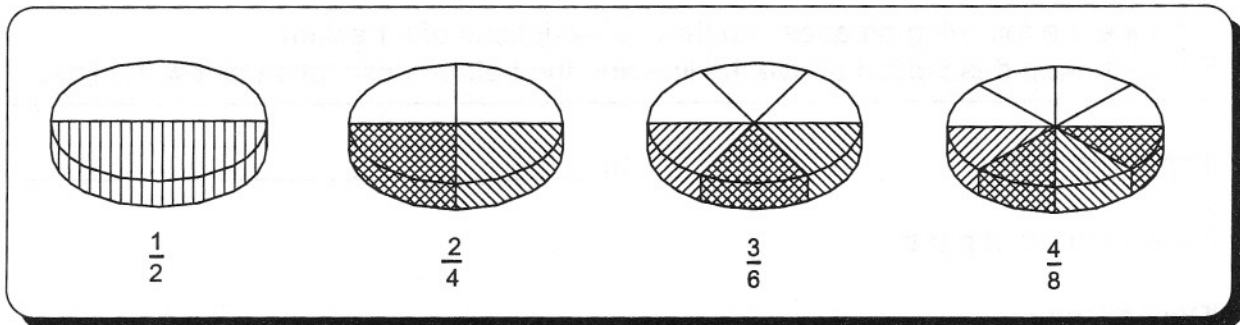# Unit 8   Equivalent Fractions

1. **Equivalent fractions** are equal even though they may have a different number of whole parts. Look at the half pizzas shown below. Each pizza has a different number of whole parts. The larger the number of whole parts, the more pieces it takes to make half a pizza.

$$\frac{1}{2} \qquad\qquad \frac{2}{4} \qquad\qquad \frac{3}{6} \qquad\qquad \frac{4}{8}$$

Multiplying the numerator (top) and denominator (bottom) of a fraction by the same number results in an equivalent (equal) fraction. This is because fractions such as $\frac{2}{2}$ equal one and multiplying a number by 1 does not change its value. Some common equivalent fractions are calculated below.

The fractions in each row of this table are equivalent.

Multiply by	$\frac{2}{2}$	$\frac{3}{3}$	$\frac{4}{4}$	$\frac{25}{25}$	$\frac{100}{100}$
$\frac{1}{4} \longrightarrow$	$\frac{1\times2}{4\times2}=\frac{2}{8}$	$\frac{1\times3}{4\times3}=\frac{3}{12}$	$\frac{1\times4}{4\times4}=\frac{4}{16}$	$\frac{1\times25}{4\times25}=\frac{25}{100}$	$\frac{1\times100}{4\times100}=\frac{100}{400}$
$\frac{2}{3} \longrightarrow$	$\frac{2\times2}{3\times2}=\frac{4}{6}$	$\frac{2\times3}{3\times3}=\frac{6}{9}$	$\frac{2\times4}{3\times4}=\frac{8}{12}$	$\frac{2\times25}{3\times25}=\frac{50}{75}$	$\frac{2\times100}{3\times100}=\frac{200}{300}$

2. Fractions as whole numbers

   A. Fractions smaller than 1 are **proper fractions**.
      Their numerator is smaller than their denominator.

   B. Fractions greater than or equal to 1 are **improper fractions**.
      Their numerator is larger than or equal to their denominator.

Fraction as a Whole Number	Whole Number as a Fraction	Equivalent Fractions
$\frac{4}{2} = 2$	$2 = \frac{2}{1}$	$\frac{4}{2} = \frac{2}{1}$

3. The line separating the numerator and denominator of a fraction is a division symbol. Other division symbols include ÷ and /. Three-fourths may be written as follows: $\frac{3}{4}$ or $3\div4$ or 3/4.