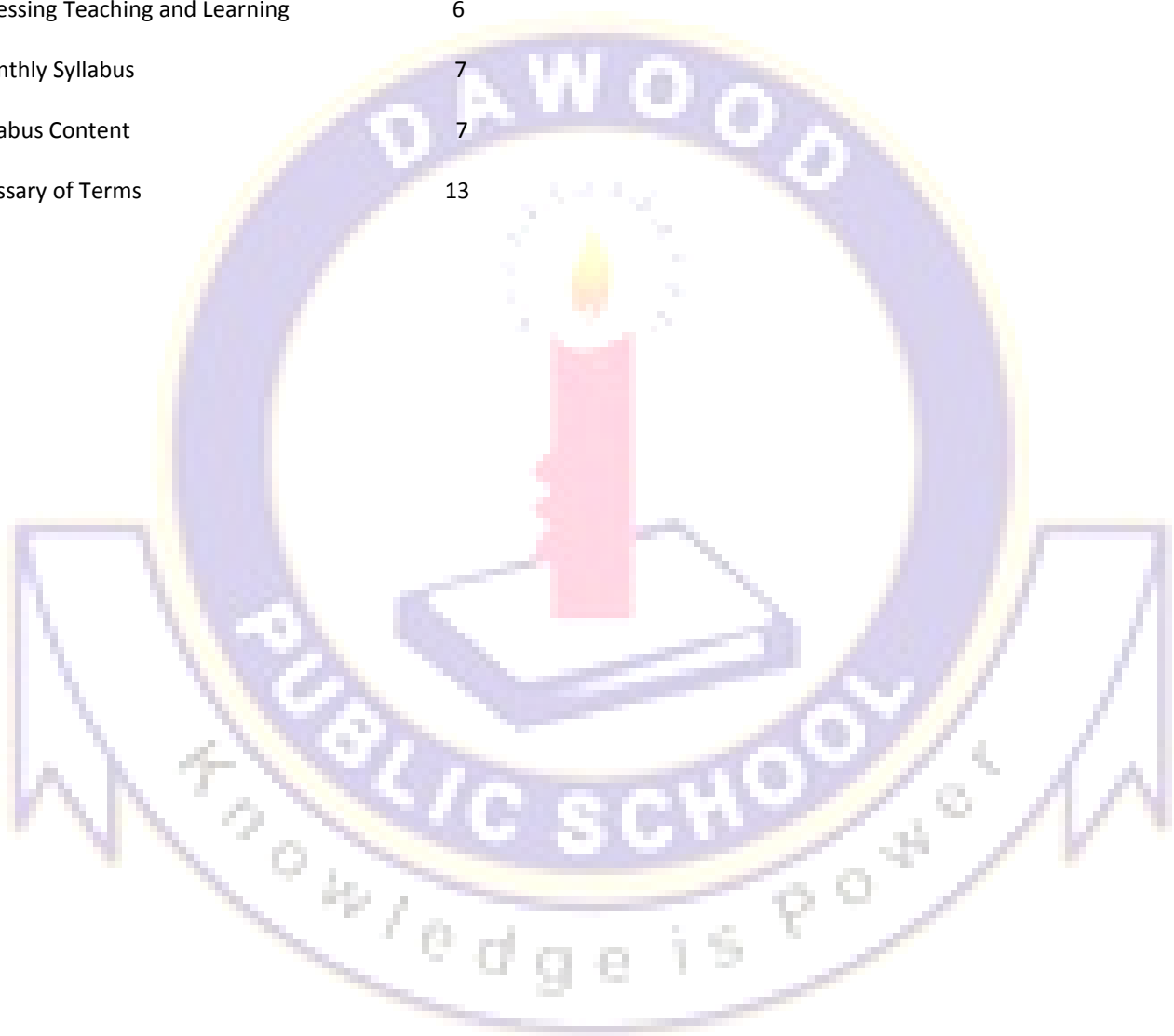


DAWOOD PUBLIC SCHOOL
Science Syllabus
2013 – 2014
Class: VII
Subject G. Science

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Book:

Ho Peck Leng et al.2009, International Lower *Secondary Science 2*, Singapore; Marshall Cavendish Education.

PREAMBLE

Well come to the science curriculum frame work.

This primary and secondary Science Syllabus is a foundation for scientific studies at lower to higher levels. The syllabus has also taken into consideration the desired outcomes of education for our primary students as well as the secondary education emphasis.

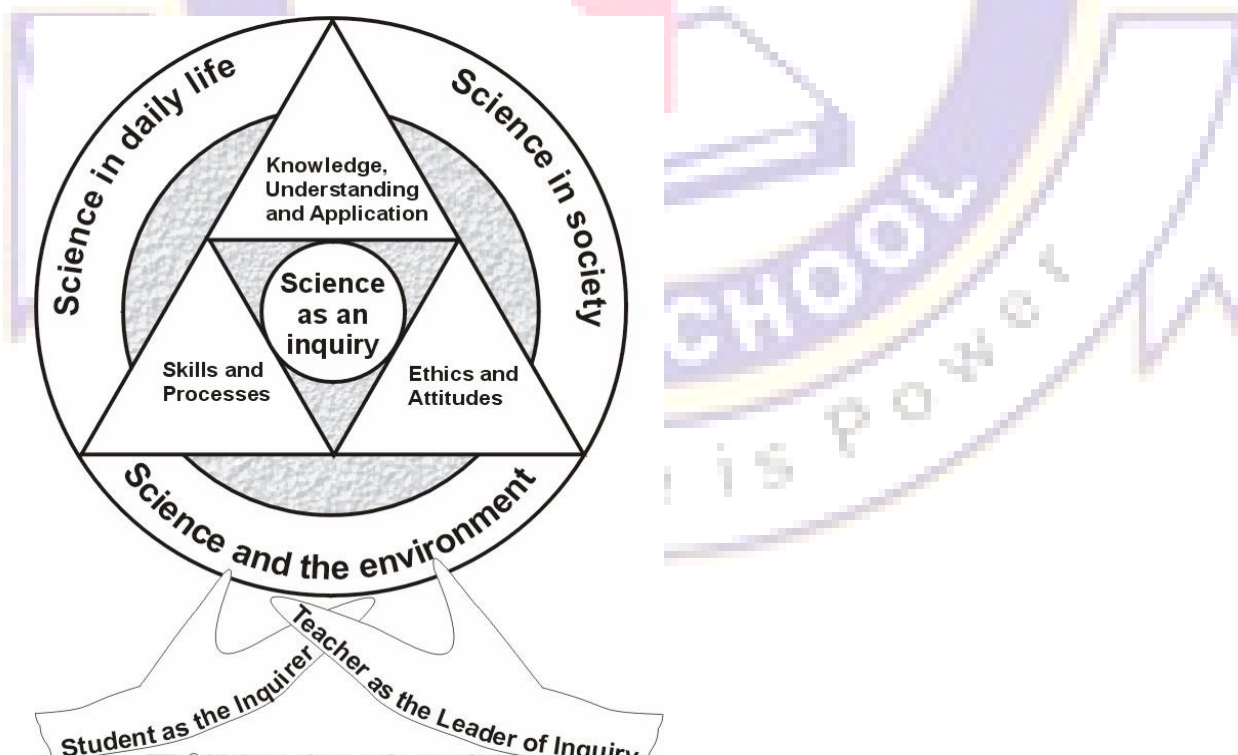
This syllabus is based on the Science Curriculum Framework and emphasizes the need for a balance between the acquisition of science knowledge, process and attitudes. In addition, as and where the topics lend themselves, the technological applications, social implications and the value aspects of science are also considered. It also emphasizes the broad coverage of fundamental concepts in the natural and physical world.

The aims spelt out in the syllabus provide the guiding principles for the suggested teaching approaches and evaluation methods.

Teachers are advised not to follow the syllabus too rigidly but to exercise their professional judgment in implementing it. Schemes of work should be developed with the interests and abilities of the students uppermost in mind. Teachers are encouraged to use a variety of approaches in their teaching and to incorporate ideas and materials from various sources, in order to enhance the learning of science.

SCIENCE CURRICULUM FRAMEWORK**1 FRAMEWORK**

The Science Curriculum Framework is derived from the Policy Framework for the Teaching and Learning of Science. It encapsulates the thrust of science education in Dawood public school to prepare our students to be sufficiently adept as effective citizens, able to function in and contribute to an increasingly technologically-driven world.



Central to the curriculum framework is the inculcation of the spirit of scientific inquiry. The conduct of inquiry is founded on three integral domains of (a) Knowledge, Understanding/ Skills and Processes, (b) Content and (c) Ethics and Attitudes.

These domains are essential to the practice of science. The curriculum design seeks to enable students to view the pursuit of science as meaningful and useful. Inquiry is thus grounded in knowledge, issues and questions that relate to the roles played by science in daily life, society and the environment.

The teacher is the leader of inquiry in the science classroom. Teachers of science impart the excitement and value of science to their students. They are facilitators and role models of the inquiry process in the classrooms. The teacher creates a learning environment that will encourage and challenge students to develop their sense of inquiry. Teaching and learning approaches centre on the student as an inquirer. The following table shows the description of each domain which frames the practice of science:

Knowledge, Understanding and Application	Content	Ethics and Attitudes
<ul style="list-style-type: none"> • Scientific phenomena, facts, concepts and principles • Scientific vocabulary, terminology and conventions • Scientific instruments and apparatus including techniques and aspects of safety • Scientific and technological applications 	<p>Skills</p> <ul style="list-style-type: none"> • Observing • Comparing • Classifying • Using apparatus and equipment • Communicating • Inferring • Formulating hypothesis • Predicting • Analyzing • Generating possibilities • Evaluating Processes • Creative problem solving • Decision-making • Investigation 	<ul style="list-style-type: none"> • Curiosity • Creativity • Integrity • Objectivity • Open-mindedness • Perseverance • Responsibility

2. AIMS

The Science Syllabus aims to:

- ❖ provide students with experiences which build on their interest in and stimulate their curiosity about their environment
- ❖ provide students with basic scientific terms and concepts to help them understand themselves and the world around them
- ❖ provide students with opportunities to develop skills, habits of mind and attitudes necessary for scientific inquiry
- ❖ prepare students towards using scientific knowledge and methods in making personal decisions
- ❖ help students appreciate how science influences people and the environment

SYLLABUS FRAMEWORK

The Science Syllabus comprises:

- The knowledge, skills and attitudes that all students should acquire.
- The freed up curriculum time, known as the white space, to enable teachers to use more engaging teaching and learning approaches, and/or to implement customized school-based programmes as long as the aims of the syllabus are met. This enables teachers to make learning meaningful and enjoyable for their students.

i. KNOWLEDGE, UNDERSTANDING/ SKILLS AND PROCESSES

The approach in this syllabus towards the learning of science is based on themes that students can relate to in their everyday experiences, and to the commonly observed phenomena in nature. The aim is to enable students to appreciate the links between different themes/topics and thus allow the integration of scientific ideas.

ii. CONTENT

In this syllabus, teachers are encouraged to provide opportunities for students to use concepts and integrate Content to inquire things and phenomena around them.

Skills

➤ **Observing**

This is the skill of using our senses to gather information about objects or events. This also includes the use of instruments to extend the range of our senses.

➤ **Comparing**

This is the skill of identifying the similarities and differences between two or more objects, concepts or processes.

➤ **Classifying**

This is the skill of grouping objects or events based on common characteristics.

➤ **Using apparatus and equipment**

This is the skill of knowing the functions and limitations of various apparatus, and developing the ability to select and handle them appropriately for various tasks.

➤ **Communicating**

This is the skill of transmitting and receiving information presented in various forms - verbal, pictorial, tabular or graphical.

➤ **Inferring**

This is the skill of interpreting or explaining observations or pieces of data or information.

➤ **Predicting**

This is the skill of assessing the likelihood of an outcome based on prior knowledge of how things usually turn out.

➤ **Analysing**

This is the skill of identifying the parts of objects, information or processes, and the patterns and relationships between these parts.

➤ **Generating possibilities**

This is the skill of exploring all the alternatives, possibilities and choices beyond the obvious or preferred one.

➤ **Evaluating**

This is the skill of assessing the reasonableness, accuracy and quality of information, processes or ideas. This is also the skill of assessing the quality and feasibility of objects.

Processes

Processes are complex operations which call upon the use of several skills. At the primary level, the processes expected of students are:

➤ **Creative Problem Solving**

This is a process of analyzing a problem and choosing an innovative and relevant solution in order to remedy or alter a problem situation.

➤ **Decision-Making**

Decision-making is the process of establishing and applying criteria to select from among seemingly equal alternatives. The process of establishing criteria involves consideration of the consequences and values.

➤ **Investigation**

This involves formulating questions or hypotheses, devising fair methods and carrying out those methods to find out answers to the questions or to verify the hypotheses.

iii. ETHICS AND ATTITUDES

In all scientific inquiry, the adoption of certain mental attitudes such as Curiosity, Creativity, Integrity, Objectivity, Open-mindedness,

Perseverance and Responsibility is advocated.

➤ **Curiosity**

Desire to explore the environment and question what they find.

➤ **Creativity**

Suggest innovative and relevant ways to solve problems.

➤ **Integrity**

Handle and communicate data and information with integrity.

➤ **Objectivity**

Seek data and information to validate observations and explanations objectively.

➤ **Open-mindedness**

Accept all knowledge as tentative and willing to change their view if the evidence is convincing.

➤ **Perseverance**

Pursue a problem until a satisfactory solution is found.

➤ **Responsibility**

Show care and concern for living things and awareness of the responsibility they have for the quality of the environment. Opportunities should be provided in the classroom for students to ask questions. Students should be encouraged to ask both closed and open questions. From the type of questions asked by the students, teachers could gather information on their “frame of mind’ and the quality of their understanding.

3. ASSESSING TEACHING AND LEARNING

Assessment is an integral part of the teaching and learning process. It involves gathering information through various assessment techniques and making sound decisions. Assessment provides information to the teacher about students’ achievement in relation to the Knowledge, Understanding/ Skills and Processes. With this information, the teacher makes informed decisions about what should be done to enhance the learning of the students and to improve teaching methods.

In an inquiry-based classroom, the assessment can take many forms. In addition to the written tests, teachers can also conduct performance-based assessment using the following modes:

- Practical’s
- Projects
- Reflections / Journals
- Model-making
- Posters
- Assessments
- Games and quizzes

Assessment provides feedback to parents, allows them to monitor their children’s progress and achievement through the information obtained.

Guidelines for Assessment

It is essential for assessment to be aligned to the teaching and learning process. School assessment, both formative and summative in nature, should be used to provide a complete picture of the students’ performance and progress, and the effectiveness of the teaching and learning process.

Monthly Syllabus

• August	• From cell to organism
• September	• Food and digestion • Elements and Compounds
• October	• Mixture • Forces and their effects Types of Energy[Kinetic ,Potential, Thermal]
• November	• Revision for Mid Term Exams
• December	• MID TERM EXAMS
• January	• Atoms, Molecules and Ions • The Particle Model Of Matter
• February	• Solutions • Classification of Plants and Animals
• March	• Electrical Circuit • Microorganism and Diseases [Lower secondary volume 3]
• April/ May	• Microorganism and Diseases • [Lower secondary volume 3] • Revision For Final Exams • FINAL EXAMS

Syllabus Content

August

	From cell to organism	Chap No.1, Pg No.(1-26)	
Contents	Knowledge, Understanding/ Skills and Processes	Application	Suggested time frame
1.1 cells-the building blocks of life 1.2 Plants and animal cells 1.3 cell Division 1.4 Different cells for different Functions.	<ul style="list-style-type: none"> To show an understanding that cells are basic unit of life. To identify different parts of plant and animal cell and relate to their function. To compare a typical plant cell and animal cell structurally. By the use of microscope observing different cells and record observation by drawing simple diagram. To recognize that cells divide and the process begin with division of nucleus. To recognize that in many multi cellular organism, cells of similar structure are organized into tissue; several tissues may make up an organ; organs are organized in to systems and different systems make up an organism 	<ul style="list-style-type: none"> Students will observe the different parts of compound microscope and will study their functions. To identify the animal and plant cell differences by observing the slides . PowerPoint presentation.	For explanation 8 units For exercise discussion 1 unit For work book 2 units required

September

	Food and digestion	Chap No.1, Pg No.(1-27)book 3	
Contents	Knowledge, Understanding/ Skills and Processes	Application	Suggested time frame
<p>1.1 Nutrients in food Protein, carbohydrate, fats.</p> <p>1.2 energy value of food.</p> <p>1.3A balance diet</p> <p>1.4 Digestion</p> <p>1.5The human digestive system.</p>	<ul style="list-style-type: none"> To recognize that food is a source of raw materials for body and energy resource to maintain the body's activities such as growth, repair and movement. To recognize that food contain mix of carbohydrates, proteins, fats, vitamins, minerals, fibers and water. To identify food which is rich in particular nutrients? <p>LAB; to use chemical test to identify protein, carbohydrate and fats.</p> <ul style="list-style-type: none"> To recognize that protein are important for growth and repair carbohydrates and fats more commonly provided energy. To recognized that a healthy diet contains a balance of food stuffs. To explain what is meant by digestion and why food must be digested. To describe the human digestive system and the role of enzymes in digestion. Describe the main functions of these parts in relation to ingestion, digestion, absorption, assimilation and egestion of food. 	<ul style="list-style-type: none"> Activity will be done in the nutrition lab. Healthy breakfast Application 	<p>For explanation</p> <p>11 units</p> <p>For exercise discussion 2 unit</p>

	Elements and compound	Chap No.3 Pg No.(52-72)	
Contents	Knowledge, Understanding/ Skills and Processes	Application	Suggested time frame
3.1 What is an element? 3.2 Classifying Elements 3.3 Uses of Elements 3.4 What is compound? 3.5 Properties of compounds 3.6 Formation of compounds	<ul style="list-style-type: none"> To identify an element as the building block of matter To state that are classified according to their properties; To differentiate between metallic and non metallic elements. To recognize the chemical symbols of common elements; To describe compounds as substance consisting of two or more elements chemically combined together To describe common properties of compounds and how compounds are formed. To recognize that substances can be classified as elements, compounds and mixtures 	<ul style="list-style-type: none"> To show different elements and compounds in chemistry lab including iron, sulfur and magnesium as elements and sodium chloride, silver nitrate and iron sulfate as compounds. 	For explanation 6 units For work book 2 units required For exercise discussion 1 unit

October

	Mixture	Chap No.4, Pg No.(73-93)	
Contents	Knowledge, Understanding/ Skills and Processes	Application	Suggested time frame
4.1 What is a mixture? 4.2 Distinguishing Among Elements, Compounds and Mixtures 4.3 Separating Mixtures	<ul style="list-style-type: none"> To describe mixtures as two or more elements and / or compound that are not chemically combined together To distinguish between elements ,compounds and mixtures To explain about some separation techniques To recognize that elements ,compounds melt and boil at particular temperature but mixtures don't To show an awareness of the application of separation techniques in everyday life and industries 	<ul style="list-style-type: none"> To separate the components of a suspension using filtration technique To perform the chromatography using ink as colored pigment. 	For explanation 8 units For work book 2 units For exercise discussion 2unit

	Forces and their effects	Chap. No 7,pg No.(139-157)	
Contents	Knowledge, Understanding/ Skills and Processes	Application	Suggested time frame
7.1What is a force 7.2Measuring forces 7.3Gravitational force and weight 7.4Upthrust and density 7.5Frictional force	<ul style="list-style-type: none"> To describe the effects of forces To identify forces such as gravity, up thrust and friction To differentiate between mass and weight To calculate the density using formula Density=mass/volume To describe frictional force and investigating the factors affecting it 	<ul style="list-style-type: none"> To show either it is easy to float in fresh water or in sea water using an egg immersed under water and saline. 	For explanation 7 units For work book 2 units For exercise discussion 2 unit

November

Revision for Mid Term Exams

December

Mid Term Examinations

January

	Atoms, Molecules and Ions	Chap No.6, Pg No.(122-138)	
Contents	Knowledge, Understanding/ Skills and Processes	Application	Suggested time frame
6.1 What is an atom? 6.2 What is a molecule? 6.3Chemical formulae of molecular Elements and compounds. 6.4 What is an Ion?	<ul style="list-style-type: none"> To define an atom as the smallest particle of an element To describe an atom as an electrically neutral entity made up of positively charged nucleus(protons and neutrons) with negatively charged electrons moving around the nucleus; To state that atoms of the same element contain the same number of protons and those of different elements contain different number of protons; To distinguish between atoms and molecules; That molecule of an element consist of a fixed number of the same type of atoms chemically combined together; That molecule of a compound consist of a fixed number of different types atoms chemically combined together; By giving chemical formula 	Assignment : to draw the atomic structure of first twenty elements showing electron distribution	For explanation 7 units For work book 2 units For exercise discussion 1 unit

	<p>of compounds, determine the types and number atoms.</p> <ul style="list-style-type: none"> To recognize that an ion is formed when an atom gain Or loses electrons. 		
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	The Particle Model of Matter	Chap No.6, pg no (122-138)	
Contents	Knowledge, Understanding/ Skills and Processes	Application	Suggested time frame
<p>6.1 The particle model of matter</p> <p>6.2 Particle models for solids, liquids and gases</p> <p>6.3 Changes in physical states</p>	<ul style="list-style-type: none"> To explain the particle model of matter; To explain diffusion and Brownian motion and how these provide evidence for the existence of particles; To the three states of matter; To differentiate the three states of matter; To explain that gas pressure is caused by particles hitting the walls of the container; To explain changes in states of matter using the particle model of matter; To recognize that theories are based on experimental data and sometimes, new evidence results in changes to theories. 	<ul style="list-style-type: none"> To observe the diffusion of potassium permagnate in water . To show change in state of solid to liquid through melting process using candle wax. 	<p>For explanation 7 units</p> <p>For work book 2 units</p> <p>For exercise discussion 1 unit</p>

February

	Solution	Chap No.5, Pg No.(94-121)	
Contents	Knowledge, Understanding/ Skills and Processes	Application	Suggested time frame
<p>5.1 Solutes, Solvents and Solutions</p> <p>5.2 Solubility</p> <p>5.3 Acids and Alkalis</p>	<ul style="list-style-type: none"> To distinguish among solute , solvent and solution; To distinguish between a saturated and an un saturated solution ; To state about concentrated and dilute solution; To explain about solubility and factors which affect the solubility of a solute in a solvent? About the properties pH acidic and alkaline solutions; To explain about indicators; To investigate the effect of a variety of acidic, alkaline and neutral solutions on Universal Indicator paper and neutral indicators. 	<ul style="list-style-type: none"> To show the color changes of different indicators in acids and alkalis using Litmus paper, phenolphthalein, methyl orange and universal indicator. 	<p>For explanation 7 units</p> <p>For work book 2 units</p> <p>For exercise discussion 1 unit</p>

	Classifying Animals and Plants	Chap No.2, Pg No.(27-51)	
Contents	Knowledge, Understanding/ Skills and Processes	Application	Suggested time frame
2.1 The Need to Classify living Organisms 2.2 Classifying plants 2.3 Classifying Animals 2.4 Using Keys to identify and Classify Living things	<ul style="list-style-type: none"> Why there is a need to classify living organisms; Classification according to common observable characteristics To classify plants and animals into major taxonomic groups; To recognize that animals can be divided in to vertebrates and invertebrates To recognize that plants can be divided in to those with vascular bundle and those without; To construct a dichotomous key. 	<ul style="list-style-type: none"> A field trip sea shore to collect plant and animal specimens and study their morphology and habitat 	For explanation 7 units For work book 2 units For exercise discussion 1 unit

March

	Electrical Circuit	Chap No.10, Pg No.(200-220)	
Contents	Knowledge, Understanding/ Skills and Processes	Application	Suggested time frame
10.1 Electrical Circuits 10.2 Electric Current 10.3 A Cell or battery as a Source of Electrical Energy 10.4 Electrical Resistance 10.5 Using Electricity Safely	<ul style="list-style-type: none"> To represent simple circuits using symbols To recognize that a cell is a source of electrical energy; To explain about electric current. Voltage and resistance with their units; To explain about devices used to measure these values; To construct ,compare and contrast series and parallel circuit To explain how a fuse protects a circuit and the hazards of main supply; To explain the effect of electric current on the human body. 	<ul style="list-style-type: none"> Students will prepare a circuit using components to study the open and closed circuit and will draw the circuit diagrams using circuit symbols. 	For explanation 8 units For work book 2 units For exercise discussion 2 unit

March/ April

	Microorganisms and Diseases	Chap No.3, Pg No.(43-68)	
Contents	Knowledge, Understanding/ Skills and Processes	Application	Suggested time frame
3.1 What are Microorganism	<ul style="list-style-type: none"> To recognize that there are different types of micro organism To describe the features of 	<ul style="list-style-type: none"> To collect data and the mode of action of different antibiotics assigned 	For explanation 12 units For exercise

<p>3.2 Are microorganism useful</p> <p>3.3 Diseases caused by Microorganism</p>	<p>three types of organism in term of relative size shape and structure.</p> <ul style="list-style-type: none"> • To recognize micro organism are useful • To recognize that some organisms can cause diseases • To identify the natural barriers of the body against infections. 	<p>by the teacher.</p>	<p>discussion 2 unit</p>
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April

Revision for Final Exams

May

Final Examinations

Teaching Support

Documentaries, multimedia, presentations, slides, lab will be used.

Resource List

New Lower Secondary Science1, 2 by Tho Lai Hoong, EPB Fong, J. et al.2008, *Lower Secondary Science Matters Volume B*, Singapore; Marshall Cavendish Education.

GLOSSARY OF TERMS

	Term	Description of meaning
1.	classify	to group things based on common characteristics
2.	compare	to identify similarities and differences between objects, concepts or processes
3.	construct	to put a set of components together, based on a given plan
4.	describe	to state in words (using diagrams where appropriate) the main points of a topic
5.	discuss	to reflect on and explore a topic in speech or writing
6.	differentiate	to identify the differences between objects, concepts or processes
7.	identify	to select and/or name the object, event, concept or process
8.	infer	to draw a conclusion based on observations
9.	investigate	to find out by carrying out experiments
10.	list	to give a number of points or items without elaboration
11.	manipulate	to control an object in order to explore and discover its behavior
12.	measure	to obtain a reading from a suitable measuring instrument
13.	recognize	to identify facts, characteristics or concepts that are critical to the understanding of a situation, event, process or phenomenon
14.	relate	to identify and explain the relationships between objects, concepts or processes
15.	show an understanding	to recall information (facts, concepts, models, data), translate information from one form to another, explain information and summarize information
16.	state	to give a concise answer with little or no supporting argument
17.	trace	to follow a path