Sing Yin Secondary School
Syllabus for Integrated Science
September 2016 – July 2017

Form One

Objectives: Students should be able to

1. **develop curiosity and interest in science**
2. **develop the ability to inquire and solve problems**
3. **show an understanding of the use of apparatus and materials in performing experiments**
4. **handle materials, manipulate apparatus and carry out experiments safely**
5. **analyze and interpret data and draw relevant conclusions**
6. **recognize the usefulness and limitations of science and the interactions between science, technology and society and to develop an attitude of responsible citizenship, including respect for the environment and commitment to the wise use of resources**
7. **appreciate and understand the evolutionary nature of scientific knowledge**
8. **develop attitude in finding the truth and eagerness in thinking the pros and cons of various issues**

Textbook: **Interactive Science** **1A, 1B** **Longman**

Unit 1: Starting Science

1. Science, work of a scientist, scientific investigation

Period: 1 cycle

After the lessons, students should be able to
a. be aware of the meaning and scope of science
b. be aware the limitations of scientific knowledge
c. be aware of the work of scientists and realize some branches of science
d. realize the steps in investigation

2. Laboratory, laboratory safety

Period: 1 cycle

After the lessons, students should be able to
a. be aware that a laboratory is a suitable place for conducting scientific investigation
b. be aware of the dangers in laboratory
c. understand and follow laboratory safety rules

3. Bunsen burner, apparatus, measurement

Period: 2 cycles

After the lessons, students should be able to
a. describe the structure of Bunsen burner and do experiments with it
b. distinguish different kinds of Bunsen flames
c. Identify and properly handle some laboratory apparatus
d. realize the importance of observation and accuracy
e. acquire skills in measurements

4. Simple scientific investigation

Period: 2 cycles

After the lessons, students should be able to
a. realize the steps in investigation and the importance of fair tests
b. realize the importance of variables and controls
c. conduct simple scientific investigation

Unit 3: Cells and human reproduction

1. The basic unit of living things

Period: 1 cycle

After the lessons, students should be able to
a. state that the basic structural and functional unit of all living things is the cell
b. describe the structure of microscope and function of each part of microscope
c. use a microscope to observe small cells
d. distinguish between plant cells and animal cells

2. Reproduction, reproductive system, born of new life

Period: 3 cycles

After the lessons, students should be able to
a. realize the existence of asexual and sexual reproduction
b. distinguish male sex cells and female sex cells: sperm and egg
c. describe the reproductive systems in human
d. describe the process of fertilization and menstruation
e. describe how a new life is born

3. Puberty, birth control

Period: 2 cycles

After the lessons, students should be able to
a. describe the changes in boys and girls during puberty
b. describe problems associated with puberty
c. realize the use of various methods of family planning and birth control

Unit 4: Energy

1. Forms of energy, energy changes

Period: 1 cycle

After the lessons, students should be able to
a. state different forms of energy
b. realize the concept that energy is interchangeable

2. Study of fuels

Period: 1 cycle

After the lessons, students should be able to:
a. name some common fuels
b. realize how fossil fuels generate electricity and heat
c. realize the safety precautions in using fuels

3. Electrical energy and other energy sources

Period: 3 cycles

After the lessons, students should be able to
a. be aware of human's increasing need for energy
b. be aware of the need to conserve energy
c. state examples of alternative energy sources
d. describe how to generate electricity by various energy sources: solar, wind, HEP, nuclear energy, geothermal power, tidal power and so on

Unit 5: Water

1. The water cycle

Period: 2 cycles

After the lessons, students should be able to
a. recognize that water exists on earth in three physical states (ice, water and water vapour)
b. describe some processes of the change of state (e.g. melting, freezing and boiling)
c. understand the processes in the water cycle (evaporation and condensation)

Unit 6: Matter as particles

1. Matter, change of state

Period: 2 cycles

After the lessons, students should be able to
d. realize the state of matter: solid, liquid and gas
e. state the differences between states
f. realize the changes of different states

2. The particle theory

Period: 2 cycles

After the lessons, students should be able to
a. State the particle theory of matter
b. explain states of matters, change of states and diffusion by particle model

3. Gas pressure, density, thermal expansion and contraction

Period: 3 cycles

After the lessons, students should be able to
a. describe how gas pressure is produced
b. state the unit of pressure and the equipment to measure gas pressure
c. relate gas pressure to the motion of particles
d. be aware that less dense objects float on denser fluids
e. calculate density and state the unit of density
f. explain thermal expansion and contraction using particle model
g. appreciate the applications of thermal expansion and contraction

Total time allocation: 26 cycles

Signature of Teacher in Charge: _____

Checked by: _____

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Form Two

Objectives: Students should be able to

1. **develop curiosity and interest in science**
2. **develop the ability to inquire and solve problems**
3. **show an understanding of the use of apparatus and materials in performing experiments**
4. **handle materials, manipulate apparatus and carry out experiments safely**
5. **analyze and interpret data and draw relevant conclusions**
6. **recognize the usefulness and limitations of science and the interactions between science, technology and society and to develop an attitude of responsible citizenship, including respect for the environment and commitment to the wise use of resources**
7. **appreciate and understand the evolutionary nature of scientific knowledge**
8. **develop attitude in finding the truth and eagerness in thinking the pros and cons of various issues**

Textbook: **Interactive Science** **2A, 2B** **Longman**

Unit 7: Living things and air

1. Gases in air, oxygen, nitrogen and carbon dioxide

Period: 2 cycles

After the lessons, students should be able to
a. name the gases in air and state their uses in our daily life
b. carry out chemical tests for identification of oxygen, carbon dioxide and water vapour

2. Unbreathed and breathed air

Period: 1 cycle

After the lessons, students should be able to
a. compare the composition of unbreathed and breathed air
b. deduce that oxygen is consumed and carbon dioxide is released in the breathing process

3. Burning and respiration

Period: 2 cycles

After the lessons, students should be able to
a. realize that oxygen can help burning of food
b. describe the three components in fire triangle
c. realize the controlled release of energy from food in living organisms

4. Photosynthesis

Period: 2 cycles

After the lessons, students should be able to
a. realize the importance of photosynthesis in green plants
b. state that the light energy from the sun is the source of energy in food
c. carry out experiments to study conditions necessary for photosynthesis
d. realize the release of oxygen from plants during photosynthesis

5. Gaseous exchange and air pollution

Period: 1 cycle

After the lessons, students should be able to
a. describe structures and functions of breathing system
b. describe how our body and green plants gets oxygen and remove carbon dioxide
c. realize the balance of oxygen and carbon dioxide in nature

Unit 8: Making use of electricity

1. Making electricity flow

Period: 4 cycles

After the lessons, students should be able to
a. realize that current is a movement of charges: electrons
b. use circuit boards for studying electric current
c. distinguish conductor and insulator
d. measure current by ammeter; measure voltage by voltmeter
e. distinguish series and parallel circuits
f. draw circuit diagrams

2. Opposing the current

Period: 2 cycles

After the lessons, students should be able to
a. describe factors affecting resistance
b. describe the uses of variable resistor and its application

3. Heating effect and fuse, household electricity

Period: 1 cycle

After the lessons, students should be able to
a. realize the heating effect of current and the use of a fuse for an appliance
b. realize the existence of the mains voltage at home
c. describe and wire a fused plug
d. realize the existence of short circuit and its danger

Unit 9: Space travel

1. Force

Period: 2 cycles

After the lessons, students should be able to
a. state the meaning of force and its units ‘Newton’
b. state the effect of force: change direction and speed of motion
c. give examples of contact force and non-contact force

2. Weight and friction

Period: 2 cycles

After the lessons, students should be able to
a. describe the effect of gravity and how friction or air resistance is formed
b. realize the hindrance and importance of friction

3. Newton's laws of motion

Period: 2 cycle

After the lessons, students should be able to
a. realize the existence of action and reaction
b. give examples of action and reaction pairs

Unit 10: Common acids and alkalis

1. Acids, alkalis, indicators

Period: 2 cycles

After the lessons, students should be able to
a. state properties and examples of acids and alkalis
b. identify acids and alkalis by indicators
c. state the changes in colour in different indicators
d. realize the meaning of pH; realize different pH in different acids and alkalis

2. Neutralization and application

Period: 3 cycles

After the lessons, students should be able to
a. realize that acid can neutralize alkali and vice versa
b. state the change in pH in neutralization
c. describe the products in neutralization
d. state uses in neutralization and describe the application of acid, alkali.
e. describe the potential hazards related to acids.

Total time allocation: 26 cycles

Signature of Teacher in Charge: _____

Checked by: _____

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