

# RATIOS OF THE **BIG** SCREEN

Scenes from upcoming  
IMAX releases *Star  
Trek* and (below)  
*Monsters vs. Aliens*

**IMAX technician  
Robert Kilburn  
uses aspect  
ratios to make  
sure audiences  
enjoy the movie.**

**I**f you've ever seen a movie in an IMAX theater—with a huge screen and excellent sound and picture—you know how realistic it can be. You might have even felt like you were inside the movie. It takes many people to make sure that the film looks the way it's supposed to. One of those people is Robert Kilburn, the manager of system installations at IMAX. His job is to supervise the installation of IMAX screens and projection and sound systems.

Kilburn's favorite films to work on might also be your favorites to watch. "I like the visually spectacular films that take you places you wouldn't normally be able to go, from the deepest depths of our oceans to the magical



world of Harry Potter," Kilburn told *MATH*. "The Harry Potter films are my favorites."

In order to make sure the picture looks perfect on an IMAX screen, Kilburn uses *aspect ratios*. A ratio compares two different numbers of the same unit. An aspect ratio of a rectangular image (like a TV or movie screen) is the relation between its width ( $x$ ) and height ( $y$ ), expressed as  $x:y$  or  $\frac{x}{y}$ .

"Films are made and presented in various aspect ratios. Understanding them and how they affect the presentation is critical to any movie presentation," Kilburn said. "While the screen remains at one fixed aspect ratio, the films can vary. Therefore, it is very important that we ensure the film is properly aligned to suit the various IMAX screens."

Our questions will help you better understand aspect ratios. Read on to get the picture!

—by Linda Buchwald

**1** An old-fashioned television screen might have a width of 12 inches and a height of 9 inches.

**a.** To find the aspect ratio for standard TV screens, write those dimensions as a ratio in simplest form:

.....  
.....  
.....

**b.** Professionals such as Kilburn often speak in mathematical terms of *unit ratios*, in which either  $x$  or  $y$  equals 1. To find the unit ratio for standard TV screens, take your answer to part **a** and divide both numbers by the simplified height (3). If necessary, round to the nearest hundredth.

.....  
.....  
.....

**2** A modern flat-screen television (LCD or plasma) could have a width of 64 inches and a height of 36 inches.

**a.** To find the aspect ratio for flat-screen TVs, write those dimensions as a ratio in simplest form:

.....  
.....  
.....

**b.** Follow the instructions in part **1b** to express that as a unit ratio.

.....  
.....  
.....

**3** Some IMAX theaters use an aspect ratio of 4:3. Kilburn is installing a screen with a width ( $w$ ) of 72 feet. He could find the desired height of the screen by using the aspect ratio in a proportion:

$$\frac{4}{3} = \frac{72}{h}$$

Cross-multiply and solve for  $h$  to find the height of the screen:

.....  
.....  
.....

**4** Some IMAX theaters use the 16:9 aspect ratio. If the height of an image at this ratio is 51.3 feet...

**a.** what proportion could you write to find the width?

.....  
.....  
.....

**b.** What is the image's width?

.....  
.....  
.....

**5** IMAX screens are often measured in metric units. Find another common IMAX aspect ratio ( $w:1$ ) if the image had a width of 22 meters and a height of 15.38 meters. Round your answer to the nearest hundredth.

.....  
.....  
.....

## THINK ABOUT IT

What would happen if Kilburn made a mistake and used the wrong aspect ratio to project a film?

## GOING PRO

**THE JOB:** IMAX technician

**THE MONEY:** Salary can vary based on experience, but the average is about \$35,000 a year.

**NECESSARY SKILLS:** Mechanical and electrical skills; knowledge of computers and statistics; strong communication skills.

**HOW TO GET STARTED:** Robert studied civil engineering in college. He later worked for a company that designed and installed a screen lifting system for an IMAX project, which is how he met people at the company.

**ROBERT'S ADVICE:** "A wide variety of skills are required to be an IMAX technician. The important thing is to have the ability to learn and understand concepts. Problem solving and attention to detail are also critical."



Robert Kilburn

Copyright of *Scholastic Math* is the property of Scholastic Inc. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.