RENEWABLE OR NOT?

Description:

Students explore the concept of sustainability through a natural resources consumption simulation game.

Objective:

- Students will define basic components of a sustainable community.
- Students will understand the difference between renewable and non-renewable resources.
- Students will relate effects of individual actions on the long-term health of the environment.

Standards:

This activity is recommended for grades 3-6.

All Grades:
LA X.1.5 Vocabulary: Students will build and use conversational, academic, and content-specific grade-level vocabulary.
LA X.3.1 Speaking: Students will develop, apply and refine speaking skills and strategies to communicate key ideas in a variety of situations.
LA X.3.2 Listening: Students will develop and demonstrate active listening skills across a variety of situations.
LA X.3.3 Reciprocal Communication: Students will develop, apply, and adapt reciprocal communication skills.

3rd Grade

- SC.3.7.2.e Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- SS 3.1.2 Describe the impact of individual and group decisions at the community level.
- SS 3.3.3 Explain relationships between humans and the physical environment.
- SS 3.3.3.c Explain the importance of Earth's natural resources.

5th Grade

- SC.5.13.4.C Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

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Materials:

- Tokens - 200
- Prizes (tattoos, stickers)
- Activity script
- Whiteboard or large post it note paper
- Student handout pages

Background Info:

Sustainability is the idea that humans must interact with the environment in a way that ensures there will be enough resources left for future generations.

Natural resources are materials or things that people use from the earth. Frequently when we think of natural resources we think of minerals and fossil fuels. However, ecosystems and the services they provide are also natural resources. Biodiversity is a natural resource as well. There are two types of natural resources: renewable and nonrenewable.

Renewable resources can be replenished by natural processes as quickly as humans use them. Some examples are sunlight and wind. Metals and other minerals are renewable, too. They are not destroyed when they are used and can be recycled. Living things are also considered to be renewable. This is because they can reproduce to replace themselves. However, they can be over-used or misused to the point of extinction. To be truly renewable, they must be used sustainably.

Sustainable use is the use of resources in a way that meets the needs of the present and also preserves the resources for future generations.

Nonrenewable resources are natural resources that exist in fixed amounts and can be used up. Examples include fossil fuels such as petroleum, coal, and natural gas. These fuels formed from the remains of plants over hundreds of millions of years. We are using them up far faster than they could ever be replaced. At current rates of use, petroleum will be used up in just a few decades and coal in less than 300 years. Nuclear power is also considered to be a nonrenewable resource because it uses up uranium, which will eventually run out. It also produces harmful wastes that are difficult to dispose of safely.

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Activity:

1. Arrange the students in a circle. Read the script. Do not elaborate.
    a. These tokens belong to all of you.
    b. When we begin, I will say go. Then everybody may take tokens from the center pile.
    c. You may not return tokens to the pile once you have removed them. However, you may trade five tokens for a prize from me.
    d. When I say stop, I will double the number of tokens that are left in the center. Then we will continue the activity for another round.
    e. The maximum number of tokens that the center pile can hold is what you see at the beginning of this activity. The pile cannot hold more than that.
    f. You may not speak or otherwise communicate with classmates during the activity.
2. Allow enough tokens in the center circle for about ¼ of the students to exchange for prizes (if you have 30 students, 1/4 of them is 8 x 5 tokens is a total of 40 tokens). Conduct one round of the activity. Allow only about 10 seconds for the round.
3. When you say stop, exchange tokens for prizes. Do not allow the students to speak to one another.
4. Count the number of remaining tokens in the center and double the number. If no tokens remain, discuss how you cannot double zero, so the game is over.
    a. If there are no tokens remaining, give the students 60 seconds to discuss what they could do differently to make the game last longer. Do not give them more than 60 seconds. Then begin the game again.
5. After a couple rounds, allow the participants to communicate for 3 minutes to discuss strategies. Do not lead a discussion, allow them to work as a class (with little to no instruction from you) to form a plan.
6. After a few more rounds, have students return to their desks.
7. As a class, discuss the questions on the student page.
    a. Explain that sustainability refers to long-term strategies to maintain environmental resources that support a standard quality of human life.
    b. Discuss renewable resources and overharvesting resources.
    c. Challenge the participants to think about what they use in their own lives that they “overuse” like the tokens.

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Assessment:

- Classroom discussion
- Completed student handout pages