

# Renewable/Non-renewable Resources Lab Activity

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## *What is a renewable energy resource?*

- \* Renewable energy is natural energy which does not have a limited supply.
- \* Renewable energy can be used again and again, and will never run out.

Types:

- \* Biomass
- \* Hydro-electric
- \* Geothermal
- \* Solar

## *What is a non-renewable energy resource?*

- \* An energy resource that is not replaced or is replaced only very slowly by natural processes
- \* Fossil fuels are continually produced by the decay of plant and animal matter, but the rate of their production is extremely slow, very much slower than the rate at which we use them.

Types:

- \* Coal
- \* Oil
- \* Nuclear
- \* Natural Gas
- \* Tar Sands and Oil Shale

## *Objectives / Purpose*

- \* Understand how population relates to energy resources
- \* Evaluate problems related to resource availability
- \* Discover differences between renewable and nonrenewable energy resources
- \* Learn strategies to prevent resource depletion

### *Activity Preparation*

- \* The class will be divided into groups of 4.
- \* Each group will need a bag with 16 marbles.

### *Part 1: Renewable Resources Activity*

1. Each team begins with 16 marbles. Each student must take at least 1 marble per round to survive, and may take as many as he/she likes.
  2. One student per team records the number of pieces each team member takes per round, and the number of pieces remaining for the team.
  3. The resource is then "renewed" by half ( if there are 8 remaining pieces after round 1, the teacher will add 4 more pieces to the bag for round 2).
  4. 6 rounds are played in this manner. The object of the game is to have the most pieces of popcorn per team member after the final round.
- At the end of the game, discuss different strategies used by teams:
    - Some may die because they'll consume too much of the resource early on
    - Others may take one piece at a time and build up a store by the end
    - Others may take more throughout but will always keep enough in reserve to be sufficiently renewed

### *Part 2: Non-Renewable Resources Activity*

1. Students each pick up a slip of paper from a bag (there are 4 "1<sup>st</sup> generation", 6 "2<sup>nd</sup> generation", 9 "3<sup>rd</sup> generation," and 14 "4<sup>th</sup> generation" slips)
2. Teacher goes to the front of the classroom with a bag of marbles, and leads a brief discussion of what it means when one generation finds a resource and how future generations are affected by it.
3. 1<sup>st</sup> generation students then come up and take as many marbles as they want back to their seats. 2<sup>nd</sup> generation students then do the same, followed by 3<sup>rd</sup> and 4<sup>th</sup> generations.

Teacher and students should then discuss:

- how the students acted in “using” the resource
- any waste that occurred (marbles 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)

### *Follow-Up Questions*

1. Categorize the following as renewable, non-renewable or perpetual resources:

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

2. Which resources would continue to be available no matter how much people used them?
3. Under what circumstances would a renewable resource *not* be renewable?
4. What could be some effects of population growth, natural disasters, disease, and advanced technology systems on resource availability?
5. What are some advantages and disadvantages of using renewable resources in place of non-renewable resources?
6. List as many renewable resources as you can find in your classroom.
7. List as many non-renewable resources as you can that are found in your classroom.