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| **Nuclear Energy  By Patti Hutchison** |  | http://www.edhelperclipart.com/clipart/edhelp1.gif |

1 *Caption: The Three Mile Island nuclear power plant near Middletown, Pennsylvania.*  
  
2 When you hear the words "nuclear energy," what do you think of? Many people think of warheads, bombs, and other dangers. However, there are "good" uses for nuclear energy, also. Just what is nuclear energy, and how is it produced?  
  
3 Nuclear energy is one energy source that doesn't come directly from the sun. It comes from atoms. Atoms are all around us. All matter, whether solid, liquid, gas, or plasma is made up of atoms.  
  
4 The core of an atom is called a nucleus. It is made of some particles that are positively charged, and others that are neutral. Some atoms are radioactive. They naturally undergo a process called nuclear fission.  
  
5 During nuclear fission, a nucleus divides and becomes smaller. This process releases a large amount of energy. Heat is given off. This energy can be used to make electricity.  
  
6 Electricity can be produced in a nuclear reactor. A radioactive element, usually uranium, is formed into rods that are made into bundles. They are put into water. The uranium is "supercritical." This means that if it is not cooled, it will eventually melt.  
  
7 To prevent the melting, control rods that can absorb the stray neutrons are put into the bundle. These rods can be raised or lowered. This allows the operator to control the rate of the nuclear reaction.  
  
8 The nuclear reaction of the uranium gives off a large amount of heat. The water surrounding the bundles is heated. It produces steam. The steam drives a turbine. The turbine spins a generator and produces electricity.  
  
9 Coal can be used to produce electricity in this same way. However, nuclear reactors produce much less pollution than coal burning energy plants. At one time, scientists thought that nuclear energy might replace fossil fuels for the production of electricity. They believed nuclear energy would cost less and cause less pollution.  
  
10 However, at this time, nuclear power plants are only producing a small amount of the world's electricity. Many people fear nuclear accidents. They do not want nuclear waste sites near their homes. Many concerns about costs and safety have been raised.  
  
11 Will scientists find a way to produce nuclear energy that is safe and efficient? Will nuclear energy be the energy of the future? The answers remain to be seen.  
  
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**Nuclear Energy**

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| |  |  | | --- | --- | | 1. | Like all energy, nuclear energy comes directly from the sun. http://stories.edhelperclipart.com/clipart/bubblea.jpgFalse http://stories.edhelperclipart.com/clipart/bubbleb.jpgTrue | | |  |  | | --- | --- | | 2. | What happens during nuclear fission? http://stories.edhelperclipart.com/clipart/bubblea.jpgThe nucleus divides and becomes smaller http://stories.edhelperclipart.com/clipart/bubbleb.jpgEnergy is given off http://stories.edhelperclipart.com/clipart/bubblec.jpgBoth a and b | |
| |  |  | | --- | --- | | 3. | Atoms that naturally undergo nuclear fission are called: http://stories.edhelperclipart.com/clipart/bubblea.jpgRadioactive http://stories.edhelperclipart.com/clipart/bubbleb.jpgElectricity http://stories.edhelperclipart.com/clipart/bubblec.jpgWarheads | | |  |  | | --- | --- | | 4. | In a nuclear reactor, the heat given off during the reaction creates: http://stories.edhelperclipart.com/clipart/bubblea.jpgA turbine http://stories.edhelperclipart.com/clipart/bubbleb.jpgUranium http://stories.edhelperclipart.com/clipart/bubblec.jpgSteam | |
| |  |  | | --- | --- | | 5. | Name one advantage of making electricity in a nuclear reaction instead of by burning coal. http://stories.edhelperclipart.com/clipart/wordline.gif  http://stories.edhelperclipart.com/clipart/wordline.gif | | |  |  | | --- | --- | | 6. | Name two reasons why nuclear energy is not widely used. http://stories.edhelperclipart.com/clipart/wordline.gif  http://stories.edhelperclipart.com/clipart/wordline.gif | |

**Write a paragraph explaining how electricity is produced in a nuclear reactor.**   
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