LESSON

Energy Conservation Materials and Measurement

BIG IDEA(S)

Modern weatherization measures are cost effective ways to conserve energy.

OBJECTIVES

Students will:

- Compare and contrast "old school" and modern weatherization measures
- Describe at least two weatherization measures for each category: building shell, incidental, mechanical, and electric

BRIGHT SOLAR FUTURES

WEATHERIZATION

TOPIC OF STUDY

Weatherization

90 MINUTES

TASK LIST SUBCATEGORY

801 Identify the principles of building science

802 Describe the interconnection of systems

810 Use industry vocabulary

OVERVIEW

Weatherization measures can be classified as "old school" or modern. Modern weatherization measures are grounded in the building science field. Modern measures also tend to be more cost-effective than older traditional methods of weatherization. Modern measures can be categorized as follows: a) building shell and insulation; b) incidental measures; c) mechanical systems measures; and d) electric measures.

KEY TERMS

baseload
building shell
weatherization measures
incidental measures

STANDARDS

PA/SDP

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

3.4.12.B1. Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of **technologies.**

3.4.12.C3. Apply the concept that many technological problems require a multi-disciplinary approach.

INSTRUCTIONAL

TEXT/REFERENCES

Energy Conservation Handbook. pp. 19-22

MATERIALS NEEDED

Teacher Presentation: Introduction to Weatherization PowerPoint presentation.

Content: Old School Measures worksheet, Modern Measures worksheet

Technology: Access to YouTube

IMPLEMENTATION (LESSON PLAN)

ENGAGE (15 - 20 MIN)

- 80s Television Commercial Analysis
  a. Ask students to imagine what life was like back in the late 1970s and early 1980s. Select 3-4 vintage television commercials listed below to share with the class.
     - Apple Macintosh 1984 Superbowl commercial: https://youtu.be/2zfqw8nhUwA
     - Commodore 64: https://youtu.be/JpZEjoKwFTM
     - Atari 2600 Game Console: https://youtu.be/7WjyBdLqzdg
     - IBM5100: https://youtu.be/KcUR65bju78
     - Historic tech breakthroughs: https://youtu.be/Qy_yzniD6m0
  b. How have some of these products changed over time? Compare and contrast current video systems such as PS4 or xBox with the Atari 2600. How has technology changed these products? What are some of the differences in "old school" and modern tech?

EXPLORE (25 - 30 MIN)

1. Show YouTube video clip about history of weatherization, highlighting old school measures: http://wxtvonline.org/2010/04/world-wx/ (00:57 - 04:51).
2. Divide students into teams of 3-4 individuals. Provide each team with the "Old School" Weatherization" worksheet. Have students describe how each measure is used and list the pros and cons for their assigned measure.

EXPLAIN (5 - 10 MIN)

- Have groups report out their results to whole class.

EXTEND/EVALUATE (15 - 20 MIN)

1. Show old school and modern Slides 12-13 from the Introduction to Weatherization PowerPoint: https://www.energy.gov/eere/wap/downloads/weatherization-installertechnician-fundamentals-20-introduction-weatherization
2. Summarize old school measures. Introduce modern measures.
3. Using the same groups of students as in the previous activity, ask groups to sort the list into the four general categories of measures: 1) building shell and insulation; 2) incidental measures; 3) mechanical systems measures; and 4) electric measures.
4. Review students' worksheets as a whole group.

RESOURCES/LINKS

DCED HOME Program: Weatherization Deferral

https://dced.pa.gov/download/home-program-appendix-3-weatherization-deferral-pilot-initiative-2017/?wpdmdl=86362&ind=0

DCED Housing Rehabilitation Guidebook

https://dced.pa.gov/download/2018-housing-rehabiliation-guidebook/

This is the World of Weatherization video

http://wxtvonline.org/2010/04/world-wx/

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