

# Sherlock Gnomes

## Math and Art, 5th Grade Teacher Guide

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### Objective

Students will be able to understand the relationship between mathematical properties and visual elements in a work of art.

### Introduction

**Movie Marketing:** A movie's Marketing Team performs the important role of making sure people are aware of the movie and are excited to go see it. The *Sherlock Gnomes* Marketing Team includes many departments, including Market Research, Publicity, and Digital Marketing. The focus of this lesson is the In-Theater Marketing department, which is responsible for producing and distributing advertisements that are displayed in movie theaters. Advertising at movie theaters is important because the Marketing Team wants to make sure they are reaching people who will go out and see the movie, so who better to advertise to than people who already like going to the movies?! This lesson follows the production of large-scale cardboard cutouts of the *Sherlock Gnomes* Goon character that can be displayed in movie theater lobbies across the country.

**Artists Use Math:** Artists must understand sizing and proportion to ensure that the characters they are drawing are accurate and consistent. Without this understanding, characters become stretched or distorted which can make the characters not look like themselves. Before an artist can think about color or details, they must first perform mathematical calculations to make sure that all of their characters' arms, legs, torsos, heads, and hats are the right size. This type of math is important not only for the artists working on the actual movie, but also for the artists who produce marketing materials that vary dramatically in size. Artists are responsible for creating not only movie posters that can hang on a wall, but also small website pop-ups and giant eye-catching billboards.

### Activities

**Discuss:** Play the video, "How to Draw Sherlock" from 0:00 to 0:58. Ask students to pay close attention to the animator's discussion of proportions. Ask: "what does the artist mean when he references the proportion of the hat?" Share with students that the artist is making sure that Sherlock's hat is the correct size when compared to the size of his face.

**List:** Working in groups, have students create a list of objects that are similar but their different proportions make them unique. Eg: car/limousine, shorts/pants, loaf of bread/baguette. Warn students that even though two items may have different sizes, their proportions may be the same. Eg: kitten/cat, tennis ball/basketball.

**Distribute Worksheet:** Distribute Worksheet 5-A *Worksheet may be completed as a whole-class activity or can be assigned to students using the differentiated options on the next page.*

**Scale:** Read #1 aloud. Have students circle the mathematical process referenced in the question ("twice as large"). Ask students process they will have to undertake to solve this problem (multiplication). Fill in the blanks next to the large Goon (hat = 8-ft.; body = 4-ft.)

**Multiply:** Read #2 aloud. Share with students that sometimes problems can be solved without actually completing any computations. Instead, they can consider the numbers in the problem and make determinations based on their number sense. On the worksheet, have students label the large ("L") and extra-large (XL) Goon. Ask students how they know which Goon was which.



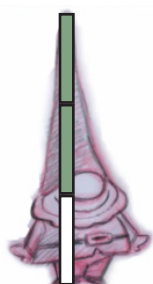
**Draw:** Share with students that establishing correct proportions before drawing will create more realistic characters. With the understanding that the hats are twice as long as the body, have the students sketch out the Goons, paying attention to proportions.

Share the following 2 strategies for drawing with proportion:



**Ruler:** Draw a 1 inch vertical line for the body. Multiply the length of this line by 2 to get the length of the hat ( $1 \times 2 = 2$ ). Draw a 2 inch line on top of the 1 inch line. The 2 inch line is the length of the hat.

**Object:** Draw a short vertical line for the body. Measure the line using an object like your finger or a book. Use this measurement twice to draw a vertical line that is two times as long as the line for the body. This longer line is the length of the hat.



**Draw:** Have the students repeat this process but change the length of the body line each time. They should end up with a variety of Goons that are different sizes but all share the same proportions.

**Draw:** Play the video, "How to Draw a Goon" and ask students to follow along as the artists draws each of the features. Make sure the students use the proportions they set up to create hats and bodies that are appropriately sized. If you wish, pause the video to figure out the proportions of the face to the torso or the torso to the legs.

**Goal Set:** Ask students to assess their work (both math and art) and set a goal for future learning. Prompt and scaffold as appropriate, but provide the space for students to set their *own* goals.

#### Duration

1 hour

#### Standards

Common Core State Standards, Mathematics  
5.NF.B.5.A

National Core Arts Standards  
VA:Cr1.2.5a

#### Differentiation

For advanced students, distribute Worksheet 5-B. This worksheet features more complex numbers and less prompting.

#### Vocabulary

Tier 3  
Ratio  
Proportion

# Sherlock Gnomes

Name \_\_\_\_\_

## Math and Art, Worksheet 5-A

To advertise for the premiere of *Sherlock Gnomes*, Paramount will be sending large cardboard Goons to movie theaters across the country. The Goons will be sent in 2 pieces: the hat and the body.

1. The cardboard company has created a small Goon with a 2-foot body and a 4-foot hat. They want to make a version that is twice as large. What size should they make the new body and hat?



2. To create a large and extra-large Goon, the cardboard company scaled the sizes of the small Goon's body and hat. Based on the numbers below, determine which will give you the dimensions for the large and extra-large Goons without doing any math! Label each with "L" or "XL"

hat: 4 x 3  
body: 2 x 3

hat: 4 x 5  
body: 2 x 5

\_\_\_\_\_

\_\_\_\_\_

3. Draw the Goon below. Just like the cardboard company, make the hat twice as long as the body.

Challenge: Draw multiple Goons in different sizes.

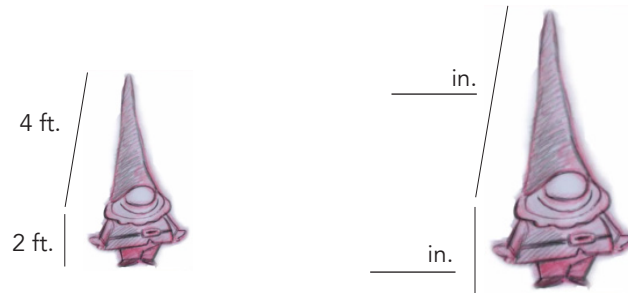
# Sherlock Gnomes

Name \_\_\_\_\_

## Math and Art, Worksheet 5-B

To advertise for the premiere of *Sherlock Gnomes*, Paramount will be sending large cardboard Goons to movie theaters across the country. The Goons will be sent in 2 pieces: the hat and the body.

1. The cardboard company has created a small Goon with a 2-foot body and a 4-foot hat. They want to make a version that is twice as large. What size should they make the new body and hat?



2. To create a large and extra-large Goon, the cardboard company scaled the sizes of the small Goon's body and hat. Based on the numbers below, determine which will give you the dimensions for the large and extra-large Goons without doing any math! Label each with "L" or "XL"

hat:  $4 \times \frac{7}{2}$   
body:  $2 \times \frac{7}{2}$

hat:  $4 \times \frac{5}{2}$   
body:  $2 \times \frac{5}{2}$

\_\_\_\_\_

\_\_\_\_\_

3. Draw the Goon below. Just like the cardboard company, make the hat twice as long as the body.

Challenge: Draw multiple Goons in different sizes.

