In Chapter 12, you will apply the big ideas listed below and reviewed in the Chapter Summary on page 830. You will also use the key vocabulary listed below.

Big Ideas

1 **Graphing rational functions**
2 **Performing operations on rational expressions**
3 **Solving rational equations**

KEY VOCABULARY

- inverse variation, *p. 765*
- constant of variation, *p. 765*
- hyperbola, *p. 767*
- branches, asymptotes of a hyperbola, *p. 767*

- rational function, *p. 775*
- rational expression, *p. 794*
- excluded value, *p. 794*
- simplest form of a rational expression, *p. 795*

- least common denominator (LCD) of rational expressions, *p. 813*
- rational equation, *p. 820*

Why?

You can use rational functions to solve problems in biology. For example, you can graph a rational function to describe how a microorganism's efficiency at performing metabolic tasks changes as its dimensions change.

Animated Algebra

The animation illustrated below for Exercise 49 on page 791 helps you answer this question: How does changing one dimension of a cylindrical microorganism change the ratio of the cylinder's surface area to its volume?

You want to see how the height affects the ratio of surface area to volume.

Drag the cylinder to change its height. Then update the table and the graph.

Animated **Algebra** at classzone.com

Other animations for Chapter 12: pages 766, 777, 783, 804, 814, and 830