



## Pump It! Burn It! Ship It!

# World Oil Consumption, Production, and Reserves Lesson

### Project Creators:

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Grade Level: 9-12

Discipline: Geography

### Description:

This project invites students to explore world oil consumption, production, and reserves across space and time, using data from the [British Petroleum web site](#).

[Download the data for the oil lesson](#) in .zip format.

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### Introduction

Natural resources found on the earth are not evenly distributed among the various countries. Oil and gas are two natural resources which exhibit an unusual geographic distribution on a worldwide basis. In this activity, you will compare the reserves, the production, and the consumption of oil as it is geographically distributed. You will analyze the data to draw some conclusions about geopolitical issues also.

### GIS Directions:

1. Sign onto your computer under your name so you can save things to your file. Remember we will save your materials in the "T" drive under "user" and your name.
2. Engage ArcView and get a new, blank view. Click on "add themes" which is the box with the + sign. Under the C: drive, find world themes again and get the "country94" theme. Pick a dark

color for the countries so you can see them as you lay other bits of data on top of the countries. You only need this theme to see where all the countries are. Data on every country is not available as this data is from British Petroleum sources.

3. Now pull up the oil reserves data as a new theme. It's in the C: drive titled "oilres6.shp". Go through the esri directory and get to the world data again. You want the end 1997 data. These numbers are in thousand million barrels (tmb). Double click on the rectangle of color so that you can manipulate the data in the legend editor. Have the computer break these numbers into as many categories as necessary to be able to differentiate between the countries that have lots of oil reserved and the ones that don't. Experiment with the classification field and classify choices. List the top 5 countries with reserves. You can tell how much are in reserves by identifying the countries that are darkest and getting the data that comes up.

4. Now take reserves and compare the 1997 data to 1977 data. After you bring in the 1977 data, break down those numbers on countries with the largest reserves and compare them to the countries in the 1996 data. Which countries have more on reserve now than they did in 1977 and which have less?

More:

Less:

5. Make three hypotheses about why you think certain countries have more oil on reserve today than 20 years ago. Cite countries specifically in your hypotheses.

6. Each barrel of oil has 42 gallons. Remember that each number above is thousand million barrels, so convert that to gallons. How many gallons of oil do the following countries have on reserve?

United States has \_\_\_\_\_ gallons of oil on reserve.

Saudi Arabia has \_\_\_\_\_ gallons of oil on reserve.

Venezuela has \_\_\_\_\_ gallons of oil on reserve.

Iran has \_\_\_\_\_ gallons of oil on reserve.

Iraq has \_\_\_\_\_ gallons of oil on reserve.

7. Now let's turn off the reserves theme and add production to the world scene. Go to the choice of themes again and find "oilprod.shp". Add the production of oil in each country during 1997 (Z997). These numbers are thousands of barrels daily. Set your color graduation scheme

so that you can see the obvious big producers. Who are the top 5 oil producing countries and how much are they producing?

- a.
- b.
- c.
- d.
- e.

8. Look at the production in 1987 (Z987). Which countries were producing more then than they do now? Name 5 of them. Why do you think they are producing less now than in 1987?

9. Pull up a table to review. Let's retrieve the oil production database. Highlight the tables and click on add. Get "oilprod.dbf". Read the chart for the following information. How much oil did Iraq produce in 1987? \_\_\_\_\_ How much oil did Iraq produce in 1997? \_\_\_\_\_ In which year did Iraq's production change the most drastically? \_\_\_\_\_ What was the cause of this change in their production?

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10. During the year of greatest change named above in question #9, did Saudi Arabia's and United States' production of oil increase or decrease from 1990-1991?

11. Turn off the production theme and let's look at consumption. This is the amount of oil a country uses measured in thousand barrels daily. Retrieve the data for consumption under "oilcons.shp." Set up a map to show you the usage as clearly as you can see the differences for 1997. What are your observations? Record 3 below.

- a.
- b.
- c.

12. Pull up the database on consumption too. "oilcons.dbf." Remember to add it as a table. The data will tell some stories in itself. Look through the data and see if you can find some interesting results. What are they?

13. Look at the numbers for Iceland's consumption of oil? What do you find unusual?

14. Now let's try to plot all three of these .shp files on your world map. Try using shades instead of colors too. See what happens as you experiment. Also print out the maps in shades since we do not have a color printer for you to print from. What happens when you do this?

15. Let's reflect on what you have learned from this GIS activity. In which region is the greatest concentration of proved oil reserves in the world? \_\_\_\_\_
16. How is the rest of the world affected when oil reserves are in one area?
17. Which countries consume more than 1 million barrels of oil per day and are able to produce enough to meet that demand?.
18. If a country were able to produce more oil than it needs, what does it do with the extra?
19. List 3 countries and one geographic region that use the most oil. Why do these places require so much oil?
20. Which of the countries listed above is the most dependent upon imported oil?
21. If the United States has "x" amount of reserves and consumes "x" amount daily, how long would the United States be able to run on the oil we have reserved?
22. How is oil transported from one country to another? List 3 ways. Circle the method of transportation which concerns you the most.
23. With petroleum prices being their lowest in many years, how does this impact our environment?
24. The Exxon Valdez oil spill in March 1989 was a huge oil spill. The spill was estimated to be approximately 11 million gallons. How does that compare to the daily usage or consumption in the United States? Remember 1 barrel = 42 gallons.

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