TECHNOLOGY in Practice
Applications and Innovations

## Chapter Overview, Concepts, and Goals
## Chapter 4, Making Decisions to Solve Problems

### Chapter Overview

The preceding chapters have provided information about different types of natural events, including their causes and consequences. Chapter 3, "Chance Affects Decision Making," focused on how people use probability to think about people's risks of experiencing different natural events. Chapter 4, "Making Decisions to Solve Problems," focuses on how people can use information about weather events and the probability of those events to design technologies that will help keep people safe and comfortable.

In the **Engage** activity, *The Right Design for the Right Place*, students will develop lists of things they would need to think about if they were to build a house for a specific location. They will consider whether the features they would want to add to the house are related to the functionality of the house or to the appearance of the house. They also will consider whether they would include different features if the house were to be built in a location with different environmental conditions.

In the **Explore** activity, *Standing against the Wind*, students are challenged to construct a model house that stands up to the wind. They must adhere to certain constraints and stay within a limited budget when they design the model.

In the **Explain** activity, *Decisions Are Part of the Design Process*, students will learn how benefits and costs can influence decisions about design.

In the **Elaborate** activity, *Designer's Dilemma*, students will think about all the factors that a designer needs to consider when designing a technology that will help people solve a problem. Some decisions are made to make the technology function more efficiently, whereas other decisions may make the technology more appealing or fun to use.

Finally, in the **Evaluate** activity, *Selling Technology*, students will design a technology to help people solve a weather-related problem.

## Chapter Organizer

### Engage—The Right Design for the Right Place

**Key idea:**
Different designs are best suited for different situations.
**Activity:**
Students express their ideas about the types of decisions that need to be made when designing a house. They then consider how those decisions might change if the house were to be built in a different location.
**Linking question:**
Can designs be improved to suit different weather conditions?

### Explore—Standing against the Wind

**Key idea:**
Decisions about designs can affect their function.
**Activity:**
Students construct a model house and test it to see how well it stands up to wind. They then refine their design before testing the model again.
**Linking question:**
What should people consider when making decisions about designs?

### Explain—Decisions Are Part of the Design Process

**Key idea:**
Decisions have both benefits and costs.
**Activity:**
Students consider how costs and benefits influenced their model house design and then apply their ideas about costs and benefits to a new situation.
**Linking question:**
How do people make decisions when designing technologies?

### Elaborate—Designer's Dilemma

**Key idea:**
Designers think about benefits and costs.
**Activity:**
Students analyze the design of an object using a series of questions to guide their thinking. They then consider a mystery object to try to determine its function and the reasons behind its design.
**Linking question:**
How can I think about costs and benefits when designing a product?

### Evaluate—Selling Technology

**Key idea:**
Designs for a product to help people protect themselves during a weather event need to consider both benefits and costs.
**Activity:**
Students create a technology that will help solve a weather-related problem for people. They then write an advertisement and explain the reasons for the product's design and the costs and benefits of the product.

## Major Concepts

- Different environments and conditions call for different designs.
- Data and information can help people make better design decisions.
- Decisions involve both benefits and costs.
- Some design decisions improve function, whereas others improve appearance.

## Goals for the Chapter

By the end of this chapter, students will

- recognize that designs are often adapted to suit a particular environment or set of conditions
- understand how data can be used to make better decisions about a design
- be able to explain how benefits and costs need to be considered when making decisions about a design
- be able to design a product and communicate the benefits and the costs related to the product.