STANDARDS FOR SECONDARY EDUCATION

INTEGRATED SCIENCE

Quality Assurance and Development Services
Ministry of Education, Youth and Sports 2004

INTEGRATED SCIENCE

Content Standard No. 1
Demonstrate ways of thinking and acting which are inherent in the practice of science and recognize the role of science in society.

Learning Outcomes
First Form

1.1 Provide an acceptable definition of science and explain the importance of science.
1.2 Define the term scientist.
1.3 List the skills of good scientists and relate them to different scientific careers.
1.4 Define the scientific method.
1.5 List and apply methods used to solve everyday problems.
1.6 List at least 5 famous scientists and their work in different scientific fields.
1.7 List at least 5 local and regional scientists and their contributions to society.
1.8 Explain the importance of scientists working safely in the environment (especially in the laboratory.)

Content Standard No. 2
Measure some physical quantities accurately using the Metric System.

Learning Outcomes
First Form

2.1 List some basic fundamental quantities.
2.2 Identify the corresponding S. I. units of the fundamental quantities.
2.3 Perform simple metric conversions.
2.4 Identify the instruments used to measure these fundamental quantities.
2.5 Read linear scales.

Content Standard No. 3
Describe and use the microscope effectively in the analysis of typical plant and animal cells and appreciate the relation to cell organization.

Learning Outcomes
Second Form

3.1 Explain the function of the microscope
3.2 Identify the parts and explain the function(s) of the parts of the microscope.
3.3 Manipulate the microscope to obtain a clear image of the specimen.
3.4 Draw and label the parts of a typical plant and animal cell visible under a light microscope.
3.5 Explain the function(s) of the parts of a typical cell visible under a light microscope.
3.6 Compare and contrast the structures of typical plant and animal cells.
3.7 Explain the relationship among cells, tissues, organs, systems and the organism, giving examples.

Content Standard No. 4
Describe the macroscopic properties of matter using the Particulate Theory.

Learning Outcomes
First Form

4.1 Describe the physical properties of solids, liquids and gases, using the particulate theory of matter.
4.2 Describe how substances change from one state to another using the particulate theory of matter.

Content Standard No. 5
Know the first 20 elements and their symbols.

Learning Outcomes
First Form

5.1 Define an element.
5.2 List the first 20 elements on the periodic table along with their corresponding symbols.
5.3 Identify common elements in our environment.

Content Standard No. 6
Investigate compounds and mixtures.

Learning Outcomes
First Form

6.1 Define a compound.
6.2 List the properties of compounds.
6.3 List some common examples of compounds.
6.4 Define a mixture.
6.5 Define and distinguish among solutions, suspensions and colloids.
6.6 List some examples of mixtures.
6.7 Use different techniques to separate substances.
6.8 Compare properties of compounds and mixtures.

Content Standard No. 7
Illustrate the arrangement of the subatomic particles in atoms of elements and the formation of compounds.

Learning Outcomes
Second Form

7.1 Define and differentiate among protons, neutrons and electrons.
7.2 Calculate the number of protons, neutrons and electrons in an atom.
7.3 Analyze the atomic structure of the first 20 elements.
7.4 Describe the basic structure of the periodic table.
7.5 Explain the basic patterns in the arrangement of the elements in the periodic table.
7.6 Define ionic and covalent compounds and list examples of each.
7.7 Illustrate the formation of simple ionic and covalent compounds.
7.8 Write chemical formula for simple compounds.

Content Standard No. 8
Identify the properties of different chemicals and relate them to their role in chemical reactions as well and to their uses.

Learning Outcomes
Second Form

8.1 Define acids, bases and salts.
8.2 List examples of acids, bases and salts.
8.3 Determine the pH of chemicals using the pH indicators.
8.4 Define neutralization reactions.
8.5 Relate the importance of neutralization reactions to everyday situations.

Content Standard No. 9
Explain the processes vital to the recycling of water and its conservation.

Learning Outcomes
First Form

9.1 Explain the role of the processes such as evaporation and condensation in the recycling of water.
9.2 List some reasons why water is important to plants and animals.
9.3 Discuss methods of conserving water.
9.4 Explain the importance of conserving water.

Content Standard No. 10
***Analyze the Nitrogen Cycle*.**

Learning Outcomes
Second Form

10.1 Construct a simple diagram of the nitrogen cycle.
10.2 Explain the roles of the bacteria in the nitrogen cycle.

10.3 Explain the formation and importance of compost heaps.
10.4 Explain the composition and identify the different types of soils.

Content Standard No. 11
Analyze the Carbon Cycle.

Learning Outcomes
First Form

11.1 Explain the processes vital to the recycling of carbon.
11.2 Describe the greenhouse effect.

Content Standard No. 12
Describe the ecology in Belize.

Learning Outcomes
Second Form

12.1 Define Ecology.
12.2 List and discuss the different types of ecosystems found in Belize.
12.3 Illustrate the energy transfer in ecosystems in food chains and food webs.
12.4 State the composition of air.
12.5 Compare the composition of inhaled and exhaled air.
12.6 Describe some effects of air, land, and water pollution on the environment.

Content Standard No. 13
Investigate hurricanes and encourage proper hurricane preparedness.

Learning Outcomes
First Form

13.1 Explain the effects of daytime and nighttime temperatures on the formation of land and sea breezes.
13.2 List the conditions necessary and explain the formation of a hurricane.
13.3 Discuss the effects of hurricanes.
13.4 Explain the steps to take for hurricane preparedness.

Content Standard No. 14
Explain the importance of earthquake and volcano preparedness.

Learning Outcomes
First Form

14.1 Explain the steps that can be taken to ensure personal safety during an earthquake.
14.2 Describe a volcano.
14.3 Explain the effects of a volcanic eruption and the importance of being prepared for one.

Content Standard No. 15
Classify living organisms into kingdoms and further classify the animal kingdom into its respective sub-groups.

Learning Outcomes
First Form

15.1 Describe the characteristics of living organisms.
15.2 Identify organisms in the different kingdoms based on their characteristics.
15.3 Differentiate between vertebrates and invertebrates.
15.4 Illustrate the sub-groups of organisms under the vertebrate and invertebrate groups.
15.5 Cite examples of organisms belonging to the sub-groups of vertebrates and invertebrates.

Content Standard No. 16
Investigate reproduction in flowering plants.

Learning Outcomes
First Form

16.1 Differentiate between flowering and non-flowering plants.

16.2 Construct a labeled diagram of the flower.
16.3 Describe the structure and function(s) of the parts of the flower.
16.4 Define the terms: pollination, cross pollination, and self pollination.
16.5 Compare wind and insect pollinated flowers.
16.6 Explain briefly the process of fertilization and the formation of fruits and seeds.
16.7 Describe methods of seed and fruit dispersal.

Content Standards No. 17
Classify plants as monocotyledons and dicotyledons.

Learning Outcomes
First Form

17.1 Describe the characteristics of monocotyledon and dicotyledon plants.
17.2 Cite local examples of monocotyledon and dicotyledon plants.

Content Standard No. 18
Describe the importance of a balanced diet.

Learning Outcomes
First Form

18.1 List and discuss the components of a balanced diet.
18.2 Explain how a balanced diet can prevent nutrition-related diseases such as diarrhea, constipation, tooth decay, and deficiency diseases.

Content Standard No. 19
Describe the use of drugs and its abuse.

Learning Outcomes
First Form

19.1 Define a drug and drug abuse.
19.2 Differentiate between legal and illegal drugs.
19.3 Identify the major side effects of some commonly abused drugs.
19.4 Suggest and explain the socio-economic impact of drug abuse.

Content Standard No. 20
Describe the reproduction and its importance to the continuation of the human specie.

Learning Outcomes
Second Form

20.1 Define asexual and sexual reproduction.
20.2 Explain the importance of reproduction.
20.3 Describe the structures and functions of the male and female reproductive system in animals.
20.4 Explain the menstrual cycle.
20.5 Explain the process of fertilization and the stages of fetal development.
20.6 Explain the consequences of Sexually Transmitted Infections (STI) on the reproductive system.

Content Standard No. 21
Identify the forms of energy and explain the law of conservation of energy.

Learning Outcomes
First Form

21.1 Define energy.
21.2 List the forms of energy and give examples.
21.3 Identify potential and kinetic energy in different situations.
21.4 State and apply the Law of Conservation of Energy.

Content Standard No. 22
Calculate work and power.

Learning Outcomes
Second Form

22.1 Define mass and weight.
22.2 Solve problems of calculating work done.
22.3 Define power.
22.4 Solve problems of calculating power.

Content Standard No. 23
Explain how forces can be applied to do work.

Learning Outcomes
Second Form

23.1 Define force.
23.2 List types of forces
23.3 Describe the effects of forces.

Content Standard No. 24
Explain how machines work in making our lives easier.

Learning Outcomes
Second Form

24.1 Define machine.
24.2 List types of simple machines
24.3 List the three types of levers.
24.4 Differentiate among types of levers and give examples.

Content Standard No. 25
Explain the importance of floatation and density in understanding why certain objects float and others sink.

Learning Outcomes
Second Form

25.1 Define and determine volume
25.2 Define and determine density.
25.3 State and apply Archimedes's Principle.
25.4 Define buoyancy.
25.5 State the Law of Floatation.

Content Standard No. 26
Explain the effects of pressure on objects on Earth.

Learning Outcomes
Second Form

26.1 Define pressure.
26.2 Solve problems for the calculation of pressure.
26.3 Explain pressure change in different medium.

Content Standard No. 27
Explain the role of static and current electricity in the home and all around us.

Learning Outcomes
Second Form

27.1 Define static electricity.
27.2 Define current electricity.
27.3 Identify electrical components.
27.4 Match electrical components with their symbols.
27.5 Draw series and parallel circuits.