

## Impact of Our Energy Use on Sustainability



**Summary:** Sustainable practices will enable future generations to meet their energy needs while ensuring the present population meets theirs. Learning about sustainable practices to conserve energy empowers individuals to take part in sharing our planet's resources equitably.

**Language Arts Connection:** Being able to communicate and discuss lessons with peers helps to form a solid understanding of new ideas. Developing communication skills by expressing ideas collaboratively strengthens individual thinking while building on the ideas of others that might have different ideas. Writing down thoughts can help strengthen and support the individual's reasoning and self-responsibility to maintain sustainable practices.

### Educational Standards

#### 4TH GRADE

- **Science 4.ESS3.1:** Students who demonstrate understanding can obtain and combine information to describe that energy and fuels are derived from renewable and non-renewable resources and how their uses affect the environment.
- **ELA 4.3.W.3:** Students will express an opinion and provide fact-based reasons as support.
- **ELA 4.7.W.1:** Students will create multimodal content that effectively communicates an idea using technology or appropriate media.
- **ELA 4.1.R.1:** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.

#### 5TH GRADE

- **Science 5.ESS3-1:** Students who demonstrate understanding can obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environments.
- **ELA 5.1.R.3:** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.

## 6TH GRADE

- **ELA 6.1.R.3:** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.

## 7TH GRADE

- **Science 7.LS.2.1:** Students who demonstrate understanding can analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- **ELA 7.1.R.3:** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.
- **ELA 7.4.R.4:** Students will recognize the connotation and denotation of words.
- **Science 7.ESS3.1:** Students who demonstrate understanding can construct a scientific explanation based on evidence for how the uneven distribution of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

## 8TH GRADE

- **Science 8.LS1.5:** Students who demonstrate understanding can construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
- **ELA 8.1.R.3:** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.
- **ELA 7.4.R.4:** Students will recognize the connotation and denotation of words.

## Learning Objectives

1. Students will be able to identify and describe how they use energy throughout the day.
2. Students will be able to describe the connection between energy use and sustainability.

## Teacher Information/Background

### Vocabulary/Concepts:

- **Sustainability:** the ability to maintain our natural resources at a certain rate or level in order to keep ecological balance
- **Energy:** the ability to do work, produce change, or move an object
- **Ecological Footprint:** a measurement of how fast we consume resources and generate waste
- **Carbon Footprint:** the amount of carbon dioxide & other carbon compounds emitted due to the use of fossil fuels by an individual, company, country, etc.
- **Climate Change:** a change in the statistical distribution of weather patterns over an extended period of time
- **Mindful Consumption:** intentionally thinking about the ecological footprint and/or carbon footprint of the products & services we consume in order to be more sustainable

### Materials

1. Paper/pen (or tablet/computer) for journal entry prompt
2. The Energy I Used Today (NEED.org) handout and teacher key on Energy Bucks
3. And/or Global Footprint Network <https://www.footprintcalculator.org/>. Students will need an email to use this, and their own tablet or computer
4. Access to computer/tablet and projector for instructor
5. PowerPoint Presentation: [Relationship Between Our Energy Use and Sustainability](#) , (see Sustainability page on OREEP website)
6. Videos: (Several options to use) TED Teen Talk by Lauren Singer: [Why I Live a Zero Waste Life](#) , PBS The Greens: [episodes](#) , TED Talk by Diana Ivanova: [The Carbon Footprint of Consumption](#) , National Geographic's Human Footprint Series: [episodes](#) (DVD can be purchased from National Geographic)

7. Fiction or Literary Nonfiction Books about Sustainable Living  
(Several options to use: Dr. Seuss' *The Lorax*, Shel Silverstein's *The Giving Tree*, Jane Craighead George's *The Talking Earth*, Rana DeOrio's *What Does It Mean to be Green?*, Eric Carle's *The Tiny Seed*, Linda Sweeney's *Connected Wisdom: Stories about Living Systems*)

## Engagement

**Essential Question:** How does our energy use impact the Earth and its inhabitants?

## Misconceptions

- Our energy use doesn't have a detrimental impact on the Earth and its inhabitants.
- Our energy use does have a detrimental impact on the Earth and its inhabitants, but that's okay, we have enough resources to indefinitely continue using energy in the same way.
- Our energy use does have a detrimental impact on the Earth and its inhabitants, but that's okay, we will create the technology needed to overcome resource deficits.

## Class Schedule/Activities Begin Here

1. Journal Entry Prompt for Students: Define *sustainability* through words and a drawing. Then, describe whether or not you feel like you live sustainably. Last, explain how you think our use of energy relates to sustainability.
2. Before discussing the journal entries, teacher should create a table on the board that separates the words *negative*, *neutral*, and *positive connotation*. As students share what they wrote, teacher should have one/some/all come to write in their observation of how they identified sustainability in their entry--as a positive, neutral, or negative concept. At the conclusion of the discussion, guide students toward recognizing their perspective on sustainability through eliciting reactions from students on what they see in the table.

## Exploration

3. Students take an energy use survey, “The Energy I Used Today,” (NEED.org). An option, or an extension, would be to use an ecological footprint calculator (<https://www.footprintcalculator.org/>) that will show how many planets they are using. The website includes questions and solutions to reducing their ecological footprints.
4. Students answer the following questions and be prepared to share their answers:
  - Identify any other ways you think you might use energy throughout the day.
  - Are you surprised by how much energy you used? Explain.
  - Do you feel like your energy use is sustainable? Explain why or why not.

## Explanation

5. Discuss survey and answers with partner or small group, then as a whole class. (Teacher will provide answers to how many energy bucks are used per question, if the NEED.org survey is used. Students tally up their energy bucks.)
6. Teacher will go over quick Powerpoint/Prezi/Google Slides Presentation ([Relationship Between Our Energy Use & Sustainability](#)) (2-5 minutes) that provides a quick review about what has been learned about energy in the unit so far, as well as an overview of sustainability concepts/terms and their connection to energy use.

## Extension

7. Brainstorm on your own, then brainstorm with a partner or group the following question: How could you alter your energy use throughout the day? Describe.
8. Watch a video about sustainable living and/or read a book about it.
9. By yourself, create an alternative [daily schedule](#) that attempts to reduce your energy use.

## Evaluation

1. Informal check-ins throughout the class, and the discussion of the survey.
2. Formal check-in: alternative schedule (#7 above)
3. KAHOOT quiz: OREEP

## Citations

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