

LEARNING STRAND 2 SCIENTIFIC AND CRITICAL THINKING SKILLS

SESSION GUIDES FOR MODULE 5:
HOW CAN I STAY SAFE AT WORK?

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 5 (HOW CAN I STAY SAFE AT WORK?)

ALS Accreditation and Equivalency Program: Junior High School
Learning Strand 2: Scientific and Critical Thinking Skills
Session Guides for Module 5 (How Can I Stay Safe at Work?)

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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 I Stay Safe at Work? 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 I STAY SAFE AT WORK? Session Guide No. 1

I. Objectives

1. Differentiate mixtures and pure substances (LS2SC-PS-PSF-AE/JHS-9);
2. Differentiate elements and compounds (LS2SC-PS-PSF-AE/JHS-10);
3. Differentiate acidic and basic mixtures (LS2SC-PS-PSF-AE/JHS-11);
and
4. Differentiate metals and nonmetals (LS2SC-PS-PSF-AE/JHS-12).

II. Subject

A. **Lesson 1:** How is Matter Different From Each Other?

B. **Materials:** toy blocks, container, short bond paper, ballpen/pencil

III. Procedure

1. Activity

- a. Assign the learners in groups.
- b. Ask the learners to do the following:
 - Segregate all toy blocks by color.
 - Combine one white toy block to two blue toy blocks such that they become blue-white-blue.
- c. Ask the learners: The segregated toy blocks represent elements, while the combined toy blocks represent compounds. What is an element? What is a compound?
- d. Ask the learners to do the following:
 - Using scissors, cut an aluminum foil in half. Continue cutting the foil until it is too small to be divided further. Using a metal cutter, do the same for a copper wire.
 - Place a pinch of rock salt on a rigid surface. Using a hammer or any hard material, break the salt crystals into smaller pieces. Continue doing so until they are too small to be divided

- further. Do the same for table sugar.
- e. Ask the learners: Aluminum and copper are elements, while rock salt and table sugar are compounds (a combination of elements). In both procedures, was it possible to cut them down into smaller components such as atoms (for elements) or its elements (for compounds) by physical means? What does that mean for the separation of elements and compounds?
 - f. Ask the learners to do the following:
 - Put aluminum foil, copper wire, rock salt, and table sugar in the same container.
 - Separate each material from each other. Place them outside the container once they are completely separated.
 - g. Ask the learners: When elements and/or compounds are placed together, it is called a mixture. In the procedure, a heterogeneous mixture is formed due to the formation of four layers (aluminum, copper, salt, and sugar). Based on what you did, how can heterogeneous mixtures be separated? (Note: rock salt and table sugar can still be separated but through other means such as sifting or screening.)
 - h. Ask the learners to do the following:
 - In a container, place a pinch of rock salt in water. Stir until rock salt cannot be seen in the water anymore. Do the same for table sugar in a separate container.
 - Combine the two containers. Observe what happens.
 - i. Ask the learners: Since rock salt and table sugar can dissolve (they are soluble) in water to make only one phase/layer, it has formed a homogeneous mixture or solution. Moreover, the individual solutions were able to still make one layer after mixing which means that they are miscible. Can this type of mixture still be separated through physical means in the same way as heterogeneous mixtures?

2. Analysis

- a. Instruct the learners to record all of their observations and insights in the activity. Ask them to discuss their results in class.
- b. Discuss to the learners that elements can be further classified into metals, nonmetals, and metalloids, while compounds can also be classified as either acids or bases.
- c. Initiate a discussion by asking the following questions to the learners:
 - What are the metals and nonmetals in the periodic table? Based on your experience, how do these two types of elements differ?
 - What are common acids and bases at home? Based on your experience, how do these two types of compounds differ?

3. Abstraction/Generalization

Using the learner's module, present the key concepts on matter, substances, elements, compounds, mixtures, acids, bases, metals, and non-metals.

4. Application

Construct a diagram on the classification of matter according to composition.

IV. Evaluation

On a clean sheet of paper, ask the learners to write their understanding of the session.

HOW CAN I STAY SAFE AT WORK? **Session Guide No. 2**

I. Objectives

1. Describe the roles of matter in improving life (LS2SC-PS-PSF-LE/AE/JHS-1); and
2. Identify the application of matter in everyday life (LS2SC-PS-PSF-LE/AE/JHS-1).

II. Subject

- A. **Lesson 2:** How Can I Use Matter in Everyday Life?
- B. **Materials:** short bond paper, ballpen/pencil

III. Procedure

1. Activity

- a. Assign the learners in pairs.
- b. Ask each pair to think of ten materials at home that are very useful. These materials must be an element (metal/nonmetal), compound (acid/base), or mixture.
- c. Each pair must be able to classify each material and explain its use/s.

2. Analysis

- a. Each pair will present the output to the class.
- b. Initiate a discussion by asking the following questions to the learners:
 - Why is it important to classify each material in the list?
 - If the world was made only of elements, what could possibly happen?

3. Abstraction/Generalization

Using the learner's module, present the key concepts on the role of matter in improving everyday life.

4. **Application**

Ask the learners to choose any combination of matter (e.g., machine, food recipe, human anatomy) and identify at least ten metals, nonmetals, acids, bases, or mixtures that are most useful and state their individual purpose. The learners must prepare an infographic as their output.

IV. **Evaluation**

On a clean sheet of paper, ask the learners to write their understanding of the session.

HOW CAN I STAY SAFE AT WORK? Session Guide No. 3

I. Objectives

1. Determine the risks and hazards of common substances and mixtures at work (LS4LC-PE-PSC-AE/JHS-9); and
2. Describe how to observe health and safety measures at work. (LS4LC-PE-PSC-AE/JHS-12).

II. Subject

- A. **Lesson 3:** How Does Matter Become Dangerous?
- B. **Materials:** short bond paper, ballpen/pencil

III. Procedure

1. Activity

- a. Assign the learners in pairs or groups.
- b. For each pair/group, assign the following scenarios:
 - somebody whose skin is scarring after spilling muriatic acid
 - somebody whose eyes are hurting after spraying perfume that contains alcohol
 - somebody who is unconscious after smelling chloroform
 - somebody who started a fire after accidentally adding water in a hot pan with oil
- c. For each scenario, the pair/group must think of a way to minimize the damage and reduce the risk of such from happening again.

2. Analysis

- a. Ask the pair/groups to present their ideas in class.
- b. Initiate a discussion by asking the following questions to each pair/group:
 - What could happen if nobody knew how to apply first-aid or to lessen the damage in each scenario?
 - How can risks and hazards be minimized in a danger-prone area?

3. **Abstraction/Generalization**

Using the learner's module, present the key concepts on observing health and safety measures to reduce risks and hazards in the workplace.

4. **Application**

Ask the learners to prepare a list of dangerous materials (at least ten items) found in their homes. The learners must be able to discuss the danger of using such material and state first-aid and preventive measures to minimize damage.

IV. **Evaluation**

On a clean sheet of paper, ask the learners to write their understanding of the session.

PRE-ASSESSMENT

PAGE 2

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

LESSON I: HOW IS MATTER DIFFERENT FROM EACH OTHER?**SHARPENING YOUR SKILLS**

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ACTIVITY I

- **BOX A:** Element
- **BOX B:** Mixture
- **BOX C:** Compound
- **BOX D:** Mixture
- **BOX E:** Compound
- **BOX F:** Mixture
- **BOX G:** Mixture
- **BOX H:** Element
- **BOX I:** Compound

ACTIVITY II

| PROPERTY | METALS | NONMETALS |
|----------------------------|------------|---------------|
| 1. Luster | lustrous | dull |
| 2. Hardness | hard | brittle |
| 3. Malleability | malleable | non-malleable |
| 4. Ductility | ductile | non-ductile |
| 5. Melting point | high | low |
| 6. Boiling point | high | low |
| 7. Sonority | sonorous | non-sonorous |
| 8. Electrical conductivity | conductive | insulator |

TREADING THE ROAD TO MASTERY

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ACTIVITY I

1. HE
2. ME
3. CO
4. HO
5. HE
6. NM
7. HE
8. ME

ACTIVITY II

- **Acids** – sour taste, produce hydrogen/hydronium ions, can rust metals
- **Bases** – bitter taste, slippery feel, produce hydroxide ions
- **Acids and Bases** – pure substances, compounds, chemical separation

LESSON II: HOW CAN I USE MATTER IN EVERYDAY LIFE?

SHARPENING YOUR SKILLS

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ACTIVITY I

| ELEMENT OR COMPOUND | USE | COLUMN A | COLUMN B | COLUMN C |
|---------------------|-----|------------------------------|-------------|----------------------------|
| A | B | 1. Aluminum | A. Element | a. Flourescent light bulbs |
| B | E | 2. Water | B. Compound | b. Thin foil |
| B | G | 3. Sodium Chloride | | c. Water sprinkler |
| A | D | 4. Copper | | d. Brassmaking |
| B | H | 5. Sucrose | | e. Drinking |
| A | A | 6. Krypton | | f. Whitening agent |
| B | F | 7. Sodium Hydrogen Carbonate | | g. Minerals |
| A | C | 8. Chlorine | | h. Sweetener |
| B | I | 9. Sodium Hypochlorite | | i. Stain remover |
| B | J | 10. Hydrogen Peroxide | | j. Mouthwash |

ACTIVITY II

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| ELEMENT OR COMPOUND | USE | COLUMN A | COLUMN B | COLUMN C |
|---------------------|-----|--------------------------------------|----------|-----------------------|
| A | A | 1. H_2SO_4 | A. Acid | a. Car batteries |
| B | F | 2. NaOH | B. Base | b. Fertilizers |
| A | C | 3. $\text{HC}_2\text{H}_3\text{O}_2$ | | c. Vinegar |
| A | E | 4. $\text{C}_6\text{H}_8\text{O}_7$ | | d. Softdrinks |
| B | H | 5. $\text{Mg}(\text{OH})_2$ | | e. Food supplement |
| B | H | 6. $\text{Ca}(\text{OH})_2$ | | f. Soaps |
| A | D | 7. H_2CO_3 | | g. Alkaline batteries |
| B | G | 8. KOH | | h. Antacid |
| A | B | 9. HNO_3 | | i. Cement |
| B | Z | 10. NH_3 | | j. Medicine |

TREADING THE ROAD TO MASTERY

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- 1 point for each correct answer

LESSON III: HOW DOES MATTER BECOME DANGEROUS?

SHARPENING YOUR SKILLS

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ACTIVITY I

1. H
2. H
3. NH
4. NH
5. NH
6. H
7. H
8. H
9. H
10. NH

ACTIVITY II

1. B
2. D
3. C
4. E
5. A

TREADING THE ROAD TO MASTERY

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1. Corrosive
2. Poisonous
3. Flammable
4. Flammable
5. Poisonous
6. Poisonous
7. Corrosive
8. Corrosive
9. Poisonous
10. Flammable

REACH THE TOP

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- | | |
|-------|-------|
| 1. A | 11. D |
| 2. B | 12. C |
| 3. C | 13. A |
| 4. D | 14. C |
| 5. C | 15. C |
| 6. A | 16. B |
| 7. B | 17. C |
| 8. C | 18. D |
| 9. B | 19. C |
| 10. C | 20. D |

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