## Lesson 1: Lots of Flags

Let’s explore the U.S. flag.

### 1.1: Scaled or Not?

1. Which of the geometric objects are scaled versions of each other?
* 
1. Pick two of the objects that are scaled copies and find the scale factor.

### 1.2: Flags Are Many Sizes

One standard size for the United States flag is 19 feet by 10 feet. On a flag of this size, the union (the blue rectangle in the top-left corner) is $7\frac{5}{8}$ feet by $5\frac{3}{8}$ feet.

There are many places that display flags of different sizes.

* Many classrooms display a U.S. flag.
* Flags are often displayed on stamps.
* There was a flag on the space shuttle.
* Astronauts on the Apollo missions had a flag on a shoulder patch.



1. Choose one of the four options and decide on a size that would be appropriate for this flag. Find the size of the union.
2. Share your answer with another group that used a different option. What do your dimensions have in common?

### 1.3: What Percentage Is the Union?

On a U.S. flag that is 19 feet by 10 feet, the union is $7\frac{5}{8}$ feet by $5\frac{3}{8}$ feet. For each question, first estimate the answer and then compute the actual percentage.

1. What **percentage** of the flag is taken up by the union?
2. What percentage of the flag is red? Be prepared to share your reasoning.

#### Are you ready for more?

The largest U.S. flag in the world is 225 feet by 505 feet.

1. Is the ratio of the length to the width equivalent to $1:1.9$, the ratio for official government flags?
2. If a square yard of the flag weighs about 3.8 ounces, how much does the entire flag weigh in pounds?

### Lesson 1 Summary

Imagine you have a painting that is 15 feet wide and 5 feet high. To sketch a scaled copy of the painting, the ratio of the width and height of a scaled copy must be equivalent to $15:5$. What is the height of a scaled copy that is 2 feet across?

| width | height |
| --- | --- |
| 15 | 5 |
| 2 | $h$ |

We know that the height is $\frac{1}{3}$ the width, so $h=\frac{1}{3}⋅2$ or $\frac{2}{3}$.

Sometimes ratios include fractions and decimals. We will be working with these kinds of ratios in the next few lessons.



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