Name: _____ Date: _____ Period: _____

Energy Resources and Use

Part 1: Constant Energy Consumption

Prediction

I think that _____ will have the most energy remaining after five years.
(Country Name)

Procedures for Constant Energy Consumption

1. Begin by removing 10 beads from your bag, two or three beads at a time until you reach 10.
2. Count how many beads (out of 10) were green and how many were black. Record for Year 1.
3. Put the green beads back into the bag (they can be replenished) and keep the black beads out of the bag (they can't be replenished).
4. Subtract the number of black beads pulled (out of 10) from 100 to determine the "Total energy beads remaining in bag." This is the number of beads (energy remaining) after your first year of consumption. Record for Year 1.
5. Repeat steps 1 – 4 until your data table is complete (four more years). Each year, be sure to subtract the number of black beads (out of 10) from "Total energy beads remaining in bag" from the year before (not from 100).
6. Share your data with the whole class as you fill out the "Whole Class – Constant Energy Consumption" data table (page 2).

Part 1 Data: Constant Energy Consumption

Your Country: _____

Your Group				
Year	**Number of energy beads removed (consumed)**	**Renewable (green) energy beads consumed (out of 10)**	**Non-renewable (black) energy beads consumed (out of 10)**	**Total energy beads remaining in bag**
1	10			
2	10			
3	10			
4	10			
5	10			

Whole Class – Constant Energy Consumption		
Country	**Energy Beads Remaining after 5 Years**	
Sweden		
United States		
China		
Mexico		
Brazil		
New Zealand		
Canada		

Part 1: Results

1. Was your prediction correct? (circle one) Yes No
2. Which country had the most energy available after five years? _____
   a. % Renewable energy? _____ % Non-renewable energy? _____
3. Which country had the least energy available after five years? _____
   a. % Renewable energy? _____ % Non-renewable energy? _____

Background: Types of Energy Production

Type of Energy Production	Renewable / Non-renewable	Advantage	Disadvantage
Solar			
Wind			
Coal			
Natural Gas			
Oil			
Hydroelectric			
Geothermal			

Part 2: Increasing Energy Consumption

Procedures for Increasing Energy Consumption

1. Begin by removing 10 beads from your bag, two or three beads at a time until you reach 10.
2. Count how many beads were green and how many were black. Record for Year 1.
3. Put the green beads back into the bag (they can be replenished) and keep the black beads out of the bag (they can't be replenished).
4. Subtract the number of black beads pulled from 100 to determine the "Total energy beads remaining in bag." This is the number of beads (energy remaining) after your first year of consumption. Record for Year 1.
5. Repeat steps 1 – 4 until your data table is complete (four more years). **Each year, you will increase the number of beads you remove from the bag by 10**. Be sure to subtract the number of black beads from "Total energy beads remaining in bag" from the year before (not from 100).
6. Share your data with the whole class as you fill out the "Whole Class – Increasing Energy Consumption" data table.

Part 2 Data: Increasing Energy Consumption

Your Group				
Year	**Number of energy beads removed (consumed)**	**Renewable (green) energy beads consumed**	**Non-renewable (black) energy beads consumed**	**Total energy beads remaining in bag**
1	10			
2	20			
3	30			
4	40			
5	50			

Whole Class – Increasing Energy Consumption		
Country	**Energy Beads Remaining after 5 Years**	
Sweden		
United States		
China		
Mexico		
Brazil		
New Zealand		
Canada		

Part 2: Results

1. Compare the **Part 1: Whole Class Data** and **Part 2: Whole Class Data**. How did increased consumption impact the availability of energy resources after five years?

2. If we continued increasing our energy consumption for more than five years, consumption would eventually exceed the total amount of energy for every country, even those with high percentages of renewable energy. This tells us that switching to renewable energy is not the only solution to meet energy needs. What else must humans do to meet increasing global energy needs?

Conclusions

1. How does use of non-renewable resources contribute to global climate change?

2. What actions can you take to decrease the impact of using non-renewable resources as a primary energy source?