

## Nuclear Energy WebQuest Jigsaw

One of the most important uses of nuclear energy is to generate electricity in nuclear power plants. This webquest is designed to give you some background information on this topic and help you explore the question: *Should we continue to use nuclear power for generating electricity?* Click on the hyperlink to for each website and read in order to answer the questions that follow. Make sure your answer completely addresses the question.



### **SECTION 1: Nuclear Reactions and Energy**

[Kids Korner - Nuclear Power](#)

1. What part of the atom stores nuclear energy?
2. What is nuclear fission?
3. What happens to the nucleus of a uranium atom when fission occurs? Draw a diagram like the one on your screen.
4. How do nuclear power plants use fission?
5. Use these two sources to complete this chart to compare two different ways that atoms can break down and produce radiation.

[NDT Resource Center - Radioactive Decay](#)

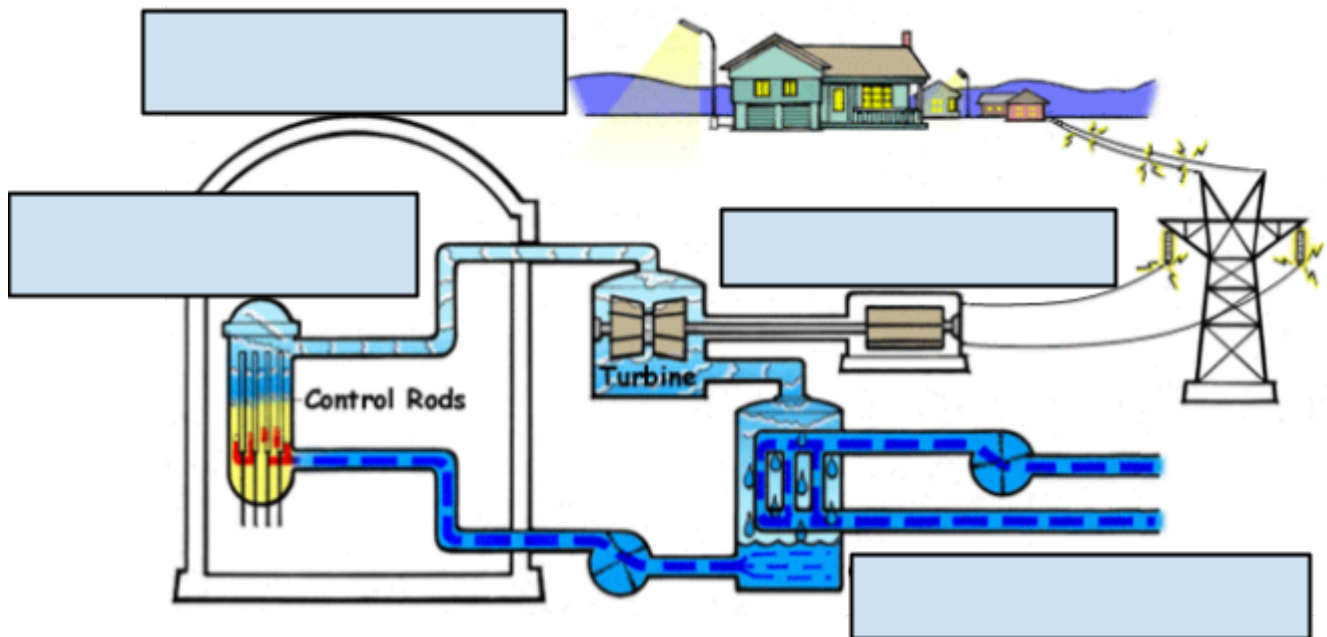
[Physics for Kids - Nuclear Energy and Physics](#)

	Radioactive Decay	Nuclear Fission
What happens to the atom's nucleus		
Amount of energy released		
What causes it to happen		

## **SECTION 2: How Nuclear Power Plants Work**

### [U.S.NRC Student Corner](#)

6. What do all power plants do to make electricity? (See the “What is Nuclear Energy?” page)
7. How is electricity generated at a nuclear power plant? In other words, what is the nuclear energy used for in the plant? (See the “What is Nuclear Energy?” page)
8. What are the main parts of a nuclear power plant? Label this diagram. (See the “Nuclear Reactors” page. Note that this diagram is NOT the first picture - scroll down!)



### [Energy Kids Nuclear Basics](#)

9. Scroll down and look for the blue chart of data from 2015 to find out what country generates more electricity from nuclear power than any other country in the world.
10. How many nuclear reactors are in this country? Read the paragraph above the chart to find out.

### [Map of Nuclear Power Plants in the US](#)

11. Which midwestern state has the most nuclear power plants?

### **SECTION 3: Radiation Health Risks**

#### **Radiation Basics (US EPA)**

12. What is radiation?

13. Questions about Ionizing Radiation

a. Why does ionizing radiation pose a health risk?

b. Go to the section labelled “Types of Ionizing Radiation” in the middle of the page. What are the four types of ionizing radiation? Briefly describe each.

1.

2.

3.

4.

#### **Radiation Questions and Answers**

14. What are some sources of background radiation in our daily lives?

15. How much radiation does the average American receive in one year?

16. How much radiation does the average American receive from commercial nuclear power plants in a year?

#### **Fact Monster - Nuclear and Chemical Accidents**

17. What happened at some of the largest nuclear accidents that have occurred around the world?

Describe the problem and if there were any deaths directly associated with it.

a. 1979: Three Mile Island (US)

b. 1986: Chernobyl (near Ukraine)

c. 2011: Fukushima (Japan)

#### **SECTION 4: Pros and Cons of Nuclear Power**

##### [World Nuclear Association - Safety of Nuclear Power Reactors](#)

18. Are nuclear accidents common? How many major accidents have occurred in the last six decades?

##### [U.S.NRC Fact Sheet on Nuclear Risk](#)

19. What are the four requirements for nuclear power plants in order to minimize the risk of a nuclear power plant accident? (Read the first paragraph to find this information.)

##### [Nuclear Energy Pros and Cons](#)

20. For each of the pros and cons listed below, write a sentence to explain what is meant by each.

PROS	CONS
Low air pollution	Environmental impact on land and water
Low operating costs once established	Radioactive waste
Reliability	Nuclear accident risk
More efficient energy than fossil fuels	High start-up costs
Potentially renewable energy	Limited Uranium supply
	Military security