Energy Resources and Use
Answer Key

Part 1: Constant Energy Consumption

Your Country: ***Mexico***

Your Group				
Year	**Number of energy beads removed (consumed)**	**Renewable (green) energy beads consumed (out of 10)**	**Non-renewable (orange) energy beads consumed (out of 10)**	**Total energy beads remaining in bag**
1	10	***1***	***9***	***91***
2	10	***0***	***10***	***81***
3	10	***2***	***8***	***73***
4	10	***2***	***8***	***65***
5	10	***1***	***9***	***56***

Students share this number for whole class data

Part 1: Results

Student answers will vary, sample data shown

Whole Class – Constant Energy Consumption		
Country	**Energy Beads Remaining after 5 Years**	
Sweden	***88***	***85***
United States	***61***	***60***
China	***62***	***64***
Mexico	***56***	***61***
Brazil	***94***	***97***
New Zealand	***90***	***84***
Canada	***86***	***89***

This is usually the case

1. Which country had the most energy available after five years? ***New Zealand***
   a. % Renewable energy? ***47*** % Non-renewable energy? ***53***
2. Which country had the least energy available after five years? ***United States***
   a. % Renewable energy? ***8*** % Non-renewable energy? ***92***

This is often the case

3. Which country do you think contributes the most greenhouse gases to Earth's atmosphere? Use background knowledge and evidence from this model to support your argument.

   The United States emits more greenhouse gases per person than any other country on Earth. As a whole, China emits more greenhouse gases, but has a much larger population that the United States. Both counties rely heavily on non-renewable energy resources.

Background: Types of Energy Production

Type of Energy Production	Renewable / Non-renewable	Advantage	Disadvantage
Solar	***Renewable***	***Can go on roofs***	***Depends on the weather***
Wind	***Renewable***	***Does not produce pollution***	***Can destroy habitat***
Fossil Fuels (coal, oil, natural gas)	***Non-renewable***	***Inexpensive***	***Releases greenhouse gases to atmosphere***
Hydroelectric	***Renewable***	***Can be generated based on need***	***Breaches can be dangerous***
Geothermal	***Renewable***	***Not weather dependent***	***Can be expensive to install***

Part 2: Increasing Energy Consumption

Your Group				
Year	**Number of energy beads removed (consumed)**	**Renewable (green) energy beads consumed**	**Non-renewable (orange) energy beads consumed**	**Total energy beads remaining in bag**
1	10	***0***	***10***	***90***
2	20	***5***	***15***	***75***
3	30	***3***	***27***	***48***
4	40	***16***	***24***	***24****
5	50	***-----***	***-----***	***-----***

*Did not make 5 years

Whole Class – Increasing Energy Consumption		
Country	**Energy Beads Remaining after 5 Years**	
Sweden	***76***	***78***
United States	***16****	***22****
China	***26****	***25****
Mexico	***31****	***24****
Brazil	***93***	***95***
New Zealand	***83***	***81***
Canada	***75***	***77***

Part 2: Results

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

   Increased consumption caused each of the countries to have less energy remaining after five years. There were even countries that did not make it to five years, like the United States, China and Mexico. At year five, the demand for energy was more than these countries could provide.

Conclusions

1. How does energy production and consumption relate to global climate change? Construct an explanation using evidence from Insulating You, Insulating Earth; Energy Audit; and Energy Resources and Use.

   The way we produce and use energy is directly related to climate change. As we saw in Insulating You, Insulating Earth, greenhouse gases in the atmosphere trap thermal energy. While the towel trapped in some energy, the Mylar blanket trapped even more. The Mylar blanket represented additional greenhouse gases in our atmosphere. When humans produce and use energy, like we saw in Energy Audit, this releases even more greenhouse gases than are naturally there. By producing and using non-renewable energy sources, we are putting the Mylar blanket on the Earth, trapping in additional thermal energy, ultimately causing climates to change.

2. Relying more on renewable resources is an important step for the global environment and for sustainable, long-term energy production. What other actions can be taken to decrease the effect of energy production and use on climate change?

   People can reduce their overall energy use; use alternative forms of transportation; teach other people about the impact of using non-renewable resources. Student answers may vary.