

## **Unit A:** General Agricultural Machinery

### **Lesson 4:** Maintaining a Safe Environment around Agricultural Machinery

#### **Student Learning Objectives:**

Instruction in this lesson should result in students achieving the following objectives:

1. Define safety, and describe how it is practiced.
2. Define hazard, and describe where hazards can be found.
3. Explain how household products could be hazardous.
4. Identify common personal protective equipment.

#### **Recommended Teaching Time:** 2 hours

**Recommended Resources:** The following resources may be useful in teaching this lesson:

- Lee, Jasper S., et al. *AgriScience Discovery*. Upper Saddle River, New Jersey: Prentice Hall Interstate, 2003.
- Illinois Farm Bureau, *Ag Mag 15*: "Safety Sleuths." Illinois Ag in the Classroom Website—[www.agintheclassroom.org](http://www.agintheclassroom.org)
- National Safety Council Website—[www.nsc.org](http://www.nsc.org)

#### **List of Equipment, Tools, Supplies, and Facilities:**

- Writing surface
- PowerPoint Projector
- PowerPoint Slides
- Transparency Masters
- Copies of student worksheets
- Story about a safety related accident
- Safety goggles
- Cooking oil

**Terms:** The following terms are presented in this lesson (shown in bold italics and on PowerPoint Slide 2):

- Caution
- Danger
- Flammable
- Hazard
- Material safety data sheet (MSDS)
- Personal protective equipment (PPE)
- Poison
- Safety
- Warning

## Interest Approach:

Tell a story about a safety related accident aloud. Have the students share any similar experiences or stories they have heard. Explain to them that because situations like this occur every day, it is important for them to learn about safety and the hazards that are around them all the time.

## SUMMARY OF CONTENT AND TEACHING STRATEGIES

**Objective 1:** Define safety, and describe how it is practiced.

*Anticipated Problem:* What does safety mean? How can you practice safety?

### (PowerPoint Slide 3)

- I. **Safety** is the prevention of injury and loss.
  - A. It would be impossible to make an activity or place totally safe. We can, however, take steps to make an activity or place as safe as possible. General safety guidelines should be considered at all times.

### (PowerPoint Slides 4 and 5)

1. Be aware of safety at all times. Always pay attention to what is going on around you and the potential dangers presented.
2. Think before you act. Rushing into things can often lead to accidents.
3. Learn safe practices and follow them every time.
4. Note where dangers are and avoid them.
5. If you see a potential safety risk, alert others of the danger.
6. Always read and follow directions carefully and completely.
7. Keep all tools and equipment in good condition.
8. Always use the proper safety equipment.
9. Do not take unnecessary risks.
10. Follow all safety rules.

### (PowerPoint Slide 6)

- B. To practice safety, we must be prepared and have the proper tools.

### (PowerPoint Slide 7)

1. Education—Education is an important step in keeping safe. Knowing what things to look out for helps us avoid dangers. Getting safety training before using a tool or performing an activity makes it easier for us to act safely.

### (PowerPoint Slide 8)

2. Signs—Many signs are posted to help keep us safe. Always read and obey all signs. Learn what different signs mean and the dangers they point out.

### (PowerPoint Slides 9 and 10)

3. MSDS—All chemicals are shipped with an MSDS. A **material safety data sheet (MSDS)** is a sheet containing information about the safe use of a chemical. An MSDS should accompany not only agricultural chemicals but also chemicals used in school laboratories. The information provided in the MSDS helps us use chemicals properly and stay safe.

**(PowerPoint Slide 11)**

4. Proper storage—Dangerous chemicals and other solutions should be stored properly. Cabinets that can be secured should be used to keep harmful substances and the people around them safe.

**(PowerPoint Slide 12)**

5. Emergency response—Even with all of the proper safety precautions, accidents do happen. The response time can make the difference between a minor accident and a serious injury. Know how to respond.

**Use TM: 4-1 to discuss general safety considerations with the students. Use TM: 4-2 to show students examples of a MSDS. Ask students if they have ever seen a MSDS. Also ask them to name any other safety signs they have seen.**

**Objective 2:** Define hazard, and describe where hazards can be found.

*Anticipated Problem:* What are hazards and where can they be found?

**(PowerPoint Slide 13)**

- II. A **hazard** is a danger. We can often see danger, but we cannot always avoid it. Even though hazards are around us, we can take steps to reduce the hazards we face.

**(PowerPoint Slide 14)**

- A. There are many areas in agriculture where hazards exist. Hazards can be found on the farm, in agribusiness, and in and around our homes. Plants and animals can always be hazards. Knowing where potential hazards exist can help us avoid them.

**(PowerPoint Slide 15)**

1. Hand tools (hammers, pliers, screwdrivers, etc.) should be in good working condition and used only for their intended purpose.

**(PowerPoint Slide 16)**

2. Power tools (saws, drills, grinders, etc.) are particularly hazardous. They should always be used properly according to the manufacturer's directions. All safety devices should be in place and working properly.

**(PowerPoint Slide 17)**

3. Engines and fuel can be hazardous. Prevent burns by being very careful of heat and hot parts. When working with engines and fuel, good ventilation is necessary. Fuels should always be stored in proper containers in a safe location.

**(PowerPoint Slide 18)**

4. Working with electricity requires great care to avoid hazards. Be sure all electrical devices are working properly and in good condition.

**(PowerPoint Slide 19)**

5. Tractors and other equipment involve using power to do work. Training on proper usage and operating at a reasonable speed are ways to decrease the danger of operating these machines. Be sure to wear a seatbelt and make sure that all safety shields are in place and functioning properly.

**(PowerPoint Slide 20)**

6. Chemicals must be handled carefully to avoid hazards. Always know what a chemical is intended to be used for and use it accordingly. If in doubt, check the MSDS. Follow all safety instructions and clean up any surface that came in contact with chemicals.

**(PowerPoint Slide 21)**

7. Working near fire or heat requires great care. Heat is especially dangerous because it is often invisible.

**(PowerPoint Slide 22)**

8. Be careful when working around animals. Animals can cause many injuries to humans, especially to children. The best way to avoid injury is to understand how animals behave and always use caution around them.

**(PowerPoint Slide 23)**

9. Plants can be hazardous. Some plants are poisonous. It is important to know what plants are around you and what plants you should be careful of.

**Use WS: 4-1 after defining the word hazard but before discussing where hazards are found. Allow students time to come up with their own ideas of where hazards exist before covering the content of the objective. Use TM: 4-3 to review the areas where hazards can be found. After reviewing the areas, have students evaluate their answers on WS: 4-1. Do they have any more hazards to add?**

**Objective 3:** Explain how household products could be hazardous.

*Anticipated Problem:* How can household products be hazardous?

**(PowerPoint Slide 24)**

- III. Products we use around the home can be just as dangerous as those found on a farm or in a laboratory. Many household products can hurt your eyes, burn your skin, and even make you sick if they aren't used properly or if the label isn't followed carefully. These products are generally called poisons.

**(PowerPoint Slide 25)**

- A. A **poison** is a substance that, even in small quantities, can cause illness or death. Most poisonous liquids have special words or symbols on their labels that tell us that they could be hazardous. It is important that we look for these special words and symbols and understand their meaning.

**(PowerPoint Slide 26)**

1. **Caution:** Indicates care should be taken when using the product.
2. **Warning:** Notifies us in advance that the product presents a danger if directions are not followed.
3. **Danger:** There is a potential exposure to injury.
4. **Flammable:** The product is capable of being easily caught on fire.

**(PowerPoint Slide 27)**

- B. All poisons should be stored in special places that are out of the reach of children and pets.

- C. Any products that the labels have fallen off of should be properly discarded. These are dangerous because you cannot tell what is in them, and you do not know how to properly handle them.

**To introduce this objective, have a student come to the front of the room and put on a pair of safety goggles that have cooking oil on the lenses. Ask them to describe to the class what they are able to see. Explain that a common household product could cause this to temporarily or permanently happen to a person's sight. Use TM: 4-4 to show students examples of some common warnings that indicate potential danger. Use WS: 4-2 as an activity to help students identify important information on products. Use WS KEY: 4-2 for information on how to set up the activity.**

**Objective 4:** Identify common personal protective equipment.

*Anticipated Problem:* What are some common types of personal protective equipment?

**(PowerPoint Slide 28)**

- IV. Proper protective equipment must always be worn and be worn properly when hazards are involved. **Personal protective equipment (PPE)** is equipment that helps protect people from certain kinds of injury.

**(PowerPoint Slide 29)**

- A. The proper PPE depends on the activity and the hazards involved. Equipment is available for many different purposes: eye, hearing, skin and body, and respiratory protection.

**(PowerPoint Slides 30 and 31)**

- B. Some of the most common types of PPE are as follows:
1. Rubber boots and steel-toed shoes
  2. Earmuffs (hearing muffs)
  3. Particle mask
  4. Face shield
  5. Safety glasses
  6. Goggles
  7. Earplugs (corded or uncorded)
  8. Apron
  9. Gloves
  10. Eyewash bottle

**Use TM: 4-5 to show students examples of common PPE. Use WS: 4-3 to have students identify various PPE items. WS KEY: 4-3 provides the correct answers to the work sheet. Bring in some PPE and have students take turns trying on gloves and goggles so they can get a feel for the protection that they provide. Explain to the students that the gloves and goggles don't fit well because only adults should handle chemicals.**

**Review/Summary:** Use the student learning objectives to summarize the lesson. **(PowerPoint Slide 31)** Have student explain the content associated with each objective. Student responses can be used in determining with objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

**Application:** Students can apply the knowledge gained from the lesson as they complete WS: 4-1, WS: 4-2, and WS: 4-3. Have students complete WS: 4-4 to apply what they have learned by getting hands-on practice at evaluating for safety risk.

**Evaluation:** Focus the evaluation of student achievement on mastery of the objectives as stated in the lesson. A written test can also be used to assess student achievement of the objectives. A sample written test is attached.

## Answers to Sample Test:

### *Matching*

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

### *Fill-in-the-blank*

1. Danger
2. Flammable
3. Behave
4. Hazard

### *Short Answer*

Answers will vary. Students should list two hazards around their home and tell how the hazards can be eliminated.

## Safety

Name: \_\_\_\_\_

**Matching:** Match each word with the correct definition.

- |            |                                  |
|------------|----------------------------------|
| a. Caution | d. personal protective equipment |
| b. Safety  | e. poison                        |
| c. Warning |                                  |

- \_\_\_\_\_ 1. Notifies us in advance that the product presents danger if directions are not followed.
- \_\_\_\_\_ 2. Indicates care should be taken when using the product.
- \_\_\_\_\_ 3. Equipment that helps protect people from certain kinds of injury.
- \_\_\_\_\_ 4. The prevention of injury and loss.
- \_\_\_\_\_ 5. A substance that, even in small quantities, can cause illness or death.

**Fill-in-the-blank:** Complete the following statements.

1. We can often see \_\_\_\_\_, but we cannot always avoid it.
2. A product that is capable of being easily caught on fire is \_\_\_\_\_.
3. To reduce the danger when dealing with animals, it is important to understand how animals \_\_\_\_\_.
4. A(n) \_\_\_\_\_ is a danger.

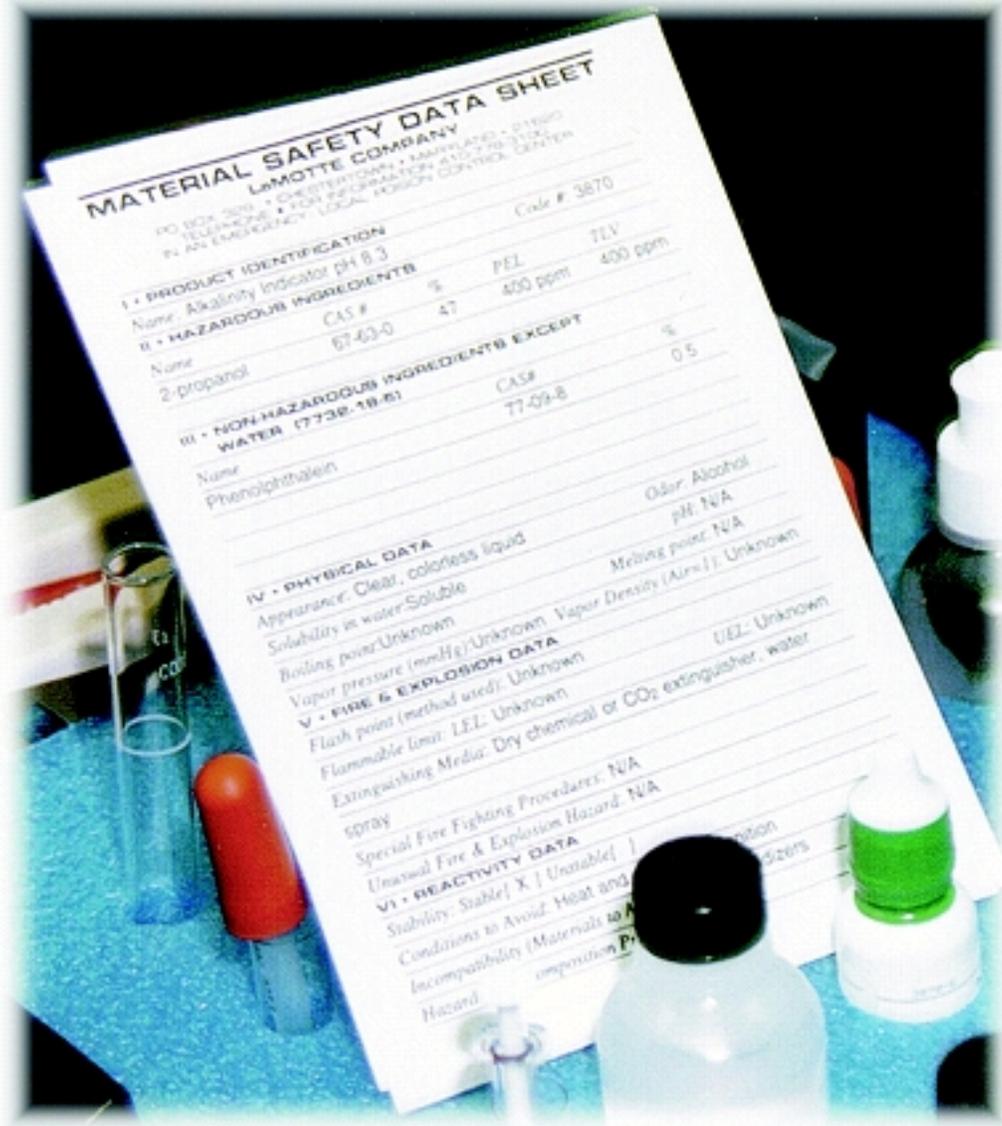
**Short Answer:** Answer the following question.

Describe two hazards around your home, and explain what steps should be taken to eliminate them.

## **GENERAL SAFETY GUIDELINES**

- Be aware of safety at all times.
- Think before you act. Rushing into things can often lead to accidents.
- Learn safe practices and follow them every time.
- Note where dangers are and avoid them.
- If you see a potential safety risk, alert others of the danger.
- Always read and follow directions carefully and completely.
- Keep all tools and equipment in good condition.
- Always use the proper safety equipment.
- Do not take unnecessary risks.
- Follow all safety rules.

# MATERIAL SAFETY DATA SHEET (MSDS)



## **AREAS OF POTENTIAL HAZARDS**

- **Hand tools**
- **Power tools**
- **Engines and fuel**
- **Electricity**
- **Tractors and other equipment**
- **Chemicals**
- **Fire and heat**
- **Animals**
- **Plants**

## POTENTIAL HAZARD STATEMENTS

**CAUTION:** Avoid contact with eyes. Contains surfactants. If contact occurs, rinse immediately and thoroughly with water. If irritation persists, get medical attention.

**KEEP OUT OF REACH OF CHILDREN.**

**DANGER:** CORROSIVE, HARMFUL IF SWALLOWED.

**KEEP OUT OF REACH OF CHILDREN.**

**WARNING:** EYE IRRITANT. Do not get in eyes. For sensitive skin or prolonged use, wear gloves.

**DANGER! EXTREMELY FLAMMABLE.** Do not spray near sparks, heat or open flames. Vapors will accumulate readily and may ignite explosively. Keep area ventilated during use and until all vapors are gone.

TM: 4-5

## COMMON PPE



# NAME THE HAZARDS

**Directions:** Below are areas of agriculture that pose hazards. List as many potential hazards for each item as you can think of.

1. Hand tools—
  
2. Power tools—
  
3. Engines and fuel—
  
4. Electricity—
  
5. Tractors and other equipment—
  
6. Chemicals—
  
7. Fire and heat—
  
8. Animals—
  
9. Plants—

# LABEL READING

**Directions:** You will be given a box of seven empty household products. Go through the box and check the labels on each of the products. Use the information to fill in the inventory below.

## Container 1

1. Product name:
2. Safety word:
3. Safety instructions:

## Container 2

1. Product Name:
2. Safety word:
3. Safety instructions:

## Container 3

1. Product Name:
2. Safety word:
3. Safety instructions:

## Container 4

1. Product Name:
2. Safety word:
3. Safety instructions:

### **Container 5**

1. Product Name:
2. Safety word:
3. Safety instructions:

### **Container 6**

1. Product Name:
2. Safety word:
3. Safety instructions:

### **Container 7**

1. Product Name:
2. Safety word:
3. Safety instructions:

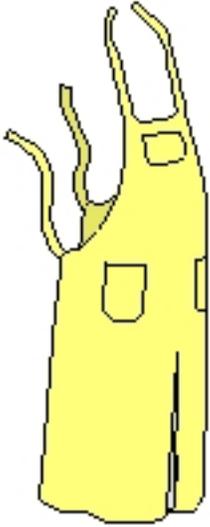
# LABEL READING KEY

## Directions for Teacher:

1. Divide the students into small groups of four or five.
2. Give each group a box of seven **empty** household product containers.
3. Have the students use WS: 4-2 to complete an inventory of the box by answering the questions on the worksheet.
4. This activity will give students the opportunity to get a good look at common products and read the labels for safety information. Not all the products need to be hazardous.

# PERSONAL PROTECTIVE EQUIPMENT

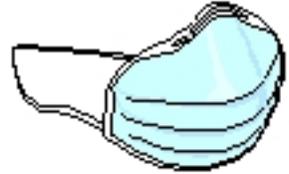
**Directions:** Identify each of the PPE items below. Write the name of each item on the line provided.



1. \_\_\_\_\_



2. \_\_\_\_\_



3. \_\_\_\_\_



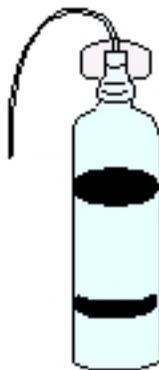
5. \_\_\_\_\_



6. \_\_\_\_\_



4. \_\_\_\_\_

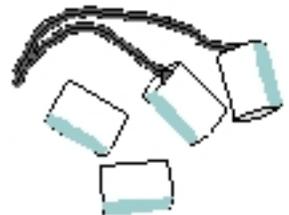


8. \_\_\_\_\_



9. \_\_\_\_\_

7. \_\_\_\_\_



10. \_\_\_\_\_

WS KEY: 4-3

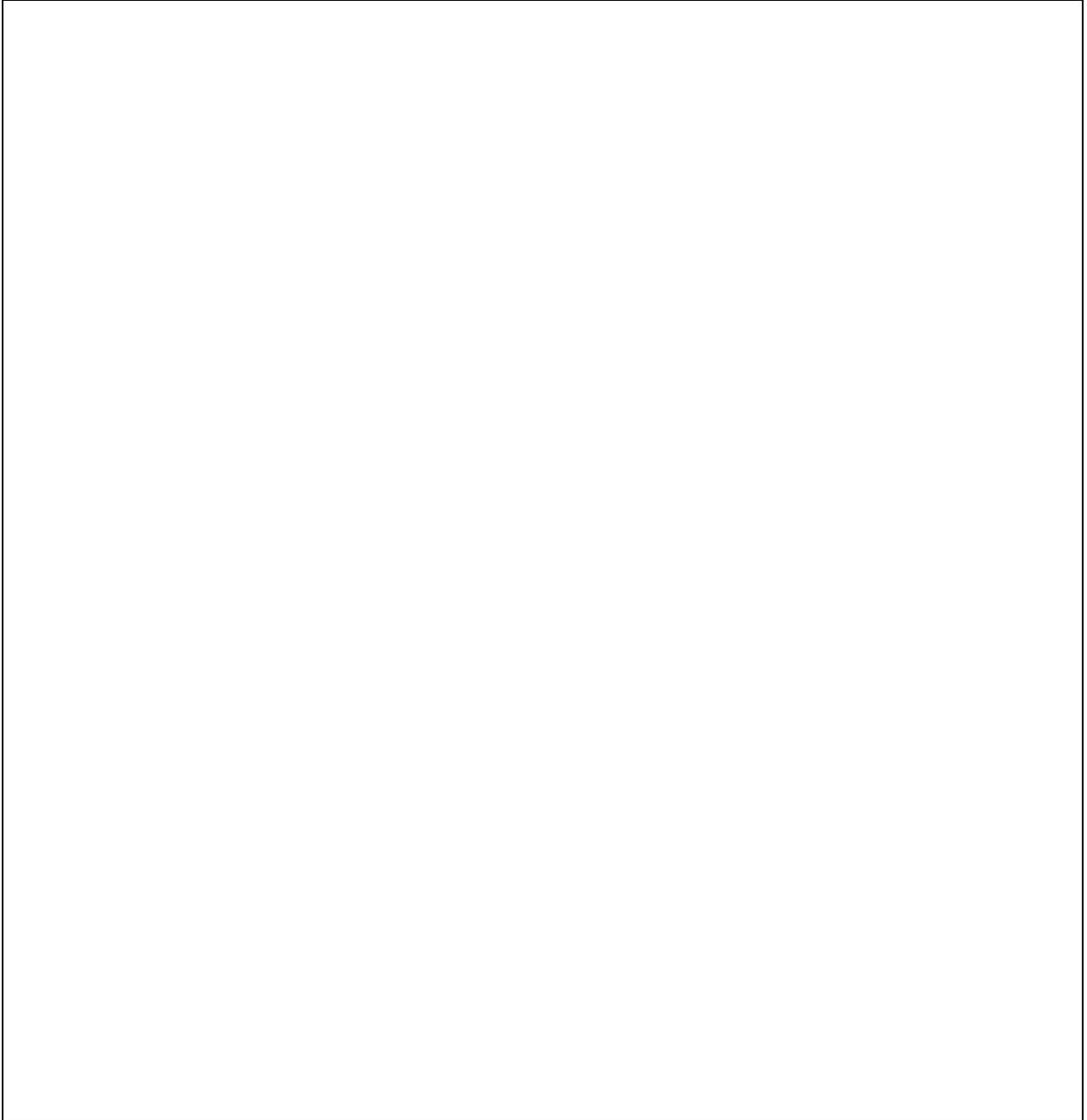
# PERSONAL PROTECTIVE EQUIPMENT KEY

1. Apron
2. Face shield
3. Particle mask
4. Rubber boots and steel-toed shoes
5. Gloves
6. Safety glasses (with sideshields and brow guard)
7. Eyewash bottle
8. Earmuffs (hearing muffs)
9. Goggles (double lens)
10. Corded and uncorded earplugs

WS: 4-4

# HOME SAFETY ASSESSMENT

Select an area around your home, and sketch a drawing of the area in the space below.

A large, empty rectangular box with a thin black border, intended for a student to draw a sketch of an area around their home. The box is currently blank.

Identify safety hazards found in the selected area of your home.

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

What can you do to rid your home of these safety hazards?