypothesis (planning the experiment) • Identify the variables, • Determine the apparatus and materials required, d. Determine the procedure to carry out the experiment. • Method to collect and analyze data. e. Carrying out the	Relating Problem solving Conceptualizing Synthesizing	Appreciate the contribution of science and technology Being flexible and open-minded Being responsible about the safety of oneself, others and the environment

2013 YEARLY PLAN FOR SCIENCE FORM 1

			experiment		
WEEK	**LEARNING AREA/ LEARNING OBJECTIVES**	**LEARNING OUTCOMES**	**LEARNING ACTIVITIES**	**SCIENCE PROCESS / THINKING SKILLS**	**SCIENTIFIC ATTITUDES & NOBLE VALUES**
9	1.6 Realizing the importance of standard units in everyday life		f. Writing down what has been observed (collecting data); g. Finding a meaning for what has been observed (analyzing and interpreting data); h. Deciding whether the hypothesis is true (making conclusions); Writing a report on the investigation (reporting).	Interpreting data Classifying Collecting data Relating Communicating Observing	Having an interest an curiosity towards the environment Being objective Being systematic Being flexible and open-minded
10	**2.0 Cell As A Unit of Life** 2.1 Understanding Cells	A student is able to: • Identify that cell is the basic unit of living things; • Prepare slides following the proper procedures; • Use a microscope properly; • Identify the general structures of animal cells and plant cells; • Draw the general structures of an animal cell and a plant cell; • Label the general structure of an animal cell and a plant cell; • State the function of each cell structure; • State the similarities and differences between the two cells.	Gather information on living organisms and identify the smallest living unit that makes up the organism. Prepare slides of cheek cells and onion cells. Study the general structure of cheek cells and onion cells under a microscope, using the correct procedure. Draw and label the different structures of an animal c ell and a plant cell. Compare an animal cell and a plant cell. Gather information on cell structures and discuss their functions	Classifying Collecting data Relating Communicating Observing Comparing & contrasting	Having an interest an curiosity towards living things Being objective Being thankful to God Being flexible and open-minded Being responsible about the safety of oneself, others and the environment

2013 YEARLY PLAN FOR SCIENCE FORM 1

WEEK	LEARNING AREA/ LEARNING OBJECTIVES	LEARNING OUTCOMES	LEARNING ACTIVITIES	SCIENCE PROCESS/ THINKING SKILLS	SCIENTIFIC ATTITUDES & NOBLE VALUES
11	2.2 Understanding unicellular organism and multicellular organism	A student is able to: State the meaning of unicellular organisms and multicellular organisms; Give examples of unicellular organisms and multicellular organisms.	Gather information about unicellular organisms and multicelullar organisms. Provide students with picture cards, name cards, 'unicellular and multicellular' cards. Students use reference materials and/or information to match the three cards for each organism. Observe examples of unicellular organisms and multicellular organisms under a microscope.	Interpreting data Attributing Classifying Relating Communicating Observing Comparing & contrasting	Being objective Being thankful to God Being systematic Being flexible and open-minded
12	2.3 Understanding that cells form tissues, organs and systems in the human body.	A student is able to: • Name different types of human cells; • State the function of different types of human cells; • Arrange sequentially cell organization from simple to complex using the terms cell, tissue, organ, system and organism.	Gather information and discuss the following: a. Types of human cells; b. Functions of different types of human cells. Use a graphic organizer (e.g ladder of hierarchy) to show the organization of cells: Cell → tissue → organ → system → organism	Relating Communicating Observing Attributing	Having an interest an curiosity towards living things Being objective Being thankful to God
13	1^{st} Term Mid Break (23^{rd} -31^{st} March 2013)				

2013 YEARLY PLAN FOR SCIENCE FORM 1

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14	2.4 Realizing that humans are complex organisms.	A student is able to: • Explain why human beings are complex organisms.	Discuss why human beings are complex organisms.	Relating Critical & analytical thinking	Being objective Being thankful to God
15	**3.0 Matter** 3.1 Understanding that matter has mass and occupies space	A student is able to: • State that things have mass and occupy space; • Explain what matter is, and to relate things and matter; • Carry out activities to show that air, water, soil and living things have mass and occupy space.	Through activities, show that things such as book, air, water, soil and living things have mass and occupy space. Discuss what matter is. List examples of matter.	Generating ideas grouping and classifying Visualizing, comparing and constrasting, defining Relating Visualising Communicating	Having an interest and curiosity towards the environment Cooperative Daring to try Being respectful and well-mannered Being flexible and open-minded Realizing that science is a means to understand nature
16	3 .2 Understanding the three states of matter	A student is able to: • State that matter is made up of particles; • State the three states of matter; • State the arrangement of particles in the three states of matter; • State the differences in the movement of particles in the three states of matter.	Gather information and discuss: a. What matter is made up of; b. What the three states of matter are. Compare the three states of matter in terms of: a. The arrangement of particles; b. The movement of particles. Simulate the arrangement and	Communicating Relating Visualising Comparing and contrasting	Appreciating the beauty of the arrangement of particles. Being systematic

2013 YEARLY PLAN FOR SCIENCE FORM 1

			movement of particles in the three states of matter.		
WEEK	**LEARNING AREA/ LEARNING OBJECTIVES**	**LEARNING OUTCOMES**	**LEARNING ACTIVITIES**	**SCIENCE PROCESS / THINKING SKILLS**	**SCIENTIFIC ATTITUDES & NOBLE VALUES**
17	3.3 Understanding the concept of density	A student is able to: • Define density; • Explain why some objects and liquid float; • Solve simple problems related to density; • Carry out activities to explore the densities of objects and liquids.	Recall the definition of density. Through activities, find the densities of: a. Objects with regular or irregular shape; b. Different liquids. Discuss why some objects and liquids float by relating them to density.	Experimenting Observing Collecting data Interpreting data Making conclusion Conceptualizing	Having an interest and curiosity towards the environment Cooperative Being systematic Being objective
18	3.4 Appreciating the use of properties of matter in everyday life	A student is able to: • Describe how man uses the different states of matter; • Describe how man applies he concept of density; • Carry out an activity to explore the applications of the concept of floating and sinking related to density.	Gather information and discuss how: a. Man uses his knowledge of different states of matter to store and transport gases and liquids; b. Man uses the concept of density in making rafts, floats etc. Carry out an activity to explore the applications of the concept of floating and sinking related to density.	Analyzing Relating Classifying Conceptualizing	Being objective Being thankful to God Being systematic Being flexible and open-minded

2013 YEARLY PLAN FOR SCIENCE FORM 1

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19	**4.0 The Variety of Resources on Earth** 4.1 Knowing the different resources on earth	A student is able to: • List the resources on earth needed to sustain life; • List the resources on earth used in everyday life.	Gather information about the resources on earth; i.e water, air, soil, minerals, fossil fuels, and living things.	Relating communicating	Having an interest and curiosity towards the environment Being thankful to God
19	4.2 Understanding elements, compounds and mixtures	A student is able to: • State what elements, compounds and mixtures are; • Give examples of elements, compounds and mixtures; • State the differences between elements, compounds and mixtures; • Carry out activities to compare the properties of different metal and non-metals; • Classify elements as metals and non-metals based on their characteristics; • Give examples of metals and non-metals; • Carry out activities to separate the components of a mixture.	Gather information and discuss: a. What elements, compounds and mixtures are; b. What metals and non-metals are; c. Examples of elements, compounds, mixtures, metals and non-metals. Compare and contrast the properties of elements, compounds and mixtures. Carry out activities to compare the properties of metals and non-metals in terms of appearance, hardness, conductivity of heat and conductivity of electricity. Carry out activities to separate the components of mixtures; e.g: a. Mixture of iron fillings and sulphur powder; b. Mixture of sand and salt.	Experimenting Observing Collecting data Interpreting data Making conclusion Classifying Comparing & Contrasting	Having an interest and curiosity Thinking rationally Daring to try Being confident and independent Being honest and being accurate in recording and validating data

2013 YEARLY PLAN FOR SCIENCE FORM 1

WEEK	**LEARNING AREA/ LEARNING OBJECTIVES**	**LEARNING OUTCOMES**	**LEARNING ACTIVITIES**	**SCIENCE PROCESS/ THINKING SKILLS**	**SCIENTIFIC ATTITUDES & NOBLE VALUES**
20	4.3 Appreciating the importance of the variety of earth's resources to man	A student is able to: • Explain the importance of variety of earth's resources to man; • State the meaning of the preservation and conversation of resources on earth; • Practice reusing and recycling of materials; e.g using old unfinished books as note books and collecting old newspaper for recycling.	Discuss the importance of earth's resources (water, air, soil, minerals, fossil fuels and living things) to man. Draw a concept map to show the relationship between these resources to the basic needs of life. Gather information on the preservation and conservation of resources on earth. Discuss the importance of the preservation and conservation of resources on earth (e.g: recycling of paper will help reduce the cutting down of trees; conserving clean water prevents water shortage). Carry out a project/ campaign/ competition on the reusing and recycling of materials.	Analyzing Relating Classifying Conceptualizing	Being objective Being thankful to God Being systematic Being flexible and open-minded
20 & 21	**MID YEAR EXAM**				
22-23	**MID YEAR BREAK**				

2013 YEARLY PLAN FOR SCIENCE FORM 1

WEEK	LEARNING AREA/ LEARNING OBJECTIVES	LEARNING OUTCOMES	LEARNING ACTIVITIES	SCIENCE PROCESS / THINKING SKILLS	SCIENTIFIC ATTITUDES & NOBLE VALUES
24	**5.0 The Air Around Us** 5.1 Understanding what air is made up of (the composition of air)	A student is able to: • State what air is made up of; • Explain why air is a mixture; • State the average percentage of nitrogen, oxygen and carbon dioxide in air; • Carry out activities to show: a. The percentage of oxygen in air; b. That air contains water vapor, microorganisms and dust.	Gather information on: a. The composition of air; b. The percentage of nitrogen, oxygen and carbon dioxide in air. Carry out activities to show: a. The percentage of oxygen in air; b. That air contains water vapor, microorganisms and dust.	Observing Collecting data Interpreting data Making inference Making conclusion Conceptualizing	Being objective Being thankful to God Being systematic Being flexible and open-minded
25	5.2 Understanding the properties of oxygen and carbon dioxide	A student is able to: • List the properties of oxygen and carbon dioxide; • Identify oxygen and carbon dioxide based on its properties; • Choose a suitable test for oxygen and carbon dioxide	Gather information on the properties of oxygen and carbon dioxide. Carry out activities to show the properties of oxygen and carbon dioxide in the following aspects: a. Solubility in water; b. Reaction with sodium hydroxide; c. The effect on: Glowing and burning wooden splinter, litmus paper, lime water, bicarbonate indicator.	Observing Collecting data Interpreting data Making inference Making conclusion Conceptualizing	Being objective Being thankful to God Being systematic Cooperative Being responsible about the safety of oneself, others and the environment

2013 YEARLY PLAN FOR SCIENCE FORM 1

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25	5.3 Understanding oxygen is needed in respiration	A student is able to: • State that energy, carbon dioxide and water vapor are the products of respiration; • Relate that living things use oxygen and give out carbon dioxide during respiration; • Compare and contrast the content of oxygen inhaled and exhaled air in humans; • State that oxygen is needed for respiration; • Carry out an experiment to show that living things use oxygen and give out carbon dioxide during respiration.	Gather information and discuss respiration. Carry out an experiment to show that during respiration, living things: a. Use oxygen b. Give out carbon dioxide	Experimenting Observing Collecting data Interpreting data Making inference Making conclusion Conceptualizing Comparing & contrasting	Being objective Being thankful to God Being systematic Being flexible and open-minded Being honest and being accurate in recording and validating data
26	5.4 Understanding oxygen is needed for combustion (burning)	A student is able to: • State what combustion is; • State that oxygen is needed for combustion; • List the products of combustion; • Carry out experiments to investigate combustion.	Gather information and discuss combustion. Carry out experiments to: a. Show that oxygen is needed for combustion; b. Investigate the effect of the size of a container on the length of time a candle burns Carry out activity to test for the products of combustion of charcoal such as carbon dioxide and water.	Observing Collecting data Interpreting data Making inference Making conclusion Conceptualizing	Being objective Being thankful to God Being systematic Being honest and being accurate in recording and validating data Being responsible about the safety of oneself, others and the environment

2013 YEARLY PLAN FOR SCIENCE FORM 1

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27	5.5 Analyzing the effects of air pollution	A student is able to: • Explain what air pollution is; • List examples of air pollutants; • List the sources of air pollutants • Describe the effects of air pollution • Explain the steps needed to prevent and control air pollution.	Gather information and discuss: a. What air pollution is; b. Examples of air pollutants; c. The sources of air pollutants; d. The effects of pollution on man and the environment; e. The steps needed to control air pollution. Carry out a project to study: a. Air pollution in an area around the school; b. The effects of air pollution.	Observing Relating Analyzing Communicating	Having an interest and curiosity towards the environment Being thankful to God
28	5.6 Realizing the importance of keeping the air clean	A student is able to: • Describe how life would be without clean air; • Suggest ways to keep the air clean; • Practice habits that keep the air clean.	Gather information and discuss: a. How life would be without clean air; b. Ways to keep the air clean; c. Habits that keep the air clean. Carry out an activity to show the pollutants in cigarette smoke.	Observing Relating Analyzing Communicating	Having an interest and curiosity towards the environment Being thankful to God Being responsible about the safety of oneself, others and the environment

2013 YEARLY PLAN FOR SCIENCE FORM 1

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29	**6.0 Sources of Energy** 6.1 Understanding various forms and sources of energy	A student is able to: • List the various forms of energy; • List the various sources of energy; • Identify energy changes; • Identify the sun as the primary source of energy; • Carry out an activity to investigate energy change from potential to kinetic energy and vice versa.	Gather information about the various forms and sources of energy and energy changes. Discuss the sun as the primary source of energy. Carry out activity to see the energy change: • From potential to kinetic energy for example a boll rolling down an inclined slope • From kinetic to potential energy for example the winding of the coil in a toy car.	Observing Collecting data Relating Analyzing Communicating	Having an interest and curiosity towards the environment Being thankful to God Think rationally
30	6.2 Understanding renewable and non-renewable energy	A student is able to: • Define renewable and non-renewable sources of energy. • Group the various sources of energy into renewable and non-renewable. • Explain why we need to conserve energy. • Suggest ways to use energy efficiently.	Gather information and discuss the meaning of renewable and non-renewable energy sources. Carry out a project on: a. Renewable and non-renewable energy sources. b. The uses of solar energy c. The ways to increase efficient use of energy	Observing Collecting data Relating Analyzing Communicating Classifying	Having an interest and curiosity towards the environment Being thankful to God Being objective Think rationally

2013 YEARLY PLAN FOR SCIENCE FORM 1

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30	6.3 Realizing the importance of conserving energy sources	A student is able to: • Describe the importance of conserving energy sources; • Explain he use and management of energy sources.	Discuss the importance of conserving energy sources. Discuss the use and management of energy sources.	Observing Relating Analyzing Communicating	Having an interest and curiosity towards the environment Being thankful to God Being responsible about the safety of oneself, others and the environment
31	**7.0 Heat** 7.1 Understanding heat as a form of energy	A student is able to: • State that the sun gives out heat; • State other source of heat; • State that heat is a form of energy; • Give examples of the uses of heat; • State the meaning of temperature; • State the difference between heat and temperature.	Carry out activities to show: a. The sun gives out heat; b. Ways to produce heat; c. Heat and temperature are not the same (ask the student to predict and observe how the temperatures change; e.g when they mix volumes of hot and cold water). Discuss: a. The heat is a form of energy b. The uses of heat in our daily life c. What temperature is d. The difference between temperature and heat	Observing Collecting data Relating Analyzing Communicating Comparing	Being objective Being systematic Being thankful to God Being responsible about the safety of oneself, others and the environment

2013 YEARLY PLAN FOR SCIENCE FORM 1

32-33	**2nd Mid Year Break**				
WEEK	**LEARNING AREA/ LEARNING OBJECTIVES**	**LEARNING OUTCOMES**	**LEARNING ACTIVITIES**	**SCIENCE PROCESS/ THINKING SKILLS**	**SCIENTIFIC ATTITUDES & NOBLE VALUES**
34	7.2 Understanding heat flow and its effect	A student is able to: • State that heat cause solids, liquids and gases to expand and contract; • State that heat flows in three different ways (conduction, convection and radiation) • State that heat flows from hot to cold; • Give examples of heat flow in natural phenomena; • State what a heat conductor is; • State what a heat insulator is; • List uses of heat conductors and heat insulators in daily life; • Carry out an experiment to investigate different materials as heat insulators.	Carry out activities to show that heat causes solids, liquids and gases to expand and contract. (ball and ring, mercury in thermometer and air in round-bottomed flask) Carry out activities to show how heat flows by conduction, convection and radiation. Carry out group activities to discuss: a. Natural phenomena such as land breeze, sea breeze and the warming of the earth by the sun; b. How buildings can be kept cool; c. What a heat conductor is; d. What a heat insulator is; e. The uses of heat conductors and heat insulators in daily life. Carry out an experiment to investigate different materials as heat insulators.	Experimenting Observing Collecting data Interpreting data Making inference Making conclusion Conceptualizing	Being objective Being thankful to God Being systematic Being honest and being accurate in recording and validating data Being responsible about the safety of oneself, others and the environment

2013 YEARLY PLAN FOR SCIENCE FORM 1

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35	7.3 Analyzing the effect of heat on matter	A student is able to: • State the change in state of matter in physical processes; • Explain that change in state of matter involves absorption and release of heat; • Give examples of daily observations which show a change in state of matter.	Carry out activities to show the change in state of matter in physical processes. Discuss: (i) The effects of heat on the state of matter (ii) Examples of daily observation which shows a change in state of matter	Experimenting Observing Collecting data Interpreting data Making inference Making conclusion Conceptualizing	Being objective Being thankful to God Being systematic Being honest and being accurate in recording and validating data Being responsible about the safety of oneself, others and the environment
36	7.4 Applying the principles of expansion and contraction of matter	A student is able to: • Explain with examples the use of expansion ad contraction of matter in daily life • Apply principle of expansion and contraction of matter in solving simple problems.	Discuss the use of expansion and contraction of matter in the following: a. Mercury in a thermometer b. The bimetallic strip in a fire alarm c. Gaps in railway tracks d. Rollers in steel bridges Discuss the use of the principle of expansion and contraction of matter to solve simple problems.	Experimenting Observing Collecting data Interpreting data Making inference Making conclusion Conceptualizing	Being objective Being thankful to God Being systematic Being honest and being accurate in recording and validating data Being responsible about the safety of oneself, others and the environment

2013 YEARLY PLAN FOR SCIENCE FORM 1

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37	7.5 Understanding that dark, dull objects absorb and give out heat better	A student is able to: • State that dark, dull objects absorb heat better than white, shine objects; • State that dark, dull objects give out heat better than white, shiny objects; • Carry out experiments to investigate heat absorption and heat release.	Carry out experiments to show that: a. Dull, dull objects absorb heat better than white, shiny objects; b. Dark, dull objects give out heat better than white, shiny objects.	Experimenting Observing Collecting data Interpreting data Making inference Making conclusion Conceptualizing	Being objective Being thankful to God Being systematic Being honest and being accurate in recording and validating data Being responsible about the safety of oneself, others and the environment
38	7.6 Appreciating the benefits of heat flow	A student is able to: • Put into practice the principle of heat flow to provide comfortable living.	Discuss and put into practice activities such as opening of windows in the classroom or laboratory to improve air circulation.	Observing Relating Analyzing Communicating	Having an interest and curiosity towards the environment Being thankful to God
39-40	**FINAL YEAR EXAM**				
41-44	**UPDATE THE PBS ASSESSMENT & DOCUMENT**				