



NSF GK-12 Graduate Fellows Program
Award # DGE-0139171
University of North Carolina at Wilmington

Natural Resources Trick-or-Treat

Activity Instructions

by

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Fuel & Energy Hunt

Estimated Time Required: 45-50 minutes for game, 1 class period if follow-up activity is used, 2 class periods if enrichment activity is used.

Goals Addressed:

- 2.01--Evaluate data related to population growth, along with problems and solutions
 - Resource Availability
- 2.02—Conclude that some ecosystem resources are finite
- 2.04—Analyze practices that affect the use, availability, and management of natural resources

Additional Outcomes

- Students will learn that some resources are finite. Also, as they are depleted, natural resources are usually more difficult to find and recover.
- Students will develop an understanding of commodities—some resources are worth more than others, so companies may choose to spend more money to find them (as long as it is profitable/advantageous)
- Students will realize that some environmental damage may occur from recovery of resources
- Students will analyze the role of technology in resource acquisition
- Students will conclude that predicting remaining reserves is problematic

Materials:

1. 5 different types of wrapped candy, either snack-size bags (M&Ms, etc.) or individually wrapped (e.g. Hershey Kisses). You can choose some types that all students will want, as well as some less popular types.
2. 5 paper or plastic grab-bags, one with an undetectable hole in the side or bottom
3. Information sheets for each natural resource
4. Paper money (optional)
5. Small prize for the winner
6. Worksheet
7. *Optional: Background reading material on each type of resource.

Procedure:

1. Before class, count a number of the mixed candy and put it in the following proportions:
 - “Coal” 50%
 - “Oil” 37%
 - “Natural Gas” 10%
 - “Uranium” 3%
 - “Solar” A quantity to exceed coal



- Optional: Unwrap a small amount of each type of candy. This will represent a resource lost during recovery and will not count as final profit.
2. Before the students arrive, hide some of the resources with a corner or two in sight. You can hide a large amount in one place to simulate a placer deposit or large reserve. Spread the rest of the candy around the room.
 3. Divide the class up into five exploration companies. Assign each team a “resource” candy. Do not tell them what their candy represents. By now the “Solar” team will be very excited because their candy is in great abundance! Pass out the grab-bags out to each team, with the “Solar” team getting the bag with the hole in it.
 4. Explain the rules: Each team will have 2 minutes to acquire as much of their resource as possible. The resource must be in the bags by the end of the two minutes to be counted. (Note how many teams focused on acquiring their product, but not converting it into useable form [placement into the bag]). If you have a small classroom, shorter rounds may be acceptable.
 5. Begin the 2 minute search
 6. At the end of the two minutes record how many pieces of candy collected by each team. Also record which teams had “bad business policy” by starting early, not ending a search when time is up, or major disruption of the environment (moving books, chairs, etc. and not putting them back).
 7. Tell the class they have one more chance and repeat the search procedure. This time note which companies had improved technology or technique.
 8. Allow one final round. This time, give the class a longer time period for their search
 9. Record the tallies for each team. If only playing the game, give the winning team a prize.
 10. By their relative abundance, have students guess the resource each candy represents.
 11. Tell them the number of each candy placed in the room and have them calculate the percentage recovered. Do not tell them where the reserves are hidden. This way some, but not all, of the information will leak out to later classes.

Follow-up activity:

Assign each resource a dollar amount, with price breakdown as follows:

1. Uranium
2. Oil
3. Coal
4. Natural Gas
5. Solar

Determine a maximum amount of paper money (the packets I found each had approximately \$2400. Therefore, if there are only 6 “Uranium” candies, each one would be worth \$400.

Allow students to submit bids for the commodities they want (as a group).



Charge a fee to enter a bid. Collect and read all bids then let the individual companies choose the deal they like. Repeat as many times as desired.

Enrichment:

Tell the class that each group represents an energy company. Explain to them that a new industry is looking to relocate to the area because of the wealth of newly discovered resources and is undecided on their energy requirements. Assign a sub-group of students to represent environmentalists, local politicians, and city council members. Distribute literature to each group and tell them to research their energy source and prepare a statement to present during the next class meeting. Instruct the environmentalists to also prepare a statement on the environmental impact of each energy source. The council members are to prepare a list of questions for each company. Take the “politicians” aside and explain to them that their goal is to make the deal as advantageous as possible for the city, so they may want to suggest courses of action or “leak” information to the companies, environmentalists, or council members (They are also allowed to be “lobbied” by any of the groups). You may also wish to assign one to be a liberal, and the other a conservative.

Each group should be aware of the following energy properties

- a. Relative abundance of their commodity (abundant/scarce)
- b. Processing costs (low/high)
- c. Efficiency and environmental impact

(For example: Solar energy is abundant, but processing costs are high. Environmental impact is low, so the net effect is a high-cost set-up with possible high returns.)

Let each group develop a strategy and delegate responsibility for the background research. Tell them that they will each have 10 minutes at the beginning of class for final preparations, and then each company will have 5 minutes to present their energy source. After each presentation there will be a 2-3 minute question and answer session. At the end of the presentations the environmentalists and politicians will each have time to voice their concerns and opinions. Finally, the city council will have the opportunity to vote on their decision. Remember, however, that the CEOs of the company (Teacher and/or Fellow) will have the final say.

This activity was adapted from “The Energy Game: Finding Energy Resources by DeWayne Backhus and can be found at the following URL:

http://www.beloit.edu/SEPM/Geology_and_the_enviro/Energy_game.html

This activity may also be used at Easter time with eggs or anytime with coins



Fuel & Energy Hunt-- Worksheet

Directions: Your team will be assigned a “natural resource” in the form of a candy type. Your resource may be one of the following: Oil, Coal, Uranium, Natural Gas or Solar. Devise a recovery plan. There are some resources that are apparently abundant and some that are hidden or hard to find. Collect your resource in the container provided. At the end of each round only the candy in the bag counts as resources collected. There will be several rounds of play. At the end, the team with the greatest amount of product wins.

Team Members: _____

Candy Product: _____

Resource Represented: _____

	ROUND 1	Round 2	Round 3	TOTAL
Number Collected				
Bad Business Procedures (list)				
Environmental Damage (list)				

Questions:

- List the resources represented by each candy and the number collected

Candy/Resource	Number Collected
1.	
2.	
3.	
4.	
5.	

- Do you think you collected all of your resource available? Why or why not?

In what Round did you collect the most? _____ Did the increased time in Round 3 help, or did it not matter?



3. Record the total number of each resource available. Calculate the percentage actually recovered.

	Candy or Resource	Total Recovered/Available	Percentage Recovered
1			
2			
3			
4			
5			

Do you think today's conditions are similar? Why or why not?

4. Did your company have practice any "Bad Business Procedures" or create "Environmental Damage" during recovery (BE HONEST...you will not be penalized). _____ . What were they (list)?

Were you "busted" performing these bad/dishonest actions or did you do them without anyone else noticing? Would you be honest about them if you were asked? How might this reflect the business procedures of real energy companies?

5. Did you improve your collection techniques during the later rounds of play? How might this relate to the role of technology in the industry?

