Safe Insulation Installation: Student Activity Worksheet

Learning Objectives

- Identify and classify different types of insulation materials
- Understand safety protocols for insulation installation
- Calculate material requirements and costs
- Recognize proper installation techniques

Material Identification Challenge (15 minutes)

Using your knowledge of insulation materials, complete the following activities:

1. Material Properties Match-Up

Draw lines connecting the insulation material with its correct R-value and characteristics:

Material	R-Value (per inch)	Key Characteristics
Mineral Wool		
EPS (Expanded Polystyrene)		
XPS (Extruded Polystyrene)		

Safety Equipment Investigation (20 minutes)

Working in pairs, analyze the safety requirements for insulation installation.

2. PPE Analysis

Safety Equipment	Required?	Purpose	EN Standard
Safety Goggles			
Dust Mask			
Cut-resistant Gloves			

Calculations Workshop (25 minutes)

Apply your mathematical skills to solve real-world insulation problems.

3. Area Calculation Challenge

Calculate the insulation required for the following room:

Room Dimensions:

- Wall Height: 4 meters
- Room Length: 6 meters
- Room Width: 5 meters
- Window: 1.5m × 1.5m (2 windows)
- Door: 2m × 0.9m (1 door)

Show your calculations here:

4. Cost Analysis

Item	Calculation	Result (Lei)
Material Cost (25 lei/m²)		
Waste Factor (10%)		
Total Cost		

Installation Techniques Workshop (30 minutes)

Practice proper installation methods and identify common mistakes.

5. Installation Sequence Analysis

Number these steps in the correct order (1-8):

Order	Installation Step
	Measure wall cavity dimensions
	Install vapor barrier if required
	Check for electrical outlets and fixtures
	Cut insulation to size with proper tools

6. Common Mistakes Identification

Review these installation scenarios and identify the errors:

Scenario 1: Insulation is compressed to fit into a smaller cavity

Error explanation: _____

Correct approach: _____

Scenario 2: Gaps left around electrical boxes

Error explanation: _____

Correct approach: _____

Thermal Performance Assessment (40 minutes)

Analyze and calculate thermal performance metrics.

7. R-Value Calculations

Layer	Thickness (mm)	R-Value per mm	Total R-Value
Exterior Brick	102	0.0012	
Air Gap	25	0.0526	
Insulation	140	0.0714	

Total Wall R-Value: _____

U-Value (1/R): _____

Energy Efficiency Analysis

8. Heat Loss Calculation

Given:

- Indoor Temperature: 21°C
- Outdoor Temperature: -5°C
- Wall Area: 45m²
- U-Value: (from previous calculation)

Calculate heat loss using the formula:

Heat Loss = U-Value × Area × Temperature Difference

Show your work here:

Quality Control Assessment (25 minutes)

Learn to identify and document installation quality.

9. Installation Inspection Checklist

Inspection Point	Pass/Fail	Notes
No gaps or voids		
Proper compression		
Vapor barrier integrity		

10. Problem-Solving Scenarios

Challenge 1: You discover a water pipe running through the insulation cavity.

Proposed solution: _____

Required materials: _____

Challenge 2: The wall cavity depth varies by 2cm along its length.

Proposed solution: _____

Required materials: _____

Final Assessment (20 minutes)

Complete these final tasks to demonstrate your understanding.

5. Installation Sequence

Number the following steps in the correct order (1-8):

___ Measure wall cavity dimensions

___ Check for electrical wiring

___ Cut insulation to size

___ Install vapor barrier

___ Secure insulation in place

Student Name: _____

Date: _____

Instructor Signature: _____