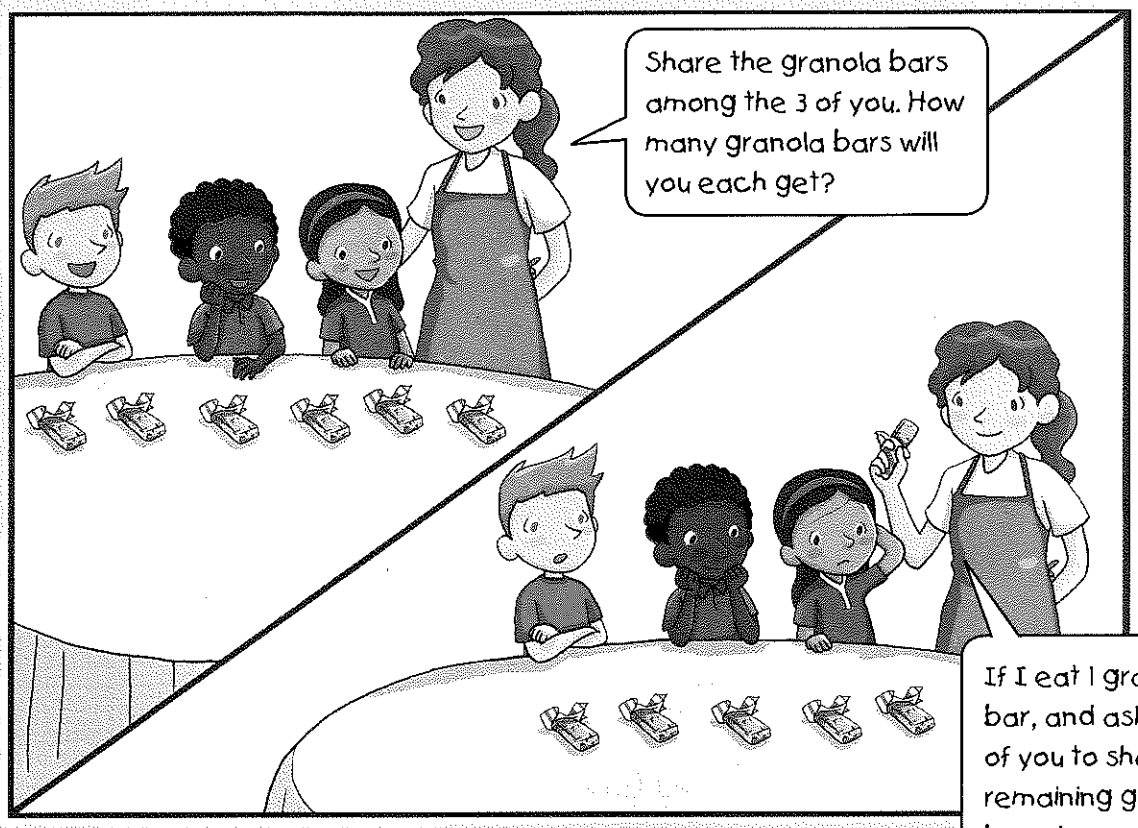
Chapter

3 Fractions and Mixed Numbers



Lessons

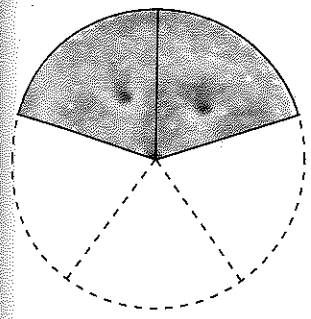
BIG IDEA

- Add and subtract unlike fractions and mixed numbers by rewriting them with like denominators.

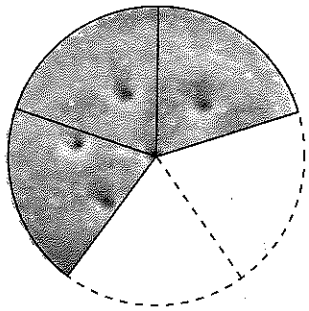
Recall Prior Knowledge

Like fractions have the same denominator.

Liam had $\frac{2}{5}$ of a cracker.



Walt had $\frac{3}{5}$ of a cracker.



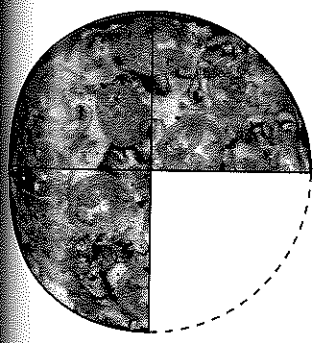
$\frac{2}{5}$ and $\frac{3}{5}$ are like fractions.

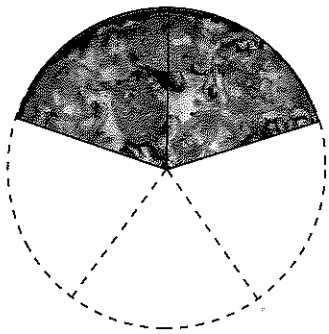
They have the same denominator, 5.

Unlike fractions have different denominators.

In one box, $\frac{3}{4}$ of a pizza was left.

In another box, $\frac{2}{5}$ of a pizza was left.

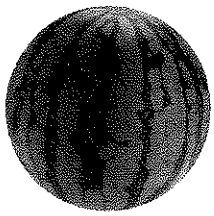




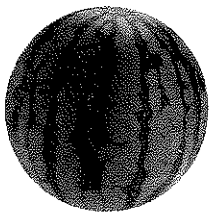
$\frac{3}{4}$ and $\frac{2}{5}$ are unlike fractions.

They have different denominators, 4 and 5.

A mixed number consists of a whole number and a fraction.



1 whole



1 whole

1 half

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

whole number | fraction | mixed number

Finding equivalent fractions

$$\frac{3}{4} \xrightarrow{\times 2} \frac{6}{8}$$

$$\frac{8}{12} \xrightarrow{\div 2} \frac{4}{6}$$

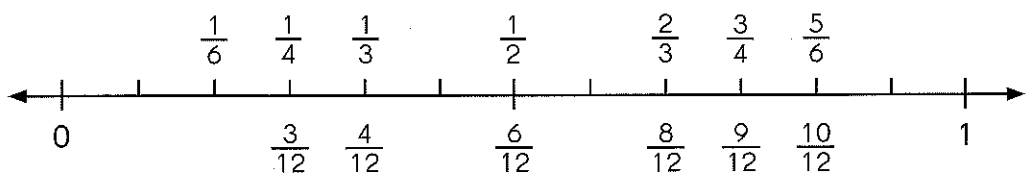
Expressing fractions in simplest form

$$\frac{6}{9} \xrightarrow{\div 3} \frac{2}{3}$$

$$\frac{8}{12} \xrightarrow{\div 4} \frac{2}{3}$$

Divide the numerator and denominator by their greatest common factor.

Representing fractions on a number line



Identifying prime and composite numbers

2 and 5 are prime numbers. They have no factors other than 1 and themselves.

$2 = 2 \times 1$ $\qquad$ $5 = 5 \times 1$

8 and 24 are composite numbers. They have factors other than 1 and themselves.

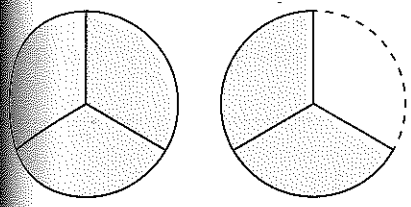
$8 = 1 \times 8$
$= 2 \times 4$

$24 = 1 \times 24$
$= 2 \times 12$
$= 3 \times 8$
$= 4 \times 6$

Expressing improper fractions as mixed numbers

Express $\frac{5}{3}$ as a mixed number.

Using models:



$\frac{5}{3}$ = 5 thirds
= 3 thirds + 2 thirds
$= \frac{3}{3} + \frac{2}{3}$
$= 1 + \frac{2}{3}$
$= 1\frac{2}{3}$

Using division:

$\frac{5}{3}$ means 5 divided by 3.

number of wholes → 1

$3\overline{)5}$

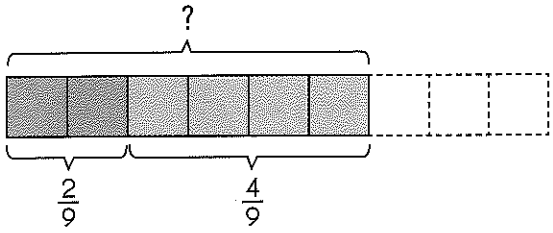
$\underline{3}$

2 ← number of thirds

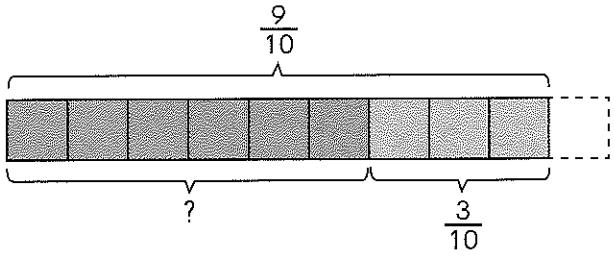
Divide the numerator by the denominator.
$5 \div 3 = 1$ R 2
This is the division rule.

There is 1 whole and 2 thirds in $\frac{5}{3}$.
$\frac{5}{3} = 1\frac{2}{3}$

Adding and subtracting like fractions



$$\frac{2}{9} + \frac{4}{9} = \frac{6}{9}$$
$$= \frac{2}{3}$$



$$\frac{9}{10} - \frac{3}{10} = \frac{6}{10}$$
$$= \frac{3}{5}$$

Adding and subtracting unlike fractions

$$\frac{2}{3} + \frac{1}{6} = \frac{4}{6} + \frac{1}{6}$$
$$= \frac{5}{6}$$

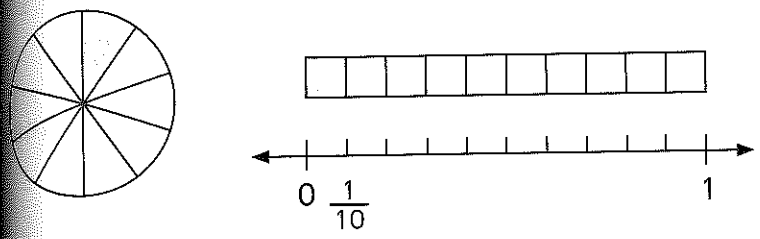
$$\frac{1}{3} + \frac{4}{9} + \frac{2}{3} = \frac{3}{9} + \frac{4}{9} + \frac{6}{9}$$
$$= \frac{13}{9}$$
$$= 1\frac{4}{9}$$

$$\frac{3}{4} - \frac{5}{12} = \frac{9}{12} - \frac{5}{12}$$
$$= \frac{4}{12}$$
$$= \frac{1}{3}$$

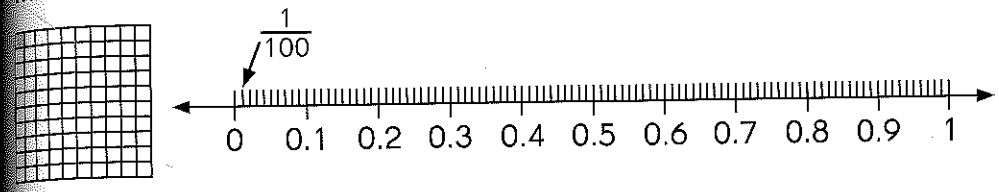
$$1 - \frac{2}{9} - \frac{7}{18} = \frac{18}{18} - \frac{4}{18} - \frac{7}{18}$$
$$= \frac{7}{18}$$

$$2 - \frac{4}{5} - \frac{9}{10} = \frac{20}{10} - \frac{8}{10} - \frac{9}{10}$$
$$= \frac{3}{10}$$

Reading and writing tenths and hundredths in decimal and fractional forms



$\frac{1}{10}$ (one tenth) is 0.1 in decimal form. You read 0.1 as one tenth.



$\frac{1}{100}$ (one hundredth) is 0.01 in decimal form. You read 0.01 as one hundredth.

Expressing fractions as decimals

Express $\frac{9}{10}$ as a decimal.

$\frac{1}{10}$ = 1 tenth

= 0.1

$\frac{9}{10}$ = 9 tenths

= 0.9

Express $\frac{17}{100}$ as a decimal.

10 hundredths = 1 tenth

$\frac{17}{100}$ = 17 hundredths

1 tenth 7 hundredths

$\frac{17}{100}$ = 1 tenth 7 hundredths

= 0.17

✔ Quick Check

the like fractions in each set.

$\frac{3}{4}$, $\frac{1}{2}$, $\frac{2}{5}$, $\frac{1}{4}$

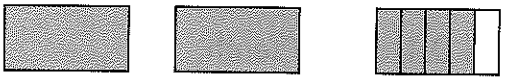
2 $\frac{5}{6}$, $\frac{5}{9}$, $\frac{9}{10}$, $\frac{7}{9}$

Find the unlike fractions in each set.

3 $\frac{1}{8}$, $\frac{2}{7}$, $\frac{3}{8}$, $\frac{1}{2}$

4 $\frac{5}{9}$, $\frac{5}{12}$, $\frac{1}{10}$, $\frac{7}{9}$

Find the number of wholes and parts that are shaded. Then write the mixed number.

5 

wholes parts = —

Complete to show the equivalent fractions.

6 $\frac{3}{5} = \frac{\quad}{10}$

7 $\frac{15}{20} = \frac{\quad}{4}$

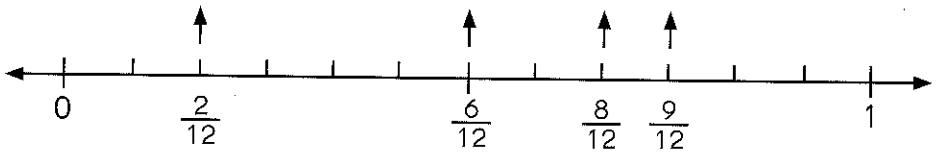
Express each fraction in simplest form.

8 $\frac{8}{10} =$

9 $\frac{12}{16} =$

Find the equivalent fractions which are missing from the number line. Give your answers in simplest form.

10



Find the prime numbers.

11 12, 2, 8, 3, 7, 15

the composite numbers.

2, 14, 18, 13, 5, 10

ress the improper fraction as a mixed number.

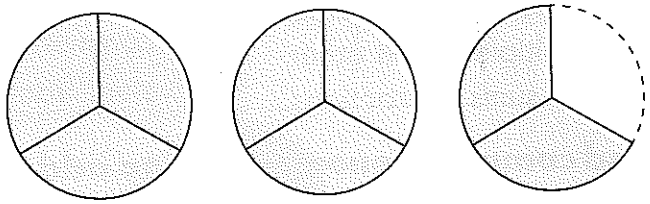
$\frac{8}{3}$ = thirds

= thirds + thirds

= +

= +

=



ress each improper fraction as a mixed number.
the division rule.

$\frac{13}{4}$ =

15 $\frac{19}{5}$ =

or subtract. Express the sum or difference in simplest form.

$\frac{5}{8} + \frac{1}{8}$ =

$\frac{1}{2} + \frac{3}{8}$ =

$\frac{4}{5} - \frac{3}{10}$ =

$1 - \frac{1}{6} - \frac{11}{18}$ =

17 $\frac{3}{10} - \frac{1}{10}$ =

19 $\frac{2}{3} + \frac{3}{4} + \frac{10}{12}$ =

21 $\frac{6}{7} - \frac{11}{14}$ =

23 $3 - \frac{1}{3} - \frac{2}{9}$ =

ress each fraction as a decimal.

$\frac{7}{10}$

25 $\frac{3}{100}$

26 $\frac{89}{100}$