Now

In Chapter 4, you will apply the big ideas listed below and reviewed in the Chapter Summary on page 317. You will also use the key vocabulary listed below.

Big Ideas

1. **Graphing and writing quadratic functions in several forms**
2. **Solving quadratic equations using a variety of methods**
3. **Performing operations with square roots and complex numbers**

KEY VOCABULARY

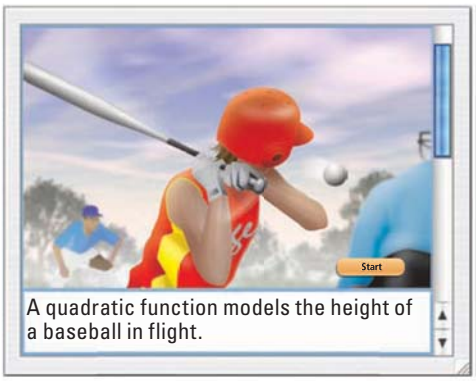
- standard form of a quadratic function, *p. 236*
- parabola, *p. 236*
- vertex form, *p. 245*
- intercept form, *p. 246*
- quadratic equation, *p. 253*
- root of an equation, *p. 253*
- zero of a function, *p. 254*
- square root, *p. 266*
- complex number, *p. 276*
- imaginary number, *p. 276*
- completing the square, *p. 284*
- quadratic formula, *p. 292*
- discriminant, *p. 294*
- best-fitting quadratic model, *p. 311*

Why?

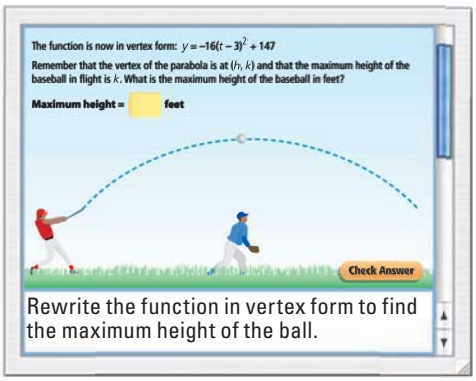
You can use quadratic functions to model the heights of projectiles. For example, the height of a baseball hit by a batter can be modeled by a quadratic function.

Animated Algebra

The animation illustrated below for Example 7 on page 287 helps you answer this question: How does changing the ball speed and hitting angle affect the maximum height of a baseball?



A quadratic function models the height of a baseball in flight.



Rewrite the function in vertex form to find the maximum height of the ball.

Animated Algebra at classzone.com

Other animations for Chapter 4: pages 238, 247, 269, 279, 300, and 317