

LEARNING STRAND 2 SCIENTIFIC AND CRITICAL THINKING SKILLS

SESSION GUIDES FOR MODULE 4:
HOW CAN WE HELP LIFE ON LAND?

ALS Accreditation and Equivalency Program: Junior High School



SESSION GUIDES

Alternative Learning System - Accreditation and Equivalency (ALS-A&E)

JUNIOR HIGH SCHOOL: SCIENTIFIC AND CRITICAL THINKING SKILLS
SESSION GUIDES FOR MODULE 4 (HOW CAN WE HELP LIFE ON LAND?)

ALS Accreditation and Equivalency Program: Junior High School
Learning Strand 2: Scientific and Critical Thinking Skills
Session Guides for Module 4 (How Can We Help Life on Land?)

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User's Guide

For the ALS Teacher/Instructional Managers/Learning Facilitator:

Welcome to the Session Guides of this Module entitled How Can We Help Life on Land? under Learning Strand 2 Scientific and Critical Thinking Skills of the ALS K to 12 Basic Education Curriculum (BEC).

This module was collaboratively designed, developed, and reviewed by select DepEd field officials and teachers from formal school and ALS, and private institutions to assist in helping the ALS learners meet the standards set by the ALS K to 12 Basic Education Curriculum (BEC) while overcoming their personal, social, and economic constraints in attending ALS learning interventions.

This learning resource hopes to engage the learners in guided and independent learning activities at their own pace and time. Furthermore, this also aims to help learners acquire the needed 21st century skills while taking into consideration their needs and circumstances.

As an ALS Teacher/Instructional Manager/Learning Facilitator, you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their learning. Moreover, you are expected to encourage and assist the learners as they do the tasks included in the module.

HOW CAN WE HELP LIFE ON LAND? Session Guide No. 1

I. Objectives

1. Enumerate the strategies and guidelines in crop rotation (LS2SC-BC-PSD-LE/AE/JHS-67, LS1CS/EN-R-PSD-LE/JHS-19);
2. Describe the procedures in crop rotation (LS2SC-BC-PSD-LE/AE/JHS-67, LS1CS/EN-R-PSD-LE/JHS-19); and
3. Explain the importance of crop rotation (LS2SC-BC-PSD-LE/AE/JHS-62).

II. Subject

- A. **Lesson 1:** How Can I Plant Safely and Wisely?
- B. **Materials:** Short bond paper, ballpen/pencil, calculator

III. Procedure

1. Pre-Assessment

Let the learners answer the pre-assessment on pages 2 – 4.

2. Introductory Activity

Before starting the session, ask the learners to read *Let's Get to Know* on page 1 of the module. This will serve as a springboard to learn about planting crops and measuring land area.

3. Activity

- a. Let the learners do the activity on page 6, *Trying This Out*. Using a clean sheet of paper, ask the learners to write their regular day-to-day schedule.
- b. Let the learners answer the questions given in the activity.
 - Why is it important to have time for breakfast, lunch, and dinner?
 - What do you think will happen if you did not have time to sleep?
 - Why is it important to spend time with friends and play games?

- c. Relate to the learners the importance of keeping a schedule of everyday activities that will help a person to stay healthy.
- d. Let the learners read Lesson 1 *Understanding What You Did* to learn the importance of crop rotation to differentiate nitrogen fixers (crops that add nitrogen to soil) from nitrogen users (crops that consume nitrogen from soil).
- e. Guide the learners in computing for the total nitrogen content of the soil for each field (continuously adding values depending on the given crop, see answer key).
- f. Explain to the learners the differences among low, medium and high-level soil fields based on nitrogen content.

4. Analysis

- a. Initiate a discussion by asking the following questions:
 - What is crop rotation?
 - Why is it important to learn about the vegetable families?
 - Why is crop rotation so important?
 - Enumerate the different strategies and guidelines in crop rotation.
- b. Explain to the learners that:
 - The quality (fertility) of a field depends on the crops placed on a particular area;
 - A field with a strong nitrogen-fixing crop does not automatically mean that it is a fertile field;
 - A field with a heavy nitrogen-using crop does not automatically mean that it is an unhealthy field; and
 - A field that is more fertile will produce healthier crops while a field that is less fertile will produce less healthy crops.

5. Abstraction/ Generalization

Ask the learners to answer the following questions:

- a. What is crop rotation and why is it important?
- b. How do you do crop rotation?

6. Application

- a. Ask the learners to do the learning module's *Sharpening Your Skills* Test I and Test II on page 12 and 14. Have them do it on a separate sheet of paper.
- b. After doing the activity, let the learners answer the following questions:
 - Which of the two fields is more fertile?
 - Why is crop rotation a good practice?
 - How can Lolo Gino improve his crops for Year 2? Why?

IV. Evaluation

Let the learners answer the questions given in *Treading the Road to Mastery* on page 15.

HOW CAN WE HELP LIFE ON LAND? Session Guide No. 2

I. Objectives

1. Enumerate the strategies and guidelines in contour farming (LS2SC-BC-PSD-LE/AE/JHS-67, LS1CS/EN-R-PSD-LE/JHS-19);
2. Describe the procedure in contour farming (LS2SC-BC-PSD-LE/AE/JHS-67, LS1CS/EN-R-PSD-LE/JHS-19); and
3. Explain the importance of contour farming (LS2SC-BC-PSD-LE/AE/JHS-62).

II. Subject

- A. **Lesson 2:** How Does Water Affect Soil?
- B. **Materials:** Short bond paper, ballpen/pencil

III. Procedure

1. Activity

- a. Ask the learners to do the activity in *Trying This Out* on page 17 and let them answer the following questions:
 - If you are driving at a speed of 30 kilometers per hour, will you be able to drive faster once you reach Road A?
 - If you are also driving at a speed of 30 kilometers per hour, will you be able to drive faster once you reach Road B?
 - How do road bumps affect the speed of your car when driving?
- b. After doing the activity let the learners realize the following:
 - Road bumps are important in driving;
 - A smooth road allows the driver to move faster because there is no obstruction to slow down the car;
 - A bump on the road suggests that the the driver should slow down while driving; and
 - A road with multiple bumps will cause the driver to move slower than the original speed.
- c. Let the learners read Lesson 2 *Understanding What You Did* for them to learn the importance of contour farming.
- d. Instruct the learners to determine the accuracy/correctness of

- the statement based on what they learned from the lesson; and
- e. Guide the learners in analyzing the statements and how a word or a set of words can make a statement incorrect.

2. Analysis

- a. Initiate a discussion by asking the following questions:
 - What is contour farming?
 - Why is contour farming so important?
 - Enumerate the different strategies and guidelines in contour farming.
- b. Explain to the learners that:
 - Contour farming involves the influence of the direction of farming along a slope of land on soil quality;
 - When the direction of farming is against the slope of land, it can improve soil quality by allowing more water to be absorbed by the soil; and
 - When the direction of farming is following the slope of land, soil quality can decrease because water is destroying the structure of land.
- c. Explain to the learners that:
 - Contour farming requires a series of steps to make sure that a field/land can be used for farming; and
 - Remembering the general (major) steps in contour farming will allow easier recall of specific (minor) steps.

3. Abstraction/ Generalization

Ask the learners to answer the following questions:

- What is contour farming and why is it important?
- How do you do contour farming?

4. Application

Ask the learners to do the *Sharpening Your Skills* Test I and Test II on page 20 and 25. Have them do it on a separate sheet of paper.

For *Sharpening Your Skills* (First Formative Assessment)

- a. Instruct the learners to determine the accuracy/correctness of the statement based on what they learned from the lesson; and
- b. Guide the learners in analyzing the statements and how a word or a set of words can make a statement incorrect.

For *Sharpening Your Skills* (Second Formative Assessment)

- a. Help learners to highlight keywords for each general (major) step in contour farming (e.g. A-frame for step 1, seeds for step 4, crop rotation for step 9, etc.); and
- b. Guide the learners in imagining each procedure (its illustrations mostly) and determine the correct sequence in contour farming.

IV. Evaluation

Let the learners answer the questions given in *Treading the Road to Mastery* on page 26.

HOW CAN WE HELP LIFE ON LAND? Session Guide No. 3

I. Objective

1. Relate geometric ideas to number and measurement ideas, including the concepts of a perimeter and area, by computing the parameter of a given piece of land (LS3MP-G-PSC-AE-5).

II. Subject

- A. **Lesson 3:** How Do I Measure My Soil/Land?
- B. **Materials:** Short bond paper, ballpen/pencil, calculator

III. Procedure

1. Introductory Activity

Ask the learners to do the activity in *Trying This Out* and let them answer the questions:

- How much money would you earn if you used only blue paint?
- How high (in feet) were you able to paint if you got 750 pesos?
- How will you be able to earn the highest income from painting the wall of your neighbor?

2. Activity

- a. Let the learners read Lesson 3 *Understanding What You Did* to learn on how to relate geometric ideas to number and measurement ideas, including the concepts of a perimeter and area, by computing the parameter of a given piece of land;
- b. Guide the learners in solving for the values of x and y ;
- c. Show that side x is the sum of the vertical distances on the opposite side;
- d. Show that side y is a part of the total distance of the opposite side.
- e. Inform the learners that perimeter can be expressed in different units of length such as meters, inches, feet, kilometers, etc.; and
- f. Guide the learners in solving for the total payment for the job which is the product of the perimeter and rate per meter (20 pesos per meter).

3. Analysis

- a. Using the learners' module, instruct the learners to present the key concepts on how to compute for the length of the missing sides of a shape before solving for its perimeter.
- b. Initiate a discussion by asking the following:
 - How can we obtain the value of x ?
The value of x can be obtained by getting the sum of all the vertical distances on the opposite side.
 - How can we obtain the value of y ?
The value of y can be obtained by getting the difference of the total distance on the opposite side and the horizontal distances of the side adjacent to side y .
 - What will happen if the perimeter of the shape increases? What will happen to the total money earned?
 - As the perimeter of the shape increases, the total money earned also increases; and
 - As the perimeter of the shape decreases, the total money earned also decreases.
 - Why is it important to compute for the length of the missing sides of the shape before solving its perimeter?
It is important to compute for the length of the missing sides of the shape before solving its perimeter because the perimeter of a shape is the total distance around (outside) a shape. We can calculate the perimeter of a shape by adding up the lengths of each of the sides.
 - What will happen if the area of the shape increases? What will happen to the total money earned?
 - As the area of the shape increases, the total money earned also increases; and
 - As the area of the shape decreases, the total money earned also decreases.

4. Abstraction/Generalization

- a. Ask the learners to answer the following questions:
 - How do we compute for perimeter? Area?
 - What is the importance of perimeter? Area? in real life?
- b. Explain to the learners that:
 - Any object that has a definite shape (including land) has a perimeter;
 - The perimeter of a piece of land can be used as reference in payment schemes and other applications (fencing, painting, surveying);
 - Area refers to the amount of space that a shape occupies;
 - Perimeter is measured along the edges of the shape while area is measured within the shape;
 - The area of a piece of land can be used as reference in payment schemes and other application (tiling jobs, volume measurements, interior designing); and
 - There can be more than one solution in finding the area of a shape and still get the same value.

5. Application

Ask the learners to do the *Sharpening Your Skills* Test I and Test II on page 33 and 36. Have them do it on a separate sheet of paper.

For *Treading the Road to Mastery* (Summative Assessment)

- a. Guide the learners in applying concepts from the formative assessments in coming up with the correct answer for the assessment; and
- b. Explain to the learners that they should:
 - Compute for the sides with missing values/measurements;
 - Identify that the unit being used in measurements is meters;
 - Compute for the perimeter of the land;
 - Compute for the total money earned in wall construction based on the given rate of 4,000 pesos per meter;

- Compute for the change after payment for wall construction by getting the difference of the initial payment to the total cost;
- Divide the shape into five parts by drawing four vertical lines and recognize that two parts from the opposite sides have the same measurements;
- (Optional) also suggest other ways to divide the shape;
- Compute for the area of the separate parts;
- Compute for the total area of the shape by getting the sum of the areas of the separate parts;
- Compute for the cost of land digging based on the given rate of 5,000 per square meter; and
- Compute for the change after payment for land digging by getting the difference of the initial payment to the total cost.

IV. Evaluation

Let the learners answer the questions given in *Treading the Road to Mastery* on page 37.

PRE-ASSESSMENT

PAGE 2

- | | |
|-------|-------|
| 1. A | 11. C |
| 2. B | 12. D |
| 3. C | 13. A |
| 4. D | 14. B |
| 5. A | 15. C |
| 6. B | |
| 7. C | |
| 8. D | |
| 9. A | |
| 10. B | |

LESSON I: HOW CAN I PLANT SAFELY AND WISELY?

SHARPENING YOUR SKILLS

PAGE 11

ACTIVITY I

- Field A = 35 (medium level soil) – 50 (corn) – 20 (oats) + 40 (soybean) – 10 (peppers) = (-) 5 nitrogen units
- Field B = 35 (medium level soil) + 25 (pinto bean) – 35 (sunflowers) – 40 (wheat) – 15 (pumpkins) = (-) 30 nitrogen units
- Field A is more fertile than Field B by (-) 25 nitrogen units. Although both fields have negative values, Field A can easily regain nitrogen in its soil than Field B.

ACTIVITY II

YEAR 2	
Mung Bean	Ornamental corn
Sweet corn	Soybean

TREADING THE ROAD TO MASTERY

Field B will produce better crops and healthier soil in year 1. Because of the alternating nitrogen fixers and users, Field B will have a balanced soil – not having too much or too little nutrients. Also, Field B will have a lower tendency of having pests since the crops within the same family are not placed beside each other. Simple cyclic rotation in Field B is enough to maintain better crops and healthy soil.

YEAR 1 FIELD B	soybean	corn	field pea	barley	pinto bean
	parsley	garden pea	cucumber	mung bean	cauliflower

YEAR2	parsley	soybean	corn	field pea	barley
	green pea	cucumber	mung bean	cauliflower	pinto bean

LESSON II: HOW DOES WATER AFFECT SOIL?

SHARPENING YOUR SKILLS

PAGE 20

ACTIVITY I

1. FALSE – contour farming is performing farming activities across the slope
2. FALSE – water is conserved in contour farming
3. TRUE – without contour farming, water can easily follow the slope of land
4. TRUE – soil will not have enough time to absorb water that is flowing too quickly along a slope
5. TRUE – contour farming minimizes water consumption for farmers' convenience

ACTIVITY II

- | | |
|------|-------|
| 1. 9 | 6. 1 |
| 2. 2 | 7. 10 |
| 3. 7 | 8. 8 |
| 4. 4 | 9. 3 |
| 5. 5 | 10. 6 |

TREADING THE ROAD TO MASTERY

PAGE 26

- | | |
|------|-------|
| 1. I | 6. A |
| 2. B | 7. J |
| 3. G | 8. H |
| 4. D | 9. C |
| 5. E | 10. F |

LESSON III: HOW DO I MEASURE MY SOIL/LAND?**SHARPENING YOUR SKILLS**

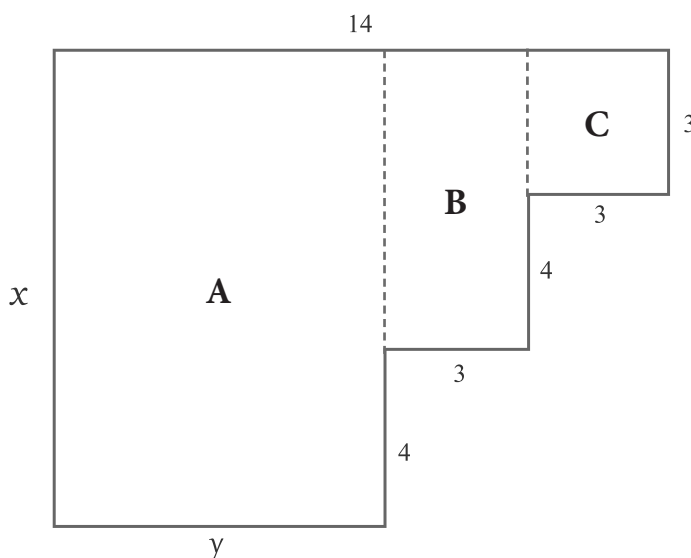
PAGE 33

ACTIVITY I

- A. length of side $x = 4 + 4 + 3 = 11$ meters
- B. length of side $y = 14 - 3 - 3 = 8$ meters
- C. perimeter of the house = $14 + 14 + 11 + 11 = 50$ meters
- D. total payment for Josh's job = $50 \times 20 = 1000$ pesos

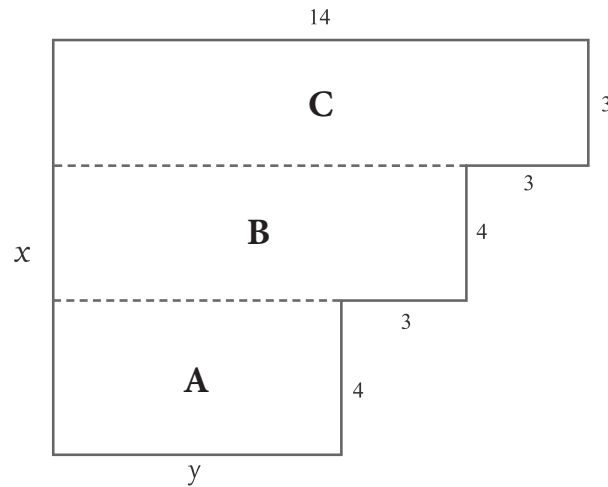
ACTIVITY II

- A. Length of side $x = 4 + 4 + 3 = 11$ meters
- B. Length of side $y = 14 - 3 - 3 = 8$ meters
- C. Area of the first floor



- Area of A = $8 \times 11 = 88$ square meters
- Area of B = $3 \times 7 = 21$ square meters
- Area of C = $3 \times 3 = 9$ square meters

ANSWER KEY



- Area of A = $4 \times 8 = 32$ square meters
- Area of B = $4 \times 11 = 44$ square meters
- Area of C = $3 \times 14 = 42$ square meters

D. Total Area = $88 + 21 + 9 = 118$ square meters OR

Total Area = $32 + 44 + 42 = 118$ square meters

E. Total payment for Jericko's job = $118 \times 25 = 2,950$ pesos

TREADING THE ROAD TO MASTERY

PAGE 37

A. length of side a = $15 - 5 - 5 = 5$ meters

length of side b = 4 meters

length of side c = 2 meters

length of side d = $29 - 15 = 14 \div 2 = 7$ meters

length of side e = 10 meters

length of side f = 7 meters

length of side g = $19 - 10 - 2 = 7$ meters

length of side h = 7 meters

length of side i = 7 meters

length of side j = 7 meters

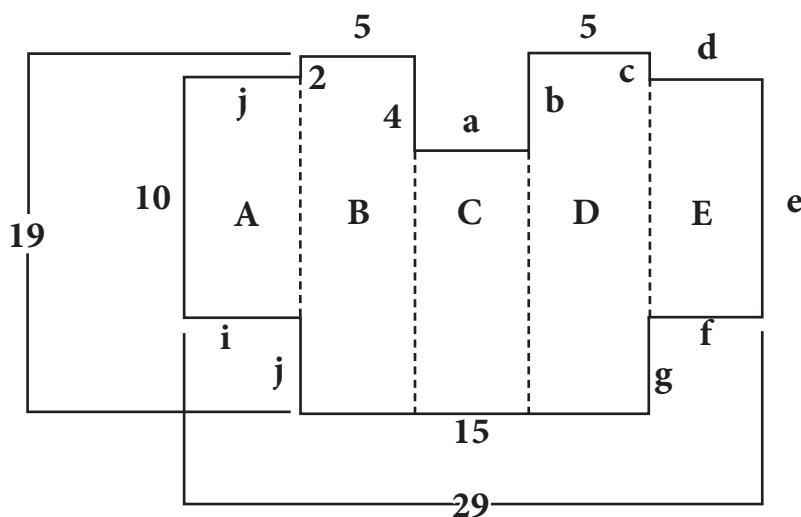
B. land perimeter = $5 + 4 + 2 + 7 + 10 + 7 + 7 + 7 + 7 + 7 + 5 + 5 + 15$
 $+ 10 + 2 + 4 = 104$ meters

C. cost of irrigation = $104 \times 2,000 = 208,000$ pesos

ANSWER KEY

D. change after payment for irrigation = $250,000 - 208,000 = 42,000$ pesos

E. area of each portion of land (in square meters)



- Area of A = $7 \times 10 = 70$ square meters
- Area of B = $5 \times 19 = 95$ square meters
- Area of C = $5 \times 15 = 75$ square meters
- Area of D = $5 \times 19 = 95$ square meters
- Area of E = $7 \times 10 = 70$ square meters

F. Total land area = $70 + 95 + 75 + 95 + 70 = 405$ square meters

G. Cost of planting crops = $405 \times 2,500 = 1,012,500$ pesos

H. Change after payment for planting crops = $1,500,000 - 1,012,500 = 237,500$ pesos

REACH THE TOP

PAGE 40

ACTIVITY I

1. G
2. I
3. I
4. P
5. G

ACTIVITY II

1. P
2. I
3. G
4. P
5. I

ACTIVITY III

1. $12 + 12 + 3 = 27$
2. Perimeter = $10 + 10 + 12 + 12 = 44$ units
3. Perimeter = $10 + 10 + 12 + 12 = 44$ units
4. Area = $10 \times 12 = 120$ square units
5. Area = $10 \times 12 = 120$ square units

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