



TOPIC OF STUDY

OSHA Safety Requirements

 90 MINUTES

KEY TERMS

3 points of contact
stabilizer
rungs
fiberglass
extension ladder

LESSON

Ladder Safety and Mitigating Jobsite Hazards

OVERVIEW

Ladder safety is critical for a safe work environment. Ladders seem straightforward to use, but when used improperly can easily lead to serious injury or even death.

OBJECTIVES

Students will:

- Identify types of ladders and when to use each type (when to use metal v. fiberglass)
- Inspect ladders for damage and label damaged ladders
- Demonstrate proper ladder safety techniques including, footing, rise over run securing, height above roof line, and various support systems
- Evaluate the surface that ladders are being placed on for slippery conditions or other issues that may cause the feet to become unstable

TASK LIST SUBCATEGORY

- 304 Identify the causes of jobsite accidents
- 305 Recognize and mitigate hazards
- 306 Evaluate and perform safe lifting and material handling

STANDARDS

PA/SDP

3.4.10.A2. Interpret how systems thinking applies logic and creativity in complex real-life problems.

13.3.1.A. (Career and Work) Evaluate personal attitudes and work habits that support career retention and advancement.

INSTRUCTIONAL

TEXT/REFERENCES

Solar Photovoltaic Basics, White. Chapter 2, pp. 13-22; ECA Energy Conservation Handbook, p. 43

Safety Toolbox Talks: Ladder Safety

<https://www.youtube.com/watch?v=lqXYDIOS0Os>

MATERIALS NEEDED

MATERIALS

- Metal extension ladder
- Fiberglass extension ladder
- Optional all: muti-purpose ladder, A-Frame ladder, Step ladder

Content: OSHA web site



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OSHA Safety
Requirements 90 MINUTES**IMPLEMENTATION (LESSON PLAN)**

1. Bring out a fiberglass extension ladder (28' preferred, 32', or 38' acceptable).
2. Have students inspect the ladder and lift it up to get comfortable with the ladder.
3. Have students break out into teams of 2. Tell pairs of students that they have to come up with a written step-by-step plan for how to set up the ladder.
4. Have the teams demonstrate their written plan
5. Whole class watches "Safety Toolbox Talks: Ladder Safety"
6. Students observe teacher giving a demonstration of how to properly use the extension ladder.
7. Teacher demonstrates again, asking students to describe and record each of the proper steps. Student initial student-generated description with the proper teacher-led method of ladder use.
8. Teacher asks students to on their own develop a list of key ladder safety guidelines. Upon completion class should compare their list with the following list of key takeaways:
 - a. Ladder must extend 3' above roof
 - b. Never use top rung
 - c. never use a ladder with bent rungs
 - d. make sure footing is stable and not slippery
 - e. 4:1 rise over run ratio
 - f. Ladder stabilizer is a great tool to not only make ladder more secure but also protect against gutter damage
 - g. Always tie off your ladder
 - h. Never leave a ladder setup in high winds
 - i. Always keep 3 points of contact when climbing a ladder
 - j. To bring material to the roof use pulleys. Do not carry material up ladder as you cannot keep 3 points of contact
 - k. Ensure any pulley system is properly secured. A falling pulley can injure or kill a worker
 - l. Ladder carrying and setup technique. Always plan out how to get the ladder into the proper position. Be aware of overhead obstructions that could pose a safety threat (for example: trees, power lines, etc.)
9. Assessment: After the list of proper safety techniques is completed, ask each student to demonstrate their learning by correctly climbing the first 6' of the ladder, focusing on maintaining three points of contact at all times.

RESOURCES/LINKS

Safety Toolbox Talks: Ladder Safety

<https://www.youtube.com/watch?v=lqXYDIOSOOs>

OSHA Ladder Safety

<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.1053>

