

**Core Focus**

- Common fractions: Making comparisons with different and the same denominators
- Common fractions: Comparing to order and calculating equivalent fractions
- Mass: Pounds and ounces
- Capacity: Gallons, quarts, pints, and fluid ounces

**Common fractions**

- This module provides students with strategies to understand equivalent fractions using models (area, number line, and arrow diagrams), instead of simply memorizing rules.
- Equivalent fractions are different names for the same fractional amount. An area model illustrates the relationship between **numerators** and **denominators** of equivalent fractions.

**9.4 Common fractions: Calculating equivalent fractions**

**Step In** Kuma wanted to figure out an equivalent fraction for  $\frac{5}{6}$ . She drew this picture to help.



Kuma realized that if she drew another line horizontally, she would find an equivalent fraction.



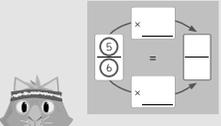
She noticed that splitting the shape that way would double the value of the denominator.

In this lesson,  $\frac{5}{6}$  is renamed as  $\frac{10}{12}$  when a horizontal line is drawn, doubling the number of pieces, but keeping the same fractional amount.

- When both the numerator and the denominator of a fraction are multiplied by the same number, as seen in this arrow diagram, an **equivalent fraction** is created.

Complete this diagram to show Kuma's thinking.

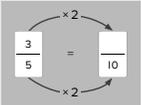
How did the total number of parts change?  
How did the number of blue parts change?  
Did the total area that was shaded change?  
What do you notice about the denominators?



I see that 12 is a multiple of 6.

- Students compare fractions with related and unrelated denominators. When the fractions are not easy to compare, students find a common denominator and rename the fraction.

I know that 10 is a multiple of 5, so I will change  $\frac{3}{5}$  into tenths. If I double 5, I get 10. To make sure the fraction is equivalent, I need to double the numerator too. Then it is easy to compare the fractions.



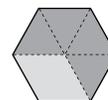
Arrow diagrams show how equivalent fractions with common denominators can be created.

**Ideas for Home**

- Fold pieces of paper to prove fractions are equivalent. Talk about fraction families and how related fractions are created by one fold that doubles the total number of pieces, e.g.  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{8}$ , etc.

**Glossary**

- **Equivalent fractions** are fractions that cover the same amount of area on a shape, or are located on the same point on a number line.



The whole hexagon is  $\frac{6}{6}$ . The dark gray blocks cover  $\frac{4}{6}$ . The light gray covers  $\frac{2}{6}$  or  $\frac{1}{3}$  of the whole.

- Students review pounds and are introduced to **ounces**. They use tools such as a pan balance and a customary scale to measure the mass of objects.

**9.9 Mass: Reviewing pounds and introducing ounces**

**Step In** Do you think an apple weighs more or less than one pound?

What are some other items that weigh less than one pound?

A granola bar would weigh less than one pound.

What unit of measure is used to describe something that weighs less than one pound?

I have seen **oz** written on jars and packets of food.

There are 16 ounces in one pound. A short way to write pound is lb. A short way to write ounce is oz. Ounce comes from the old Italian word onza.

In this lesson, students are introduced to ounces.

- Students are also introduced to fluid ounces, and make comparisons to pints, quarts and gallons.

**9.11 Capacity: Reviewing gallons, quarts, and pints, and introducing fluid ounces**

**Step In** This table shows the number of containers that are required to make one gallon.

What do you notice?

Size of Container	Number of Containers
Quart	
Pint	
Cup	

I can see a doubling pattern. 1 quart is equal to 2 pints or 4 cups.

**Complete this statement.**

1 gallon =  quarts =  pints =  cups

What is a unit of capacity that is less than one cup?

A fluid ounce is less than a cup.

There are 8 fluid ounces in one cup. A short way to write fluid ounce is fl oz.

In this lesson, students are introduced to fluid ounces.

**Ideas for Home**

- Point out the different capacities of groceries in your pantry or fridge so your child has mental images to fall back on. These could be 1 gallon (milk), 1 quart (half and half), and 1 pint (ice cream), or smaller items such as a 6 fluid oz juice box.
- Many items are labeled in both customary units and metric units. E.g. laundry detergent might also be labeled 1.47 liters. You should not ask your child to convert between customary and metric units. However, it is helpful to be familiar with the basic relationships between the two systems (see below), such as knowing that 1 liter is just slightly more than 1 quart.

Customary Units of Liquid Volume	Metric Units of Liquid Volume
8 fluid ounces	1 cup
2 cups	1 pint
2 pints	1 quart
4 quarts	1 gallon