



# Computing

# Science

Based on the Basic Education Curriculum B.E. 2551 (Revised Edition B.E. 2560)

# Lesson Plan



Primary  
Education  
Smart+  
Prathomsuksa

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# Chapter 1 Solving Simple Problems

**Duration:** 12 hours

**STAND 4:** Technology

**Standard:** Sc. 4.2

**Indicators:** P1/1 Students will be able to solve simple problems by using comparison and trial and error methods.

P1/2 Students will be able to demonstrate work procedures and simple problem-solving by using pictures, symbols or texts.

## **Introduction:**

In this chapter, students will solve some simple problems successfully by using problem-solving methods. The simple problems include maze games, photo hunting games and bag packing. They will demonstrate the problem-solving methods by writing, storytelling, drawing or using symbols.

## **Learning objectives:**

Students will be able to:

1. Solve simple problems successfully by using problem-solving methods.
2. Demonstrate problem-solving methods by writing, storytelling, drawing or using symbols.
3. Be responsible and work with friends in groups.

## **Key competencies:**

1. Thinking capacity
2. Problem-solving capacity
3. Capacity for applying life skills
4. Capacity for technological application

## **Concepts:**

- Trial and error, comparing, and listing down items are a few ways to solve some simple problems.
- Trial and error is the way of trying with option that has the best chance of success.
- When we compare two things, we may find similarities or differences they have. The similarities or differences may depend on the appearance or use.
- We can describe the problem we solve by writing and drawing
- We can use symbols to describe how certain problems are solved. Some symbol has special meaning.

## **Start up:**

1. Ask students some questions such as
  - Do you face any problems when you go to school?
  - Have you ever had any problems? (Ask some of them to give examples of their problems.)
  - How you solve the problems?
2. Tell students that in this chapter they will study about solving simple problems.

## Teaching/Learning activities:

### Part 1 What are problems?

1. Referring to the startup activity, ask students to give more examples of problems in their daily life. Teacher may assign groups of students with some daily activities such as having meals, getting dressed and planning a trip. Students need to think about the problems they have faced during those activities.
2. Ask students what are problems. Tell them that problems are the things that are difficult to deal with.

### Part 2 Solving simple problems

#### 2.1 Trial and error

1. Referring to the problems stated in Part 1, ask them how they overcome them. Ask them to give some examples of how they solved problems.
2. Tell students that there are many methods that we can use to solve simple problems.
3. Assign groups of students to play maze games. Ask them to explain how they solve the games.
4. Explain more of how the method of trial and error works.
5. Assign students to work on Hands-on Activities 1 to 5.
6. Encourage them to play other games online by scanning the QR code on page 12.
7. Ask them to conclude of the use of the trial and error method in solving problems.
8. Ask them more questions about this method such as
  - Should we give up if we did not succeed in the first attempt?
  - What are the advantages and disadvantages of this method?
  - Can we use the trial and error method if we face complex problems? Why or why not?

#### 2.2 Comparing

1. Show students some pictures of clothes. Ask students to choose the appropriate clothes for some activities such as going to a party, playing football, shopping and others.
2. Ask them to explain their choices.
3. Show students a picture of a bowl and a picture of a plate. Then, ask them to find the similarities or differences between the bowl and the plate.
4. Explain to them that when we are comparing two things, we are finding the similarities or differences between them. The similarities or differences may depend on their appearances or uses. Refer to pages 13 and 14.
5. Assign them to work on Hands-on Activities 6 and 7 on pages 15 and 18.
6. Ask them more questions about this method such as;
  - What are the advantages and disadvantages of this method?
  - Can we use the comparing method if we face complex problems? Why or why not?

### **2.3 Listing down items**

1. Ask students if they or their parents do any preparations before going shopping such as
  - Do their parents list down the items they want to buy?
  - Why do they list down before going out?
2. Referring to pages 19 to 21, explain how to solve simple problems by using the listing down method.
3. Ask them more questions:
  - What types of problems can we use this method to solve?
  - If you are preparing for a trip, how will the listing down method help you?
4. Guide them to read the More Info on page 21. Ask them if they do so.
5. Assign students to work on Hands-on Activity 8 on page 22.

## **Part 3 Describing how a problem is solved**

### **3.1 Describing verbally**

1. Assign each group of students to describe verbally how to go to the library from their classroom. Ask them if their descriptions are clear and easy to understand. Why or why not?
2. Referring to pages 23 to 26, explain to students that we can describe verbally how a problem is solved.
3. Explain further to make students understand better such as how to describe well so that others can understand easily.
4. Assign students to work on Hands-on Activity 9 on page 26.

### **3.2 Writing and drawing**

1. Let students to make a sandwich by follow the steps, then ask them that they success in making sandwich, why or why not.
2. Ask students to writing or drawing how to go to school library. Give their direction to another group to follow the steps. Ask them whether they succeed, why or why not.
3. Refer to page 27 – 28, explain them more understanding of writing and drawing.
4. Assign them to do Hands-on 10 on page 29.

### **3.3 Using symbols**

1. Explain how to use symbols to describe how certain problems are solved. Refer to pages 30 and 31.
2. Assign them to work on Hands-on Activities 11 and 12 on pages 32 and 33.

### **Closing:**

1. Revise and lead them to discuss what they have learnt. Refer to page 34.
2. Use these following questions to discuss:
  - How do we solve simple problems by using the trial and error, comparing, and listing down methods?
  - What are the advantages and disadvantages of using each method?
  - Ask them to give more examples of using each method in our daily life.

3. End the lesson by asking students to do the exercise on pages 34 and 36.

**Assessment:**

1. Assessing students’ cognitive behaviors based on Exercises on pages 34 to 36 (Learning objectives 1 and 2)
2. Assessing students’ affective behavior based on the Affective Domain Rubric Score (Learning objective 3)

**Affective Domain Rubric Score**

| <b>Behavior</b>       | <b>No judgement can be made<br/>0</b> | <b>Need improvement<br/>1</b>   | <b>Partially proficient<br/>2</b>   | <b>Proficient<br/>3</b>   | <b>Advanced<br/>4</b>  |
|-----------------------|---------------------------------------|---|---|---|--|
| <b>Responsibility</b> | No judgment can be made.              | Always relies on others to complete assignments.  | Rarely does work, needs constant reminders to focus on assignments.   | Usually does work, seldom needs reminders to focus on assignments.  | Always does work without being reminded.   |
| <b>Teamwork</b>       | No judgment can be made.              | Joins a group cooperatively. Listens attentively to members of the group. Contribute to the end product of the group. | Gives inputs and/or recommendations confidently. Respects different points of view. Agrees on group priorities, goals and procedures. | Completes assignments in a timely fashion. Helps to build a consensus. Takes an active position in group by speaking for the group. Takes responsibilities for end product with others. | Takes an active position in group by assigning tasks and/or speaking for the group. Takes responsibilities for end product that reflects the minority as well as the majority conclusions of the group. Encourages and acknowledges the work of other group members. |

## Chapter 2 Computer Programming

**Duration:** 10 hours

**STAND 4:** Technology

**Standard:** Sc. 4.2

**Indicators:** P1/3 Students will be able to write a simple computer program by using computer software or multimedia.

### **Introduction:**

In this chapter, students will write a simple computer program by using computer software or multimedia. Students will write the programs in order to move, enlarge or shrink the characters or to change their forms. Students will do simple coding activities which some are unplugged and some are plugged activities.

### **Learning objectives:**

Students will be able to:

1. Follow instructions to solve simple problems.
2. Give instructions in words and symbols for solving simple problems.
3. Write a simple computer program by using computer software or multimedia.
4. Pay attention and work responsibly.

### **Key competencies:**

1. Communication capacity
2. Thinking capacity
3. Capacity for technological application

### **Concepts:**

- Computer programming is the setting up of an order of instructions for computer operations.
- Some examples of the programs are the writing of instructions to move characters or to shrink, enlarge or change their forms.
- The software or media used in computer programming includes flashcard demonstrating computer programming, Code.org and others.

### **Start up:**

1. Ask students some questions such as
  - Have you ever helped your mom cooking some special foods?
  - Do we need to follow the steps in stated in a cookbook?
2. Tell students that in this chapter they will study about coding.

## Teaching/Learning activities:

### Part 1 Giving instructions

1. Let students prepare some egg mayonnaise sandwiches. Explain how to prepare them. Refer to pages 37 and 38. They can also watch a video of egg mayonnaise sandwich making by scanning the QR code on page 37.
2. When they have done, ask students some questions such as
  - Do you need to follow the steps closely?
  - Are the instructions clear and easy to understand?
  - What will happen if we do not follow the steps closely?
3. Assign students to work on Hands-on Activity 1 on page 38. Then, ask students whether the instructions are clear and easy to understand.
4. Assign students to work on Hands-on Activity 2 on page 39. Then, ask them these questions.
  - Is your answer the same as your friend? Why or why not?
  - Is it possible to have different answers? Why or why not?
5. Explain that we can use symbols for instructions instead of words. Refer to page 40.
6. Guide them to answer the question in Figure It Out on page 40.
7. Assign them to work on Hands-on Activity 3 on page 41.
8. Discuss and explain more about using symbols instead of words as instructions. After that, assign them to work on Hands-on Activity 4 on page 43.
9. Encourage students to play games online by scanning the QR code on page 43.

### Part 2 Simple coding

1. Explain what computer programming is. Refer to page 44.
2. Guide them to read and understand the extra information in More Info on page 44.
3. Assign students to watch the video by scanning the QR code on page 44 to understand more about coding. When they have finished watching the video, guide them to discuss and conclude what they know about coding
4. Introduce Minecraft Hour of Code to students. Explain to them that we will be using this software to learn coding.
5. Explain the components of the screen, how to write and read codes (giving the instructions) in this software. Refer to pages 44 to 48.
6. You may let them play or familiarize themselves with the new software. Assign them to work in pairs with one student sets the problem another solves the problem.
7. Ask them to use the symbols learned in Chapter 1 to create some instructions so that they will understand the connection between coding and giving instruction in words.

### **Closing:**

1. Revise and lead them to discuss what they have learnt. Refer to page 49.
2. End the lesson by asking students to do the exercise on pages 49 and 50.

**Assessment:**

1. Assessing students’ cognitive behaviors based on Exercises on pages 49 and 40 (Learning objectives 1 to 3)
2. Assessing students’ affective behavior based on the Affective Domain Rubric Score (Learning objective 4)

**Affective Domain Rubric Score**

| <b>Behavior</b>                     | <b>No judgement can be made.<br/>0</b> | <b>Need improvement<br/>1</b>   | <b>Partially proficient<br/>2</b>  | <b>Proficient<br/>3</b>   | <b>Advanced<br/>4</b>   |
|-------------------------------------|--|---|--|---|---|
| <b>Attention and responsibility</b> | No judgment can be made.               | Always relies on others to complete assignments. Needs more instructions or needs to be repeated some instructions. | Rarely does work. Pays attention in class sometimes. Needs constant reminders to focus on assignments. | Usually does the work. Pays attention in class. Seldom needs reminders to focus on assignments. | Always does work without being reminded. Pays attention and focuses on assignments. |

## Chapter 3      Computers

**Duration:** 10 hours

**STAND 4:** Technology

**Standard:** Sc. 4.2

**Indicator:** P1/4      Students will be able to use technology to create, store and retrieve data according to their purposes.

### **Introduction:**

In this chapter, students will understand computers as a tool for working with data. They will practice to create, store and retrieve data. They will use hardware such as the mouse, keyboard and monitor. They will learn how to turn on and off the electronic devices. In addition, they will learn how to access and exit programs, create new files, save and open existing files which are done in Word Document program, graphic design program and presentation program.

### **Learning objectives:**

Students will be able to:

1. Turn on, turn off, create, store and retrieve data according to their purposes.
2. Name and use the computer hardware such as the mouse, keyboard, monitor.
3. Turn on and off electronic devices.
4. Use of computer software.
5. Pay attention and work responsibly.

### **Key competencies:**

1. Communication capacity
2. Capacity for technological application

### **Concepts:**

Computers are a device that processes data. They are very useful. There are many types of computers. Computers have many parts. Each part has its own functions.

### **Start up:**

1. Show students pictures of computers. Then, ask students that they have ever seen these computers. If yes, where or when?
2. You may show the video of evolution of computer from this link [https://www.youtube.com/watch?v=t\\_aXUGkobQQ](https://www.youtube.com/watch?v=t_aXUGkobQQ) . Then, discuss with students by posing these questions.
  - What is a computer?
  - Where are computers used?
  - Have you ever used a computer?

## Teaching/Learning activities:

### **Part 1 Types of computers**

1. Show students the types of computers. You may use a video from this link [https://www.youtube.com/watch?v=RQ98\\_ksHwgY](https://www.youtube.com/watch?v=RQ98_ksHwgY). Then, discuss the types of computers students have used or seen before.
2. Referring to page 51, explain to students that computers are a device that processes data.

### **Part 2 Uses of computers**

1. Based on the previous activity, ask students the activities we can do with computers. You may assign each group to think as many as possible the uses of computers. Then, ask each group to present their ideas.
2. Lead them to discuss about the uses of computers and conclude that computers are very useful. Computers allow us to do many things easily in our daily life. Refer to page 52.

### **Part 3 Where computers are used**

1. Based on the previous activity whereby students presented their ideas about the uses of computers, ask students where computers are used. Allow each group to think and connect their previous answers with this question. Then, let them present their ideas.
2. Lead students to discuss where computers are used and then to conclude that computers are used in many places. Refer to page 53.

### **Part 4 Parts of a computer**

1. Lead students to the computer lab in the school. Then, ask them to observe the parts of the computer at each station.
2. Lead students to discuss and conclude that a computer has many parts. Each part has different functions. Refer to page 54.
3. Encourage them to watch the video to learn more about the functions of the computer parts by scanning the QR code on page 54.
4. You may ask students to compare the parts of a desktop computer, a laptop computer and a tablet computer. Are they the same? Which parts are different?

### **Part 5 How to operate a computer**

Tell students that we have to know how to operate a computer so that we can use it properly and effectively.

#### **5.1 Turning on a computer**

1. Point to the symbol of power on the computer. Show students step by step how we turn on the computer. Refer to page 55.
2. If it is possible to have students in the computer lab, allow students to practice turning on the computer.
3. Ask students to think about their safety when they are using computers as computers are electrical devices.

## 5.2 Opening a file

1. Show students what files are and where they can be found on the computers. Demonstrate how to open files. Refer to pages 56 and 57.
2. You may let them understand that different versions of programs have different settings or displays.
3. Let students practice how to open files.

## 5.3 Saving a file

1. Ask a student to open a specific file and make some changes to it. Ask students what we can do if we want to have the changes kept by the computer. Guide them to understand why we need to save a file after some changes are done in it.
2. Demonstrate how to save files. Refer to pages 57 and 58.
3. Guide them to differentiate between Save and Save As.
4. Let students to practice how to save files.
5. Encourage students to answer the question in Figure It out on page 58.

## 5.4 Retrieving a file

1. Get students to practice all of operations learned from the previous classes.
2. Demonstrate how to retrieve files. Refer to pages 59 and 60.
3. Let students practice how to retrieve files.

## 5.5 Shutting down a computer

1. Ask students in generally what we should do when we finish using an electrical equipment.
2. Explain and demonstrate how to shut down a computer. Refer to pages 60 and 61.
3. Let them practice shutting down a computer.
4. Ask students to think for the reasons for shutting down the computer when we have finished using it.
5. Assign students to work on Hands-on Activity 1 on page 61.

## Closing:

1. Review and conclude all lessons on how to operate computers.
2. Lead students to conclude that there are many types of computers. They are very useful. Each part of computers has its own functions. We should know the proper way to use a computer. Refer to page 62.
3. You may assign each group of students to conclude what they have learnt in each topic and then let them present or show how to do.
4. End the lesson by asking students to do the exercise on pages 62 and 63.

### Assessment:

1. Assessing students' cognitive behavior based on Exercises on pages 62 and 63 (Learning objectives 1 to 3)
2. Assessing students' affective behavior based on the Affective Domain Rubric Score (Learning objective 4)

#### Affective Domain Rubric Score

| Behavior       | No judgement can be made<br>0 | Need improvement<br>1                             | Partially proficient<br>2   | Proficient<br>3  | Advanced<br>4                                  |
|----------------|-------------------------------|---|---|--|--|
| Attention      | No attention at all.          | Sometimes refuses to pay attention during lesson. | Pays attention only when required to do so.                         | Pays attention when asked or cued.                                     | Pays attention without being asked.            |
| Responsibility | No judgment can be made.      | Always relies on others to complete assignments.  | Rarely does work. Needs constant reminders to focus on assignments. | Usually does the work. Seldom needs reminders to focus on assignments. | Always does assignment without being reminded. |

3. Assessing students' computer skills based on the Computer Skills Rubric Score (Learning objectives 1 to 4)

#### Computer Skills Rubric Score

| Computer skill   | No judgement can be made<br>0   | Need improvement<br>1  | Partially proficient<br>2  | Proficient<br>3   | Advanced<br>4   |
|--|---|--|--|---|---|
| Turning on and off the computer, creating, storing and retrieving data | Cannot turn on and off the computer and create, store and retrieve data.  | Always needs suggestions to turn on/off the computer and create, store and retrieve files. | Sometimes needs suggestions to turn on/off the computer, and create, store and retrieve files. | Demonstrates the ability to turn on/off the computer but cannot create, store and retrieve files. | Demonstrates the ability to turn on/off, the computer. Efficiently creates, stores and retrieves files by own self. |
| Using computer hardware such as the mouse, keyboard, monitor           | Cannot use the computer hardware such as the mouse, keyboard and monitor. | Always needs suggestions to use the mouse, keyboard and monitor.                           | Sometimes needs suggestions to use the mouse, keyboard and monitor.                            | Uses the mouse, keyboard and monitor fairly by own self.  | Demonstrates the ability to use the mouse, keyboard and monitor efficiently by own self.                            |

**Additional resources:**

- How do computer work? - [https://www.youtube.com/watch?v=P2Fc0Aj\\_u58](https://www.youtube.com/watch?v=P2Fc0Aj_u58)
- What are Computers for Kids | Intro to Computers | Programming for Kids - <https://www.youtube.com/watch?v=RmbFJq2jADY>
- Uses of Computer - <https://www.youtube.com/watch?v=-UrZjOIQXGI>
- History and Generations of Computer - <https://www.youtube.com/watch?v=t4QJFKmgvc>
- Computers - <https://www.youtube.com/watch?v=2CgK3FWM-4w>
- Working and Types of Computers - [https://www.youtube.com/watch?v=uFfpFct\\_j9o](https://www.youtube.com/watch?v=uFfpFct_j9o)

## Chapter 4 Proper Use of Computers

**Duration:** 8 hours

**STAND 4:** Technology

**Standard:** Sc. 4.2

**Indicator:** P1/5 Students will be able to use information technology safely and comply with the practices when sharing computers with others, basic device maintenance and proper use of computers.

### **Introduction:**

In this chapter, students will understand how to use the internet safely. Students will also know how to take care of the computers. Learning by practicing will enable students to use computers effectively.

### **Learning objectives:**

Students will be able to:

1. Describe and demonstrate how to take care of computer.
2. Describe and demonstrate healthy computer habits.
3. Describe how to use the Internet safety.
4. Pay attention, be responsible and work with friends in groups.

### **Key competencies:**

1. Communication capacity
2. Capacity for applying life skills
3. Capacity for technological application

### **Concepts:**

- We must take care of computers.
- We must practice healthy computer habits.
- We must use keep ourselves safe when using the Internet.

### **Start up:**

1. Ask students some questions such as
  - Do you have your own computer or are you sharing the computer with your parents?
  - Do you think we should take care of the computer? Why or why not?
  - How do you or your parents take care of the computer?
2. Tell students that in this chapter they will learn how to take care of computers and use the Internet safely.

## Teaching/Learning activities:

### **Part 1 Taking care of computers**

1. Explain and demonstrate how to take care of computers. Refer to pages 64 and 65.
2. Guide them to answer the question in Figure It Out on page 64.
3. Ask students to describe how to take care their own computers at home and in school.
4. Let students to watch the video to know more about computer care by scanning the QR code on page 65. You may assign students to watch the video at home as homework and then discuss in classroom in next day.
5. Assign students in groups to create a poster on how to take care of computers.

### **Part 2 Healthy computer habits**

1. Ask students these questions in order to assess their prior computer habits:
  - How do you sit while you are using the computer? Show me.
  - What will happen if our sitting posture is incorrect in long term?
  - Should we take any breaks to go to the toilets or to drink water when you are using the computers? Why?
2. Demonstrate the right siting posture. Refer to page 66.
3. Assign each pair of students to check their partner siting posture.
4. Assign students to think about what they should do if we have to work on the computer for a long period. Lead them to present and discuss some activities they can do when they have to work on computer for a long period.
5. Let students watch the video to know more the right things to do when we are using computer by scanning the QR code on page 67.

### **Part 3 Internet**

#### **Uses of the Internet**

1. Ask students these questions:
  - Have you used the Internet before? What devices did you use?
  - Do you know what the Internet is?
2. Explain to students that the Internet is a very large computer network that connects millions of computers in the world. Refer to page 69.
3. Lead students to discuss how we use the Internet. Refer to pages 69 to 70.

#### **Internet safety**

1. Ask students these questions:
  - Have you seen your family buying things on the Internet?
  - Have you seen your family communicating with someone on the Internet?
  - Can we trust everyone who contact us through the Internet? Why or why not?
2. Assign each group of students to discuss how to use the Internet safety.
3. Lead the class to discuss and conclude that when we are using the Internet, we must be extra cautions.

**Closing:**

1. Revise and lead students to discuss what they have learnt. Refer to page 72.
2. Use these following questions to discuss:
  - How do we ensure our computers work properly?
  - How should we sit while we are using the computer especially for a long period of time?
  - Name some activities that we can do when we are taking breaks while on the computer for a long period of time.
  - Why should we keep ourselves safe while we are using the Internet?
  - What type of data that we should keep secret when we are using the Internet?
3. End the lesson by asking students to do the exercise on pages 73 and 74.

**Assessment:**

1. Assessing students' cognitive behavior based on Exercises on pages 73 and-74 (Learning objectives 1 to 3)
2. Assessing students' affective behavior based on the Affective Domain Rubric Score (Learning objective 4)

**Affective Domain Rubric Score**

| Behavior                            | No judgement can be made<br><b>0</b> | Need improvement<br><b>1</b>   | Partially proficient<br><b>2</b>  | Proficient<br><b>3</b>  | Advanced<br><b>4</b>  |
|-------------------------------------|--------------------------------------|--|---|---|---|
| <b>Attention and responsibility</b> | No judgment can be made.             | Always relies on others to complete assignments.<br>Needs more instructions or repeated instructions.                        | Rarely does work.<br>Pays attention in class sometimes.<br>Needs constant reminders to stay on task.  | Usually does the work. Pays attention in class. Seldom needs reminders to stay on task.   | Always does assignments without being reminded. Pays attention and stay on task.  |
| <b>Teamwork</b>                     | No judgment can be made.             | Joins a group cooperatively.<br>Listens attentively to members of the group.<br>Contributes to the end product of the group. | Gives inputs and/or recommendations confidently.<br>Respects different points of view.<br>Agrees on group priorities, goals and procedures. | Completes assignment in a timely fashion.<br>Helps to build a consensus.<br>Takes an active position in group by speaking for the group. Takes responsibility for end product with other. | Takes an active position in group by assigning tasks and/or speaking for the group. Takes responsibility for end product that reflects the minority as well as the majority conclusions of the group.<br>Encourages and acknowledges the work of other group members. |

3. Assessing students' ability to practice (Learning objectives 1 and 2)

**Ability to Practice Rubric Score**

| <b>Ability</b>                            | <b>No judgement can be made<br/>0</b> | <b>Need improvement<br/>1</b>   | <b>Partially proficient<br/>2</b>  | <b>Proficient<br/>3</b>                                | <b>Advanced<br/>4</b>   |
|---|---------------------------------------|---|--|--|---|
| <b>Taking care of computers</b>           | No judgment can be made.              | Needs assistance to demonstrate how to take care of computers.        | Sometimes needs assistance to demonstrate how to take care of computers. | Demonstrates how to take care of computers.            | Shows a good example of taking care of computers.                   |
| <b>Practicing healthy computer habits</b> | No judgment can be made.              | Always is warned about poor sitting posture while using the computer. | Sometimes is warned about poor sitting posture while using the computer. | Shows the right sitting posture while using computers. | Shows a good example of good sitting posture while using computers. |