

Join the national conversation!



Word Generation - Unit 2.09

Focus Words

generate | derives | advantage | consume | contaminate



Weekly Passage

Pilgrim Nuclear Station sits just off the road forty miles from Boston. This power plant makes electricity by heating water with a controlled nuclear reaction. Boiling water makes steam. The steam turns a turbine to generate electricity. Power lines take electricity derived from the plant all over the state of Massachusetts.

President Obama and other politicians want to build more nuclear power plants like Pilgrim. They see nuclear power as a good alternative to expensive oil. Because we consume so much oil in America, we depend on oil from other countries. Nuclear power can be made right here so nuclear energy cannot be cut off by another country. Nuclear power has another major advantage. It does not pollute the air like gas or coal does.

People who are concerned about nuclear power point to safety issues. Some nuclear power plants have leaked radioactive chemicals. The chemicals are blown by the

wind and can contaminate water in nearby communities. Doctors have found higher rates of cancer in towns near the Pilgrim power plant.

The biggest worry about nuclear power is a meltdown. In a meltdown, the nuclear reaction gets out of control inside the plant. It gets so hot, the building explodes or breaks apart. Clouds of poisonous chemicals spread over a huge area. At Chernobyl, in Eastern Europe, a nuclear plant meltdown in 1986 spread contamination all over Europe. Thousands of people developed cancer after the meltdown. After the Chernobyl disaster, the U. S. stopped building new nuclear power plants.

Supporters of nuclear power believe that safer power plants can prevent these problems. They want the U. S. to start building nuclear power plants again. Is nuclear power worth the risks?

Unit 2.09**Nuclear power: Our energy future, or danger to society?****Focus Word Chart**

Word	Meaning	Forms	Examples of Use	Notes
generate	(v.) - produce			
derives	(v.) - comes from			
advantage	(n.) - helpful quantity			
consume	(v.) - to use up			
contaminate	(v.) - poison; pollute			

Nuclear power: Our energy future, or danger to society?

Problem of the Week



Americans **consume** more energy each year, and we are looking for cleaner, greener ways to produce it. Nuclear power has many **advantages**. It doesn't pollute the air, and it can be produced in the U.S. But nuclear opponents raise several concerns. One is nuclear waste. Nuclear waste **derives** from the nuclear reactions that create nuclear energy, as well as from the mining and enrichment of nuclear fuel. If nuclear waste is not stored properly, it can **contaminate** soil and water. Some nuclear waste will remain dangerous for thousands of years.

Yucca Mountain in Nevada has been proposed as a site for long-term storage of nuclear waste. But this has **generated** a lot of controversy. Many Nevada residents don't want a nuclear dump in their home state. In 2001, the Environmental Protection Agency set safety standards for Yucca Mountain for the next 10,000 years.

Option 1: The average American lives about 80 years. How many lifetimes is 10,000 years?

- A) 125 lifetimes
- B) 130 lifetimes
- C) 135 lifetimes
- D) 210 lifetimes

Option 2: An appeals court ruled that the 10,000-year safety standards for Yucca Mountain were inadequate. After all, some nuclear waste may be dangerous for hundreds of thousands of years. The new EPA safety standards cover the next million years. Write 10,000 and 1 million in scientific notation. How many orders of magnitude separate the two numbers?

Discussion Question: With violence in the Middle East and worries about global warming, traditional energy sources like oil and coal are falling out of favor. The **advantages** of nuclear power seem increasingly appealing. Many experts say nuclear power is safe. They say that many of the fears people have about nuclear power **derive** from misinformation and from the confusion of nuclear power with nuclear weapons. But nuclear waste remains a problem. A long-term, ultra-secure facility is needed. But, given the fact that leaks could **contaminate** the local environment, no one wants this facility to be in his or her backyard. The Obama Administration has cut government funding for the Yucca Mountain facility. Meanwhile, the nation's nuclear power plants continue to **generate** nuclear waste. Where should it go?

Nuclear power: Our energy future, or danger to society?

Debating the Issue



I. Get ready...

Pick one of these positions (or create your own).

A Nuclear power is too risky and should not be used. We cannot risk contaminating the air, earth, and water.

B Nuclear power will save us from pollution and conflict over foreign oil and should be used as much as possible.

C The advantages of nuclear power are worth the risks as long as we pay attention to safety issues.

D We can solve our energy problems by conserving energy and using safe sources like solar power.

E _____

GO!

Be a strong participant by using phrases like these.

In my experience . . .

that's similar to what I think too...

What makes you think that?

When I re-read the text, it reminded me...

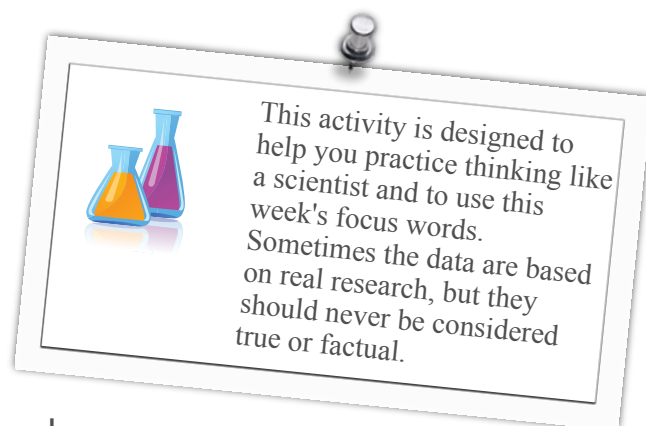
2. Get set...

Be ready to provide evidence to back up your position during your class discussion or debate. Jot down a few quick notes:

Unit 2.09

Nuclear power: Our energy future, or danger to society?

Science Activity



Professor Seemy's class is debating the **advantages** and disadvantages of nuclear energy.

"As we **consume** more energy, we need to look for cleaner ways to produce it," says Jennifer. "We should **derive** more of our energy from nuclear reactions. Nuclear reactions **generate** energy without creating air pollution."

"What about the dangers?" asks Mario. "Nuclear accidents like the one in 1979 at Three Mile Island (TMI) in Pennsylvania can **contaminate** the air, soil, and water with deadly radiation."

"A judge ruled that no one was hurt by the TMI accident," says Jennifer.

Mario shakes his head. "Not everyone agrees. One scientist named Steven Wing studied cancer rates near TMI. Take a look at what he found."

Question:

Were cancer rates higher than normal downwind from TMI?

("Downwind" means in the path of radiation that may have escaped during the accident.)

Hypothesis:

Downwind from TMI, cancer rates will be higher than normal.

Materials:

- ▶ a 1990 report on cancer rates near TMI

Procedure:

Re-analyze 1990 data on cancer rates near the TMI accident.

Data:

	Downwind Rates
Lung Cancer	2 to 10 times higher than normal
Leukemia	2 to 10 times higher than normal

Conclusion:

Is the hypothesis supported or not by the data?

What evidence supports your conclusion?

How would you make this a better experiment?



Writing Prompt

Is nuclear power worth the risks?

Support your position with clear reasons and specific examples. Try to use relevant words from the Word Generation list in your response.

Focus Words

generate | derives | advantage | consume | contaminate

A tool to help you think about your own writing!

Remember you can use focus words from any of the WG Units.

Check off what you accomplished:

Good Start

- ☐ Stated my own position
- ☐ Included 1 focus word

Pretty Good

- ☐ Stated my own position clearly
- ☐ Included 1-2 arguments
- ☐ Included 1-2 focus words

Exemplary

- ☐ Stated my own position clearly
- ☐ Included 1-2 arguments
- ☐ Included 1 counterargument
- ☐ Used 2-5 focus words

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal grey lines across its entire width, typical of notebook or legal stationery. The paper is otherwise completely empty, with no margins, text, or other markings.