



WEATHERIZATION

TOPIC OF STUDY

Weatherization



90 MINUTES

KEY TERMS

Work Scope: full list of work to be performed and materials to be installed; also known as a work order.

LESSON

WAP Priority List of Energy Saving Measures & Savings to Investment Ratio

BIG IDEA(S)

Some energy saving measures are used more frequently because they more cost-efficient.

OBJECTIVES

Students will:

- Identify top priority list measures
- Explain why some measures are higher on the list than others
- Identify top health and safety issues for workers and building occupants
- Explain the Savings to Investment Ratio

TASK LIST SUBCATEGORY

- 102 Describe how energy is fundamental to our everyday lives
- 106 Describe the impact of energy systems (economic, health, environmental)
- 801 Identify the principles of building science
- 810 Use energy efficiency industry vocabulary

OVERVIEW

An energy auditor creates a list of measures to be completed in the home. The sequence of measures is based upon a state list. The list is created base of maximizing cost-effectiveness. The list must be performed in order; otherwise funding could be at risk. Measures higher on the list must be performed first. The order of measures is based on a variety of factors such as overall condition of the house, repairs needed, and weatherization needs. The Savings to Investment Ratio helps to determine the cost of a measure as it relates to the long term savings from investment. Health and safety of workers and occupants is a top priority. If a building is unsafe the work cannot be performed until the issues are resolved.

STANDARDS

PA/SDP

3.2.10.B6. Explain how behavior of matter and energy follow predictable patterns that are defined by laws.

INSTRUCTIONAL

TEXT/REFERENCES

Training Handbook, pp. pp. 18-19, 24-25

MATERIALS NEEDED

Content: PA Priority List

Technology: Device with internet to watch YouTube video





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IMPLEMENTATION (LESSON PLAN)

ENGAGE

1. Watch the video, *The Weatherization Assistance Program: A Client's Story*: <https://youtu.be/IDgaL7Z3DHo>
2. Ask students if they can relate to Carlos' wanting to help people like the woman in the story.

EXPLORE

1. In advance put each measure from the priority list on page 18 on a separate index card or print on a slip of paper. Create enough materials for students to work in groups of 2-3 students.
2. Provide each group with a set of the priority measures.
3. Have groups sort and rank the measures in a list of highest level of cost-effectiveness to lowest level.

EXPLAIN

- Have student teams present their top five measures in order of cost-effectiveness and explain their rationale.

EXTEND/EVALUATE

- Have student groups look up the cost of a minimum of five different materials from the priority list in order to see the price differences. Include in the list:
 - Caulk
 - Front door
 - Refrigerator
 - Insulation
 - Spray foam
- Have students calculate the Savings to Investment Ratio for a minimum of three items. (p. 25) (see sample at end of lesson plan)

HOMEWORK

With your family, use the questionnaire a WAP Auditor would use for a homeowner. How is this information helpful for someone who is auditing the house?

<https://hcr.ny.gov/system/files/documents/2018/10/wap11hhquest.pdf>

RESOURCES/LINKS

PA Weatherization Field Guide

<https://www.paweatherization.org/vertical/sites/%7BF27E296C-7668-49FF-9408-DF453C70C62E%7D/uploads/%7BCA71D0C1-C3CE-4B1A-9858-B75BD3F5AF92%7D.PDF>

The Weatherization Assistance Program: A Client's Story

<https://youtu.be/IDgaL7Z3DHo>





SIMPLE SAVINGS TO INVESTMENT RATIO (SIR) COMPARISON

ATTIC INSULATION VS. REPLACEMENT WINDOW

Actual SIR calculations supported by NEAT, MHEA, and other approved audit tools account for the Present Value (PV) of money and fuel escalation rates over the lifetime of the measures to arrive at more accurate savings numbers. For the purposes of this exercise, the simple SIR calculations outlined here are adequate.

Use these sample numbers or plug actual numbers based on local audits, installation costs and utility prices to discuss SIR and how it supports measure selection within the WAP.

Change the assumptions and have students complete the calculations.

Attic Insulation

Assumptions

Savings/yr: \$100

Lifetime: 25 years

Investment: \$400

SIR = Lifetime Savings/Investment

SIR = $25 \times 100/400$

SIR = 6.25

Replacement Window

Assumptions

Savings/yr: \$5/window

Lifetime: 25 years

Investment: \$200/window

SIR = Lifetime Savings/Investment

SIR = $25 \times 5/200$

SIR = .62



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