Unit 2, Lesson 14

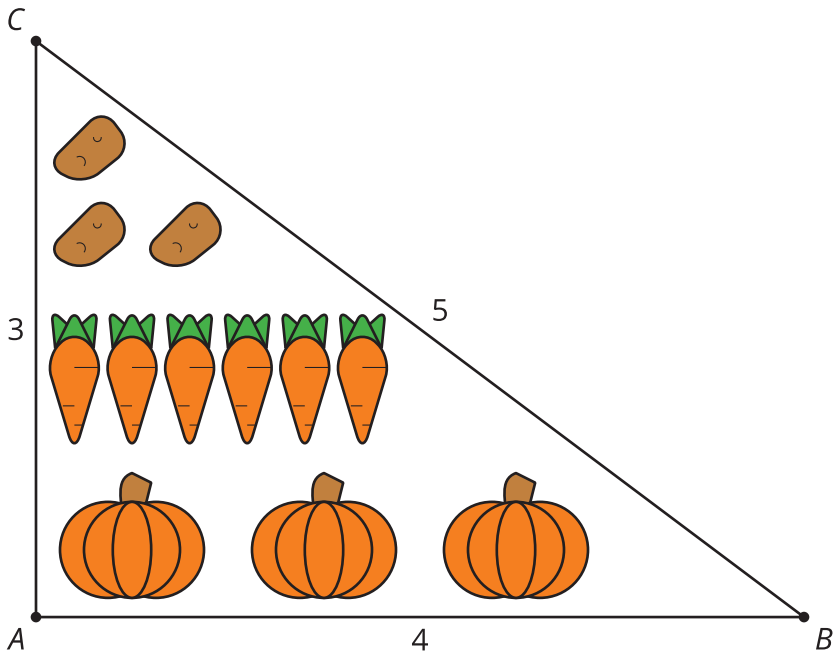
Practice with Proportional Relationships

Let's find unknown values in proportional relationships.

14.1 Vegetable Garden

These are the plans for a vegetable garden that a school is designing.

Scale: 1 unit = 2.8 ft



Write at least 3 equivalent ratios or equations using lengths from both the diagram and the full-size garden.

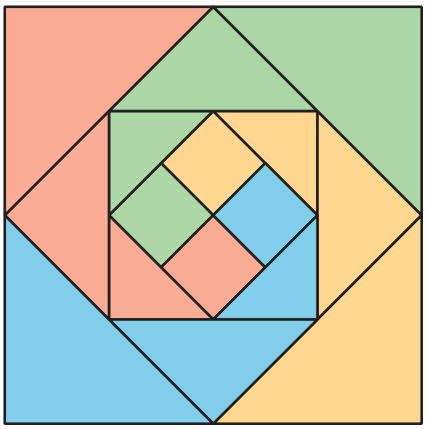
14.2 Card Sort: Corresponding Parts

Your teacher will give you a set of cards. Group them into pairs of similar figures. For each pair, determine:

1. a similarity statement.
2. the scale factor between the similar figures.
3. the missing lengths.

14.3 Quilting Questions

Here is a quilt design made of right isosceles triangles. The smallest squares in the center have an area of 1 square unit.



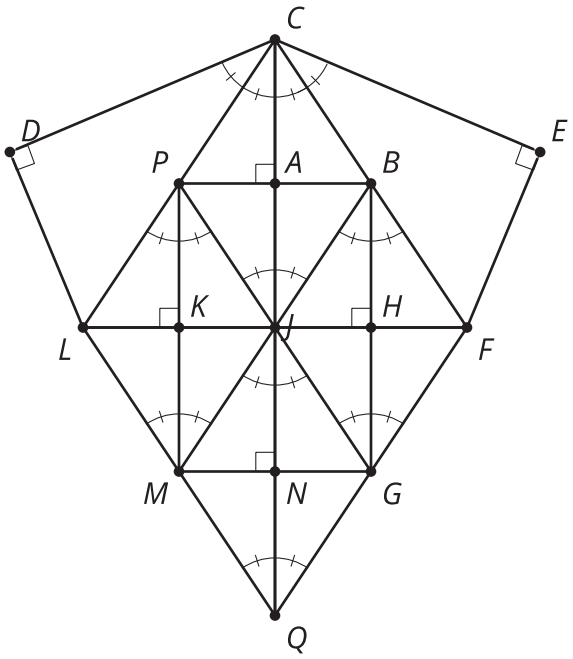
1. Find the dimensions of the triangles.

2. Are the triangles similar? If so, what are the scale factors?

3. The instructions that came with this pattern are for a baby's quilt. The instructions say "1 unit = 6 inches." To make this quilt for a queen-sized bed, the length of one side of the quilt needs to be 90 inches. What dimensions should the center squares of the big quilt have to reach that width?

Are you ready for more?

1. Here is a quilt design made of right triangles. Find as many different size triangles as you can.



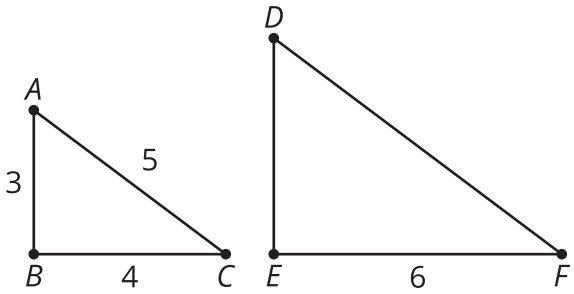
2. Write similarity statements for 2 pairs of triangles.

3. The smallest triangles have legs 2 units and 3 units long. Write some equivalent ratios or equations that will help you determine the dimensions of triangle LCQ. Use your equivalent ratios or equations to find the dimensions of triangle LCQ.

Lesson 14 Summary

When two figures are similar, there are lots of equivalent ratios between the triangles and within the triangles. We can use those relationships to find missing lengths. For example, if we know that triangle ABC is similar to triangle DEF, we know that pairs of corresponding side lengths are in the same proportion. $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

$\triangle ABC \sim \triangle DEF$



We also know that pairs of side lengths in one triangle are in the same proportion as pairs of side lengths in the other triangle.

$\frac{AB}{BC} = \frac{DE}{EF}$ $\frac{AB}{AC} = \frac{DE}{DF}$ $\frac{AC}{BC} = \frac{DF}{EF}$

We can use these equivalent ratios to find unknown side lengths. Which equivalent ratios would work to find DE?

We can use $\frac{AB}{BC} = \frac{DE}{EF}$ to find DE. Then $\frac{3}{4} = \frac{DE}{6}$, which gives $DE = 4.5$.

Or we can use $\frac{AB}{DE} = \frac{BC}{EF}$ to find DE. In this case, we get $\frac{3}{DE} = \frac{4}{6}$, which also gives $DE = 4.5$.