

# Supply and Demand: The Future of World Oil

OVERVIEW & OBJECTIVES	GRADES
<p>Students will analyze recent history of world oil production and consumption to identify patterns, which will allow predictions of future supply and demand. Students will then synthesize ways in which the supply and demand of world oil may impact both the future use of this limited resource and the impact it may have on the students as individuals.</p> <p><i>Students will be able to...</i></p> <ul style="list-style-type: none"><li>Analyze patterns of past and present world oil production and consumption to predict future world oil supply and demand.</li></ul>	8 <sup>th</sup> Global Studies and 9 <sup>th</sup> Geography
	<b>TIME</b> Two 85-minute class periods
	<b>REQUIRED MATERIALS</b> <ul style="list-style-type: none"><li>✓ Internet access for students</li><li>✓ Blank World Map</li><li>✓ Colored pencils</li><li>✓ Handouts: “Pre-Post Quiz: World Oil Production and Consumption”, “APPARTS”</li></ul>
MINNESOTA SOCIAL STUDIES STANDARDS & BENCHMARKS	

(8<sup>TH</sup> GRADE)

**Standard 10.** The meaning, use, distribution and importance of resources changes over time.

**8.3.3.10.5** Describe how the distribution and development of oil and water resources influence the economy and societies of Southwest Asia and North Africa.

**Standard 2.** Geographic inquiry is a process in which people ask geographic questions and gather, organize and analyze information to solve problems and plan for the future.

**8.3.1.2.1** Formulate questions about topics in geography; pose possible answers; use geospatial technology to analyze problems and make decisions within a spatial context.

*For example:* Questions about geographic issues might relate to urban development, environmental concerns, transportation issues, flood control. Geospatial technology—Geographic Information Systems (GIS), online atlases and databases, Google Earth or similar programs.

(9<sup>TH</sup> GRADE)

**Standard 10.** The meaning, use, distribution and importance of resources changes over time.

**9.3.4.10.1** Describe patterns of production and consumption of fossil fuels that are traded among nations.

**Standard 2.** Geographic inquiry is a process in which people ask geographic questions and gather, organize and analyze information to solve problems and plan for the future.

**9.3.1.2.2** Use geospatial technologies to develop plans for analyzing and solving local and regional problems that have spatial dimensions.

*For example:* Geospatial technology—Geographic Information Systems (GIS), online atlases and databases, Google Earth or similar programs. Regional problems that have spatial dimensions might relate to urban development, environmental concerns, transportation issues, flood control.

## SUGGESTED PROCEDURE

### INTRODUCTION

*Instruct students to:* Complete the “Pre-Post Quiz: World Oil Production and Consumption”.

*Instruct students to:* Write a brief list of ways the world oil price increase has affected their lives.

- Cost of gas, food, clothing
- Loss of homes, jobs, wages

*Ask students to:* Volunteer to share their reflections with the class. The teacher creates a web or list examples on the whiteboard.

### DEVELOPMENT

The teacher poses the question: What is the future of U.S. oil production and consumption?

The teacher explains that examining the past production and consumption and focusing on short-term and long-term forecasts will assist students to answer the question.

The teacher will form students into groups of 2 or 3 to compare and contrast world oil production and consumption trends over the past 30 years by creating maps for each continent of the world (minus Antarctica) in each of the years 1980, 1990, 2000, and 2010. *Note:* This will result in a total of 12 maps for comparison (six each for production and consumption).

- Each map should contain accurate visual data representing the amount of oil produced or consumed by each country of the continent chosen. Data is to be taken from Index Mundi charts. For example: The students with the 1980 North American Consumption Map will create their map to reflect the oil consumed by the individual countries of the U.S., Canada, and Mexico as well as Central America and the Caribbean.
- Students will color their maps with progressively darker colors to indicate the greater amounts or intensity. The common legend for both production and consumption is:

< 100 barrels/day (in thousands of barrels) Negligible
100 -1000
1000 - 2000
2000 - 3000
3000 - 4000
>4000

- Students will post their completed maps organized by continent for easy comparisons.
- Students identify patterns of production and consumption on the continents by answering these questions: Which countries have the greatest changes over the past 30 years? The least? Which continents changed the most/least over the past 30 years? What can we predict for the next 5 and 30 years for these countries and continents based on the comparisons you have made? Note any countries that seem to have had a significant difference between oil production and consumption.

*Instruct students to:* Read the Executive Summary of the annual “World Oil Outlook” from OPEC [http://www.opec.org/opec\\_web/en/publications/340.htm](http://www.opec.org/opec_web/en/publications/340.htm), which would be completed as a homework assignment, using the APPARTS strategy identified below. The next day, students will work in groups to construct a concept map to identify factors that influence global oil supply and demand according to OPEC’s predictions. Students will be able to differentiate the five years and thirty years’ forecasts (2018 medium-term and 2035 long-term forecasts).

*Ask:* Compared to today how does OPEC expect the production of world oil to change over the next 30 years? Compared to today how does OPEC expect the consumption of world oil to change over the next 30 years? What are the major factors affecting the predictions? How will the predictions affect global oil supply and demand?

*Ask:* Where, specifically, does OPEC expect the greatest amount of change to take place? What do they base this prediction on? Do you agree with them? Why or why not?

Students will use substantive discussion in small groups to summarize the lesson and apply prior knowledge of factors of supply and demand to predict the medium-term and long-term future of U.S. oil production and consumption. Students record their prediction on a concept map.

## **CLOSING**

*Instruct students to:* Complete the “Pre-Post Quiz: World Oil Production and Consumption”. Students will write a brief essay on the back that will include:

- Reflecting on patterns of oil production and consumption since 1980, the OPEC forecast for the next 30 years, and combining this information with prior knowledge of supply and demand, students predict how future world oil production and consumption may potentially impact them as individuals.
- Students will include in their response an answer to the question “What can you do individually to change the future that you have predicted?”

## **EXTENSIONS**

1. Students select a developing country and complete a T-chart comparing future oil production and consumption of the U.S. with the developing country.

2. Students work in small groups to examine several long-term predictions of oil production and consumption from a variety of sources. Students compare and contrast the predictions using a graphic organizer and postulate the long-term future of oil supply and demand.

“The Future of Oil: Yesterday’s Fuel” from The Economist

<http://www.economist.com/news/leaders/21582516-worlds-thirst-oil-could-be-nearing-peak-bad-news-producers-excellent>

“Long Term Outlook: Crude Oil Prices to 2030” from Natural Resources Canada

<http://www.nrcan.gc.ca/energy/publications/markets/6511>

“Shell’s Predictions for the Future” from BitTooth Blog <http://oilprice.com/Energy/Energy-General/Shell-Predictions-for-the-Future.html>

“OGPSS: The EXXonMobil Future—A Review” from BitTooth Blog

<http://bittooth.blogspot.com/2013/03/ogpss-exxonmobil-future-review.html>

“AEO2014: Early Release Overview” from U.S. Energy Information Administration

[http://www.eia.gov/forecasts/aeo/er/early\\_prices.cfm](http://www.eia.gov/forecasts/aeo/er/early_prices.cfm)

“Predicting the Future of Oil” from Scientific American

<http://www.scientificamerican.com/podcast/episode.cfm?id=predicting-the-future-of-oil-11-03-06>

## **ASSESSMENTS**

- Pre- and Post-Quiz: World Oil Production and Consumption
- Maps of Oil Production or Consumption
- APPARTS strategy
- Concept Map of factors that influence global oil supply and demand
- Concept Map of U.S. future oil production and consumption
- Brief paragraph on impact of world oil production and consumption on individuals

## **RESOURCES**

Executive Summary at “2013 World Oil Outlook” from OPEC

[http://www.opec.org/opec\\_web/en/publications/340.htm](http://www.opec.org/opec_web/en/publications/340.htm)

Crude Oil Production and Consumption by Year Bar Graphs from Index Mundi

<http://www.indexmundi.com/energy.aspx?region=sa&product=oil&graph=production+consumption>

Crude Oil Production by Year from Index Mundi

<http://www.indexmundi.com/energy.aspx?product=oil&graph=production>

Crude Oil Consumption by Year from Index Mundi

<http://www.indexmundi.com/energy.aspx?region=sa&product=oil&graph=consumption>

### **\*APPARTS Strategy**

**Author:** Who created the source? What do you know about the Author?

**Place and time:** Where and when was the source produced?

**Prior knowledge:** What do you know that helps your understanding of this source?

**Audience:** To whom is the author writing?

**Reason:** Why was this source produced?

**The main idea:** What point is the source trying to convey?

**Significance:** Why is this source important?

### **Answer Key for Pre-Post Test**

1. E
2. A
3. B
4. A
5. E

## Pre-Post Quiz: World Oil Production and Consumption

1. United States consumption of crude oil from 1980 to 2010
  - a. increased by 100 billion barrels per day
  - b. doubled
  - c. tripled
  - d. quadrupled
  - e. remained about the same
2. Which country has the greatest difference in oil production vs. oil consumption?
  - a. United States
  - b. Iraq
  - c. China
  - d. Russia
  - e. Saudi Arabia
3. Which country is expected to have the largest increase in oil consumption in the next 20 years?
  - a. United States
  - b. China
  - c. Japan
  - d. India
  - e. Iraq
4. Where does the United States get most of its energy today?
  - a. United States
  - b. Canada
  - c. Mexico
  - d. Saudi Arabia
  - e. Russia
5. Alternative fuels, alternative energy sources, demographic changes, and vehicle technology and use are factors needed to:
  - a. determine oil prices
  - b. determine current oil production and consumption
  - c. determine the distribution of oil resources
  - d. predict U.S. oil prices in 2035
  - e. predict world oil supply and demand

# APPARTS

**A** \_\_\_\_\_

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**P** \_\_\_\_\_

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**P** \_\_\_\_\_

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**A** \_\_\_\_\_

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**R** \_\_\_\_\_

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**T** \_\_\_\_\_

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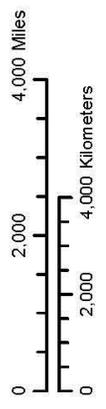
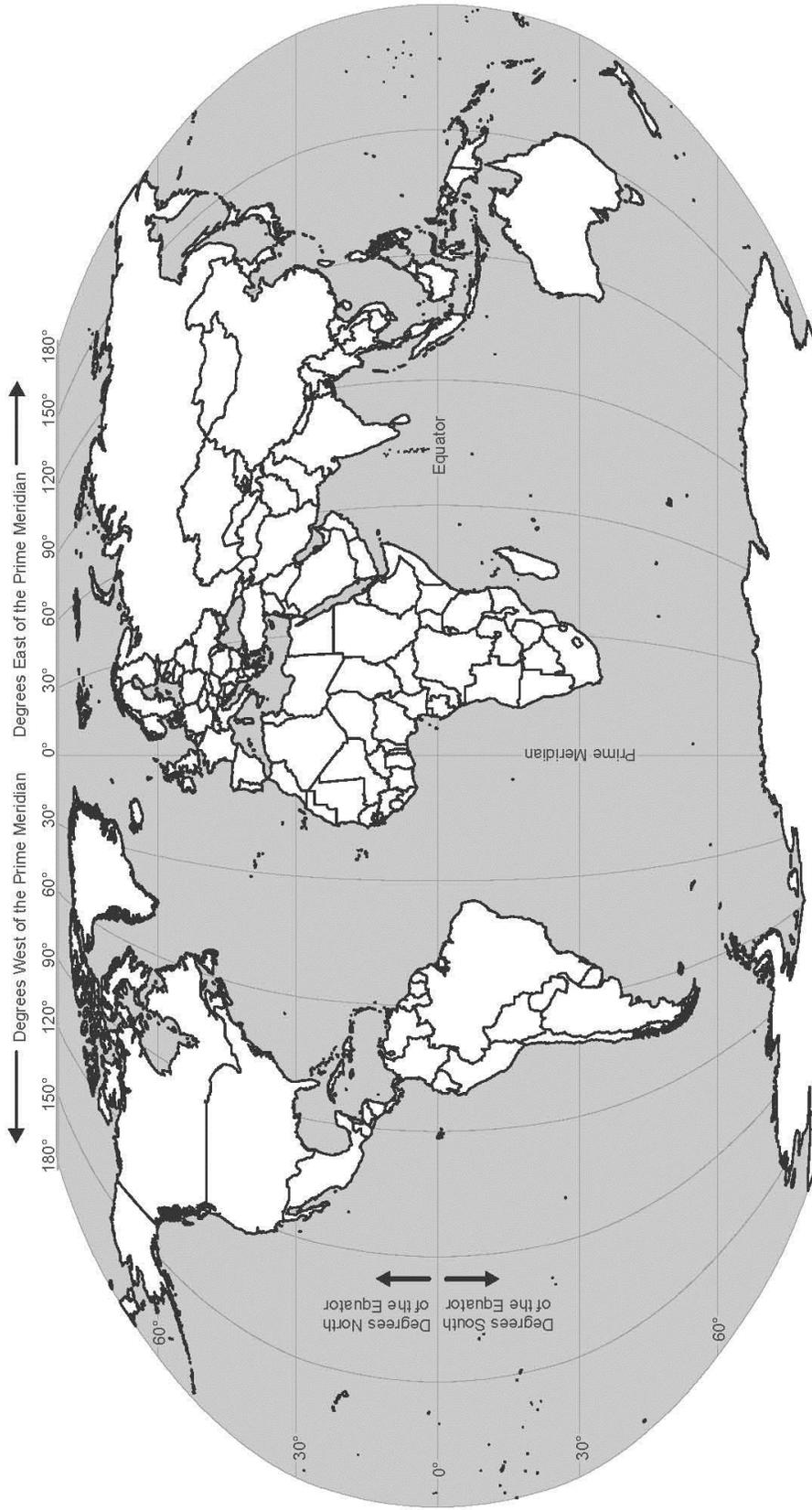
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**S** \_\_\_\_\_

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# T H E W O R L D



Projection: Robinson

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 Minnesota Alliance for Geographic Education

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