

Equal Parts Workshop

Draw equal-area parts and name the fraction of each whole.

GRADE 3 • 3.G.A.2

CCSS.Math.Content.3.G.A.2 "Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape."

NAME _____

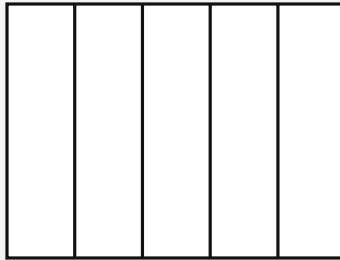
DATE _____

EVERY PART COUNTS EQUALLY

To partition a shape, draw lines that split the whole into parts. The parts must have equal areas. If the whole has 4 equal-area parts, each part is $\frac{1}{4}$ of the whole. Equal shares can have different shapes. Draw carefully; a ruler may help.

WORKED EXAMPLE

This rectangle is divided into 5 equal-area strips. What fraction of the whole is EACH strip?



1. The strips have equal widths and the same height, so their areas are equal.
2. There are 5 equal-area parts; each is one of those 5 parts.

Answer: Each strip is $\frac{1}{5}$ of the whole rectangle.

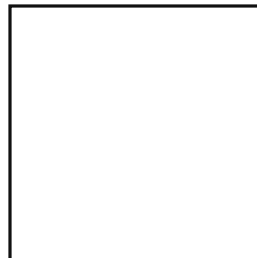
PRACTICE 4 problems

- 1** Draw one line to split this rectangle into 2 equal-area parts. Write the fraction **INSIDE** **EACH** part.



ANSWER _____

- 2** Split this square into 4 equal-area parts. Write the fraction inside **EACH** part.



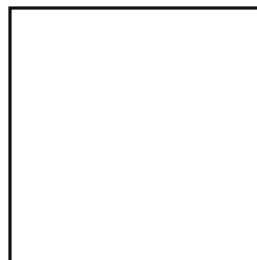
ANSWER _____

- 3** Split this rectangle into 3 equal-area parts. Label each part with its unit fraction.



ANSWER _____

- 4** Draw **ONE** diagonal between opposite corners of this square. Label the fraction of each triangle. Why are the areas equal?



ANSWER _____

APPLY IT Show your work

1

Six friends share this rectangular garden equally. Draw 6 equal-area parts and label each friend's share as a fraction of the whole.



REASONING AND ANSWER

2

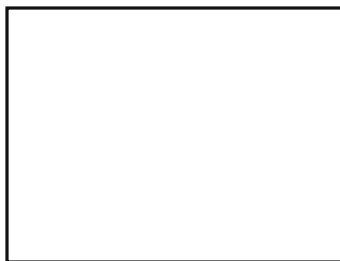
A square quilt is shared by 4 children. Split this square into 4 equal-area TRIANGLES. Label every share.



REASONING AND ANSWER

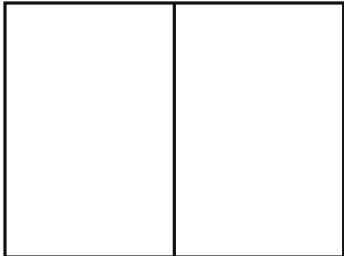
CHALLENGE One step up

Divide this rectangle into 4 parts with UNEQUAL areas. Explain why counting 4 parts alone does not make every part $\frac{1}{4}$.

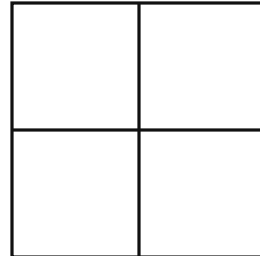


PRACTICE 1

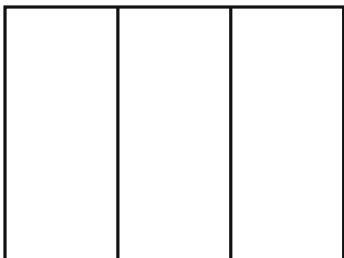
One line through the middle gives two equal rectangles. Label each part $\frac{1}{2}$.

**PRACTICE 2**

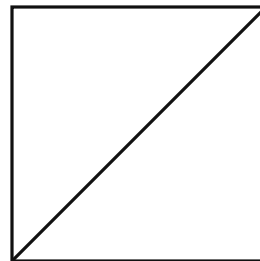
Four equal squares, equal strips, or equal-area triangles are valid. Each part is $\frac{1}{4}$.

**PRACTICE 3**

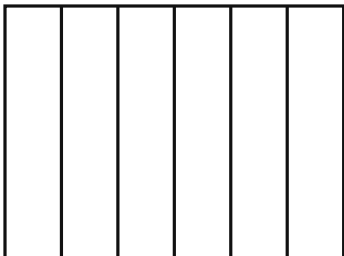
Three equal-width strips with equal heights; label every strip $\frac{1}{3}$.

**PRACTICE 4**

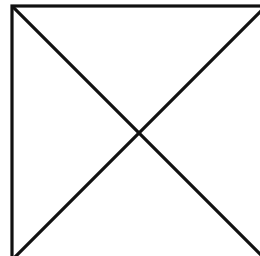
Each triangle is $\frac{1}{2}$. The two triangles match when one is turned over, so they have equal areas.

**APPLY IT 1**

Each part is $\frac{1}{6}$.
Six equal-width strips of equal height have equal areas. A 2-by-3 arrangement of equal rectangles also works.

**APPLY IT 2**

Each triangle is $\frac{1}{4}$ of the quilt.
Draw both diagonals. They make four triangles with equal bases and heights; each is one of four equal-area parts.



CHALLENGE

Example: widths 10, 20, 30 and 60 in a 120-wide rectangle. The areas differ, so not every part is $\frac{1}{4}$. Equal areas, not just the number of parts, are required.

Model diagrams show possible partition lines; students must label EVERY equal part with its unit fraction. Accept other accurate equal-area partitions. Judge reasonable hand-drawn equality, not ruler precision. In the challenge the unequal areas are intentional; do not accept four equal parts. All construction outlines are blank on student pages.

