

FIRST TERM : 4 JANUARY – 4 JUNE 2010 (21 weeks)

THEME : INTRODUCING BIOLOGY

LEARNING AREA : 1.0 INTRODUCTION TO BIOLOGY

WEEK	LEARNING OBJECTIVES	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
1	1.1 Understanding the study of Biology	<p>Carry out small group discussion on the following and present the findings:</p> <p>a) What is the study of Biology?</p> <p>b) The importance of Biology with respect to the study of living things, environment, interaction between living things and the environment.</p> <p>Construct a concept map based on information gathered on the different fields of study and careers related to Biology.</p> <p>Small group discussion on the importance of the following :</p> <p>a) Acquiring scientific skills, b) Scientific method, c) Practising scientific attitudes and noble values.</p>	<p>A student is able to :</p> <ul style="list-style-type: none"> ❖ State what the study of Biology is, ❖ Explain the importance of Biology, ❖ List the different fields of study in Biology ❖ List the careers related to Biology, ❖ State various ways of studying Biology 	<p>TSTS</p> <ul style="list-style-type: none"> ▪ Attributing ▪ Generating ideas <p>Noble Values</p> <ul style="list-style-type: none"> ▪ Having an interest and curiosity towards the environment ▪ Realising the science is a means to understand nature ▪ Appreciating the balance of nature <p>TSTS</p> <ul style="list-style-type: none"> ▪ Sequencing ▪ Grouping & classifying ▪ Relating ▪ Making inferences ▪ Making hypothesis ▪ Making conclusion <p>Noble Values</p> <ul style="list-style-type: none"> ▪ Being systematic ▪ Being diligent &

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	1.2 Applying scientific investigation	<p>Observe a situation and identify all the variables. Suggest a question that is suitable for a scientific investigation. Discuss to :</p> <ol style="list-style-type: none"> Form a hypothesis Plan the method of investigation including selection of apparatus and work procedures. <p>Carry out an experiment :</p> <ol style="list-style-type: none"> to collect and tabulate data, present data in a suitable form interpret the data and draw the conclusion, write a complete report <p>Carry out an experiment on the making of bread using yeast in the absence and presence of sugar. Record the time taken for the dough to double its size. For further investigations, salt is used. During investigations, highlight the need to practice scientific attitudes and noble</p>	<p>A student is able to :</p> <ul style="list-style-type: none"> ❖ Identify variables in a given situation, ❖ Identify the relationship between two variables to form a hypothesis, ❖ Design and carry out a simple experiment to test the hypothesis, ❖ Record and present data in a suitable form, ❖ Interpret data to draw conclusions, ❖ Write a report on an experiment 	<ul style="list-style-type: none"> ▪ persevering ▪ Being cooperative ▪ Daring to try <p>Teaching Aids</p> <ul style="list-style-type: none"> ▪ Text book ▪ CD Roms ▪ News paper cutting ▪ Pamphlet <p>This activity helps the teacher to assess students capabilities in carrying out a scientific investigation</p> <p>TSTS : Attributing, Grouping and classifying, making inferences, predicting, making hypotheses, synthesizing, making generalizations, visualizing,</p> <p>Teaching aids : text book, transparency, news paper cutting, LCD Projector, apparatus using in lab, internet</p> <p>Noble Values : - Appreciating the contribution of science and technology</p>

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		values such as honesty and accuracy in recording and verifying the data.	❖ Practice scientific attitudes and noble values.	- Having an interest and curiosity towards the environment - appreciating the balance of nature These attitudes and values should be observed for all investigations in other learning areas.

THEME : INVESTIGATING THE CELL AS A BASIC UNIT OF LIVING THINGS

LEARNING AREA : 2.0 CELL STRUCTURE AND CELL ORGANISATION

WEEK	LEARNING OBJECTIVES	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
2	2.1 Understanding cell structure and function	Prepare and study slides to compare the epidermal cells of onion or cells of <i>Hydrilla</i> leaf with human cheek cells. Observe, draw and label diagrams of an animal cell and plant cell as seen through a light microscope. Study electron micrographs of animal cells	A student is able to : <ul style="list-style-type: none"> • draw and label an animal cell, • draw and label a plant cell, • identify the cellular 	

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3		<p>and plant cells to identify cellular components of cell :</p> <p>(a) plasma membrane and cell wall,</p> <p>(b) cytoplasm,</p> <p>(c) organelles :</p> <p>(i) nucleus : nucleolus, chromosomes, nucleoplasm and nuclear membrane,</p> <p>(ii) rough and smooth endoplasmic reticulum,</p> <p>(iii) mitochondria,</p> <p>(iv) Golgi apparatus</p> <p>(v) Lysosomes</p> <p>(vi) Ribosomes</p> <p>(vii) Chloroplasts</p> <p>(viii) Centrioles</p> <p>(ix) Vacuoles</p> <p>Work in small groups to match cellular components to their functions.</p> <p>Students present a comparison between the structure of an animal cell and plant cell.</p> <p>Discuss the relationship between the density of certain organelles with the function of specific cells :</p>	<p>component of an animal cell,</p> <ul style="list-style-type: none"> • identify the cellular components of a plant cell <ul style="list-style-type: none"> • state the functions of the cellular components in an animal cell, • state the functions of the cellular components in a plant cell 	

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		<p>(a) mitochondria with the function of sperm cells, flight muscle cells in insects and birds, cells in the meristems,</p> <p>(b) chloroplasts with the function of palisade cells.</p>	<ul style="list-style-type: none"> • compare and contrast an animal cell and a plant cell • relate the density of certain organelles with the functions of specific cells. 	
3 & 4	<p>INTERVENSI 1 SPM 18-28JAN 2010</p>			
5	2.2 Understanding cell organisation	<p>Observe the living processes of unicellular organisms such as feeding, locomotion and reproduction through computerised animation / video / microscope.</p> <p>Carry out small group discussion on the following and present the findings :</p> <p>(a) cell specification in multicellular organisms,</p> <p>(b) the necessity for cell specialization in multicellular organisms.</p> <p>(c) Cell organisation in the formation of tissues, organs and systems in humans, animals and plants.</p> <p>Construct models of tissues, organs and systems in human, animals and plants.</p>	<p>A student is able to :</p> <ul style="list-style-type: none"> • State the necessity for cell specialisation in multicellular organism as compared to unicellular organism, • Describe cell specialization in multicellular organisms, • Describe cell organisation in the formation of 	

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		<p>Conduct a discussion on the following :</p> <p>(a) the meaning of internal environment,</p> <p>(b) factors affecting the internal environment including temperature, pH, osmotic pressure and glucose level.</p> <p>(c) It is important that the organisms cells always experience conditions which permit efficient functioning,</p> <p>(d) The involvement of various systems in maintaining optimal internal environment.</p>	<p>tissues, organs and systems in multicellular organisms,</p> <ul style="list-style-type: none"> • State the meaning of internal environment, • Identify factors affecting the internal environment, • Explain the necessity to maintain optimal internal environment, Describe the involvement of various systems in maintaining optimal internal environment. 	<p>A simple explanation.</p>
	<p>3.3 Appreciating the uniqueness of the cell</p>	<p>Discuss and predict the cell condition without a particular cellular component.</p> <p>Conduct a role play activity to show that cells become adapted for different functions.</p>	<p>A student is able to:</p> <ul style="list-style-type: none"> • Predict the state of certain cells without a particular cellular component, • Illustrate that most cells specialized for the job that they perform. 	

THEME : INVESTIGATING THE CELLS AS A BASIC UNIT OF LIVING THINGS
LEARNING AREA :3.0 MOVEMENT OF SUBSTANCES ACROSS THE PLASMA MEMBRANE

WEEK	LEARNING OBJECTIVE	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
	3.1 Analysing the movement of substances across the plasma membrane	1. Discuss and gather information on : <ol style="list-style-type: none"> substances that are required by cells substances to be eliminated from cells the necessity for movement of substances across the plasma membrane the structure of the plasma membrane as comprising the phospholipids bilayer, carrier protein and pores. 2. Conduct an experiment using starch suspension and glucose to study the movement of substances across egg membrane or Visking tubing 3. Discuss and gather information on <ol style="list-style-type: none"> the properties of the plasma membrane as a semi-permeable membrane. the movement of soluble substances across the plasma membrane through simple 	A student is able to : <ol style="list-style-type: none"> state the substances required by living cells state the substances that have to be eliminated from cells explain the necessity for movement of substances across the plasma membrane describe the structure of the plasma membrane describe the permeability of the plasma membrane 	<p><i>Only a brief account of the structure of the plasma membrane is required</i></p>

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		diffusion and facilitated diffusion.		
		<p>4. Carry out an activity to show osmosis using a simple osmometer.</p> <p>5. Discuss the movement of substances across the plasma membrane through active transport</p> <p>6. Use computer simulation to show the movement of substances across the plasma membrane through passive and active transport.</p> <p>7. Discuss the processes of passive transport and active transport in living organisms</p> <ul style="list-style-type: none"> a. gaseous exchange in the alveoli and blood capillaries (simple diffusion) b. absorption of digested food in the villus (facilitated diffusion) c. absorption of water by root hairs of a plant (osmosis) d. ion intake by root hairs of a plant (active transport) 	<p>A student is able to :</p> <ul style="list-style-type: none"> a. explain the movement of water molecules across the plasma membrane by osmosis. b. explain the movement of substances across the plasma membrane through the process of active transport. c. Explain the process of passive transport in living organism using examples. d. Explain the process of active transport in 	<p><i>Only basic explanation of the active transport process is required</i></p>

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		<p>8. Construct a concept map by using a graphic organizer to show the movement of substances across the plasma membrane.</p> <p>9. Use a graphic organizer to compare and contrast passive transport and active transport</p>	<p>living organisms using examples.</p> <p>e. Compare and contrast passive transport and active transport</p>	
7	<p>CHINESE NEW YEAR HOLIDAY 15-21 FEB 2010</p>			
8	<p>3.2 Understanding the movement of substances across the plasma membrane in everyday life</p>	<p>1. Carry out activities to study the effect of hypotonic and hypertonic solutions on plant and animal cells:</p> <ol style="list-style-type: none"> a. plasmolysis and deplasmolysis in plant cells. b. Haemolysis and crenation in red blood cells. <p>2. Discuss :</p> <ol style="list-style-type: none"> a. hypotonic, hypertonic and isotonic solution b. plasmolysis , deplasmolysis, haemolysis and crenation c. flaccidity and turgidity of plant cells. 	<p>A student is able to:</p> <ol style="list-style-type: none"> a. explain what hypotonic, hypertonic and isotonic solutions are b. explain the effect of hypotonic, hypertonic and isotonic solutions on plant cell and animal cell. c. explain plasmolysis, deplasmolysis, heamolysis and crenation. 	<p><i>The use of human blood is discourage</i></p>

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		<p>3. Carry out an investigation using various concentration of salt or sugar solution to determine the concentration of external solution which is isotonic to the cell sap of plant tissues.</p> <p>4. Discuss and make an inference on the concentration of cell sap in plant tissues which is equivalent to the concentration of isotonic solution.</p> <p>5. Discuss and correlate the movement of substances across the plasma membrane with the difference in concentration of the external solution and that of the cell sap.</p> <p>6. Discuss:</p> <ul style="list-style-type: none"> a. wilting of plants caused by the excessive use of chemical fertilisers b. preservation of food using salt or sugar 	<p>d. design an experiment to determine the concentration of external solutions which is isotonic to cell sap.</p> <p>e. make an inference on the concentration of cell sap in plant tissues.</p> <p>f. Relate the movement of substances across plasma membrane with concentration gradient.</p> <p>g. Explain the phenomenon of wilting in plants using examples.</p> <p>h. Explain the preservation of food using examples</p>	<p><i>The concentration of the external solution which is isotonic to the cell sap is determined from the plotted graph</i></p> <p><i>Discussion should be based on the concepts of osmosis and plasmolysis</i></p>

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	3.3 Appreciating the movement of substances across the plasma membrane	1. Compose poem to appreciate the movement of substances across the plasma membrane.	A student is able to: a. explain the necessity of movement of substances across the plasma membrane which is occur in a continuous and controlled manner for survival of a cell.	

LEARNING AREA : 4.0 CHEMICAL COMPOSITION OF THE CELL

WEEK	LEARNING OBJECTIVES	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
9	4.1 Understanding the chemical composition of the cell	Carry out small group discussion on the following and present the findings: a) elements in the cell, including carbon, hydrogen, oxygen, nitrogen, sulphur, phosphorus, calcium, potassium, magnesium, chlorine, sodium and ferum, b) the presence and importance of chemical compounds in the cell.	A student is able to: <ul style="list-style-type: none"> • state the elements in the cell, • list the chemical compounds in the cell, • explain the importance of organic compounds in the cell, • explain the 	Chemical compounds in the cell are limited to carbohydrates, lipids, proteins, nucleic acids and water only. A brief account on the importance of carbohydrates, lipids, proteins and nucleic acids Is required.

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	4.2 Understanding carbohydrates	<p>Carry out small group discussion on the following and present the findings:</p> <p>a) elements in carbohydrates b) types of carbohydrates, i.e. monosaccharides, disaccharides and polysaccharides, using examples, c) the formation and breakdown of disaccharides, such as maltose, sucrose and lactose, d) the formation and breakdown of polysaccharides, such as starch, glycogen and cellulose.</p> <p>Conduct an activity to differentiate between reducing and non-reducing sugars.</p>	<p>importance of water in the cell.</p> <p>A student is able to:</p> <ul style="list-style-type: none"> state the elements in carbohydrates, state the types of carbohydrates, explain the formation and breakdown of disaccharides and polysaccharides, 	<p>A detailed molecular structure is not required.</p> <p>A brief account of condensation and hydrolysis reactions is required.</p>
	4.3 Understanding proteins	<p>Carry out small group discussion on the following and present the findings:</p> <p>a) elements in protein, such as carbon, hydrogen, oxygen, sulphur nitrogen and phosphorus, b) dipeptides and polypeptides, c) the formation and breakdown of dipeptides and polypeptides,</p>	<p>A student is able to :</p> <ul style="list-style-type: none"> state the elements in proteins, state the various structures of proteins, explain the formation and breakdown of 	

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	4.4 Understanding lipids	<p>d) essential amino acids and non-essentials amino acids.</p> <p>Use charts to illustrate the various protein structures, i.e. primary, secondary, tertiary and quaternary.</p> <p>List the main types of lipids:</p> <p>a) fat, b) oil, c) wax, d) phospholipids, e) steroids, such as cholesterol, testosterone, oestrogen and progesterone.</p> <p>Carry out small group discussion on the following and present the findings:</p> <p>a) elements in lipids, b) components of fats and oils, c) formation and breakdown of fats and oils</p> <p>Use a graphic organizer to compare</p>	<p>dipeptides and polypeptides,</p> <ul style="list-style-type: none"> • explain the meaning of essential amino acids and non-essential amino acids. <p>A student is able to :</p> <ul style="list-style-type: none"> • state the elements in lipids, • state the main types of lipids <p>A student is able to :</p> <ul style="list-style-type: none"> • state the components of fats and oils, • explain the formation and breakdown of fats and oils, • compare and contrast saturated fats and unsaturated fats 	

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		saturated fats and unsaturated fats.		
9	4.5 Understanding enzymes	<p>Discuss on the following :</p> <ol style="list-style-type: none"> what enzymes are, enzyme requirement in the living process, general characteristics of enzyme, naming of enzyme based on the substrate, sites of enzyme synthesis, intracellular and extracellular enzymes and examples, <p>Conduct a role-play activity to show the involvement of ribosomes, endoplasmic reticulum and Golgi body in the production of extracellular enzymes.</p>	<p>A student is able to:</p> <ul style="list-style-type: none"> state what enzymes are, explain why enzymes are needed in life processes, list the general characteristics of enzymes, relate the name of enzyme to substrate, state sites where enzymes are synthesized, state the meaning of intracellular and extracellular enzymes, explain the involvement of specific organelles in the production of extracellular enzymes, 	

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		<p>Conduct experiments to study the effects of pH and temperature on the activities of amylase and pepsin.</p> <p>Discuss the effects of enzyme substrate concentration on enzyme activity.</p> <p>Discuss the mechanism of enzyme action using the 'lock and key' hypothesis.</p> <p>Discuss and correlate pH temperature, enzyme concentration and substrate concentration on enzyme activity using the 'lock and key' hypothesis.</p> <p>Gather information from the internet and other sources on the uses of enzymes in :</p> <p>a) daily life, e.g. tenderizing meat b) industry e.g. food processing and detergent manufacturing.</p>	<ul style="list-style-type: none"> explain the effects of pH, temperature, enzyme concentration and substrate concentration on enzyme activity, explain the mechanism of enzyme action, relate the mechanism of enzyme action with pH, temperature, enzyme concentration and substrate concentration, explain the uses of enzymes in daily life and industry using examples. 	
10	4.6 Realising the importance of the chemical composition in cells	Conduct a role play or story telling session to predict the consequences of deficiency in one of the chemical components in the cell.	<ul style="list-style-type: none"> Predict the consequences of deficiency in carbohydrates, protein, lipids or enzymes in the cell. 	

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FIRST TERM SCHOOL HOLIDAY 13-20 MAC 2010				

THEME : INVESTIGATING THE CELL AS A BASIC UNIT OF LIVING THINGS
LEARNING AREA : 5. CELL DIVISION

WEEK	LEARNING OBJECTIVES	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
11	5.1 Understanding mitosis	<p>Conduct a brainstorming session on the following:</p> <p>a) the need for production of new cells in organisms, b) the need for production of new cells identical to parent cells</p> <p>Derive the meaning and significance of mitosis from the brainstorming session.</p> <p>Study charts to identify the various of the cell cycle.</p> <p>Make models to demonstrate mitosis and cytokinesis.</p> <p>Prepare and observe a slide of onion root tip to identify different stages of mitosis.</p> <p>Study the process of controlled and uncontrolled mitosis and cytokinesis through simulation, computerized, animation or video.</p>	<p>A student is able to:</p> <ul style="list-style-type: none"> • State the necessity for the production of new cells in organisms • Explain the necessity for the production of new cells identical to parent cells, • State the significance of mitosis, • Identify the phases in the cell cycle , • Explain the process of mitosis and cytokinesis, • Arrange the various stages of mitosis in the correct sequence, 	

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12		<p>Conduct a brainstorming session to come up with examples on mitosis as a controlled process for the perpetuity of living things such as regeneration, of lizard tail, certain plant parts and the healing of skin.</p> <p>Gather information on diseases, including cancer or tumour, caused by uncontrolled mitosis in living things.</p> <p>Make a trip to a research institute to study tissue or culture technique.</p> <p>Conduct a debate or forum on cloning issues.</p>	<ul style="list-style-type: none"> • Compare and contrast mitosis and cytokinesis in animal and plant cell, • Explain the important of controlled mitosis, • explain the effects of uncontrolled mitosis in living things, • Describe the application of knowledge on mitosis in cloning, • Explain the advantages and disadvantages of cloning. 	Techniques of cloning include tissue culture
13	5.2 Understanding meiosis	<p>Discuss the following :</p> <p>a) trait inheritance in offsprings ,</p> <p>b)the need to maintain diploid chromosomal number from one generation to another,</p> <p>c) the need to produce gametes with</p>	<p>A student is able to :</p> <ul style="list-style-type: none"> • State the necessity of traits inheritance in offspring for continuation of life. • State the necessity to maintain diploid chromosomal 	

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		<p>haploid number of chromosomes,</p> <p>d) the uniqueness of diploid number of chromosomes in organisms,</p> <p>e) the significance of meiosis,</p> <p>f) the type of cell that undergoes meiosis in human, animals and plants.</p> <p>Observe the process of meiosis through computerized animation, photomicrograph, prepared slides, or video.</p> <p>Use simulation activities to show change in chromosome behaviour during meiosis I and meiosis II</p> <p>Use graphic organizers to compare and contrast :</p> <p>a) meiosis I and meiosis II. b) Meiosis and mitosis</p>	<p>number from generation to generation.</p> <ul style="list-style-type: none"> • State the necessity for production of haploid gametes in sexual reproduction • State the significance of meiosis, • Identify the type of cell that undergoes meiosis, • Explain the process of meiosis, • Arrange the various stages of meiosis in the correct order, <ul style="list-style-type: none"> • Compare and contrast meiosis I and meiosis II , • Compare and contrast meiosis and mitosis 	
14	5.3 Appreciating the movement of	a) conduct a role play .	A student is able to:	

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	chromosomes during mitosis and meiosis.	b) avoid radioactive and carcinogenic substances.	<ul style="list-style-type: none"> describe what will happen when the movement of chromosomes during mitosis and meiosis do not occur in an orderly manner. Know and avoid things that maybe harmful. 	

Theme : Investigating The Physiology Of Living Thing

Learning Area : 6.0 Nutrition

WEEK	LEARNING OBJECTIVES	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
15	6.1 Understanding types of nutrition	<p>Observe and identify types of nutrition in various organism.</p> <p>Discuss autotrophic and heterotrophic nutrition with reference to chemosynthesis, photosynthesis, holozoic nutrition, saprophytism, and paratism.</p> <p>Use a graphic organizer to show the types of nutrition.</p> <p>Conduct an activity to classify various organisms according to types of nutrition.</p>	<p>A student is able to:</p> <ul style="list-style-type: none"> State the types of nutrition, Explain autotrophic nutrition, Explain heterotrophic nutrition, Classify organisms according to the types of nutrition 	

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16	6.2 Applying the concept of balanced diet	<p>Carry out small group discussion on the following and present the finding:</p> <p>a) requirements of a balanced diet b) factors affecting the daily energy requirement such as age, sex, body weight and occupation.</p> <p>Conduct an activity to determine the energy value in food samples.</p> <p>Design activities to test for the presence of starch, reducing sugar, non-reducing sugar, protein and lipid in food samples.</p> <p>Conduct an experiment to determine the vitamin C content in various fruit juices</p> <p>Match the vitamins , minerals and roughage with their sources, functions and effects of deficiency</p> <p>Discuss the sources and functions of water in the body</p> <p>Formulate and justify an appropriate diet menu for pregnant mother ,infants, children, teenagers, athletes, people with specific diseases, the aged and</p>	<p>A student is able to :</p> <ul style="list-style-type: none"> • explain the necessity for a balanced diet • explain the factors affecting the daily energy requirement • Determine the energy value, • Determine the nutrient content in food samples • explain the functions and sources of vitamins, minerals , roughage in a diet to maintain health • explain the functions of water in the body • justify the selection of an appropriate balanced diet for a target group 	<p>The unit for energy used is Joule</p>

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		vegetarians		
17	6.3 Understanding malnutrition	Group discussion and presentation on the following: a) meaning of malnutrition b) effects of deficiency in proteins, vitamins, minerals on health c) effects of excessive intake of carbohydrates, lipids, vitamins and minerals d) effects of diet with low saturated fats on cardiovascular disease e) ways to reduce the risk of high blood pressure, diabetes mellitus and osteoporosis	A student is able to: <ul style="list-style-type: none"> • explain what malnutrition is • explain the effects of malnutrition • describe ways to reduce certain health problems due to one's diet 	
18	6.4 Analyzing food digestion	Discuss the following : a) glucose, amino acids and lipids are required to carry out metabolic processes b) complexed substances need to be digested Draw and label parts of the human digestive system Discuss the functions of digestive juices and other substances that aid the process of digestion	A student is able to : <ul style="list-style-type: none"> • state the substances that are required to carry out metabolic processes • list the complex substances that need to be digested • explain the necessity to digest complex substances • draw and label the human digestive system • state and describe the digestive juices and substances involved in 	

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		<p>Discuss the digestion of food on the following aspects: location, chewing and movement of food, glands involved, enzymes, pH, substrates and products</p> <p>Identify the parts of digestive system and digestion of cellulose in ruminants and rodents</p> <p>Compare and contrast the process of cellulose digestion in humans, ruminants and rodents</p> <p>Plan and conduct experiments to study enzymes actions on starch and protein</p> <p>Discuss problems related to food digestion: a) incomplete digestion b) bile stone c) reduced production of specific digestive enzyme</p>	<p>human digestive system</p> <ul style="list-style-type: none"> explain the digestion of carbohydrates, proteins and lipids identify and describe the digestion of cellulose in ruminants and rodents compare and contrast the digestive processes in human, ruminants and rodents design experiments to study the digestion of starch and proteins describe problems related to food digestion 	
19	6.5 Understanding the processes of absorption and assimilation of digested food	<p>Examine models or diagrams of the digestive system and cross-section of the small intestine.</p> <p>Using models or diagrams to discuss: a) adaptation of the small intestine</p>	<p>A student is able to:</p> <ul style="list-style-type: none"> identify the parts of digestive system explain the adaptive characteristic of the digestive system related 	

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20		<p>b) absorption process of digested food in the villus</p> <p>Carry out an activity to study the movement of substances through the Visking tubing Correlate the movement of substances through the Visking tubing with nutrient absorption in the small intestine Discuss the absorption of water and minerals in the colon</p> <p>Using diagrams, charts or computerized animation discuss: a) the transport of amino acid, glucose, water soluble vitamins minerals by circulatory system i) from small intestine to liver through the hepatic portal vein ii) from liver to body cell b) transport of lipids and fat soluble vitamins Make a schematic diagram to show the transport of nutrients from the intestine to the body cells. Discuss the function of liver: a) storage of nutrients</p>	<p>to absorption</p> <ul style="list-style-type: none"> draw and label the structure of the villus explain the process of absorption in the villus make an analogy on the process of absorption in the small intestine explain the absorption of water and minerals in the colon describe the transport of nutrients by circulatory system for assimilation explain the main functions of the liver 	

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		b) processing the products of digestion i.e. excess glucose and amino acid c) detoxification Discuss the process of assimilation	<ul style="list-style-type: none"> describe the process of assimilation 	
21	6.6 Understanding the formation of faeces and defecation	Identify the colon and rectum in the digestive system Discuss: a) the formation of faeces b) the role of microbes in the colon c) effects of antibiotics on the microbes in the colon d) what defecation is e) the importance of defecation f) importance of high fiber diets g) defecation related problem i.e. constipation, colon cancer and hemorrhoids	A student is able to: <ul style="list-style-type: none"> identify the part where the formation of faeces takes place describe the formation of faeces explain the role of microbes and the effect of antibiotics on them explain what defecation is explain the importance of defecation and high fibre diets describe the problems related to defecation 	
MID YEAR EXAMINATION 2008 (10 – 26 MAY 2010) (10 DAYS)				
MID YEAR SCHOOL HOLIDAY 5-20JUNE 2010 (16 DAYS)				
SECOND TERMS : 21JUNE – 19 NOVEMBER 2010 (21 WEEKS)				

WEEK	LEARNING OBJECTIVES	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
1	6.7 Evaluating eating habits	Discuss: a) relationship between eating habits and health problems such as gastritis, obesity, anorexia nervosa, bulimia b) evaluate the nutrient contents based on food labels or advertisements c) evaluate the eating habits of classmate	A student is able to: <ul style="list-style-type: none"> • relate eating habits with health problems • evaluate critically whether a particular eating habit is good or bad 	Eating habits involve the frequency and time of eating and the type of food consumed
2	6.8 Realizing the importance of healthy digestive system	Conduct an of a defective the digestive system. Conduct a discussion on ways to take care of the digestive system, such as good eating habits, avoid junk food, try to cut down on sweet and fatty foods.	A student is able to: <ul style="list-style-type: none"> • Predict the effects of defective digestive system on health, • Take care of the digestive system for one's well-being. 	
2	6.9 Understanding the importance of macronutrients and micronutrients in plants	Carry out small group discussion on the following and present the findings: a) the elements required by plants, b) classify the elements required by plants based on the amount needed: (i) macronutrients consisting of carbon, hydrogen, oxygen, nitrogen, phosphorus, potassium, calcium, magnesium, and sulphur, (ii) micronutrients consisting of boron, molybdenum, zinc, manganese, copper and ferum.	A student is able to: <ul style="list-style-type: none"> • List elements required by plants, • Classify elements required by plants based on the amount needed, 	Maize seedlings may be used for this experiment.

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		<p>Plan and conduct an experiment on plants to study the effects of macronutrient deficiency i.e. nitrogen, phosphorus, potassium, calcium, magnesium, and sulphur.</p> <p>Discuss and correlate the effects of macronutrient deficiency with the function of the macronutrient based on the results of the experiment.</p> <p>Collects and interpret data from various sources such as Internet on the function of each macronutrient in plants.</p> <p>Discuss the function of micronutrients and effects of micronutrient deficiency in plants.</p>	<ul style="list-style-type: none"> • Design an experiment to study the effects of macronutrient deficiency in plants, • Relate the effects of macronutrient deficiency with the function of macronutrients, • Explain the function of each macronutrient in plants, • State the function of micronutrients in plants, • State the effects of micronutrient deficiency in plants, 	
3	6.10 Understanding photosynthesis	Students read about the discovery of photosynthesis and extract important facts from it.	<p>A student is able to:</p> <ul style="list-style-type: none"> • Describe the development that leads 	

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		<p>Study a cross-section model of a leaf. Draw and label it.</p> <p>Discuss the following: a) functions of the part of a leaf, b) adaptation of the leaf for optimal photosynthesis.</p> <p>Carry out an activity to investigate the adaptation of plants such as hibiscus, water lily, <i>Hydrilla</i> and cactus with respect to: a) distribution of stomata b) distribution of chloroplasts.</p>	<p>to the discovery of photosynthesis,</p> <ul style="list-style-type: none"> • State the substance required for photosynthesis, • State the substance produced from photosynthesis, • Draw and label the cross-section of a leaf, • State the function of each part of the leaf with respect to photosynthesis, • Explain leaf adaptation to optimize photosynthesis, • Explain how plants from different habitats are adapted to carry out photosynthesis 	
3	6.11 Understanding the mechanism of photosynthesis	<p>With reference to the structure of chloroplast discuss the light and dark reactions of photosynthesis with respect to: a) substances required. b) location of reaction c) products of reaction.</p>	<p>A student is able to;</p> <ul style="list-style-type: none"> • Identify the part of chloroplast related to photosynthesis, • Explain the light reaction of photosynthesis, 	<p>Detailed structure of chloroplast is not required. Detailed pathways for light and dark reactions are not required.</p>

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		<p>Draw a simple schematic diagram of the light and dark reactions in photosynthesis.</p> <p>Discuss the following:</p> <ol style="list-style-type: none"> compare and contrast the light reaction and dark reaction in photosynthesis. Correlate light reaction with dark reaction in photosynthesis <p>Write an equation to represent the overall process of photosynthesis.</p>	<ul style="list-style-type: none"> Explain the dark reaction of photosynthesis, Compare and contrast light reaction and dark reaction in photosynthesis, Relate light reaction in photosynthesis Write an equation to represent the process of photosynthesis, 	
4	6.12 Synthesizing factors affecting photosynthesis	<p>Conduct a brainstorming session to identify the factors affecting the rate of photosynthesis i.e. concentration of carbon dioxide, light intensity and temperature.</p> <p>Plan and carry out an experiment to study the effect of light intensity on the rate of photosynthesis.</p> <p>Carry out a small group discussion on the</p>	<p>A student is able to:</p> <ul style="list-style-type: none"> Identify the factors affecting the rate of photosynthesis, Design an experiment to investigate the effect of light intensity on the rate of photosynthesis, Identify the factor that limits the rate of photosynthesis at different light intensity, Explain the effects of temperature and concentration of carbon dioxide on the rate of 	

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		<p>effects of light intensity temperature and concentration of carbon dioxide on rate of photosynthesis.</p> <p>Plan a strategy based on factors affecting the rate of photosynthesis to ensure crop production throughout the year in countries with four seasons.</p>	<p>photosynthesis,</p> <ul style="list-style-type: none"> • Explain the difference in the rate of photosynthesis in plants throughout the day based on the changes in light intensity and temperature, • Identify some ways to meet the need of increasing the productivity of crops based on on factors affecting the rate of photosynthesis. 	
4	6.13 Practicing a caring attitude towards plants	<p>Compose a poem or lyric of a song to show appreciation of the role of photosynthesis in ensuring the perpetuation of life</p> <p>Conduct a planting project in the science resource garden or school compound.</p>	<p>A student is able to :</p> <ul style="list-style-type: none"> • Tell why we need to take good care of plants, • Identify cases of mishandling or destruction of plants. 	
5	6.14 Understanding the	Carry out small group discussion on the following and present the findings:	A student is able to:	

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	<p>technology used in food production</p>	<p>a) the quantity of food needed for the present and future population of the country,</p> <p>b) the need for improving the quality and quantity of food for the country in line with the national food production policy,</p> <p>c) effort by various agencies to diversify food production,</p> <p>d) methods used to improve the quality and quantity of food production through the following:</p> <ul style="list-style-type: none"> (i) direct seeding for rice, (ii) hydroponics and aeroponics, (iii) breeding, (iv) tissue culture, (v) genetic engineering, (vi) soil management, (vii) biological control. <p>Conduct a field trip to relevant agencies such as Institute of Agriculture Research and Development of Malaysia (MARDI), Agriculture Department and Fishery Department.</p> <p>Carry out a vegetable planting project</p>	<ul style="list-style-type: none"> • explain the need for improving the quality and quantity of food, • explain the effort to diversify food production, • explain ways to improve the quality and quantity of food production in the country. 	

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	6.15 Evaluating the technological development in food processing	<p>Discuss the need for food processing based on the following:</p> <ol style="list-style-type: none"> a) overcoming the factors causing spoilage of food such as the action of microorganisms and oxidation, b) extending the lifespan of food , c) avoiding food wastage, d) diversifying the uses of food like milk and dairy products, e) ensuring sufficient food supply. <p>Prepare a portfolio on the technological development of food processing from the early days till the present.</p> <p>Correlate the following food processing methods with factors causing food spoilage:</p> <ol style="list-style-type: none"> i. cooking, ii. using salt, sugar and vinegar, iii. fermentation process, iv. drying, v. pasteurization, vi. canning, vii. refrigeration, 	<p>A student is able to:</p> <ul style="list-style-type: none"> • explain the necessity for food processing • describe the development of food processing technology, • relate food processing methods with factors causing food spoilage, • assess the 	

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		Conduct a forum entitled "The effects of processing food on health".	methods of food processing to justify the choice of consuming certain processed food.	

THEME : INVESTIGATING THE PHYSIOLOGY OF LIVING THINGS
LEARNING AREA :7.0 RESPIRATION

WEEK	LEARNING OBJECTIVE	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
6	7.1 Understanding the respiratory process in energy production	<ol style="list-style-type: none"> 1. Discuss and gather information : <ol style="list-style-type: none"> a. living process require energy b. the main substrate for respiration, that is glucose, is obtained from the following : <ol style="list-style-type: none"> i) the digestion of carbohydrates in human and animals, ii) the process of photosynthesis in plant c. types of respiration (aerobic and anaerobic) 2. a) Carry out an activity to show aerobic respiration. b) Discuss the energy production in aerobic respiration 3. Carry out an experiment to 	<p>A student is able to :</p> <ol style="list-style-type: none"> a. state that all living processes require energy. b. identify the main substrate for producing energy c. state the two types of respiration d. explain what cell respiration is e. explain the energy production from glucose during the process of aerobic respiration. f. state the condition 	

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		<p>investigate anaerobic respiration in yeast</p> <p>4. Discussion</p> <p>a. condition leading to an aerobic respiration in cells</p> <p>b. the process of an aerobic respiration in human muscles.</p> <p>5. Use a graphic organizer (mind map) to compare and contrast aerobic respiration with anaerobic respiration</p>	<p>leading to an aerobic respiration in cells</p> <p>g. explain the process of anaerobic respiration in yeast</p> <p>h. explain the process of an aerobic respiration in human muscles</p> <p>i. write the chemical equations for aerobic and anaerobic respiration</p> <p>j. compare and contrast aerobic respiration with anaerobic respiration</p>	
7	7.2 Analysing the respiratory structures and breathing mechanisms in human and animal	<p>1. Observe graphics and discuss the respiratory structures in human and other organisms including protozoa, insects, fish and amphibians.</p> <p>2. a) Conduct an activity to compare the total surface area of a flat card with a corrugated card and correlated the increase in total</p>	<p>A student is able to :</p> <p>a. state the respiratory structures in human and some animals.</p> <p>b. make an inference on the various adaptation of the respiratory structures.</p>	

WEEK	LEARNING OBJECTIVE	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
		<p>surface area with the modified surface structure.</p> <p>b) Discuss the relationship between total surface area of the respiratory structures and the efficiency of gaseous exchange in various organisms.</p> <p>c) Observe the respiratory structures to generalise the characteristics of the respiratory surfaces in human and other organisms.</p> <p>3. a) Use a model to explain the breathing mechanism in human.</p> <p>b) Use a graphic organizer to compare and contrast human respiratory system with other organisms.</p>	<p>c. describe the characteristic of respiratory surfaces in human and other organisms.</p> <p>d. describe the breathing mechanism in human and other organisms</p> <p>e. compare and contrast the human respiratory system with other organisms.</p>	
8	7.3 Understanding the concept of gaseous exchange across the respiratory surfaces and transport of gases in human	<p>1. Using a diagram to discuss the process of gaseous exchange across the surface of the alveolus and blood capillaries in the lung in relation to :</p> <p>a. the difference in partial pressure of respiratory</p>	<p>A student is able to :</p> <p>a. describe the process of gaseous exchange across the surface of the alveolus and blood capillaries in the lungs</p>	

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		<p>gaseous in the air of the alveolus and blood capillaries in the lungs i.e</p> <ul style="list-style-type: none"> i. partial pressure of oxygen and carbon dioxide in the air of the alveolus compared to the partial pressure in the blood capillaries b. The difference in partial pressure of oxygen and carbon dioxide in the blood entering the alveolus with the blood living the alveolus ie: <ul style="list-style-type: none"> i. partial pressure of oxygen and carbon dioxide in the blood entering the alveolus compared to the blood living in alveolus. <p>2. Discuss :</p> <ul style="list-style-type: none"> a. the transport of respiratory gases in human b. explain the process of gaseous exchange between the blood and body cells <p>3. Mind maps/ graphic organizer to explain the exchange and transport of respiratory gasoues in human.</p>	<ul style="list-style-type: none"> b. explain the transport of respiratory gases c. explain the process of gaseous exchange between the blood and body cells 	<p><i>Cautions :</i></p>

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		4. Conduct an experiment to investigate the differences between inhale and exhale air	d. distinguish the composition of inhale and exhale air.	<i>Handle the following solution with care : Alkaline pyrogallate and Concentrated potassium hydroxide</i>
9	7.4 Understanding the regulatory mechanism in respiration	<p>1. Conduct an experiment to study the effect of a vigorous exercise on the rate of respiration and heart beat.</p> <p>2. Discussion on the following :</p> <p>a. correlate the rate of respiration with the oxygen and carbon dioxide content in the body.</p> <p>b. regulatory mechanism of oxygen and carbon dioxide content in the body</p> <p>3. Discussion on human respiratory response, rate of respiration and heart beat in different situation:</p> <p>a. vigorous activities eg : swimming, running, aerobic</p>	<p>A student is able to :</p> <p>a. describe the change in rate of respiration after completing a vigorous exercise.</p> <p>b. correlate the rate of respiration with the oxygen and carbon dioxide content in the body.</p> <p>c. explain the regulatory mechanism of oxygen and carbon dioxide content in the body</p> <p>d. explain the human respiratory response and rate of respiration in different situation</p> <p>e. correlate the rate of respiration with the rate of heart beat</p>	

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		<p>exercise, mountain climbing and playing badminton</p> <p>b. relaxing</p> <p>c. fear</p>		
10	7.5 Realising the importance of maintaining a healthy respiratory systems	<p>1. Discuss and conduct an experiment to show the effects of cigarette smoke on white cotton wool and draw an analogy between the lung and the white cotton wool.</p> <p>2. Show the slides of damaged lungs (cancer) due to smoking.</p>	<p>A student is able to :</p> <p>a. care and maintain efficient function of the respiratory organ</p>	<i>Say "Tak Nak" to cigarette</i>
	7.6 Understanding respiration in plants	<p>1. Discuss and gather information:</p> <p>a. the energy requirement and the intake of oxygen intake by plants for respiration.</p> <p>2. Use graphic organizer to show the intake of oxygen in plants</p> <p>a. discuss anaerobic respiration carried out by rice plant in a paddy field or other plants in certain situations.</p> <p>3. Use a graphic organizer to compare the process of respiration</p>	<p>A student is able to :</p> <p>a. describe the energy requirement</p> <p>b. explain the intake of oxygen for respiration</p> <p>c. explain aerobic respiration in plants</p> <p>d. explain anaerobic respiration in plants under certain conditions.</p> <p>e. Compare and contrast the process</p>	<i>A diagram of the cross section of a leaf is required</i>

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		with the process of photosynthesis in plants. 4. Discuss and gather information a. meaning of compensation point b. correlate light intensity with compensation point from graph. c. The effect on living things when the rate of photosynthesis and rate of respiration remains at compensation point.	of photosynthesis and respiration f. Explain what compensation point is g. Relate light intensity with the attainment of compensation point h. Predict the situation when the rate of photosynthesis and rate of respiration remains at compensation point	
11	SECOND TERM SCHOOL HOLIDAY 4-14 SEPT 2010 HARI RAYA PUASA 2010 10-11 SEPT 2010			

THEME : INVESTIGATING THE RELATIONSHIP BETWEEN LIVING THINGS AND THE ENVIRONMENT

LEARNING AREA : 8.0 DYNAMIC ECOSYSTEM

WEEK	LEARNING OBJECTIVES	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
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WEEK	LEARNING OBJECTIVES	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
12	8.1 Understand the abiotic and biotic components of the environment	<p>Conduct a field study to:</p> <ol style="list-style-type: none"> a) identify the abiotic components including, pH, temperature, light intensity, humidity, topography and the microclimate of an ecosystem b) identify the biotic components of an ecosystem c) investigate the feeding relationships of the biotic components to construct the food chains and food webs, and classify the biotic components into trophic levels d) investigate the interaction between biotic components as follows: <ol style="list-style-type: none"> i) symbiosis among plants and animals encompassing the following: <ul style="list-style-type: none"> - commensalisms - parasitism - mutualism ii) saprophytism, iii) predator-prey interaction. e) investigate the interaction between biotic components in relation to competition, which are: <ol style="list-style-type: none"> i) intraspecific competition, ii) intraspecific competition. <p>Conduct an experiment to study the intraspecific competition and interspecific competition of plants, e.g. maize and rice</p> <p>Collect and interpret data to study intraspecific competition and interspecific competition involving <i>Paramecium</i>, for example <i>Paramecium Aurelia</i> and <i>Paramecium caudatum</i>.</p>	<p>A student is able to :</p> <ul style="list-style-type: none"> • identify the abiotic components of an ecosystem, • identify the biotic components of an ecosystem, • classify biotic components into trophic levels • explain the interactions between biotic components in relation to feeding, using examples, • explain the interaction between biotic components in relation to competition, using examples. 	<p>Emphasis is on field study for the students to reinforce their understanding in this area.</p>

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13	8.2 Understanding the processes of colonisation and succession in an ecosystem	<p>Conduct a field study on an ecosystem i.e. a mangrove swamp or a pond to:</p> <ol style="list-style-type: none"> a) identify the niche, habitat, community and population, b) investigate the process of colonization, c) investigate the process of succession, d) identify pioneer species, successor species, dominant species and climax community, e) identify the adaptive characteristics of pioneer species and subsequent species in the habitat for the processes of colonization and succession. <p>Students present their findings or make a folio.</p> <p>Study the processes of colonization and succession through video, computer software and printed material.</p> <p>Discuss and correlate the abiotic components during the processes of colonization and succession in an ecosystem.</p>	<p>A student is able to:</p> <ul style="list-style-type: none"> • state what an ecosystem is, • identify the niche, habitat, community and population of ecosystem, • explain the process of colonization, • explain the process of succession, • identify the pioneer species in an ecosystem, • identify the successors in an ecosystem , • identify the dominant species in an ecosystem, • identify the adaptive characteristics of pioneer species, • identify the adaptive characteristics of successors, • explain the changes in habitat caused by pioneer species, 	

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			<ul style="list-style-type: none"> • explain the changes in habitat caused by successors at every level of succession until I climax community is reached, • relate the abiotic components with the biotic components in an ecosystem during the processes of colonization and succession. 	
14	8.3 Sythesising ideas on population ecology	<p>Discuss the appropriate sampling techniques to study the pollution size of an organism.</p> <p>Conduct a field study or use an appropriate anology to:</p> <ul style="list-style-type: none"> a) estimate the population size of animals such as garden snail and wood lice, b) investigate the distribution of plants using the quadrat sampling technique, <p>Based on the above study discuss the distribution of an organism in a habitat.</p>	<p>A student is able to:</p> <ul style="list-style-type: none"> • identify the appropriate sampling technique to study the population size of an organism, • estimate the population size of an organism in a habitat, • determine the distribution of 	

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		<p>Discuss and correlate the change in pollution distribution of an organism with the changes in each of the abiotic factors.</p> <p>Plan and conduct an experiment to study the relationship of population distribution of an organism with changes in any one of the abiotic factors such as pH, temperature, light intensity and humidity. Suggested organisms: <i>Pleurococcus, Lemna</i></p>	<p>organisms in a habitat based on the density, frequency and percentage coverage of the species,</p> <ul style="list-style-type: none"> • correlate the change in a population distribution of an organism with the changes in each of the abiotic factors, • design an experiment to investigate the effect of a change in any <u>one</u> of the abiotic factors or the population growth rate of an organism. 	
15	8.4 Understand the concept of biodiversity	<p>Discuss the following:</p> <ol style="list-style-type: none"> a) meaning of biodiversity, b) need for the classification system of organisms. 	<p>A student is able to:</p> <ul style="list-style-type: none"> • explain the meaning of biodiversity, 	

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		<p>Gather information on the following:</p> <ol style="list-style-type: none"> the five kingdoms in the classifications of the organisms, which are Monera, Protista, Fungi, Plantae and Animalia, main characteristics of organisms in each kingdom, examples of organisms in each kingdom, <p>Discuss the following:</p> <ol style="list-style-type: none"> the hierarchy in the classification of organisms from kingdom to species, the method of naming a number of vertebrates and local flowering plants, using the Linnaeus binomial system, the importance of biodiversity. <p>Conduct a field trip to create awareness of biodiversity of an ecosystem.</p>	<ul style="list-style-type: none"> explain the need for classification of organisms, state the five kingdoms used in the classification of organisms, identify the main characteristics of organisms in each kingdom, list examples of organisms in each kingdom, state the hierarchy in the classification of organisms, using examples, explain through examples, the method of naming organisms using the Linnaeus binomial system, explain the importance of biodiversity 	
16	8.5 Understanding the impact of	Using charts, slides and photomicrographs, identify and list various	A student is able to:	The scientific names of pathogen and life cycle of

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	microorganisms on life	<p>types of microorganisms i.e. protozoa, algae, fungi, bacteria and virus.</p> <p>Conduct an experiment to study the effects of temperature, pH, light and nutrients on the activity of microorganisms e.g. <i>Bacillus subtilis</i> or yeast.</p> <p>Gather information and discuss the role of useful microorganisms in the following:</p> <ol style="list-style-type: none"> decomposition nitrogen cycle, alimentary canal of termite, digestive system in human. <p>Gather information and discuss the effects of harmful microorganisms:</p> <ol style="list-style-type: none"> causing diseases, spoilage of food and substances. <p>Gather information and present the findings on the following:</p> <ol style="list-style-type: none"> pathogens, vectors, symptoms and methods in transmission of diseases such as malaria, dengue fever, cholera, ringworm, food poisoning, AIDS, hepatitis and 	<ul style="list-style-type: none"> classify various types of microorganisms based on their basic characteristics, state the abiotic components affecting the activity of microorganisms, explain the effects of a change in each abiotic component on the activity of microorganisms, explain the role of useful microorganisms, explain the effect of harmful microorganisms explain the meaning of pathogen, identify the pathogen, vector and symptoms of one particular disease, 	vectors are not required.

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		<p>SARS, b) methods to control pathogens including the use of antibiotics, vaccines, antiseptics and disinfectants.</p> <p>Gather information and present the uses of microorganisms in biotechnology, such as:</p> <p>a) production of antibiotics and vaccines b) cleaning of oil spills, c) waste treatment, d) food processing e) production of bioplastic, f) production of energy from biomass</p>	<ul style="list-style-type: none"> • explain how the disease spreads, • describe the methods for controlling pathogen, • explain the use of microorganisms in biotechnology, using examples. 	
16-18	<p>FINAL YEAR EXAMINATION 7 OKT 2010 - 20 OKT 2010</p>			
19	8.6 Appreciating biodiversity	<p>Conduct a forum to discuss the importance of preservation and conservation of biodiversity,</p> <p>Conduct an activity to preserve and conserve various living things around us.</p>	<p>A student is able to:</p> <ul style="list-style-type: none"> • justify the importance preservation and conservation of biodiversity. • preserve and conserve various 	

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			living things around him/her.	

THEME : INVESTIGATING THE RELATIONSHIP BETWEEN LIVING THINGS AND ENVIRONMENT

LEARNING AREA : 9.0 ENDANGERED ECOSYSTEM

WEEK	LEARNING OBJECTIVES	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
	9.1. Evaluating human activities that endanger an ecosystem	Carry out small group discussion on the following and present the findings: c) Human activities that threaten the ecosystem, d) The impact of human activities on the ecosystem e) The effects of unplanned development of the ecosystem, such as ; I. Soil erosion II. Flash flood III. Landslide IV. Eutrofication V. Water , air , thermal , and noise pollution VI. Global warming VII. Ozone depletion VIII. Climatic change IX. Ex tinction of living things X. Deforestation d) Types of pollution and sources of pollution	A student is able to : ❖ Identify human activities that threaten the ecosystem ❖ Explain the impact of human activities on the ecosystem ❖ Evaluate critically the effects of unplanned development and mismanagement of the ecosystem ❖ Describe types of pollution and sources	TSTS: <ul style="list-style-type: none"> • Generating ideas • Grouping and classifying • Evaluating Nobles values : <ul style="list-style-type: none"> • Having an interest and curiosity towards the environment Teaching aids : <ul style="list-style-type: none"> • Newspaper cuttings • Charts

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20		<p>e) Effects of pollution on the following:</p> <ul style="list-style-type: none"> I.Human health (diseases affecting the respiratory system,skin problems , conjunctivitis,cancer and cholera. II.Animal and plant habitats III.Buildings IV.Agriculture V.Climate <p>Conduct an activity to analyse data on air pollution index of some cities within and outside the country,and make an inference on the sources of pollution.</p> <p>Conduct an activity to analyse data on water pollution , such as Oxygen Demand (BOD) value and content to heavy metals in some rivers,and make an inference on the sources of pollution.</p> <p>Conduct activities to formulate a strategy to reduce the level of air and water pollution in a particular location by :</p> <ul style="list-style-type: none"> a) Analyzing information on the population , such as the size of population , socio – economic activities , and level of air and water pollution b) Conducting an activity to predict the level 	<p>of pollution</p> <ul style="list-style-type: none"> ❖ Explain the effects of pollution on living things and the environment ❖ Compare and contrast pollutants in the air from different environments ❖ Interpret data on the level of water pollution in some rivers ❖ Make an inference on the sources of water pollution in some rivers ❖ Predict the level of air and water pollution in a particular location within the next ten years ❖ Suggest strategies to solve problems 	

WEEK	LEARNING OBJECTIVES	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
	9.2 Understanding the greenhouse effect and thinning of the ozone layer	<p>of air and water pollution at a particular location within the next ten years</p> <p>c) Preparing an action plan consisting of a strategy to reduce the level of air and water pollution at that particular location within the next ten years.</p> <p>Carry out small group discussion on the following and present the findings :</p> <p>a) Greenhouse effect , including its cause and effect</p> <p>b) Concentration of carbon dioxide in the atmosphere and correlate it with global warming</p> <p>c) Ozone depletion , including its cause and effect</p> <p>d) Impact of ozone depletion and global warming on the ecosystem</p>	<p>related to air and water pollution in a particular location within the next ten years</p> <p>A student is able to:</p> <ul style="list-style-type: none"> ❖ Explain what greenhouse effect is ❖ Correlate the concentration of carbon dioxide in the atmosphere with global warming ❖ Explain the thinning of the ozone layer ❖ Explain the impact of thinning of the ozone layer and global warming on the ecosystem. 	<p>TSTS :</p> <ul style="list-style-type: none"> • Analysing • Evaluating <p>Nobles values :</p> <ul style="list-style-type: none"> • Balance of nature • Being thankful to God <p>Teaching aids :</p> <ul style="list-style-type: none"> • CD Rom • Charts • Scrap-book

WEEK	LEARNING OBJECTIVES	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
21	9.3 Realising the importance of proper management of development activities and the ecosystem	<p>Conduct a debate on the need for development to improve the quality of life and to meet the requirements of an increasing population.</p> <p>Discuss the effects of an increase in population on the ecosystem.</p> <p>Carry out small group discussion on the following and present the findings:</p> <ol style="list-style-type: none"> Implementation of laws Use of technology Education on the management of resources , including the reduce , reuse and recycle of resources Preservation and conservation of soil , water , flora and faun of forests and mangrove swamps Practice of biological control Use of renewable energy Efficient use of energy <p>Conduct activities to care for the following ecosystem in school and at home :</p> <ol style="list-style-type: none"> Fish ponds Gardens <p>Plan and conduct a programme related to the management of the ecosystem for example , “ Environment Day “</p>	<p>A student is able to:</p> <ul style="list-style-type: none"> ❖ Justify the need for development ❖ Explain the effects of increase in population on the ecosystem ❖ Explain measure taken in the management of development activities and the ecosystem to ensure a balance of nature is maintained. ❖ Care for the ecosystem ❖ Participate in activities related to the management of the ecosystem 	<p>TSTS :</p> <ul style="list-style-type: none"> • Making decisions • Detecting bias <p>Nobles values :</p> <ul style="list-style-type: none"> • Being flexible and open-minded • Thinking rationally • Being cooperative <p>Teaching aids :</p> <ul style="list-style-type: none"> • Text book • Internet • transparancies

WEEK	LEARNING OBJECTIVES	SUGGESTED LEARNING ACTIVITIES	LEARNING OUTCOMES	NOTES
	YEAR END SCHOOL HOLIDAY 20 NOVEMBER 2010 – 3 JANUARY 2010			