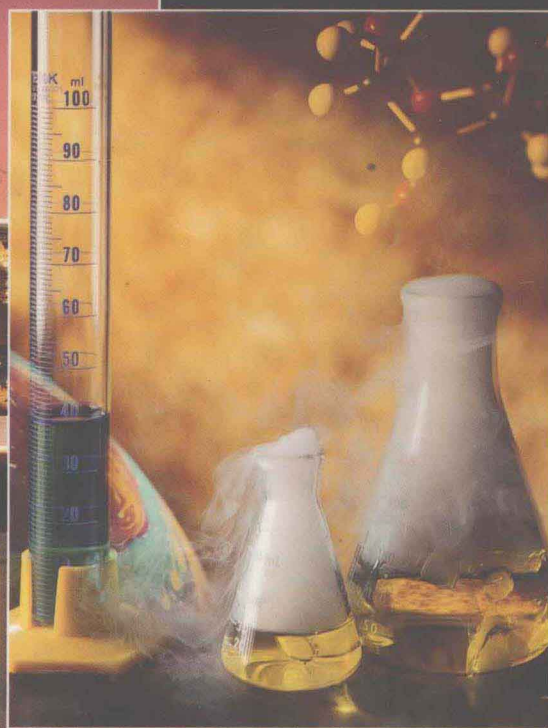
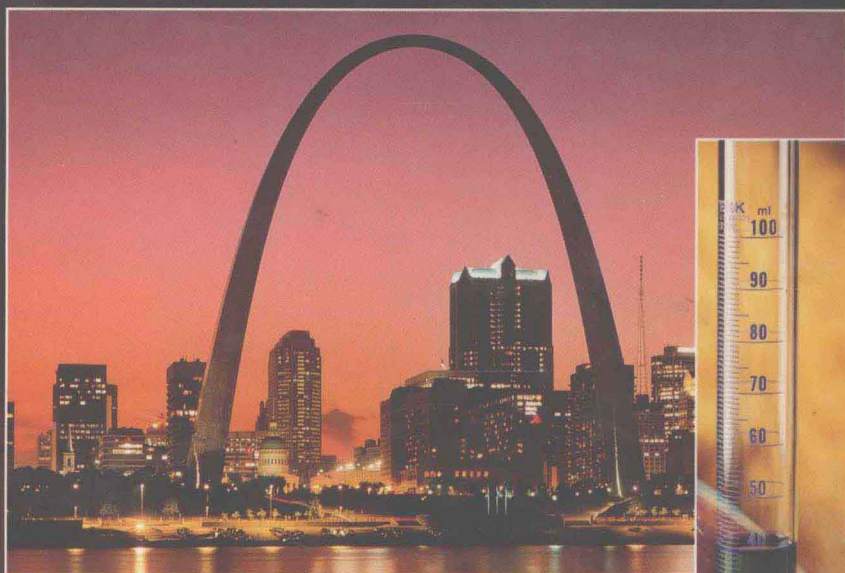


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# Algebra 2

Integration  
Applications  
Connections

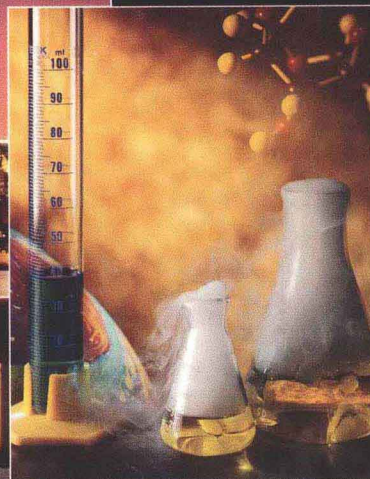
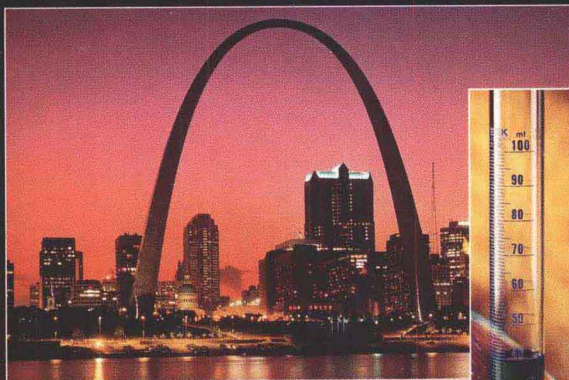




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# Algebra 2

Integration  
Applications  
Connections



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# WHY IS ALGEBRA IMPORTANT?

**A**lgebra is a tool that you'll be able to use throughout your life.

*Algebra 2* is designed to illustrate how you'll be using algebra in the real world. This goal is accomplished through **integration**, **applications**, and **connections**.

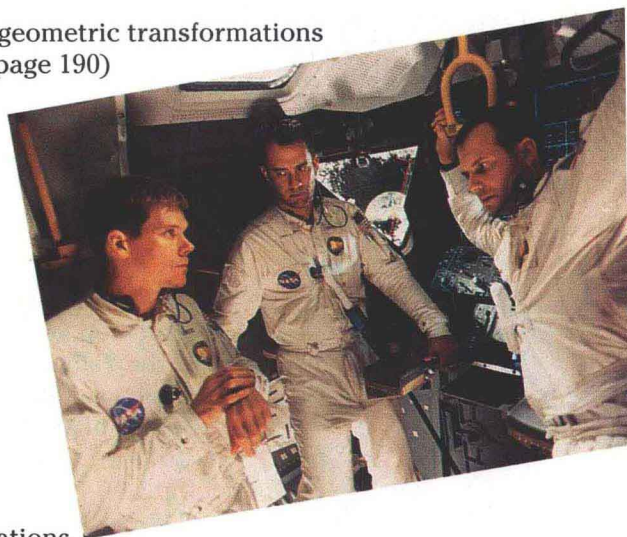


In addition to algebra, you'll study many other math topics. You'll learn how different branches of mathematics, such as geometry and statistics, are interrelated.

You'll use matrices to perform geometric transformations such as dilations. (Lesson 4-1, page 190)



Mathematics can usually be related to real-life events, even the making of a hit movie. Relevant, real-world uses of mathematics are featured throughout this book.

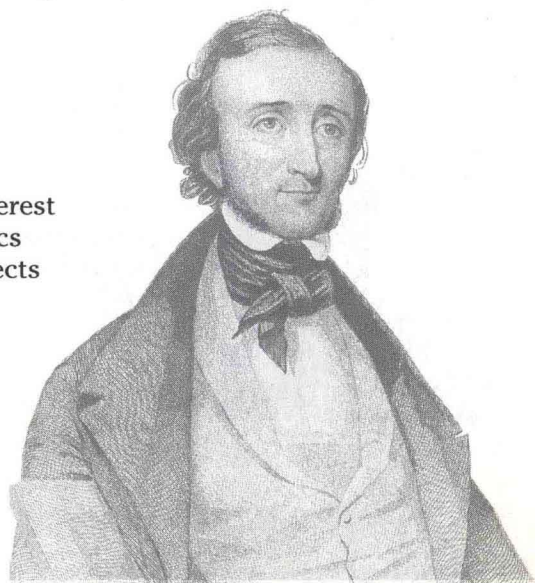


You'll learn how quadratic equations and parabolas are related to the making of the hit movie *Apollo 13*. (Lesson 6-1, page 334)



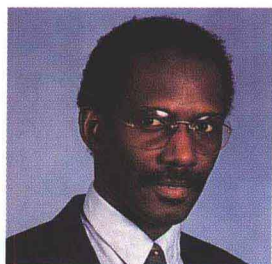
Many authors incorporate their interest in math in their writing. Mathematics topics are connected to other subjects that you study, even literature.

You'll use Edgar Allen Poe's *The Pit and the Pendulum* to evaluate expressions with rational exponents. (Lesson 5-7, page 296)





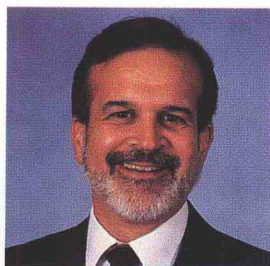
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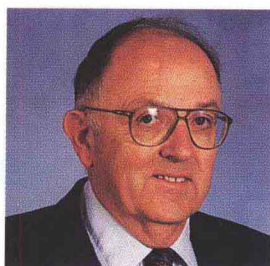
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*"In this era of educational reform and change, it is good to be part of a program that will set the pace for others to follow. This program integrates the ideas of the NCTM Standards with real tools for the classroom, so that algebra teachers and students can expect success every day."*



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*"Using this textbook, you will learn to think mathematically for the 21st century, solve a variety of problems based on real-world applications, and learn the appropriate use of technological devices so you can use them as tools for problem solving."*

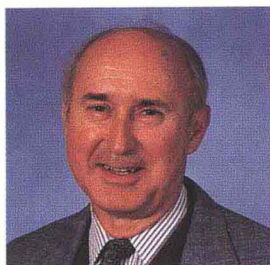




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*"This program will bring algebra to life by engaging you in motivating, challenging, and worthwhile mathematical tasks that mirror real-life situations. Opportunities to use technology, manipulatives, language, and a variety of other tools are an integral part of this program, which allows all students full access to the algebra curriculum."*



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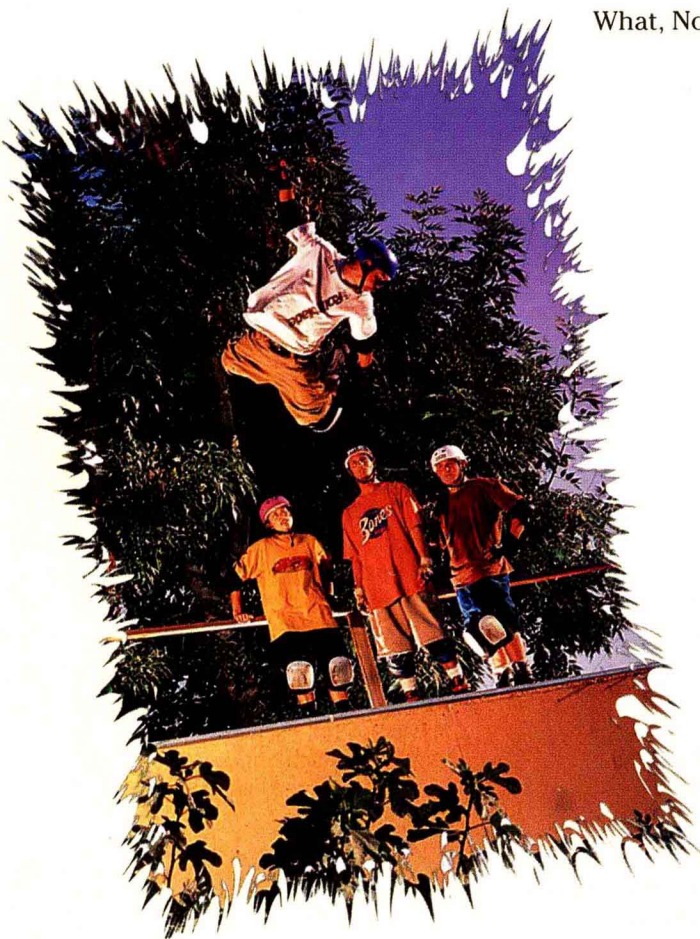
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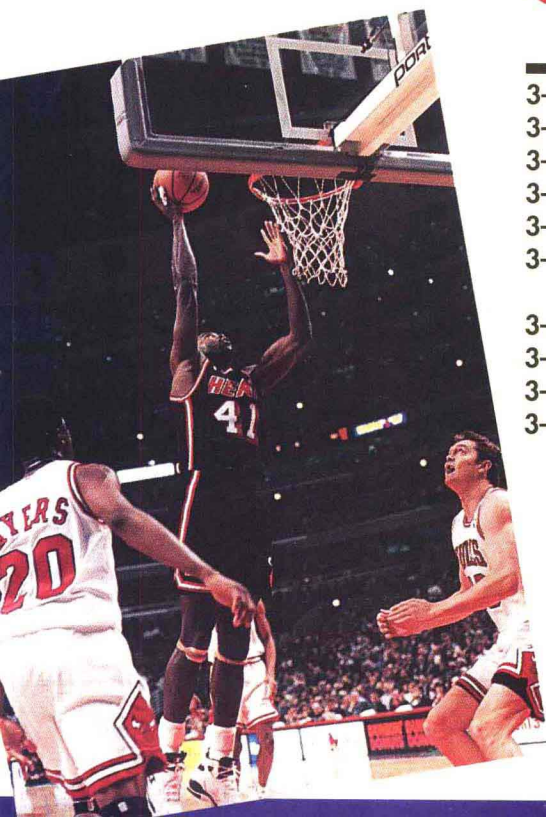
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## Content Integration

**W**hat does geometry have to do with algebra? Believe it or not, you can study most math topics from more than one point of view. Here are some examples.



**Geometry** You'll use your skills with matrices to find the coordinates of the vertices of a parallelogram. (Lesson 3–3, pages 141 and 143)

**Look Back** features refer you to skills and concepts that have been taught earlier in the book.

### LOOK BACK

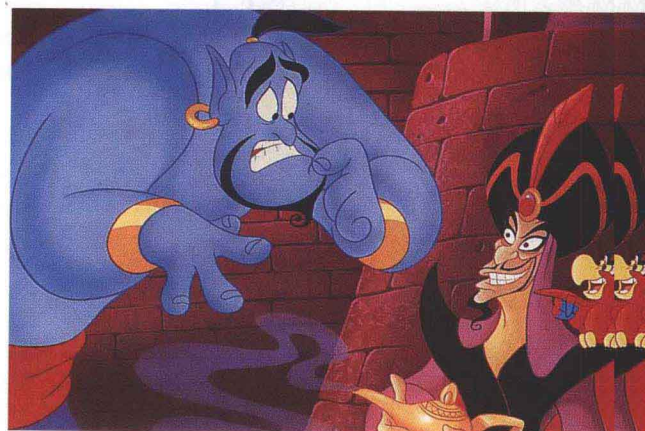
You can refer to Lesson 1–5 for information about absolute value equations.

(Lesson 2–6, page 104)

### ▲ Problem Solving

You'll solve real-world problems by using matrix logic.

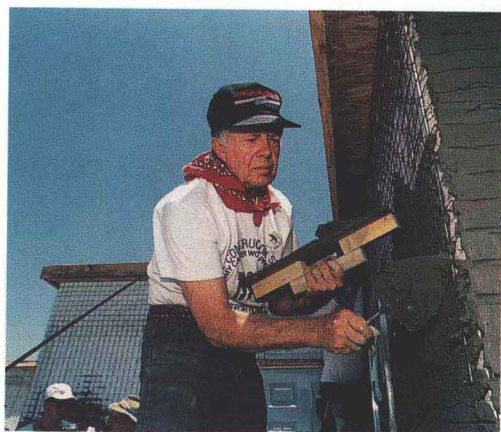
(Lesson 4–1, page 187)



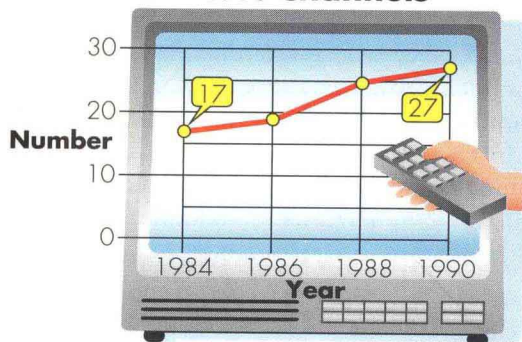
### Discrete Mathematics ▲

You'll use permutations to find out why certain movies are shown on some theaters but not others. (Lesson 12–2, page 718)

▼ **Number Theory** You'll learn how complex numbers are used in building houses. (Lesson 5–9, pages 310 and 313)



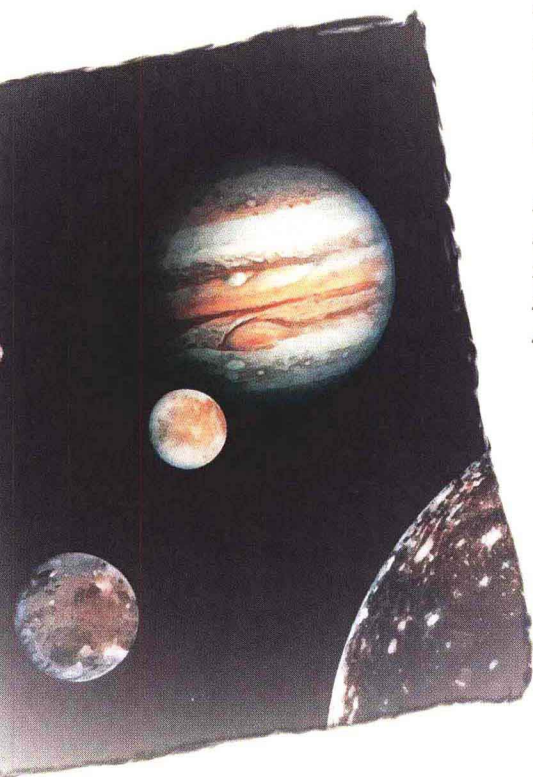
### T.V. Channels



◀ **Statistics** You'll learn how to draw scatter plots and from the scatter plots to determine prediction equations. (Lesson 2–5, pages 95–100)

**Probability** You'll model the behavior of mice by using probability and transition matrices. (Lesson 4–3, page 200)





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Exploring Quadratic Functions  
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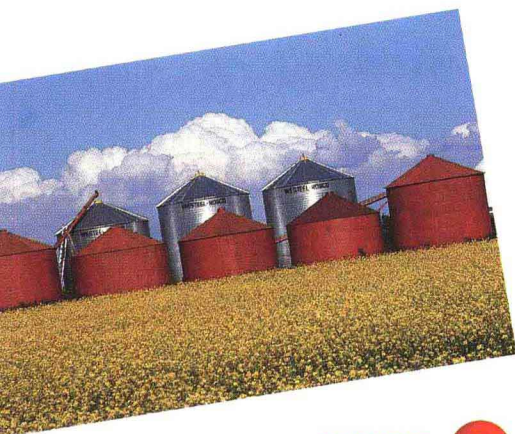
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## Real-Life Applications

**H**ave you ever wondered if you'll ever actually use math? Every lesson in this book is designed to help show you where and when math is used in the real world. Since you'll explore many interesting topics, we believe you'll discover that math is relevant and exciting. Here are some examples.

**Top Five List, FYI, and Fabulous Firsts** contain interesting facts that enhance the applications.



Singles of All Time in the U.S.

1. *White Christmas*, Bing Crosby, 1942
2. *I Want to Hold Your Hand*, Beatles, 1964
3. *Hound Dog/Don't Be Cruel*, Elvis Presley, 1956
4. *It's Now or Never*, Elvis Presley, 1960
5. *I Will Always Love You*, Whitney Houston, 1992

(Lesson 12–2, page 721)

**Auto Racing** You'll use racing data from the Indianapolis 500 in your study of the slope of lines. (Lesson 2–3, pages 80–81)

**Cryptography** You'll learn how matrices can be used to encode secret messages. (Lesson 4–5, pages 212–213)



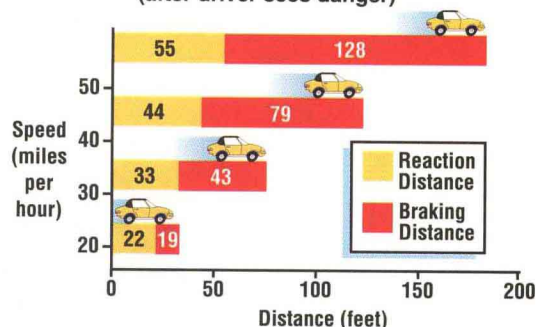
The strongest earthquake in American history measured 8.4 on the Richter scale. It occurred on March 27, 1964 near Prince William Sound, Alaska. It killed 131 people and caused an estimated \$750 million in property damage.

(Lesson 7–3, page 423)



**Solar Energy** You'll learn how to write an equation of a parabola that models the shape of a mirror used to harness solar energy. (Lesson 7–2, page 418)

**BRAKING DISTANCES**  
(after driver sees danger)



**Law Enforcement** You'll evaluate a radical expression that police officers often use at the scene of an auto accident. (Lesson 5–6, page 288)

**World Cultures** You'll relate the solution of a number puzzle to the study of functions and their inverses. (Lesson 8–8, page 528)

**fabulous**

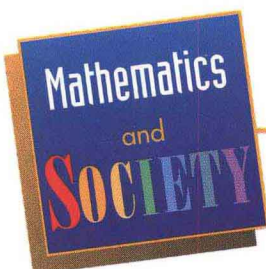
**FIRSTS**



**Mae Carol Jemison**  
(1956– )

Mae Carol Jemison was the first African-American woman astronaut. She was the computer engineer and physician aboard the space shuttle Endeavor, launched September 12, 1992.

(Lesson 3–4, page 148)



## Divine Mathematics

Did you know that the great American poet Henry Wadsworth Longfellow enjoyed math? Reprints of actual articles or works of literature illustrate how mathematics is a part of our society. (Lesson 5–6, page 295)





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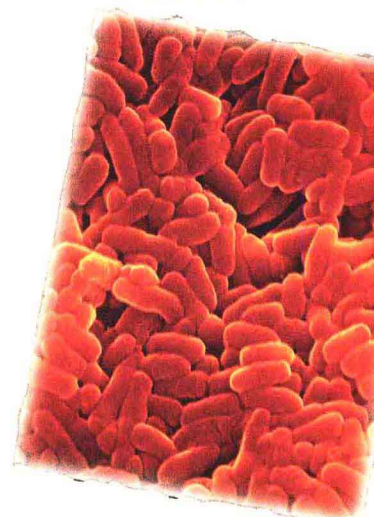
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### Long-Term Investigation

Fill It Up!

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### Mathematics and Society

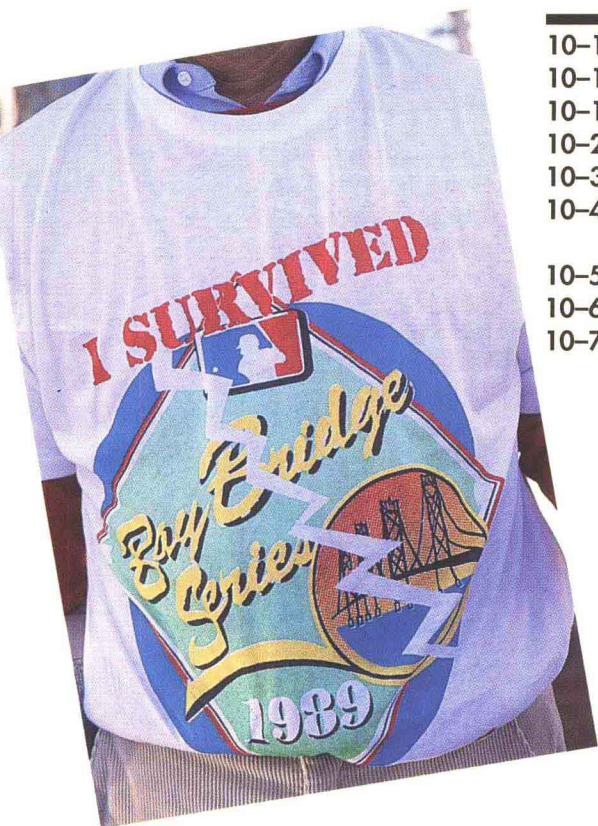
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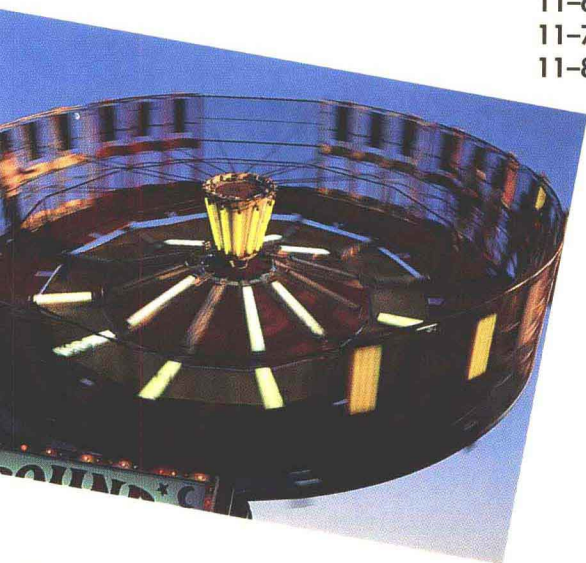
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## Interdisciplinary Connections

**Global Connections** features introduce you to a variety of world cultures. ▼

### GLOBAL CONNECTIONS

Malaysian foot tennis is a very popular sport in Malaysia and other countries in the Far East. It is played by teams of two using a volleyball-type net. A ball woven from rattan must be kept in the air using only feet, knees, or thighs.

(Lesson 3–3, page 145)

### CAREER CHOICES



Engineers apply the principles of science and mathematics to solve practical technical problems. **Electrical engineers** design, develop, test, and supervise the manufacturing of electrical and electronic equipment. They comprise more than one fourth of all engineers. A bachelor's degree in engineering is the minimum requirement.

For more information, contact:  
Institute of Electrical and  
Electronic Engineers  
1828 L St. NW, Suite 1202  
Washington, DC 20036

(Lesson 5–10, page 321)

**S**ome people believe that mathematics has very little use in other subjects such as chemistry or music. Of course, this isn't true. In this textbook, mathematics is frequently connected to other subjects that you are studying.



▲ **Biology** You'll model the shape of a deadly frog's leap by using an equation of a parabola.  
(Lesson 6–6, page 370)

**Physics** You'll model speed of sound data by using a linear equation. (Lesson 2–2, page 73)

**Chemistry** You'll solve a problem involving Avogadro's constant. (Lesson 5–1, page 258)

**Health** You'll evaluate a polynomial that is a model for the number of people who are likely to get the flu. (Lesson 5–3, page 272)

◀ **Career Choices** features include information on interesting careers.

**Geography** The growth of the population of Arizona is used to introduce mathematical relations. (Lesson 2–1, page 64)



◀ **Literature** You'll solve a Sherlock Holmes mystery. (Lesson 13–1, page 772)

**Math Journal** exercises give you the opportunity to assess yourself and write about your understanding of key math concepts. (Lesson 3–1, Exercise 6)



6. Write a paragraph explaining how to identify whether the graph of a system of linear equations would be two intersecting lines, two distinct parallel lines, or two coincident lines.