

## LESSON PLAN

# Renewable vs. Non-Renewable

### Learning Objectives:

- 1 Students will be able to define energy.
- 2 Students will learn the difference between renewable and non-renewable energy sources.
- 3 Students will learn the benefits of renewable energy and the costs of non-renewable.



### Before the Activity:

Use the **What is Solar?** PowerPoint presentation to introduce the concepts of renewable vs. non-renewable resources.

### Activity:

- 1 Teacher fills a bag with slips of paper that say "1st", "2nd", "3rd", or "4th generation" on them, making sure that there is one slip per student in the classroom, and that the number of slips per generation increases with the generation number (for example: there could be 4 "1st generation", 6 "2nd generation", 9 "3rd generation," and 14 "4th generation" slips). Each student picks a slip of paper from the bag.

**2** Teacher goes to the front of the classroom with a bag of popcorn (or some other material), and leads a brief discussion of what it means when one generation finds a resource and how future generations are affected by it:

If 1st generation users consume too much of the resource in their lifetime, very little will be left for the 2nd generation to use, and even less for the 3rd generation. Non-renewable resources are finite and will not be recreated over a human time span. We only have a limited number of resources to use, so we must use them with future generations in mind.

**3** 1st generation students then come up and take as much popcorn as they want back to their seats. 2nd generation students then do the same, followed by 3rd and 4th generations.

**4** Teacher and students should then discuss:

- How the students acted in “using” the resource
- Any waste that occurred (popcorn dropped on the floor)
- Whether any thought was given to students coming afterwards
- If there were protests from other students
- The degraded quality of popcorn towards the end (everyone’s hands were in it before, and it’s been crushed into smaller, less desirable pieces)
- What would be a better system that would allow for future generations to have access to the same amount/quality of popcorn as the 1st generation? Write down the students’ solutions and compare it to the definition of renewable resources.
- Ask students to design rules for a new round of the activity where there would be enough resources for all the generations.



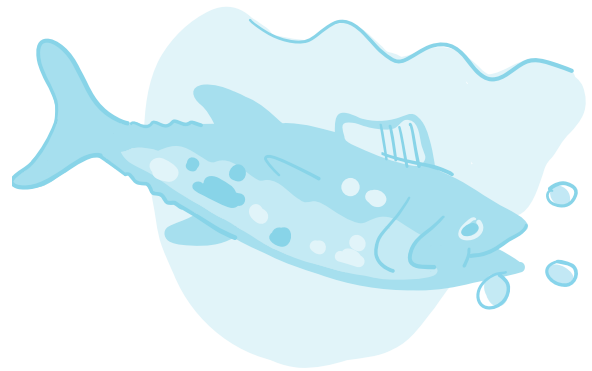
**5** Recreate activity steps 1-4 using the new rules created by the class. Debrief:

- How did students act differently than the first round?
- Was there more/less waste?
- Were there protests?
- Did the popcorn degrade?
- Which system was better and why?

**6** Debrief with the class to make the direct connections between non-renewable energy (round 1) and renewable energy (round 2).

**7** Have students work in pairs and pick another slip of paper out of a bag with one of these resources written on it:

- A field of corn
- Oil in the Arctic tundra
- Coal in the Appalachian Mountains
- Sunshine
- Trees in a forest
- Tuna in the ocean
- Sand on a beach
- A breeze over the Texas plains
- Water in a river



**8** Label one side of the classroom as “renewable” and the other as “non-renewable” and have students go stand on the side they think best represents the resource they picked.

**9** Each pair will share their resource and explain why they think it is renewable or non-renewable.