observe its work. Have students measure the height of the paperclip before and after the water is poured.

7. Moderate the competition between groups.
8. Administer the questions.

Day 3

Presentations

1. Facilitate the group presentations.
2. Evaluate students' notebooks and/or group posters using the rubric provided.

Answers to Questions in the Student Guide

Connections

1. List 10 items that you use on a daily basis that use electricity.

   Answers will vary, but may include electric toothbrushes, toasters, microwaves, cell phones, game consoles, automobiles, stereos, refrigerators, hair dryers, and lights.

2. List several examples of nonrenewable and renewable energy sources.

   Coal and oil are nonrenewable energy sources; solar, wind, hydroelectric power are renewable energy sources.

3. How could you harness the power of the water wheel to generate electricity?

   If the water wheel was affixed to a central shaft that was connected to a turbine, the motion of the water would rotate the shaft and turn the turbine to produce electricity.

Questions

1. Describe the similarities and differences between the hand generator you observed and a water wheel.

   Answers will vary. The hand generator and the water wheel both turn by mechanical force. The mechanical force used by the hand generator is from my arm and hand turning the crank. The mechanical force used by the water wheel is the force of the falling water hitting the blades.

2. How might you modify the hand generator to have it serve as a motor; that is, how could you use electrical energy to turn the hand crank?

   I could use a battery to turn the hand crank. The same generator, within the device, can serve as a motor. If a battery provides electrical current to the motor, that energy can be converted into mechanical energy to turn the crank.

3. What about your hydroelectric power generator design worked successfully?

   Answers will vary.

4. What about your hydroelectric power generator design did not work?

   Answers will vary.

5. If you were to try again, how would you change your design to make your water wheel more effective?

   Answers will vary.

NOTES