

## Natural Resources Lesson 1: *The Solve* Educator's Resource Guide

### 4-ESS3-1

#### Lesson Overview

##### Objective

In *The Solve*, the students will:

1. Solve a mystery that demonstrates the differences between renewable and nonrenewable resources.
2. Complete a Mind Map of new terms, definitions, and visuals for natural resources vocabulary.
3. Demonstrate understanding that environmental resources cycle at different rates, and that human removal of these resources has a drastic effect on the environment.

##### Lesson Prep

| Time Required                                                                                                                                                                                                                                                               |                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 45-75 minutes                                                                                                                                                                                                                                                               |                                                                                                                                              |
| Materials Required                                                                                                                                                                                                                                                          |                                                                                                                                              |
| <ul style="list-style-type: none"><li>• Student Guide</li><li>• Renewable Resource <a href="#">Comic Mystery</a></li><li>• Computer with speakers (for projecting video) or headphones (for student viewing on laptops)</li><li>• Scissors</li><li>• Glue or tape</li></ul> |                                                                                                                                              |
| Safety Considerations                                                                                                                                                                                                                                                       | Science & Engineering Practices                                                                                                              |
| None                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"><li>• Developing and Using Models</li><li>• Constructing Explanations or Arguments From Evidence</li></ul> |

## Inquiry Scale

*The Solve* can be completed in various settings, including presentation-style, small groups, or individually. In the case of a flipped or blended classroom, it can be completed entirely at home.

### Level 1: Teacher-driven

Read or watch the mystery twice as a class as the students follow along: go through it once completely and a second time while answering the discussion questions. Direct the students to complete the Mind Map in small groups, either digitally or on paper. Then, come back as a class to review the correct answers. Have the students informally quiz each other on the vocabulary until you feel they're familiar with the terms, then use the discussion questions at the bottom of the Mind Map to have a group discussion. Finally, have the students complete the Exit Ticket digitally or on paper.

### Level 2

Provide the students with the mystery (either in comic or video form), and have them read/watch it in small groups. Have the students answer the episode questions in their table groups either online or on paper. Then, as a class, review the mystery again, pausing as needed to discuss questions in a think-pair-share format. Direct the students to complete the Mind Map in small groups, either digitally or on paper. Then, come back as a class to review the correct answers. Have the students informally quiz each other on the vocabulary until you feel they're familiar with the terms, then use the discussion questions at the bottom of the Mind Map to have a group discussion. Finally, have the students complete the Exit Ticket digitally or on paper.

### Level 3: Student-driven

Provide the students with the mystery (either in comic or video form) and have them read/watch it in small groups or pairs. Have the students answer the episode questions either online or on paper and review their answers with a neighboring table group. Then, have the students complete the Mind Map in pairs, either digitally or on paper, and quiz each other on the vocabulary until they're familiar with the terms. Have these same pairs go through the discussion questions on their own, then review the answers as a class. Finally, have the students complete the Exit Ticket digitally or on paper.

## Agenda

### I. Solve the Renewable Resources Mosa Mack Mystery (20 minutes)

**Differentiation Tip:** The comic book and motion comic video can be read/watched as a class, in small groups, individually, or completed for homework. For additional support, students can read or watch the comic/episode twice: once before completing the questions and once with teacher guidance, pausing to discuss each answer.

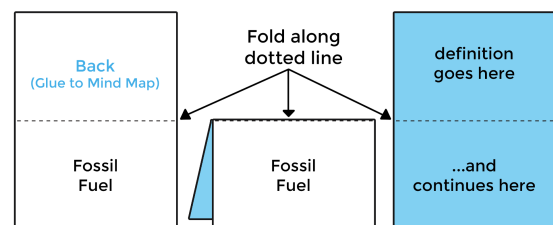
1. Either Read or [watch](#) the Mosa Mack Mystery on natural resources and have the students answer the questions in their Student Guide as they read/watch. Encourage them to cite the specific page numbers/time codes.

### II. Vocabulary Mind Map Activity (15-45 minutes)

**Differentiation Tip:** The Mind Map can be done as a class, in small groups, individually, or completed for homework.

1. Have the students complete the Mind Map either digitally or on paper.
  - For **Digital** (15 minutes), the students will
    - a. Go to <https://mosamack.com/home/natural-resources>
    - b. Select **Lesson 1: The Solve**.
    - c. Select **Vocabulary** and complete **Part 1**: matching terms with definitions.
    - d. Complete **Part 2**: matching terms and definitions with images on a diagram.
  - For **on paper** (45 minutes),
    - a. Print and pass out the Student Guide: Renewable Resources Lesson 1: *The Solve*.
      - If you don't have access to a color printer, provide the students with black and white copies of the Mind Map and project the colored version so the students can reference both images.
    - b. Introduce the activity.
    - c. Model the directions carefully, emphasizing that the students should:
      - Cut out the vocabulary cards on the **solid** lines.
      - Fold the cards on the **dotted** lines.
      - Write the term definitions on the **inside** of the card using the provided definitions.

Vocab Cards: **How To**



- d. Have the students use the clues from the Mind Map images, definitions, and terms to place the cards in the correct location in the Mind Map.
- e. Check that the students have matched their cards correctly before they glue/tape them down.
  - If you see a student or group who has placed a card in the correct place, ask a facilitating question such as, “Why do you think that term goes there?” or “What evidence leads you to believe that term goes there?” When students explain their thinking, this is a great opportunity to provide positive reinforcement. Then, encourage them to share their reasoning with the class or to other groups who may have trouble identifying the location of that specific term.
- f. Once verified, have the students use glue or double-sided tape to connect the back of the vocabulary card to the correct place on the Mind Map.
- g. Have the students discuss the questions in their student guide with their group or as a class.

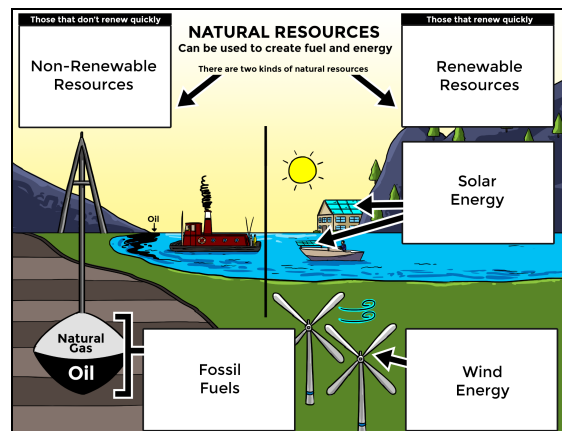
### III. Exit Ticket: Check for Understanding (10–15 minutes)

1. Have the students complete the exit ticket in groups, pairs, individually, or online.
  - a. To complete the quiz online, click the [Quiz](#) button in Lesson 1.

## Answer Key

### Mind Map Discussion Questions

- a. What are some examples of natural resources that humans can use for energy and survival? *Oil, natural gas, trees, water, wind, and sunlight*
- b. What renewable forms of energy are shown in the Mind Map? *Wind, water, and solar energy*
- c. What environmental problems can occur through the use of fossil fuels? *Fossil fuels like oil can spill into oceans, polluting the ocean. When burned, fossil fuels can pollute the air.*



### Episode Questions

1. What may stop summer vacation plans for students and their families? (0-1:50) *It's too expensive to travel.*
2. What are three types of fossil fuels? (2:00-2:24) *Petroleum (oil), coal, and natural gas.*

# MOSA MACK SCIENCE

3. Place the steps below into the correct order to show how fossil fuels are formed over millions of years. (3:00-3:51) *B, C, A*

|           |                                                                    |
|-----------|--------------------------------------------------------------------|
| <i>a.</i> | Heat and pressure turn the carbon into fossil fuels.               |
| <i>b.</i> | Plants and sea creatures die and some of their carbon gets buried. |
| <i>c.</i> | Earth piles on top of the plant and animal remains.                |

4. List one problem that can occur with the use of fossil fuels such as coal, oil, or natural gas. (4:00-5:24 ) *Potential answers:*
- *When oil is burned, carbon dioxide is released into the atmosphere. This traps heat and causes the Earth to heat up, leading to climate change.*
  - *When coal is mined from the ground, mining damages the land.*
5. Name two other types of natural resources that can be used over and over to create energy. (6:00 - 8:45) *The wind and sun*
6. What did Mosa figure out? How can the kids' vacations be saved? (8:45-9:30) *Mosa figured out how to make traveling by car less expensive using a solar car.*

## Quiz

- Which of the following is a renewable form of energy?
  - Coal
  - Wind**
  - Natural Gas
  - Oil
- What type of device is designed to capture a renewable form of energy?
  - Solar Panel**
  - Plane
  - Boat
  - Car
- Which of the following is a type of nonrenewable energy?
  - Solar
  - Water
  - Trees
  - Oil**
- True or False: It takes millions of years for fossil fuels to form.

- a. **True**
  - b. **False**
5. Which of the following are problems with the use of fossil fuels?
- a. Burning fossil fuels releases more carbon dioxide into the atmosphere, causing the planet to warm.
  - b. Mining coal can damage the land.
  - c. Fossil fuels take millions of years to form and once we use all of them in a location, they are gone.
  - d. **All of the above**