

## Objectives

- Students will calculate the increased and decreased size of triangles and quadrilaterals.
- Students will use these various sized shapes to create mythological animals.
- Students will observe art, looking for the use of proportional thinking and design.

## Introduction

Begin by observing the works of art. Not all suggested items are required, but the more works students view with varied representations of proportions, the greater their grasp of the concept will be.

In using *The Contortionist*, ask students to tell you what they notice. Eventually, lead your questioning to ask whether they think the statue is lifelike and to tell you what makes it so. Similar questioning can be done with the remaining works.

## Definitions

Introduce the terms proportion and scale.

**Proportion-** the relationship of the parts within the whole, or the relative size of the parts within a whole.

**Scale-** the size relationship of a whole object to another whole object.

In *The Rhinoceros*, the scale is evident between the large rhinoceros in the confined space of the setting.

With the terms introduced, review one or two of the artworks to assess for deeper understanding of proportion and scale.

Ask students where they are also working with scale and proportion. (If needed, remind them of the learning they are doing in math.)

## Math Activity

Using graph paper, have students draw a triangle that is three units at the base, and three units in height. (I suggest using isosceles triangles, and then use right angle triangles with a different set of numbers.) Ask them to label the height and base with the units, and write a ratio of height to base. They can also calculate the area of the triangle ( $a=1/2bh$ ). Ask students to consider what they would do if they wanted a similar triangle that was larger by a factor of two. (Multiply the base and height by two.) Draw this triangle and write the ratio of height to base. This triangle's ratio is 6 units height to 6 units base. Optionally, reduce this triangle by dividing both base and height by 3 to create a 2 unit high and 2 unit base triangle. Ask students to describe what they see as they work with these triangles.



John Held, Jr., *Dancin in the Jazz Age*, 1920

## Materials

- Graph Paper with a half-inch grid (smaller grid will work; larger is easier to see)
- Pencils, markers, colored pencils, colored paper, scissors, glue
- Rulers
- Paper for drawing
- Optional – measuring tape

## Images from the Museum

- Deon Duncan, *The Contortionist*, 2011
- John Held, Jr., *Dancin in the Jazz Age*, 1920
- James Christensen, *The Rhinoceros*, 1981
- J. Leo Fairbanks, *Buffalo*, 1930

## Utah Core Standards

### Mathematics

Standard 6.RP.1

Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

Standard 6.RP.3.d

Use ratio reasoning to convert measurements units, manipulate and transform units appropriately when multiplying or dividing quantities.

### Fine Arts/Visual Arts

Standard 6.V.CR.3

Demonstrate openness in trying new ideas, materials, methods, and approaches in making works of art and design.

Standard 6.V.CR.6

Reflect on whether personal artwork conveys the intended meaning, and revise accordingly.

## Math Activity continued

Using a right triangle, ask students to draw a 3 unit high and a 4 unit base right triangle. Invite them to choose a factor to change this triangle into a larger triangle. Again, have the students label the parts and write the ratio used. Then, create one more by either multiplying base and height, or dividing both values, by the same quantity.

Discuss with your students how artists use similar objects to create works of art. Ask them to apply what they see with the simple shapes to the works of art you previewed earlier.

## Art Activity

Ask students to think of an animal they might find in a myth or to develop a new mythological beast. They need to choose a shape that they will develop into different proportions. The animal can only be made of one type of shape, in varying sizes. Once the animal has been chosen, create a rough sketch of the size and proportions of the animal. Then draw the animal on graph paper using correct proportions with the chosen shape. You could also cut out the shape in various sizes and then paste them together to form the animal.

## Assessment

The completed animal will be made of only one shape in varying sizes that represent proportional thinking.

## Variation

You can also do the math work using rectangles and squares. Use these if you need to provide ideas for fast finishers, or to solidify the learning.

You can add an activity in which students, with a partner, measure their height in inches, the distance from their belly button to the floor, the distance from the shoulder bone to longest finger, and the height and width of their head. Divide each of these by four. Use these dimensions for the height and width of the animal drawing. (This idea is elaborated in the blog, *The Helpful Art Teacher*. Link included: <http://thehelpfulartteacher.blogspot.com/2010/11/proportion.html>)

## Extension

Using the animal as the central character for a story, ask students to write a myth that shows the animal in its habitat and how it becomes a mythological creature.



James R. Christensen, *The Rhinoceros*, 1985

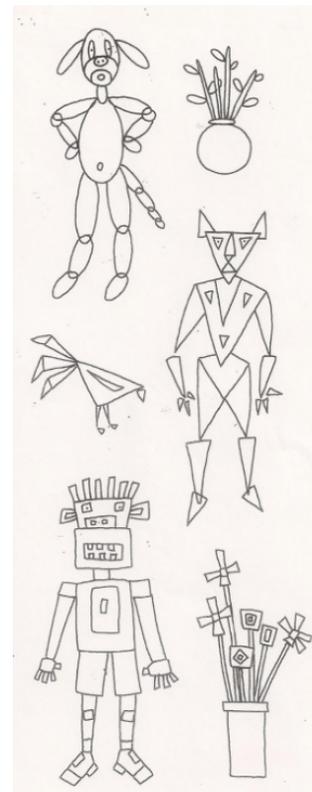


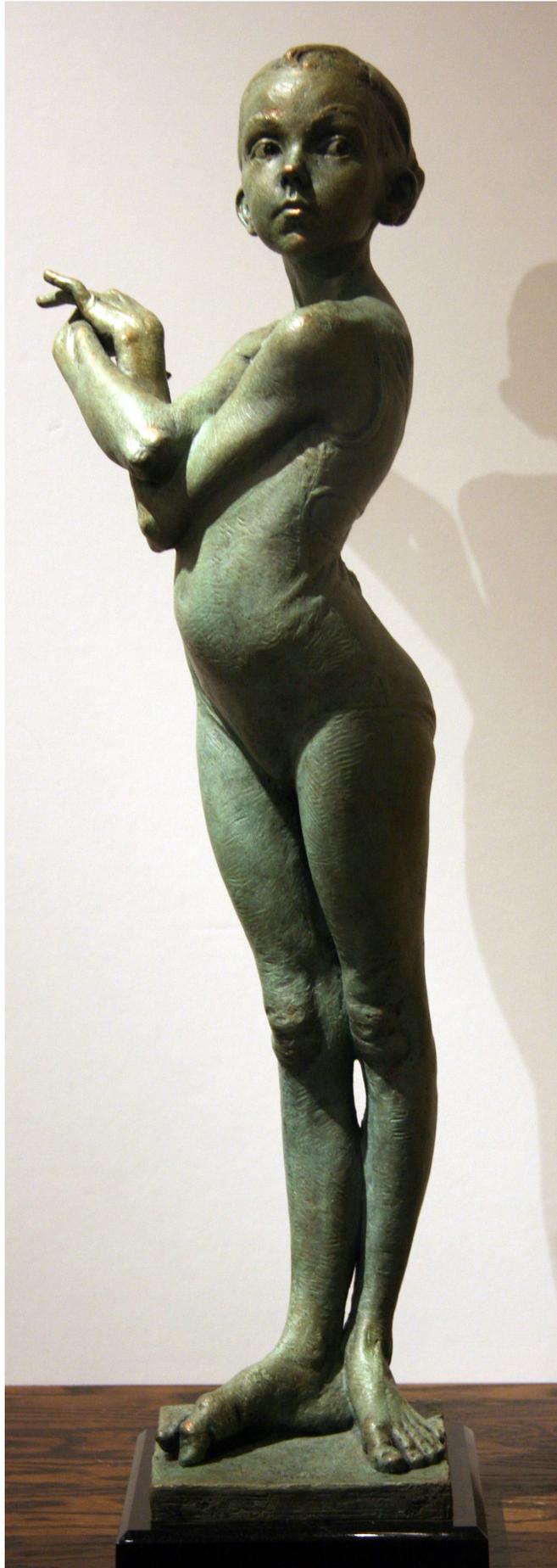
J. Leo Fairbanks, *Buffalo*, 1930



Deon Duncan, *The Contortionist*, 2011

## Student Example





Deon Duncan, *The Contortionist*, 2011



J. Leo Fairbanks, *Buffalo*, 1930



James R. Christensen, *The Rhinoceros*, 1985



John Held, Jr., *Dancin in the Jazz Age*, 1920