TECHNOLOGY in Practice
Applications and Innovations

Chapter Overview, Concepts, and Goals
Chapter 4, Taking Action

Chapter Overview

This chapter serves as a capstone for the *Designing Environmental Solutions* module. In the first three chapters of the module, students learned about three different environmental concerns and the technologies that are related to those concerns. In this chapter, they explore local environmental issues and apply what they have learned to develop an environmental solution using the process of technology design.

In the **Engage** activity, students read about some of the finalists in the *Siemens We Can Change the World Challenge* for middle school students. They also discuss what they know about various environmental concerns.

In the **Explore** activity, teams of students decide on the local issue on which they would like to focus. They use resources to learn more about the issue and begin brainstorming about the solution they might design to affect the issue.

As students work through the **Explain** activity, they will create detailed plans for their design and build a model of the solution.

During the **Elaborate** activity, students will test and evaluate their solutions.

Finally, in the **Evaluate** activity, the teams will complete their own applications for the *Siemens We Can Change the World Challenge*, though they do not have to submit these applications. Although they will work as a team to create the applications, they will then revise the applications as individuals to demonstrate what they have learned. Throughout the activity, students will reflect on which phases of the process of technology design they have completed.

Designing Environmental Solutions

Chapter Organizer

Engage—Changing the World
Key idea:
Students can have an impact on local environmental issues.
Activity:
Students read about finalists in the *Siemens We Can Change the World Challenge* and share what they know about environmental issues.
Linking question:
What are the local environmental issues in my area?

Explore—Local Issues
Key idea:
Many local environmental issues can impact an area.
Activity:
Students research a local issue and brainstorm ways to address that issue.
Linking question:
How can a technology solution have an impact on issues in my area?

Explain—Addressing the Problem
Key idea:
Technology solutions can affect environmental issues.
Activity:
Using the idea from the Explore activity, students design and build a model of their solutions.
Linking question:
How do engineers and designers know if their solutions work?

Elaborate—Testing 1-2-3
Key idea:
Modeling and testing solutions help designers know if a solution works.
Activity:
Students test and evaluate their solutions to the environmental issue.
Linking question:
Once I have a solution, how do I complete the design process?

Evaluate—Meeting the Challenge
Key idea:
Sharing results is an important part of the design process.
Activity:
Students complete an application for the *Siemens We Can Change the World Challenge*.

Major Concepts

- Technology can have an impact on environmental issues.
- All local areas have environmental issues.
- The process of technology design can help people develop environmental solutions.
- Middle school students can design technology that has an impact.

Goals for the Chapter

By the end of this chapter, students should

- be able to show an understanding of a local environmental issue
- complete the process of technology design
- present a design for an environmental solution
- describe how technology can address environmental issues.

Designing Environmental Solutions *Taking Action*