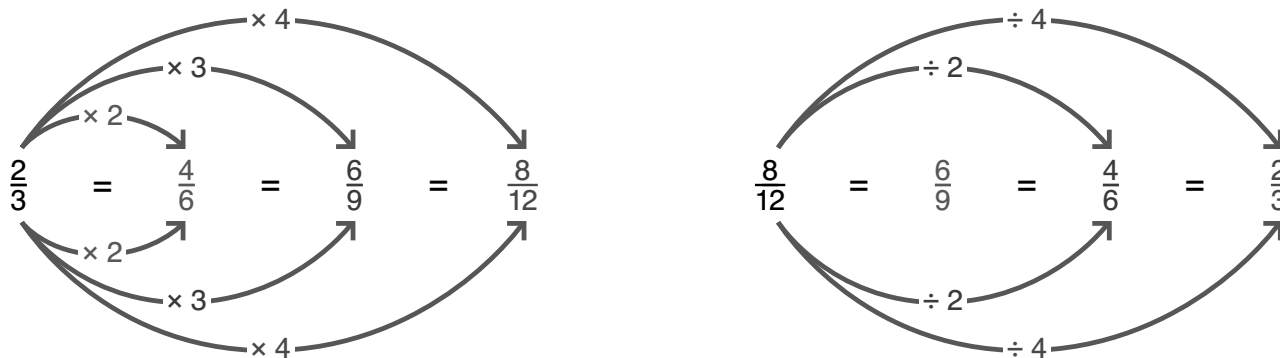


## Home Connection

In this chapter, your child moves from whole numbers to fractions. They will use equivalent fractions to compare and order fractions. Students will then apply that knowledge to express an improper fraction as its equivalent mixed number and vice versa.

## Equivalent Fractions

In Dimensions Math 3, students learned that equivalent fractions have the same value. They can be found by multiplying or dividing both the numerator and denominator by the same number.



When we divide to find an equivalent fraction, it is called simplifying a fraction, or expressing a fraction in simplest form. Students will be expected to give answers in simplest form in Dimensions Math 4.

## Comparing Fractions

Fractions with different denominators can be compared by finding equivalent fractions.

To compare  $\frac{2}{3}$  and  $\frac{4}{5}$ , we can use a common multiple of the denominator, such as 15.

$$\frac{2}{3} = \frac{10}{15}$$

Arrows indicate:  $\times 5$  (upward) and  $\times 5$  (downward).



$\frac{12}{15}$  is greater than  $\frac{10}{15}$ , so  $\frac{4}{5}$  is greater than  $\frac{2}{3}$ .

$$\frac{4}{5} = \frac{12}{15}$$

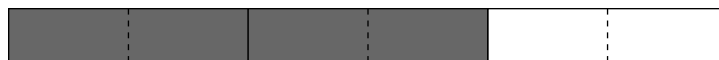
Arrows indicate:  $\times 3$  (upward) and  $\times 3$  (downward).



Fractions can also be compared by finding a common numerator.

To compare  $\frac{2}{3}$  and  $\frac{4}{5}$ , we can use a common multiple of the numerator, such as 4.

$$\begin{array}{c} \times 2 \nearrow \\ \frac{2}{3} = \frac{4}{6} \\ \nwarrow \times 2 \end{array}$$



$$\frac{4}{5}$$



$\frac{4}{6}$  is less than  $\frac{4}{5}$ , so  $\frac{2}{3}$  is less than  $\frac{4}{5}$ .

## Improper Fractions and Mixed Numbers

Your child will next learn some fraction terms before expressing equivalent improper fractions and mixed numbers.

$\frac{1}{3}$  and  $\frac{2}{3}$  are **proper fractions**. Proper fractions are less than 1.

$\frac{3}{3}$ ,  $\frac{4}{3}$ , and  $\frac{5}{3}$  are **improper fractions**. An improper fraction is equal to or greater than 1.

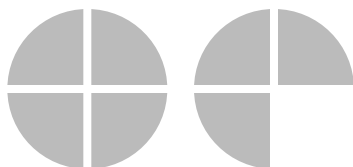
$1\frac{1}{3}$  and  $1\frac{2}{3}$  are **mixed numbers**. A mixed number is the sum of a whole number and a fraction.

$$1 + \frac{2}{3} = 1\frac{2}{3}$$



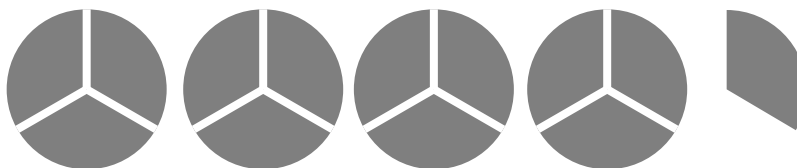
First, we can express an improper fraction as a mixed number.

$$\begin{aligned} \frac{7}{4} &= \frac{4}{4} + \frac{3}{4} \\ &= 1 + \frac{3}{4} \\ &= 1\frac{3}{4} \end{aligned}$$



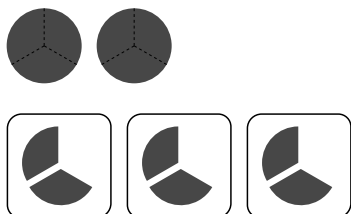
Then students learn to express a mixed number as an improper fraction.

$$\begin{aligned} 4\frac{1}{3} &= 4 + \frac{1}{3} \\ &= \frac{12}{3} + \frac{1}{3} \\ &= \frac{13}{3} \end{aligned}$$

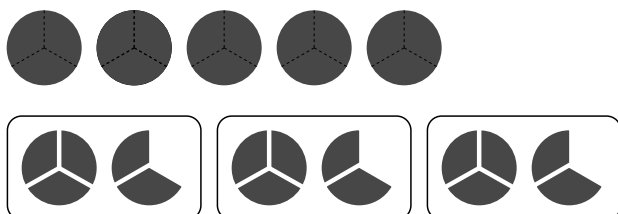


Finally, students will learn that a fraction is a division expression and that they can use division to express an improper fraction as a mixed number.

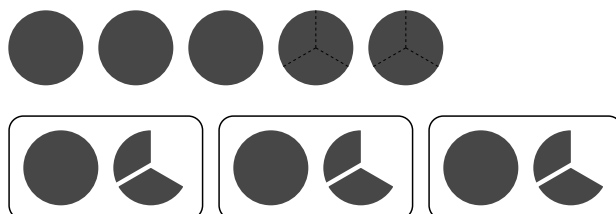
2 wholes divided into 3 groups is  $\frac{2}{3}$  in each group.



We can split each whole into thirds, and then divide 15 thirds by 3. There are 5 thirds in each group, which is  $1\frac{2}{3}$ .



We could instead first divide as many wholes as we can into 3 groups, and then divide the remaining 2 wholes. The remainder is expressed as a fraction.



This can also be shown with division:

$$\begin{array}{r} 1 \\ 3 \overline{) 5} \\ \underline{3} \\ 2 \end{array}$$

$$5 \div 3 = \frac{5}{3} = 1\frac{2}{3}$$

This method can be helpful for improper fractions that are more challenging to convert to mixed numbers:

$$\frac{41}{9} = 9 \overline{) 41} = 4\frac{5}{9}$$

$$\begin{array}{r} 4 \\ 9 \overline{) 41} \\ \underline{36} \\ 5 \end{array}$$

## What can we do at home?

Some of the methods used in this chapter might differ from the way many adults were taught. Allow your child to draw pictures of fractional amounts until they can readily convert between improper fractions and mixed numbers. In the next chapter, students will use this knowledge to add and subtract mixed numbers.