

$$\frac{1}{10} = \frac{10}{100}$$



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$$0.1 = 0.10$$

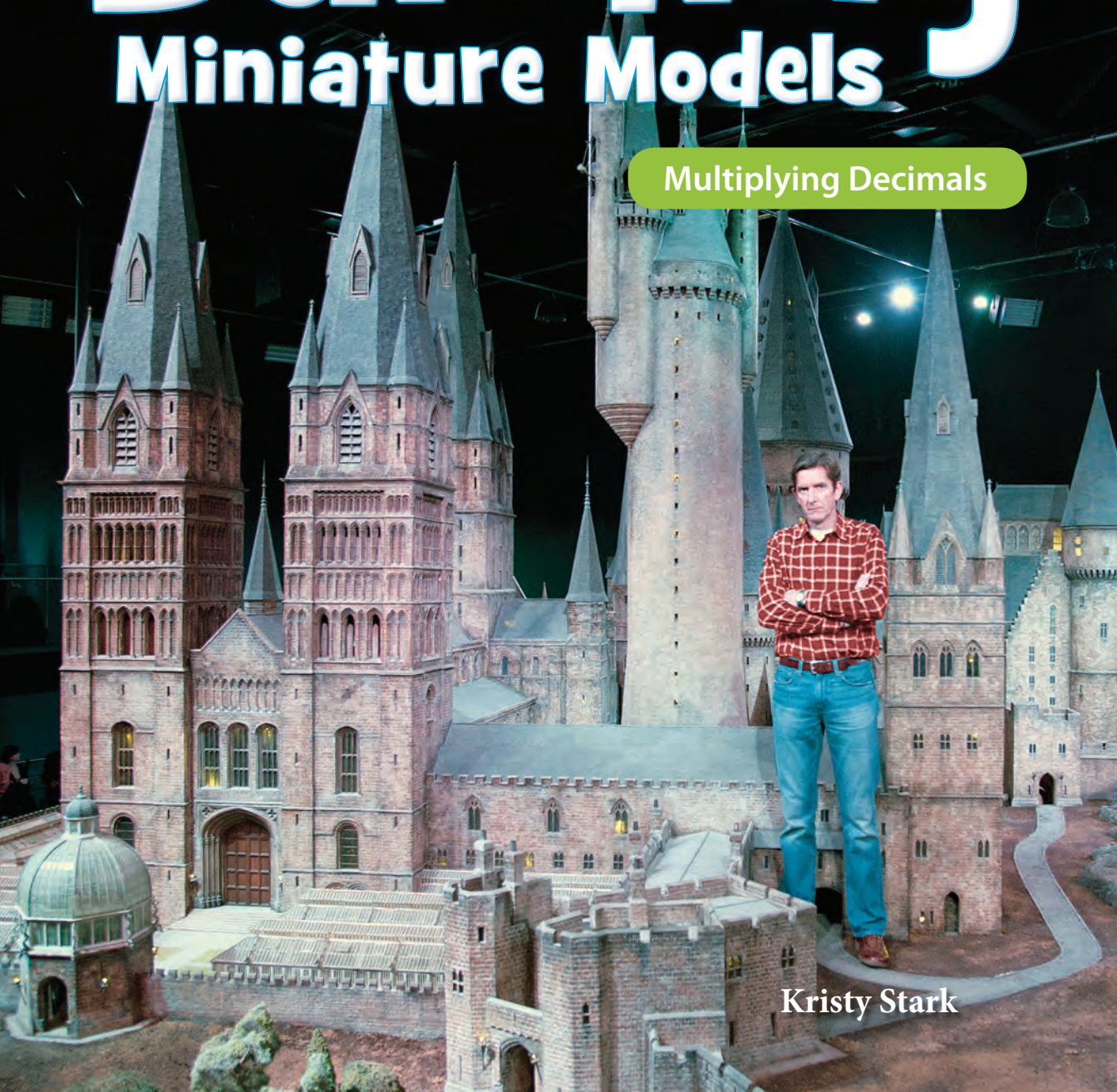
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FUN AND GAMES

Building Miniature Models

Multiplying Decimals



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Table of Contents

Miniature Models Equal Big Fun.....	4
The History and Purposes of Models.....	6
Scale Models	14
Getting Started	18
Where Will You Start?.....	26
Problem Solving	28
Glossary	30
Index.....	31
Answer Key	32

Miniature Models Equal Big Fun

Do you like to build things? Maybe you started building with blocks when you were younger. Perhaps you made tall towers and other types of buildings. Maybe you have used building bricks to make cars and airplanes.

If you enjoy building things, you may be interested in building **miniature** models. These are smaller versions of real objects. Models can be made for buildings, vehicles, airplanes, and trains. Models of landscapes can be made to show a favorite place. Some people make models of entire cities and towns, too. The possibilities are endless when it comes to the available choices of miniature models.

Building models requires many different types of skills. You might paint a model. You might need to sew fabric for parts of the model. Some models have working lights, so you might even have to wire lights to batteries.

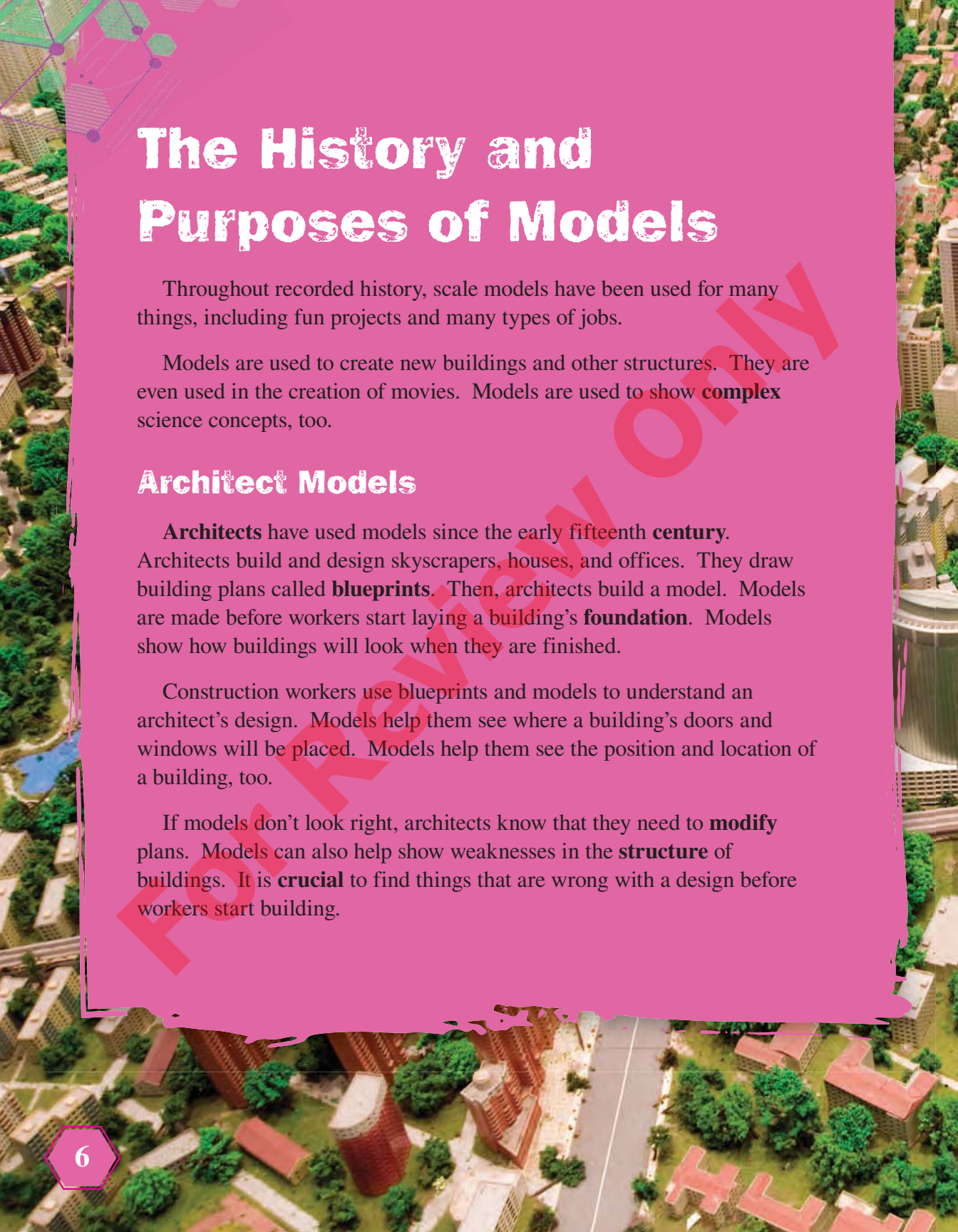
Building miniature models, also called **scale** models, is a fun project for people who like to work with their hands and build things. But, building models is not only for people looking for a fun activity. Models are also used to create many of the things you see in the world around you.

A photograph of a man in a yellow safety vest and cap kneeling on the grass, working on a large-scale model of a white fighter jet. The jet is positioned horizontally, and the man is connected to it by a blue cable. A white equipment case is on the ground nearby. The background is a solid purple color.

A model-plane enthusiast works on a large-scale model aircraft in England.



Model maker Sylvia Menelao competes in a model-building contest in Germany.



The History and Purposes of Models

Throughout recorded history, scale models have been used for many things, including fun projects and many types of jobs.

Models are used to create new buildings and other structures. They are even used in the creation of movies. Models are used to show **complex** science concepts, too.

Architect Models

Architects have used models since the early fifteenth **century**. Architects build and design skyscrapers, houses, and offices. They draw building plans called **blueprints**. Then, architects build a model. Models are made before workers start laying a building's **foundation**. Models show how buildings will look when they are finished.

Construction workers use blueprints and models to understand an architect's design. Models help them see where a building's doors and windows will be placed. Models help them see the position and location of a building, too.

If models don't look right, architects know that they need to **modify** plans. Models can also help show weaknesses in the **structure** of buildings. It is **crucial** to find things that are wrong with a design before workers start building.



LET'S EXPLORE MATH

Architects use several different sizes of rectangular paper to draw blueprints. The smallest size has dimensions of about 30.5 centimeters by 22.9 centimeters. Which of the following choices is the area of the paper? Explain your reasoning.

- A. 6.9845 square centimeters
- B. 69.845 square centimeters
- C. 698.45 square centimeters
- D. 6,984.5 square centimeters



Movie Models

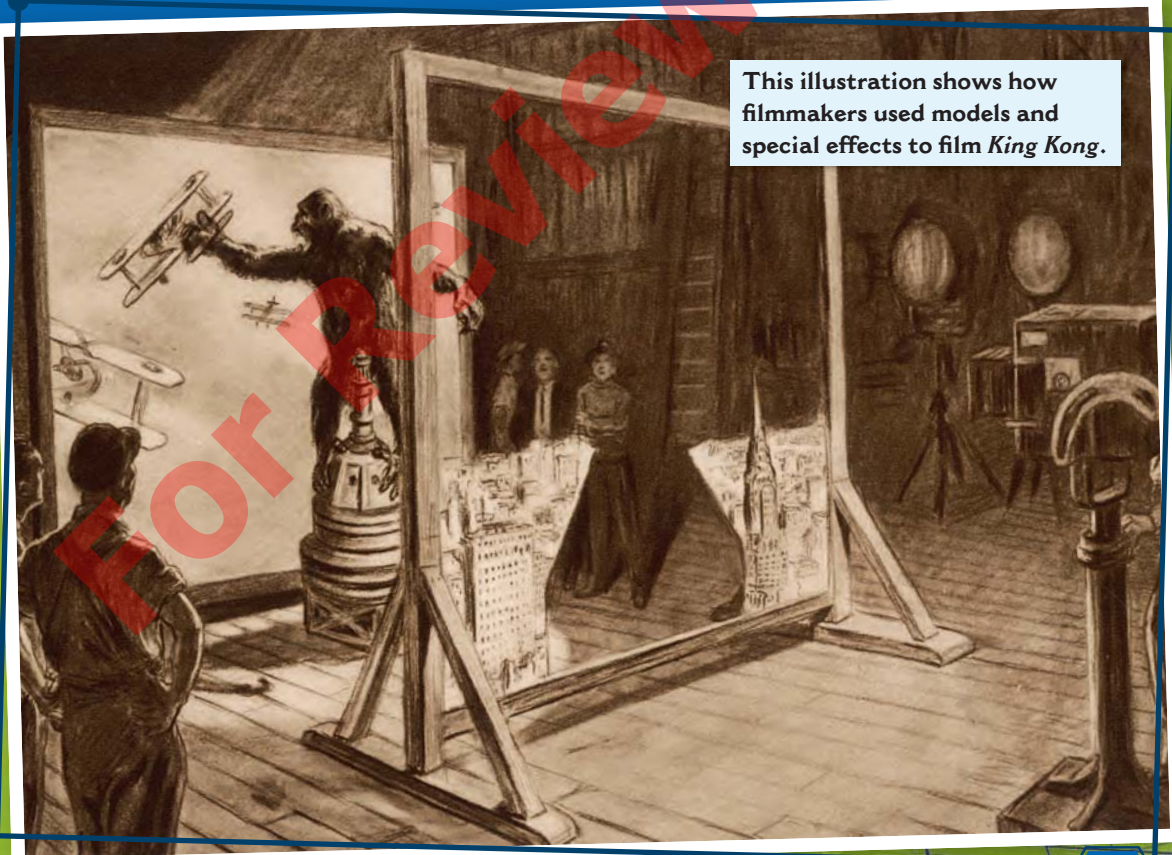
In 1933, the movie *King Kong* was made. It was one of the first major films to use models. In the movie, a huge gorilla wreaks havoc on New York City. A model of the giant beast was created to look like a real gorilla. The moviemakers created a model of New York City and the Empire State Building, too.

This 1933 poster
advertises *King Kong*.

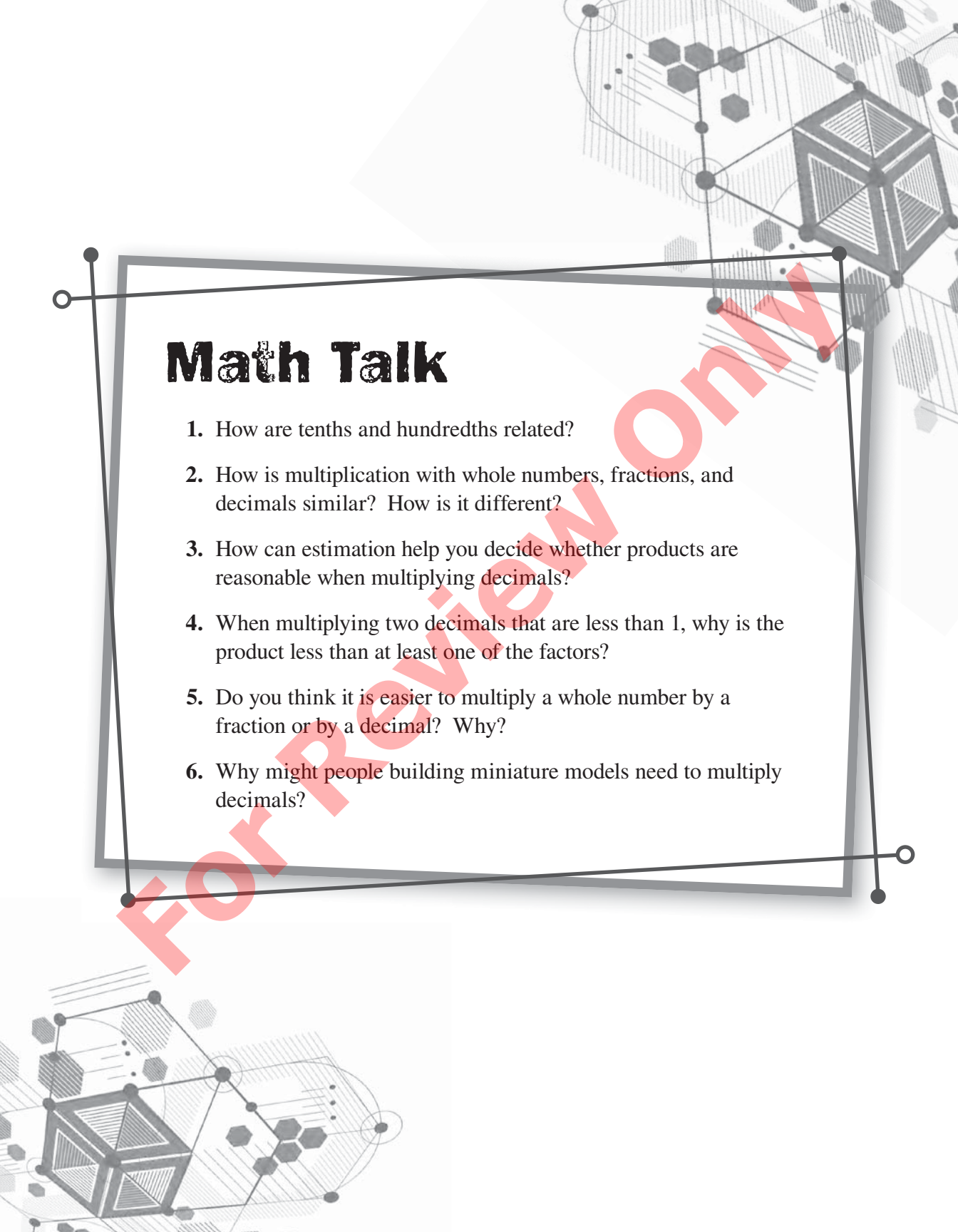


Throughout the history of movies, scale models have been used for special effects. Directors and producers use models to form make-believe creatures. They also use models of cities, cars, buildings, and other things that they want to destroy in a scene. Models help create the scene without destroying real objects. Models allow filmmakers to make fictional scenes look real.

The Empire State Building was the tallest building in the world at the time *King Kong* was made. The building was the focus of a famous scene in the movie. King Kong kidnaps a woman and climbs to the top of the Empire State Building. He swats at planes that circle the building as people try to rescue the woman.



This illustration shows how filmmakers used models and special effects to film *King Kong*.



Math Talk

1. How are tenths and hundredths related?
2. How is multiplication with whole numbers, fractions, and decimals similar? How is it different?
3. How can estimation help you decide whether products are reasonable when multiplying decimals?
4. When multiplying two decimals that are less than 1, why is the product less than at least one of the factors?
5. Do you think it is easier to multiply a whole number by a fraction or by a decimal? Why?
6. Why might people building miniature models need to multiply decimals?