

**COMPARISON OF ENERGY PRODUCTION/CONSUMPTION IN
KOREA, JAPAN, CHINA, AND U.S.**

Lesson Overview:

Students will create bar graphs to compare the energy production and consumption of the 4 countries, Japan, Korea, China, and U.S. They will compare nonrenewable energies (Coal, Crude Oil, and Dry Natural Gas) and renewable energies (Hydroelectric, Nuclear, and Other). Students will then write a 1 page summary of their findings and what these findings might mean to the economic futures of these countries.

Grade Level: 8th grade

Ohio Academic Science Grade Level Indicators:

Science & Technology (ST) 8.2 – Examine how choices regarding the use of technology are influenced by constraints caused by various unavoidable factors (e.g., geographic location, limited resources, social, political, and economic considerations).

Scientific Inquiry (SI) 8.3 – Read, construct and interpret data in various forms produced by self and others in both written and oral form (e.g. tables, charts, maps, graphs, diagrams and symbols).

Time: Two 45 minute class periods

Vocabulary: Renewable, Nonrenewable, Energy Resources, Production, Consumption

Leading Question: How does energy production and consumption in the United States compare to that of 3 of the leading Asian countries?

Materials:

Internet, Large Poster Sized Graph Paper, Markers

Procedure:

Day 1:

- 1) Students will meet in the computer lab. Ask students which countries they think **produce** the most Fossil Fuels (Coal, Natural Gas, and Oil) Hydroelectric power and Nuclear. Then ask them which countries they think **use** the most of these energies.
- 2) Have students go to the following website: indexmundi.com/energy.aspx
- 3) Allow students a few minutes to explore the website and look at some different countries and their energy production/consumption.

- 4) Divide students into 7 groups. Each group will be responsible for one of the following energy resources: Coal, Dry Natural Gas, Crude Oil, Hydroelectric, Nuclear, Liquid Natural Gas, and Other.
- 5) Hand out 2 large poster sized graph sheets and 4 different colored markers for each group. Using the website, have groups graph their assigned energy resource on the graph paper. One graph should show the energy **production** for the countries of China, Japan, Korea, and United States and the other graph should show the energy **consumption** for those same countries. Students should create bar graphs, with the 4 countries represented on the graphs by different colors. Graph the energy resources for the years 2000-2006. Students should make sure graphs are titled, x and y axis are labeled, and key is given for different colors.
- 6) At the bottom or on the back of each graph paper, groups should write 1 statement that summarizes what that graph shows about the energy production and consumption.

Day 2:

- 1) Groups will take turns presenting their graphs and summaries to the class. (Students in the audience may want to take notes on each group's presentation so they can use these notes to refer to when doing the homework. When each group s finished presenting, they should leave their graphs up in the front of the room. Each group should include the following in their presentations: What years produced/consumed the most? The least? Which countries consumed the most? The least? Do you notice any patterns?
- 2) When all groups have presented, have students share their thoughts on the different findings. Some discussion question could be: Why are certain energy resources found in certain countries? What do the production/consumption findings mean for the future of the countries? What impact might this have on the 4 countries' economics?
- 3) For homework, students are to write a 1-2 page paper on the impact these energies could have on each country and its economic condition. They should write at least 1 paragraph on each country. They should also discuss what implications the production and consumption of each type of energy will have on the future of the 4 countries. What might happen in the future if you consume more than you can produce? What might happen if you produce more than you can consume?
- 4) Summaries should be turned in the next day.

Assessment:

- 1) Bar Graphs
- 2) Written Summary

Differentiations :

- 1) For special needs students, have them compare only Korea and US in energy production and consumption.
- 2) Instead of having special needs students navigate the website, prepare a handout with amounts of energy consumed and produced for each country.
- 3) Have students work in pairs, splitting the work between them, then writing their summary together.

Extensions :

- 1) Research how wealthy each country is. (Korea, Japan, China, and US). Then have students compare country wealth to energy produced and consumed. Is there a correlation to how much is sold and how much is consumed?
- 2) Research the leading country for each type of energy. Which country produces the most of different energies? (Fossil Fuels, Wind, Hydroelectric, Nuclear, Geothermal, Solar, Other). Which country consumes the most of each type of energy?

Resources:

- 1) indexmundi.com/energy.aspx