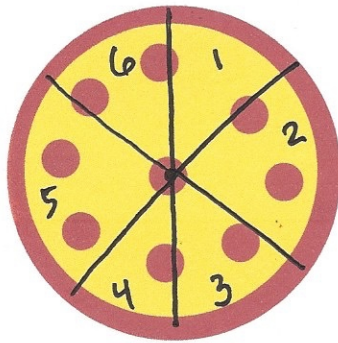


Fractions Bite – What's So Improper About Fractions?

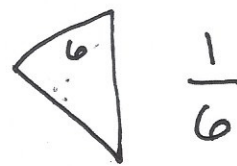
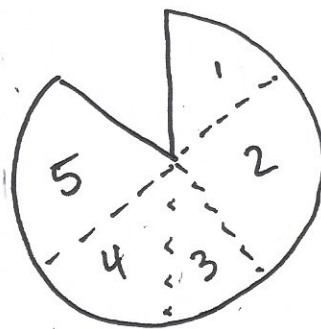
Remember that a fraction can be used to count pieces of something (in this series, I've been using pizza.) So the fraction $\frac{5}{6}$ represents 5 pieces of a pizza that's been cut into 6 pieces

$$\frac{5}{6} = \frac{\text{\# pieces you get}}{\text{total \# pieces}}$$



Whole Pizza
 $= \frac{6}{6}$

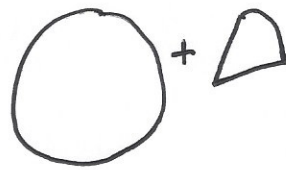
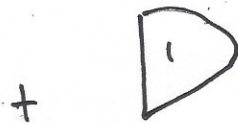
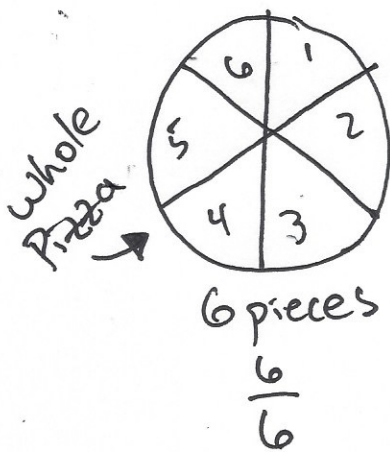
$$\frac{5}{6}$$



$$\frac{1}{6}$$

But then what would $\frac{7}{6}$ mean?

$\frac{7}{6} = \frac{7 \text{ pieces}}{6 \text{ total pieces}}$, which means that we have more than a whole pizza:



1 piece

= 7 pieces

$$\frac{1}{6}$$

$$\frac{7}{6} = 1 \frac{1}{6}$$

Improper fraction

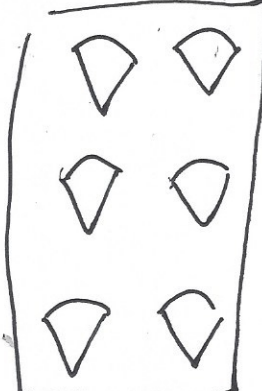
Mixed Number

Fractions like this, where the numerator (top) is greater than the denominator (bottom) are called **improper fractions**. Improper fractions can be rewritten in a form that includes a whole number and a fraction that's called a **mixed number**.

How do you convert from one type of fraction to another?

First, you can only convert improper fractions to mixed numbers – the numerator (top) has to be greater than the denominator (bottom.) If the numbers are small, you can sometimes work it out in your head.

Ex: Convert $\frac{13}{6}$ to a mixed number using pizzas:



$$\Rightarrow \frac{13}{6} = 2 \frac{1}{6}$$

$$1 = 13$$

$\frac{13}{6}$ ← We have 13 pieces
6 ← Each pizza has 6 pieces

What if the numbers are too big to draw a picture, or you don't like pizza?

If you don't want to draw a picture, you'll need to use long division to work it out.

Ex: Convert $\frac{13}{6}$ to a mixed number.

Remainder \div

$$13 \div 6 \rightarrow \begin{array}{r} 2 \text{ r } 1 \\ 6 \overline{) 13} \\ \underline{-12} \\ 1 \end{array} = 2 \frac{1}{6}$$

Ex: Convert $\frac{100}{7}$ to a mixed number.

$$100 \div 7 \rightarrow \begin{array}{r} 14 \text{ r } 2 \\ 7 \overline{) 100} \\ \underline{-7} \downarrow \\ 30 \\ \underline{-28} \\ 2 \end{array} \Rightarrow \frac{100}{7} = 14 \frac{2}{7}$$

Ex: Convert $\frac{10}{2}$ to a mixed number.

$$10 \div 2 \rightarrow \begin{array}{r} 5 \text{ r } 0 \\ 2 \overline{) 10} \\ \underline{-10} \\ 0 \end{array} \Rightarrow \frac{10}{2} = 5 \frac{0}{2} = 5$$

What if you want to convert back from a mixed number to an improper fraction?

Since we use division to go from improper fractions to mixed numbers, we use multiplication to go from mixed numbers to improper fractions:

Ex: Convert $2\frac{1}{6}$ to an improper fraction



6 pieces + 6 pieces + 1 piece = 13 pieces $\rightarrow \frac{13}{6}$

$$2\frac{1}{6} : 2 \cdot 6 + 1$$
$$= 12 + 1 = 13 \rightarrow \frac{13}{6}$$

Ex: Convert $10\frac{3}{5}$ to an improper fraction

$$10\frac{3}{5}$$

$$\rightarrow 10 \cdot 5 + 3 = 50 + 3 = 53$$
$$\rightarrow \frac{53}{5}$$

When should you use each type? Generally speaking, unless you are asked to write answers as a mixed number, leave your answer as an improper fraction. The one exception is word problems – when answering a word problem, you should usually use a mixed number as the answer