LESSON

Baseload/Seasonal Load

BIG IDEA(S)

a) Baseload energy usage varies very little throughout the year; seasonal load energy can change drastically based on the time of year. b) Baseload energy usage can be reduced with consumer education.

OBJECTIVES

Students will:

- Distinguish between baseload and seasonal load costs
- Given a set a yearly energy bills accurately calculate baseload and seasonal load costs
- Using technology such as Adobe Spark, YouTube, TikTok, etc., create a consumer education social media campaign highlighting ways to reduce baseload home energy costs with a minimum of three strategies
- Summarize the step for calculating baseload and seasonal load costs

BRIGHT SOLAR FUTURES

WEATHERIZATION

TOPIC OF STUDY

Auditing

120-150 MINUTES

TASK LIST SUBCATEGORY

102	Describe how energy is fundamental to our everyday lives
104	Describe sources and uses of energy
809	Apply math concepts to weatherization
810	Use industry vocabulary

KEY TERMS

baseload
seasonal conditioning load
phantom/vampire power

OVERVIEW

Baseload energy is the energy that is used in the same amount year-round. This often comes from appliances that are used daily such as refrigerators, lights, and electronics. Baseload is not directly affected by seasonal changes in temperature. An estimate of baseload energy usage can be calculated by analyzing energy bills. Consumer education methods can help the public lower their baseload costs.

STANDARDS

PA/SDP

3.2.12.A9. Formulate and revise explanations and models using logic and evidence.

3.2.12.B2. Explain how energy flowing through an open **system** can be lost.

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

3.1.12.B7. Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution.

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

3.4.12.B2. Illustrate how, with the aid of **technology**, various aspects of the environment can be monitored to provide information for decision making.

INSTRUCTIONAL

TEXT/REFERENCES

Energy Conservation Training Handbook. pp. 23-24, 96-101, and 115-118

MATERIALS NEEDED

Teacher Presentation: Baseload Measures PowerPoint (optional)

Content: *Utility Bill Analysis* worksheet and sample bills

Technology: Calculator, access to social media creation tools such as Adobe Spark, YouTube, TikTok, a digital video recording device such as a cell phone camera

IMPLEMENTATION (LESSON PLAN)

ENGAGE (10 - 15 MIN)

- Ask students to brainstorm a list of all of the appliances or devices in their homes that are left on regularly. Teacher will create a master list on the board or on an electronic Google doc. Ask students to sort their responses by year-round or only certain times of the year.

EXPLORE (45 - 60 MIN)

1. Have students work in pairs. Provide each team of students with a 12 month set of electric and gas bills and the "Utility Bill Analysis worksheet."
2. Have students complete the table and calculate baseload and seasonal load.

EXPLAIN (10 - 20 MIN)

1. Student teams report back results to whole group, explaining results.
2. Ask students to create a definitions of the terms "baseload" and "seasonal load."

EXTEND (10 - 20 MIN)

1. Revisit the list of items students brainstormed at the beginning of the lesson. Ask students to classify the energy use of each item as either baseload or seasonal.
2. Ask students to think of ways to reduce the baseload costs in their homes

EVALUATE (40-75 MIN)

- Students will create a consumer education social media campaign using technology such as Adobe Spark, YouTube, TikTok, etc., highlighting ways to reduce baseload home energy costs with a minimum of three strategies. Video should be approximately 3 minutes in length. Could be assigned whole or partially as homework.

RESOURCES/LINKS

WAP Baseload Measures lesson and PowerPoint:

https://www.energy.gov/eere/wap/downloads/energy-auditor-single-family-20-base-load-measures

Home Idle Load: Devices Wasting Huge Amounts of Electricity When Not in Active Use

https://www.nrdc.org/sites/default/files/home-idle-load-IP.pdf

Department of Energy Baseload/Seasonal Load PowerPoint

https://www.energy.gov/sites/prod/files/2016/07/f33/8_base_load_measures_v2.0.pptx

BRIGHT SOLAR FUTURES

WEATHERIZATION

TOPIC OF STUDY

Auditing

120-150 MINUTES