

28.1 Hydrocarbons and Energy



Summarize main points from each video.

Video Title / topic _____

Video Title / topic _____

Video Title / topic _____

Topic Introduction



Summarize your understanding of each paragraph.

North America's massive energy diet is largely made up of hydrocarbons—a full 83 percent comes from oil, gas, and coal, and if we include nuclear energy, 91 percent comes from nonrenewable fuel sources. (as of January, 2011). <http://www.resilience.org>

Petroleum, natural gas, coal, renewable energy, and nuclear electric power are primary energy sources. Electricity is a secondary energy source that is generated from primary energy sources.

In 2016, energy produced in the United States was equal to about 83.9 quadrillion Btu, which was equal to about 86% of U.S. energy consumption. The difference between production and consumption was mainly in net imports of petroleum.

Natural gas production in 2016 was the second largest amount after the record high production in 2015. More efficient and cost-effective drilling and production techniques have resulted in increased production of natural gas from shale formations.

Read/Summarize Text



1. Read the passage.
2. Underline key expressions in each sentence.
3. Re-write each word (or expression) you underlined.
4. Summarize the passage.

The mix of U.S. energy production changes

1

Total renewable energy production and consumption both reached record highs of about 10 quadrillion Btu in 2016.

2

Hydroelectric power production in 2016 was about 12% below the 50-year average, but increases in energy production from wind and solar helped to increase the overall energy production from renewable sources.

Energy production from wind and solar were at record highs in 2016.

<https://www.eia.gov>

Re-write words you underlined

3

Using a complete sentence, summarize or rephrase the passage

4

Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

Energy from moving air

Wind is caused by uneven heating of the earth's surface by the sun. Because the earth's surface is made up of different types of land and water, it absorbs the sun's heat at different rates. One example of this uneven heating is the daily wind cycle.

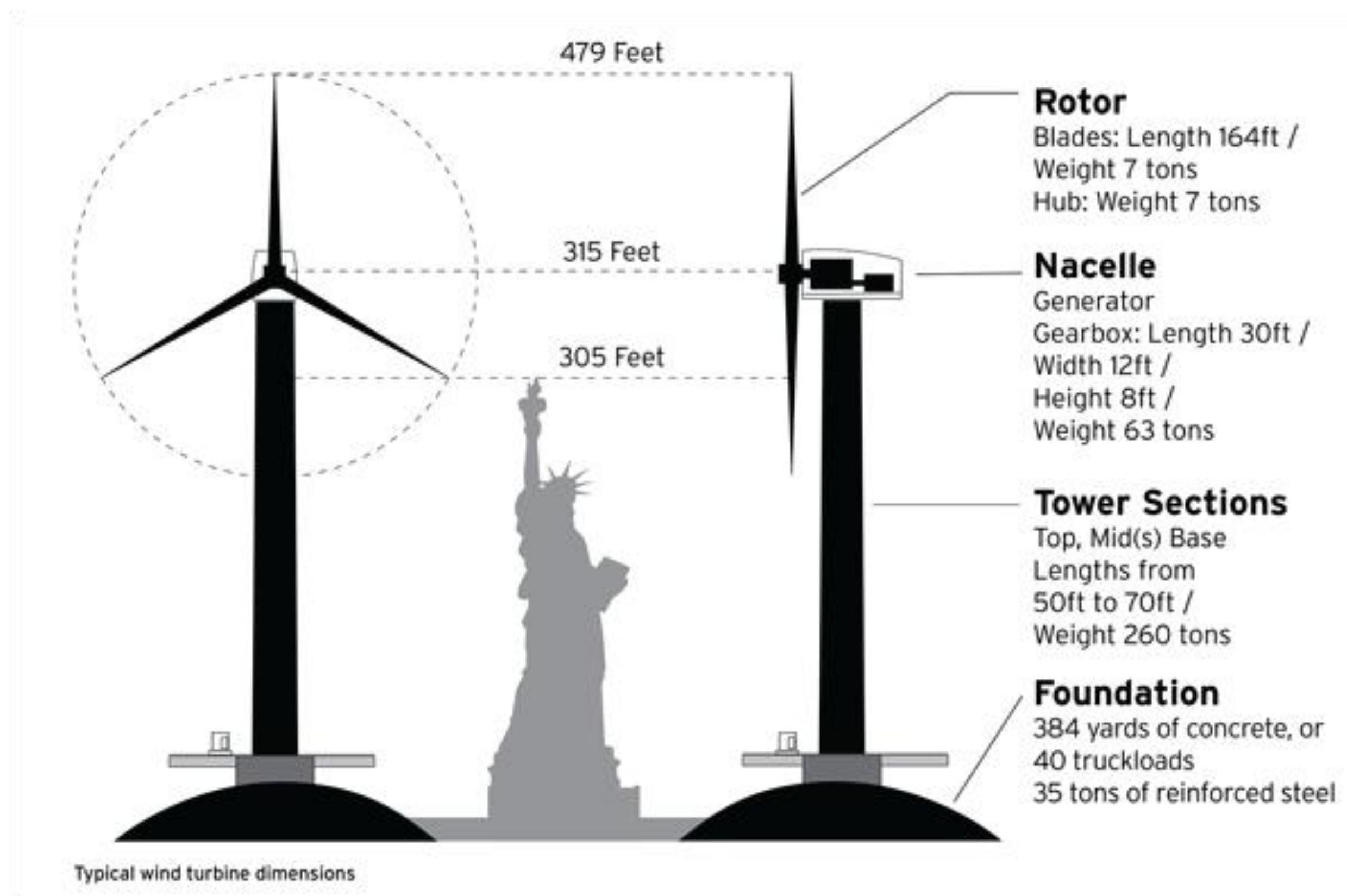
The daily wind cycle

During the day, air above the land heats up faster than air over water. Warm air over land expands and rises, and heavier, cooler air rushes in to take its place, creating wind. At night, the winds are reversed because air cools more rapidly over land than it does over water.

In the same way, the atmospheric winds that circle the earth are created because the land near the earth's equator is hotter than the land near the North Pole and the South Pole.

Wind energy for electricity generation

Today, wind energy is mainly used to generate electricity, although water pumping windmills were once used throughout the United States.



Draw Illustration

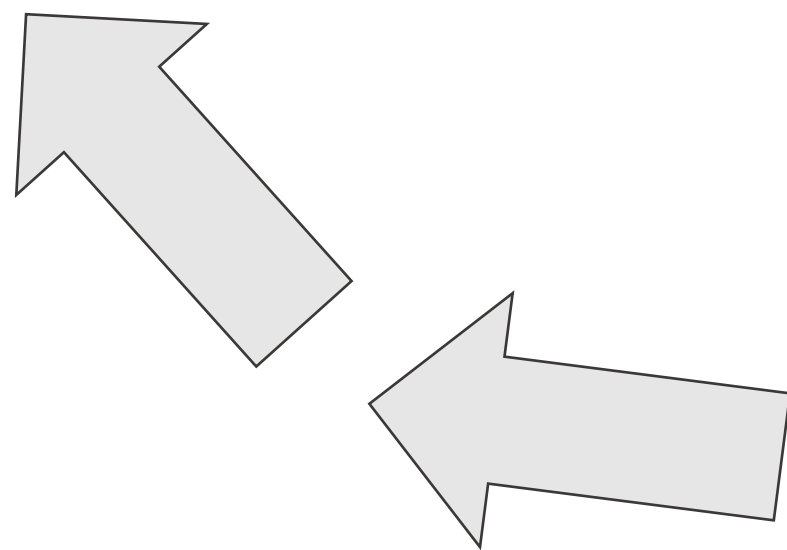
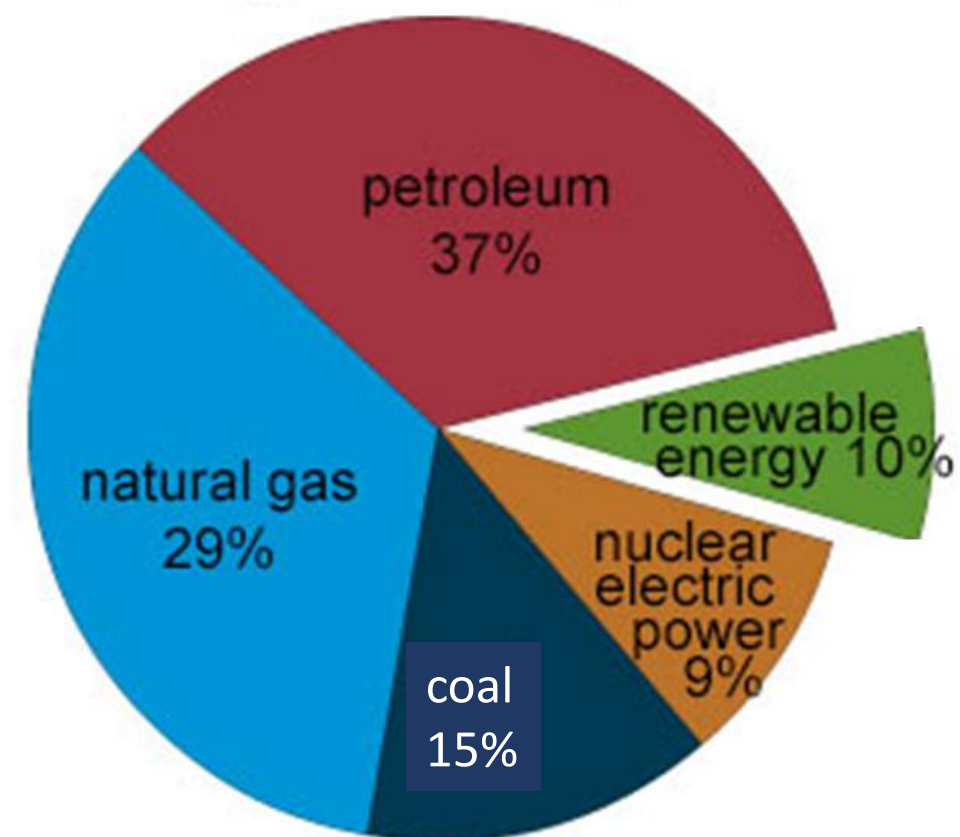


Copy and Label the Illustration in the Space Provided

In 2016, the shares of total primary energy consumption for the five energy-consuming sectors were:

- Electric power—39%
- Transportation—29%
- Industrial—22%
- Residential—6%
- Commercial—4%

energy source, 2016



Multiple sources including D.O.E.

Draw (Copy) the Illustration Here

Interpret a Graph



Write the title of the graph _____

Circle the type of chart this represents

Bar Chart Line Chart Pie Chart Other

If applicable,

What does the X-axis represent _____

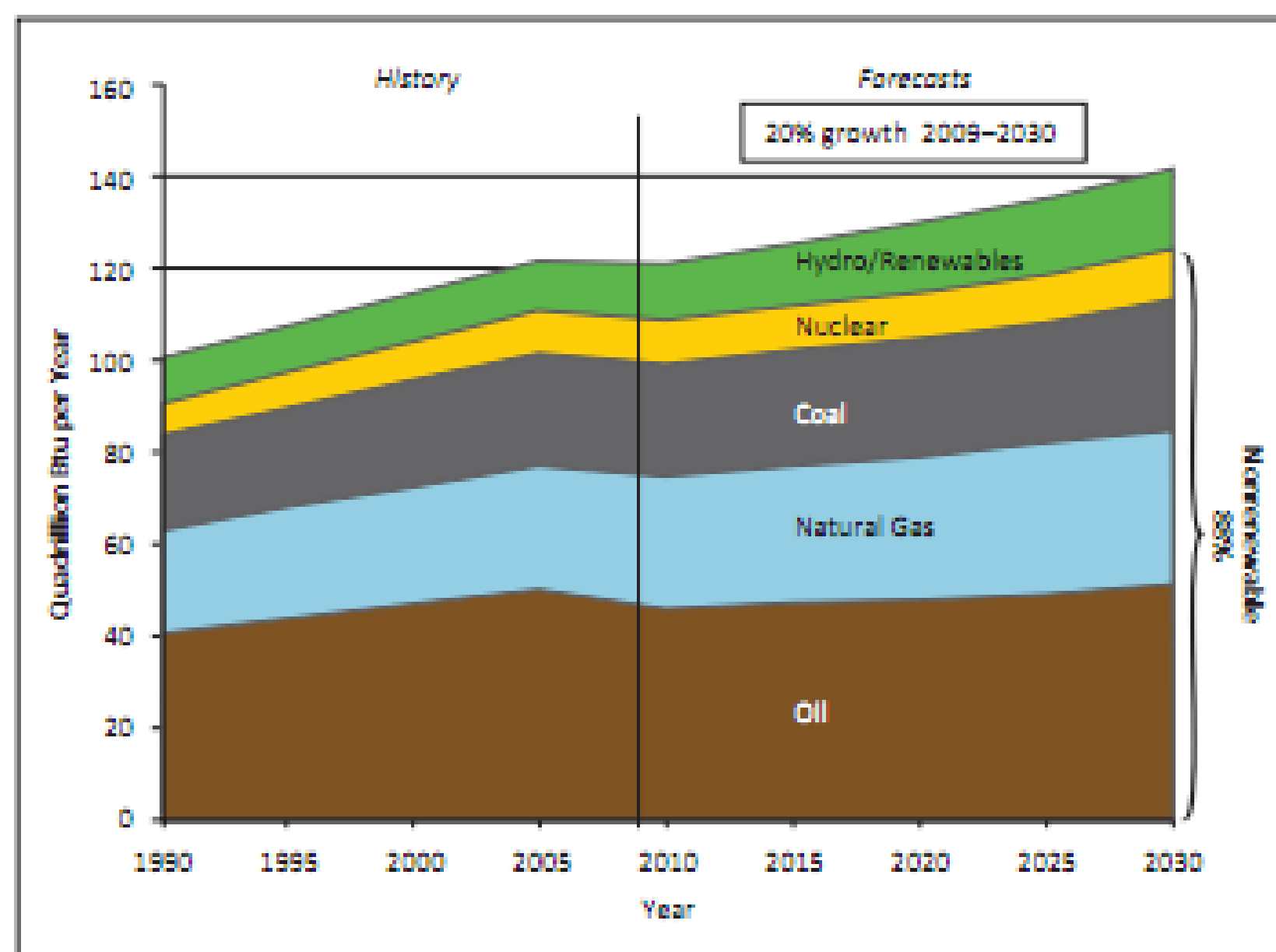
What does the Y-axis imply _____

Summarize what this graph represents or conveys

<http://www.resilience.org/wp-content/uploads/files/images/figure-17.1.PNG>

FIGURE 17.1

History and forecasts of North American energy consumption by fuel, 1990–2030.



Source: Data from U.S. Energy Information Administration, *International Energy Outlook 2009*, DOE/EIA-0484, May 27, 2009, <http://www.eia.doe.gov/oiaf/ieo/>.

Show-Off Your Smarts!



Instructions

- Complete as an individual or small group.
- Discuss your ideas/answers/responses in a small group.
- Select one person to present your responses to the class.

Q1. How can this information be applied to a young-person's life?

Q2. How does this information apply to (or impact) communities?

Q3. When do scientists need to apply this information? How?

Q4. How would a person from 100 years ago view this information?

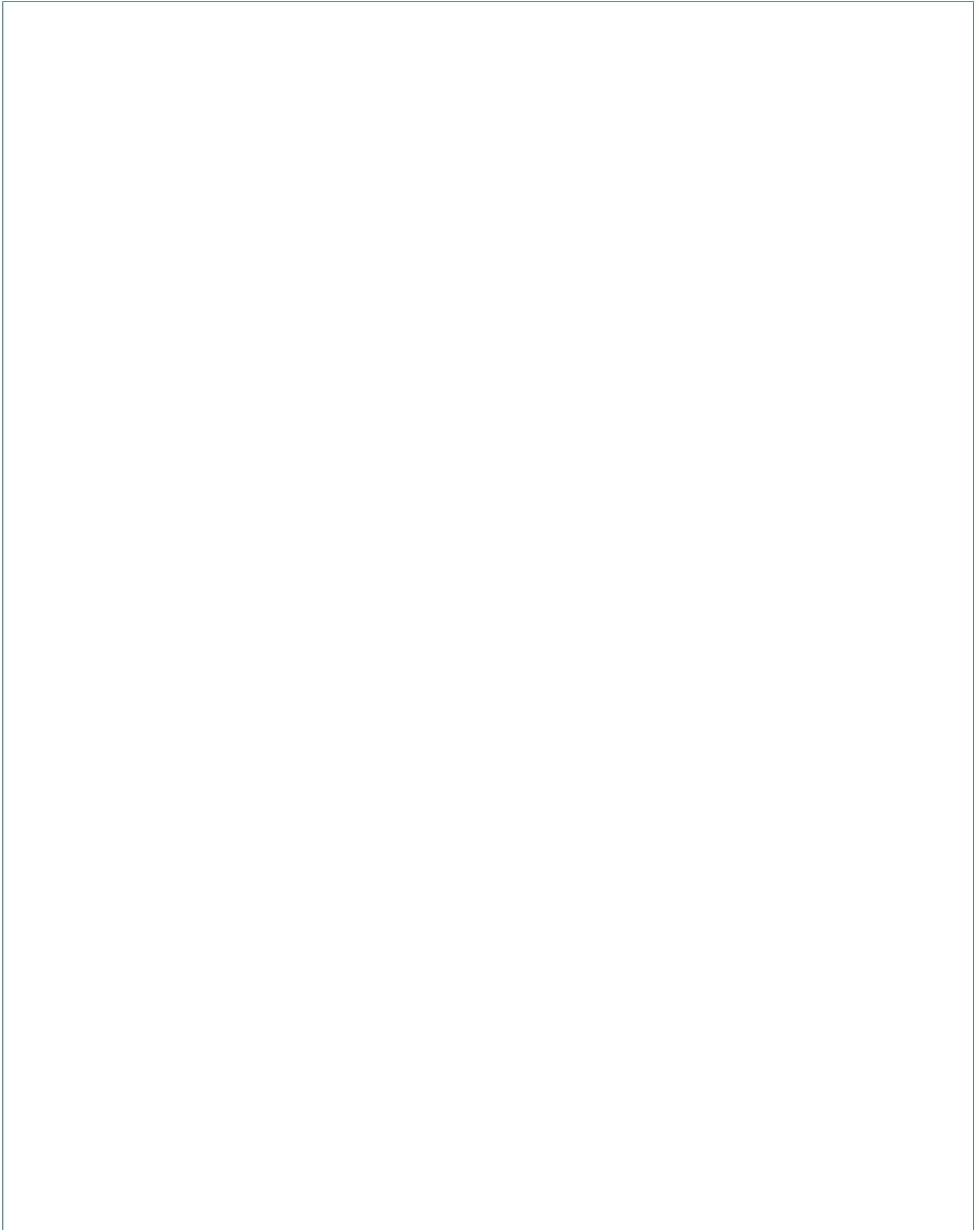
Q5. How does this topic connect to other science topics or math?

Write down at least three words introduced or covered by this topic.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Make a Poster

In the space provided here, create/draw a poster which conveys the concepts you have learned on this topic.

A large, empty rectangular box with a thin blue border, intended for the student to create a poster. The box occupies the majority of the page below the instructions.