LESSON

LAB: Sealing the Rim or Band Joists

BIG IDEA(S)

Uninsulated rim joists allow a great deal of heat loss in a house.

OBJECTIVES

Students will:

- Identify a rim joist and describe how it transmits heat when not insulated
- Use a utility knife, a caulk gun or foam canister to seal the insulation
- Properly dispose of trash and put away materials

TASK LIST SUBCATEGORY

804 Identify infiltration and exfiltration points

806 Understand weatherization task including air sealing and insulation

810 Use energy efficiency industry vocabulary

OVERVIEW

Uninsulated rim joists allow a great deal of heat loss in a house. There are several kinds of materials to use for this application. This lab is a continuation of *Lesson 22: Air Sealing Holes, Cracks and Large Openings* which is a demonstration in Year 1. This lab is presented as a hands-on sealing opportunity for students and uses rigid foam board and, depending on the width of the crack around the foam board, a chance to seal with spray foam or caulk.

STANDARDS

PA/SDP

3.2.10.B3. Explain how heat energy will move from a higher temperature to a lower temperature until equilibrium is reached. Analyze the processes of convection, conduction, and radiation between objects or regions that are at different temperatures.

3.4.10.B2. Demonstrate how humans devise technologies to reduce the negative consequences of other technologies.

NGSS

NGSS HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

INSTRUCTIONAL

TEXT/REFERENCES

Energy Conservation Handbook. pp. 73 - 75

BRIGHT SOLAR FUTURES

WEATHERIZATION

TOPIC OF STUDY

Weatherization

90 MINUTES

KEY TERMS

Band/rim joist: band joists are the same as rim joists and are the boards at the end of the floor joists that wrap around the house (photo provided

Rigid foamboard: extruded polystyrene (think white coffee cups or clam-shell containers for take away). A 2" think board has an R-10 rating. Can be pink, blue or white.

INSTRUCTIONAL (CONTINUED)

MATERIALS NEEDED

MATERIALS

- Tools, consumables and safety equipment listed in *Energy Conservation Handbook*, p. 74

Technology: Computer with internet access for YouTube video

IMPLEMENTATION (LESSON PLAN)

1. Assemble enough tools, materials, and PPE to outfit the number of students present, who should work in pairs. Students will share in the steps of the sealing process and share cutting foam board and applying a seal.
2. Provide this video prior to the LAB. Sealing and insulating the rim joist: https://www.youtube.com/watch?v=h1UuyM0SRWM

   This is a solid review of how we lose heat through the rim joists for both platform and balloon framed houses, and demonstrates the process of sealing with foam.
3. Review how students will clean up after the install.
4. Locate the rim joist and explain how it enables heat loss.

5. Provide examples of what students will do. This foamboard is backed with foil.

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IMPLEMENTATION (LESSON PLAN) - CONTINUED

6. Once teams of two are formed, review needed tools, materials, and PPE. Demo the process paying special attention to the way to cut the foam board using the utility knife and the technique for using the caulk gun (Procedure p.74). Also, determine whether your install left a space around the board that was ¼ inch or less (caulk), 1" or less (spray foam).
7. For students whose cuts leave 1" or less gaps, demo to all how to use spray foam.
8. Allow one team to work on a sample joist and have other students fishbowl the install. Once completed, debrief with the class.
9. Allow other groups to complete the task with the props that are available.
10. Debrief the experience:
    a. What went well in your install?
    b. Was there anything that was harder than you thought it would be?
    c. For what do you need more practice?
    d. Were you able to use caulk or did you use spray foam.
11. Have students clean work area, store tools and materials.

RESOURCES/LINKS

Alternative rim joist sealing where fiberglass insulation is replaced with two-part spray foam:

https://www.youtube.com/watch?v=jLGbmjFgL9k

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