

**Course syllabus (ประมวลรายวิชา)**

Subject Code	SCI 21101
Subject	SCIENCE1
Credit	1.5 units
Learning Standards	SCIENCE
Teacher	Ms.GenÇ Chonthicha
School	The Demonstration School of Suan Sunandha Rajabhat University (English Program: Secondary Section)
Semester	1 <sup>st</sup> Semester
Academic Year	2018 (B.E. 2561)
Educational Levels	Lower Secondary Education Level (Lower secondary education grades 1-3, also known as grades 7-9)
Grade Level	Grade 7 (Matthayom 1)
Curriculum	The Basic Education Core Curriculum 2017 (B.E. 2560) was announced by The Ministry of Education.
Learning Time	3 hrs/ week
Total Learning Time	60 hrs

**Learning Area of Science**

Science plays an important role in our present and future world communities, as it concerns all of us in our daily lives and livelihoods. Science also involves technologies, instruments, devices and various products at our disposal, which facilitate our life and work. All these benefit from our scientific knowledge, which is combined with creativity as well as other disciplines. Science enables us to develop our thinking skills in various respects—logical, creative, analytical and critical. It also enables us to acquire essential investigative skills for seeking knowledge, and allows the ability for systematic problem-solving, and for verifiable decision-making based on diverse data and evidences. Science is essential to the modern world, which is intrinsically a knowledge society. All of us therefore need to be provided with scientific knowledge so as to acquire knowledge and understanding of nature and man-made technologies that can be applied through logical, creative and moral approaches.

The learning area of science is aimed at enabling learners to learn this subject with emphasis on linking knowledge with processes, acquiring essential skills for investigation, building knowledge through investigative processes, seeking knowledge and solving various problems. Learners are allowed to participate in all stages of learning, with activities organized through diverse practical work suitable to their levels. The main content areas are prescribed as follows:

- **Living Things and Processes of Life:** living things; basic units of living things; structures and functions of various systems of living things and processes of life; biodiversity; genetic transmission; functioning of various systems of living things, evolution and diversity of living things and biotechnology
- **Life and the Environment:** diverse living things in the environment; relationship between living things and the environment; relationships among living things in the eco-system; importance of natural resources, and utilization and management of natural resources at local, national and global levels; factors affecting survival of living things in various environments

- **Substances and Properties of Substances:** properties of materials and substances; binding forces between particles; changes in the state of substances; solution formation and chemical reaction of substances, chemical equations and separation of substances

### Strand 1: Living and Family

**Standard Sc1.1:** Understanding basic units of living things; relationship between structures and functions of living things, which are interlinked; investigative process for seeking knowledge; ability to communicate acquired knowledge that could be applied to one's life and care for living things.

#### Grade level indicators

1. Observe and explain forms and characteristics of cells of unicellular and multicellular organisms.
2. Observe and compare essential components of plant and animal cells.
3. Experiment and explain functions of essential components of plant and animal cells.
4. Experiment and explain processes of passing substances through cells by diffusion and osmosis.
5. Experiment to find some factors essential for photosynthesis of plants, and explain that light, chlorophyll carbon dioxide and water are essential for photosynthesis.
6. Experiment and explain results obtained concerning photosynthesis by plants.
7. Explain importance of the photosynthesis process of plants on living things and the environment.
8. Experiment and explain groups of cells involved in transportation of water in plants.
9. Observe and explain structures of the systems for transportation of water and nutrients in plants.
10. Experiment and explain floral structures involved in plant reproduction.
11. Explain sexual reproduction processes of angiosperms and plant asexual reproduction processes by referring to various parts for propagation.
12. Experiment and explain responses of plants to light, water and touch.
13. Explain principles and effects of biotechnological application for propagation, improved breeding and increased productivity of plants, and apply acquired knowledge for useful purposes.

### Strand 3: Substances and Properties of Substances

**Standard Sc3.1:** Understanding of properties of substances; relationship between properties of substances and structures and binding forces between particles; investigative process for seeking knowledge and scientific mind; and communicating acquired knowledge for useful purposes

#### Grade level indicators

1. Experiment and classify substances into groups by using their texture or particle size as criteria and explain properties of each group of substances.
2. Explain properties and transition of substances by using particle arrangement models.
3. Experiment and explain acid-base properties of solutions.
4. Verify pH value of solutions, and apply the knowledge gained for useful purposes.

### Strand 3: Substances and Properties of Substances

**Standard Sc3.2 :** Understanding of principles and nature of change in the state of substances; solution formation; reaction; investigative process for seeking knowledge and scientific mind; and communication of acquired knowledge that could be applied for useful purposes.

#### Grade level indicators

1. Experiment and explain methods of preparing solutions with density in percentage, and discuss application of knowledge about solutions for useful purposes.

2. Experiment and explain change of properties, mass and energy of substances when they change state and dissolve.
3. Experiment and explain factors affecting changes in the state and dissolution of substances.

#### **Strand 8: Nature of Science and Technology**

**Standard Sc8.1: Application of scientific process and scientific mind in investigation for seeking knowledge and problem-solving; knowing that most natural phenomena assume definite patterns that are explainable and verifiable within limitations of data and instruments available during particular periods of time; and understanding that science, technology, society and the environment are interrelated<sup>1</sup>**

#### **Grade level indicators**

1. Pose questions prescribing the issues or important variables for exploration and verification or conduct comprehensive and reliable study and research on matters of their interest.
2. Make verifiable hypotheses and plan several methods for exploration and verification.
3. Select techniques and methods for quantitative and qualitative exploration and verification yielding accurate and safe results by using appropriate materials and equipment.
4. Collect data and process it quantitatively and qualitatively.
5. Analyse and evaluate conformity of eye-witnesses with the conclusions both supporting and contradicting the hypotheses and data abnormality from exploration and verification.
6. Create models or formats explaining or showing results of exploration and verification.
7. Pose questions leading to exploration and verification of relevant matters, and apply the knowledge gained in new situations or to explain the concepts, processes and results of the project or task for others to understand.
8. Make a record and explain results of additional observation, exploration, verification and research from various sources of knowledge in order to obtain reliable data, and accept changes in the knowledge discovered when presented with new and additional data, eye-witnesses or contradictory data.
9. Display their work, write reports and/or explain the concepts, processes and results of the project or task so that others can understand.

#### **Requirements**

##### ***Learners are expected to:***

- Complete all assignments.
- Participate and actively engage in discussions with fellow learners while contributing to the social construction of knowledge.
- Be self-directed and self-motivated.
- Ask for assistance when they need it.

##### ***Facilitators are expected to:***

- Provide feedback to all learners.
- Participate in discussions to keep them moving forward.
- Provide assistance to learners who need it.

#### **Course Activities**

Course activities may include:

- Do experiment in Laboratory
- Watching linear and interactive animations and simulations
- Completing hands-on and virtual activities
- Participating in threaded discussions with teachers and fellow students in a section, cohort, or group
- Completing self-check exercises

Graded assignments may include:

- Online or paper-based worksheets and practice sets
- Quizzes
- Exams (unit, semester and final)
- Threaded discussions
- Essays, research papers, and other writing assignments
- Presentation

#### Student Evaluation (60:40)

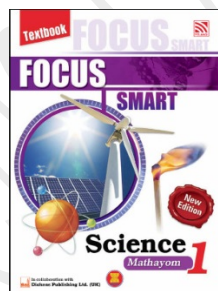
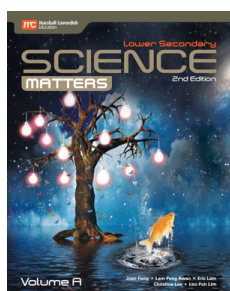
Unit tests and Quizzes	15%
Activities, labs and field investigations	10%
Lecture/ Workbook	15%
Class participation, class work and case study	10%
One project / oral presentation	10%
Midterm exam	20%
Final exam	20%

Grading Scale:

Grade	Percent
4	= 100-80 percent
3.5	= 79-75 percent
3	= 74-70 percent
2.5	= 69-65 percent
2	= 64-60 percent
1.5	= 59-55 percent
1	= 54-50 percent
0	= below 50 percent

#### Teacher Resources

Textbooks



Reference Textbooks

marshall cavendish science matters volume a

Focus Smart Science1

Earth Science

Base on IPST Science Curriculum

Lab Manuals



Videos/ Internet Sites/E-book online

<http://www.ipst.ac.th/FlipBook/Science/ScienceTextbook/ScienceMiddle1Textbook1/>

<http://www.ipst.ac.th/FlipBook/Science/ScienceTextbook/ScienceMiddle1Textbook2/#4>

<http://www.ipst.ac.th/FlipBook/Science/ScienceTextbook/ScienceMiddle2Textbook1/>

<https://www.youtube.com/user/ipstwebportal/featured>

[https://www.youtube.com/channel/UCsooa4yRKGN\\_zEE8iknghZA](https://www.youtube.com/channel/UCsooa4yRKGN_zEE8iknghZA)

### Long Term Planning

Week	Date	Scope and Sequence of Lesson	Note
1.		<ul style="list-style-type: none"> <li>Orientation</li> <li>Project ICT integrated with Library class (ICT Literacy)</li> </ul>	
2.		<ul style="list-style-type: none"> <li>Forms and characteristics of cells of unicellular and multicellular organisms.</li> <li>Functions of essential components of plant and animal cells. Experiment: functions of essential components of plant and animal cells.</li> </ul>	
3.		<ul style="list-style-type: none"> <li>Processes of passing substances through cells by diffusion and osmosis.</li> </ul>	
4.		<ul style="list-style-type: none"> <li>Factors essential for photosynthesis of plants, and explain that light, chlorophyll carbon dioxide and water are essential for photosynthesis.</li> </ul>	
5.		<ul style="list-style-type: none"> <li>Groups of cells involved in transportation of water in plants.</li> <li>Structures of the systems for transportation of water and nutrients in plants.</li> <li>Floral structures involved in plant reproduction.</li> </ul>	
6.		<ul style="list-style-type: none"> <li>Sexual reproduction processes of angiosperms and plant asexual reproduction processes by referring to various parts for propagation</li> </ul>	
7.		<ul style="list-style-type: none"> <li>Responses of plants to light , water and touch.</li> <li>Principles and effects of biotechnological application for propagation, improved breeding and increased productivity of plants, and apply acquired knowledge for useful purposes.</li> </ul>	
8.		Midterm Test	
9.		<ul style="list-style-type: none"> <li>. Sexual reproduction processes</li> <li>Double Fertilization</li> </ul>	
10		<ul style="list-style-type: none"> <li></li> </ul>	

Week	Date	Scope and Sequence of Lesson	Note
11		<ul style="list-style-type: none"> <li>Classification of substances into groups by using their texture or particle size as criteria</li> <li>Properties of each group of substances.</li> <li>Properties of substances by using particle arrangement models.</li> </ul>	
12		<ul style="list-style-type: none"> <li>Atomic structure</li> </ul>	
13		<ul style="list-style-type: none"> <li>Classification of matters</li> </ul>	
14		<ul style="list-style-type: none"> <li>Classification of matters</li> <li>Diversity of matters</li> </ul>	
15		<ul style="list-style-type: none"> <li>Application of knowledge about solutions for useful purposes.</li> </ul>	
16		<ul style="list-style-type: none"> <li>Change of properties, mass and energy of substances when they change state and dissolve.</li> <li>Factors affecting changes in the state and dissolution of substances.</li> </ul>	
17		Final Test	