

### Topic 3.1 How is electrical energy part of your world?

#### *Different Types of Energy, page 108*

1. False; Mechanical energy is the sum of kinetic energy and potential energy.
2. False; Fission reactions are carried out in reactors on Earth or fusion reactions occur in the Sun.
3. True.
4. False; One type of energy can be transformed into another type of energy.
5. False; Thermal energy from Earth's interior is geothermal energy.
6. True.
7. False; Potential energy is stored energy that a system has due to its position or condition.

#### *Energy In Your Life, page 109*

	Example	Type of Energy	Explanation of Energy Type
a)	Canada geese	chemical	The geese are animals. Animals are a form of biomass. Biomass stores chemical energy.
b)	driftwood	chemical solar	The driftwood was recently part of a living plant. Plants are a form of biomass. Biomass stores chemical energy. Plants transform solar energy into chemical energy.
c)	sunlight	solar	Solar energy is carried by electromagnetic radiation given off by the sun. On Earth we see this as sunlight.
d)	wind	kinetic	Wind is moving air. Any moving object has kinetic energy.
e)	waves	kinetic	Water moves in waves. Any moving object has kinetic energy.
f)	battery	chemical	Batteries store chemical energy.
g)	hot chocolate	chemical thermal	The ingredients in hot chocolate come from plants and animals. These are types of biomass and store chemical energy. The beverage is hot, so it has thermal energy.
h)	tide	kinetic	The tides move water. Any moving object has kinetic energy.
i)	waterfall	potential kinetic	The water at the top of a waterfall, just before it falls, has potential energy because of its position, and kinetic energy because it is moving. The potential energy is converted into more kinetic energy as the water falls due to gravity.
j)	hot springs pool	thermal	Hot springs gain thermal energy from molten rock under Earth's crust.

#### *Generating Electrical Energy, page 110*

1. a) At the dam station, water stored behind the dam has potential energy. As it flows downhill it gains kinetic energy, which turns a turbine connected to a generator.  
b) In a coal-burning generating station, thermal energy from burning coal is used to boil water into steam. Pressure associated with the moving steam turns the blades of turbines connected to generators.

- c) Inside a nuclear reactor, uranium or plutonium atoms undergo fission reactions. Splitting one atom sets off a chain reaction that causes more atoms to split. The nuclear reactor contains and controls these reactions and the energy they release. Most of this energy is thermal energy, which is used to boil water into steam. Pressure associated with the moving steam turns turbines connected to generators.

***Technology Fair, page 111***

1. solar energy, photovoltaic effect, electromagnetic radiation, kinetic energy, generator system, controller, anemometer

***3.1 Assessment, pages 112–115***

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|------|-------|-------|-------|
| 1. E | 7. D  | 13. B | 19. C |
| 2. B | 8. B  | 14. A | 20. C |
| 3. D | 9. A  | 15. A | 21. A |
| 4. A | 10. D | 16. B | 22. B |
| 5. F | 11. C | 17. D |       |
| 6. C | 12. B | 18. B |       |

23.

