

Lesson 13

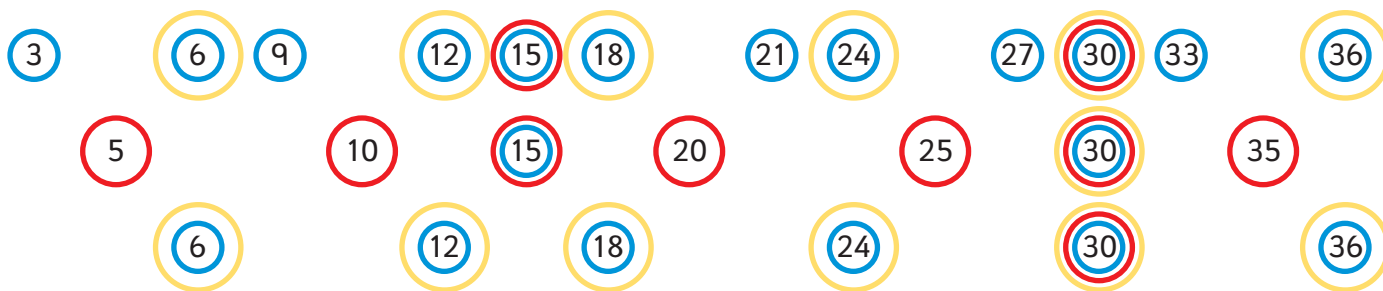
► Adding Three Fractions

Problem Solving:
► Choosing the Best Graph

► Adding Three Fractions

How do we use good number sense with fractions?

Let's review least common multiples. Look at the following set of numbers. What do you think the colors represent?



The colors surrounding each number show multiples of 3 (blue), 5 (red), and 6 (yellow). The number surrounded by all three colors is the least common multiple of 3, 5, and 6.

It is important to have good number sense when we do any kind of calculation. Look at the problem below. It does not make sense to use paper and a pencil to subtract. We just count backward in our heads and get 998.

$$1,000 - 2$$

Good number sense is also important when we work with fractions. The problem requires that we add three fractions. Look at the denominators carefully.

How do we find the least common multiple for three fractions?

To solve this problem, we need to find the least common multiple of all three denominators.

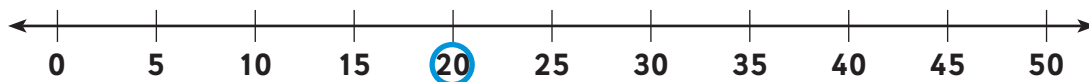
$$\begin{array}{r} \frac{1}{5} \\ \frac{2}{4} \\ + \frac{3}{10} \\ \hline \end{array}$$

If we think about least common multiples, we can use one of two strategies to find a smaller common denominator.

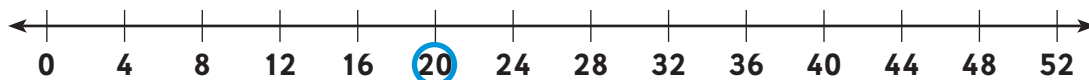
We might think it easiest to multiply all three denominators together to get a common denominator. If we multiply $5 \cdot 4 \cdot 10$, we get 200. The number 200 is a multiple of 5, 4, and 10. However, 200 is so large that the fractions would be hard to understand.

Use a Number Line

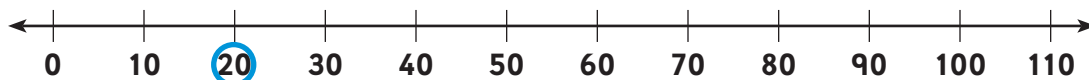
Multiples of 5:



Multiples of 4:



Multiples of 10:



Count by Multiples

5s	5	10	15	20	25	30	35	40	45	50	55	60			
4s	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
10s	10	20	30	40	50	60	70	80	90	100	110				

In all three numbers, 20 is the first, or least, common multiple.

Now that we know that 20 is the least common multiple of 5, 4, and 10, we can solve the problem in two steps.

$$\begin{array}{r} \text{Add:} \quad \frac{1}{5} \\ \quad \frac{2}{4} \\ + \frac{3}{10} \\ \hline \end{array}$$

STEP 1

Find the common denominator.

$$\frac{1}{5} \cdot \frac{4}{4} = \frac{4}{20}$$

$$\frac{2}{4} \cdot \frac{5}{5} = \frac{10}{20}$$

$$\frac{3}{10} \cdot \frac{2}{2} = \frac{6}{20}$$

STEP 2

Solve the problem.

$$\begin{array}{r} \frac{4}{20} \\ \frac{10}{20} \\ + \frac{6}{20} \\ \hline \frac{20}{20} \end{array}$$

The answer is $\frac{20}{20}$, or 1.

In this problem, the numerator and the denominator are the same. So we know that this fraction equals 1.

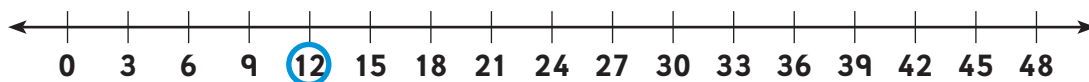
Let's see how this works with three other fractions.

Example 1

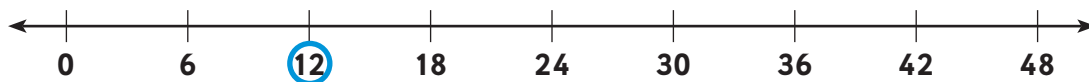
Find the least common multiple to make common denominators.
Count on a number line, or count by multiples.

$$\begin{array}{r} \frac{2}{3} \\ \frac{1}{6} \\ + \frac{3}{4} \\ \hline \end{array}$$

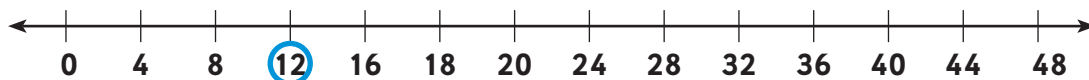
Multiples of 3:



Multiples of 6:



Multiples of 4:



3s	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
6s	6	12	18	24	30	36	42	48								
4s	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	

Solve the problem.

$$\frac{2}{3} \cdot \frac{4}{4} = \frac{8}{12}$$

$$\frac{8}{12}$$

$$\frac{1}{6} \cdot \frac{2}{2} = \frac{2}{12}$$

$$\frac{2}{12}$$

$$\frac{3}{4} \cdot \frac{3}{3} = \frac{9}{12}$$

$$+ \frac{9}{12}$$

$$\frac{19}{12}$$

The answer is $\frac{19}{12}$.



Apply Skills

Turn to *Interactive Text*, page 36.



mBook Reinforce Understanding

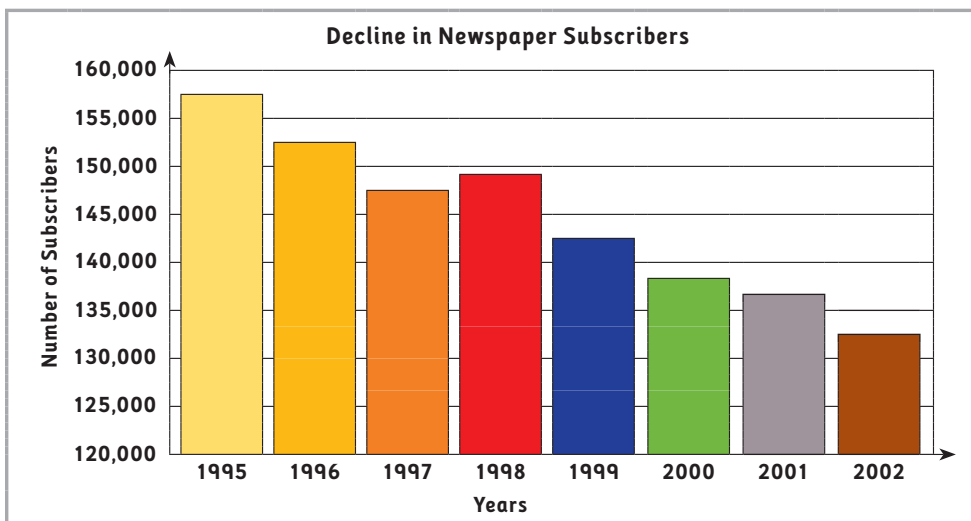
Use the *mBook Study Guide* to review lesson concepts.

► Problem Solving: Choosing the Best Graph

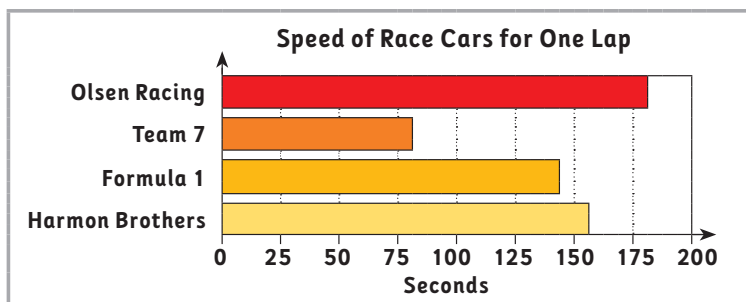
Which graph displays our data in the best way?

Each graph below shows data in a different way. Study each graph to see why one type is better than another for showing different sets of data.

Vertical Bar Graph

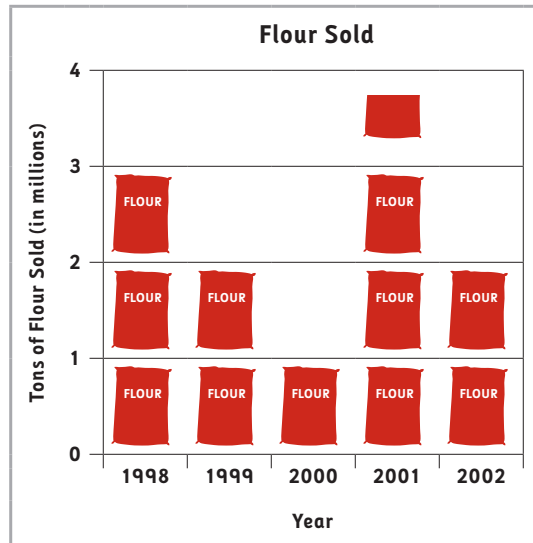


Horizontal Bar Graph



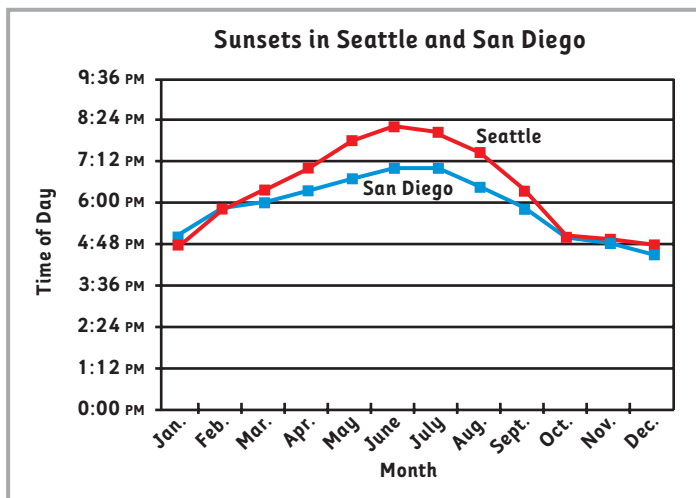
Bar graphs are good for showing relationships between numbers over time.

Pictograph



Pictographs are good when we want to communicate a general idea.

Line Graph



Line graphs are good for showing trends.



Problem-Solving Activity

Turn to *Interactive Text*, page 37.



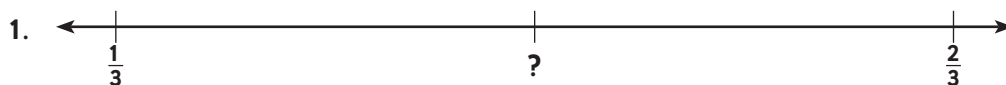
mBook Reinforce Understanding

Use the *mBook Study Guide* to review lesson concepts.

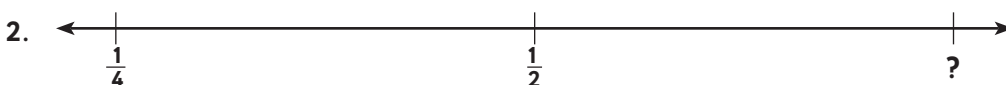
Homework

Activity 1

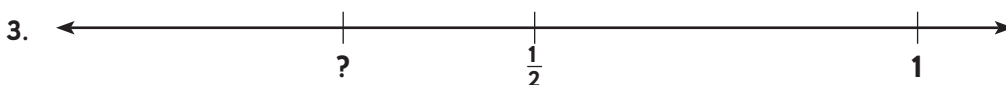
Tell which fraction goes in the blank on each number line.



Is the missing fraction $\frac{1}{4}$, $\frac{3}{4}$, or $\frac{1}{2}$?



Is the missing fraction $\frac{3}{4}$, $\frac{2}{4}$, or $\frac{1}{3}$?



Is the missing fraction $\frac{3}{4}$, $\frac{2}{3}$, or $\frac{1}{4}$?

Activity 2

Add the fractions. Find the least common multiple to help you find a common denominator.

1. $\frac{1}{2} + \frac{1}{5} + \frac{1}{10}$

2. $\frac{1}{3} + \frac{1}{2} + \frac{5}{6}$

3. $\frac{1}{4} + \frac{2}{8} + \frac{4}{6}$

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

Activity 3

Solve.

1. $\frac{1}{2} - \frac{1}{5}$

2. $\frac{3}{6} + \frac{1}{2}$

3. $\frac{7}{8} + \frac{1}{4}$

4. $\frac{2}{5} - \frac{1}{3}$

5. $\frac{1}{6} + \frac{4}{9}$

6. $\frac{5}{6} - \frac{1}{4}$

Activity 4 • Distributed Practice

Solve.

1.
$$\begin{array}{r} 5,795 \\ + 5,045 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 7,901 \\ - 1,097 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 70 \\ \times 40 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 700 \\ \times 8 \\ \hline \end{array}$$

5. $8 \overline{)728}$