

# TECHNOLOGY in Practice



## Applications and Innovations

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### Chapter Overview, Concepts, and Goals

#### Chapter 3, Chance Affects Decision Making

#### Chapter Overview

Chapter 3, “Chance Affects Decision Making,” introduces students to the idea of probability. Probability relates to technological problem solving because people use probability when making decisions. The activities in this chapter help students to see how understanding the chances of different events occurring can help people decide what action they should take. Probability is also based on patterns. In the previous chapters in this module, students have learned how patterns can help scientists understand weather phenomena.

In the **Engage** activity, *What Will the Future Be?*, students will express their ideas about the words *prediction* and *forecast*. They will begin to think about probability when they recognize that weather forecasts often use words such as “a chance of” or “the possibility of.” These words reflect some degree of uncertainty.

The **Explore** activity, *Yes, No, Maybe*, focuses on how different words that people commonly use indicate chance or probability. Students will sort words using two scales that range from a low chance to a high chance of occurrence.

In the **Explain** activity, *Probable Outcomes*, students will build on their ideas from the Explore activity as they are formally introduced to the idea of probability. They will use a simulation to learn about the probability that certain weather events will happen.

In the **Elaborate** activity, *What Will Happen Here?*, students will use probability to decide which events are most likely to happen in different locations.

Finally, in the **Evaluate** activity, *You, the Decision Maker*, students will analyze information about the probability of different events occurring, and make recommendations to a town that needs to solve its water problems caused by drought.

## Chapter Organizer

### Engage—What Will the Future Be?

**Key idea:**

Weather forecasts provide information about what may happen in the future.

**Activity:**

Students express their ideas about the terms *forecast* and *prediction*. They also discuss phrases used in weather forecasts to identify words that indicate some degree of uncertainty.

**Linking question:**

How accurate are weather predictions?

### Explore—Yes, No, Maybe

**Key idea:**

Some events are more likely to happen, and others are less likely.

**Activity:**

Students sort words used to express the likelihood of an event happening in the future. They then practice ranking events on a scale from no chance to a certainty of occurrence.

**Linking question:**

Can numbers be used to express how likely it is something will happen?

### Explain—Probable Outcomes

**Key idea:**

Probability is a measure of the chance that something will happen.

**Activity:**

Students participate in a demonstration and an online simulation to learn about probability.

**Linking question:**

How does probability relate to the chances of different weather-related events happening?

### Elaborate—What Will Happen Here?

**Key idea:**

The probability of a specific type of weather event may depend on where you live.

**Activity:**

Students use their understanding of probability to identify areas of the country where specific events are more likely to occur.

**Linking question:**

How does knowing the probability of an event affect decisions?

### Evaluate—You, the Decision Maker

**Key idea:**

Knowing the probability of different events can help people make decisions.

**Activity:**

Students analyze a scenario of a town that is at risk for drought. They use their understanding of probability to decide how the town should solve its problem.

## Major Concepts

- Some events are more likely to happen than other events.
- Probability is the use of numbers to describe how likely it is an event will happen.
- Probability helps people think about which weather events are most likely to happen in their area.
- Probability gives people more information for making decisions.

## Goals for the Chapter

By the end of this chapter, students will

- be able to describe the chance that something will happen
- understand that probability is the use of numbers to describe how likely it is that something will happen in the future
- have practiced using their understanding of probability to think about people's chances of experiencing a severe weather event
- have used their understanding of probability to analyze a situation and make decisions.