**Learning Goals**

Inquire and Explore: What is the relationship between adding and subtracting fractions? How can you show the addition or subtraction of fractions visually?

After this section, I can

4.1	■ use models to determine the common denominator for two or more fractions ■ represent and describe equivalent positive fractions
4.2	■ model the addition and subtraction of fractions with unlike denominators ■ solve problems involving the addition and subtraction of fractions ■ check that my answers are reasonable using mental math and estimation
4.3	■ model the addition and subtraction of mixed numbers with like and unlike denominators ■ solve problems involving the addition and subtraction of mixed numbers ■ check that my answers are reasonable using estimation

4.1 Common Denominators, pages 102–107

1. a) Draw a Venn diagram like the one shown to list the first three common denominators for $\frac{1}{2}$ and $\frac{1}{5}$.

Multiples of 2 / Multiples of 5
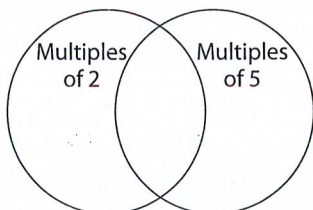
b) Draw and label a Venn diagram like the one shown to list the first three common denominators for $\frac{1}{3}$, $\frac{1}{2}$, and $\frac{1}{4}$.

Multiples of 3 / Multiples of 2 / Multiples of 4
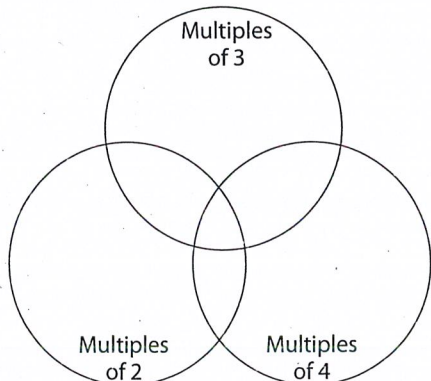
2. Determine a common denominator for each set of fractions. Write the equivalent fractions.

a) $\frac{3}{5}$ and $\frac{1}{4}$

b) $\frac{12}{7}$ and $\frac{1}{4}$

c) $\frac{5}{6}$, $\frac{2}{5}$, and $\frac{3}{10}$

3. Jean finds an old set of wrenches at her grandfather's house, but the measurements are worn off them. She would like to label them. Her grandfather tells her the sizes were $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{3}{8}$, $\frac{5}{8}$, $\frac{9}{16}$, $\frac{11}{16}$, and $\frac{21}{32}$. What advice would you give her for determining the size to put on each wrench?
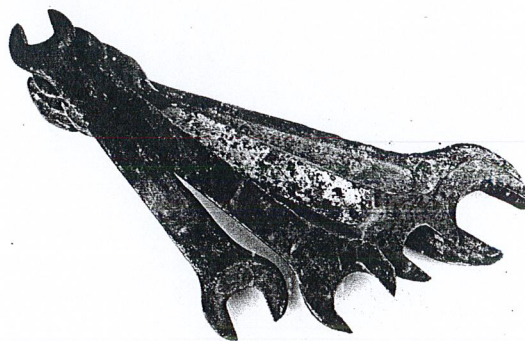
4.2 Add and Subtract Fractions With Unlike Denominators, pages 108–115

4. Write an addition or subtraction statement to represent each diagram. Then solve.

a)
 +

b)
 –

c)
 +

d)
 –
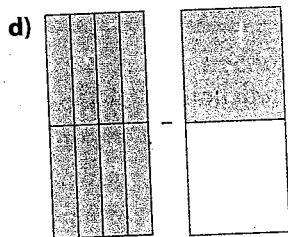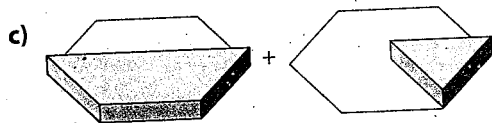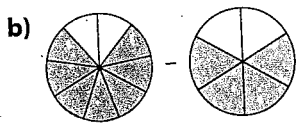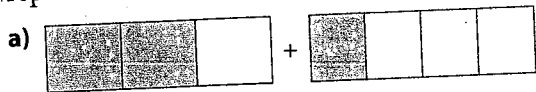
5. Add or subtract. Write your answers in lowest terms.

a) $\frac{1}{6} + \frac{2}{3}$

b) $\frac{3}{4} - \frac{3}{5}$

c) $\frac{5}{6} - \frac{1}{2}$

d) $\frac{1}{7} + \frac{5}{6}$

e) $\frac{1}{12} + \frac{2}{3}$

f) $\frac{7}{8} - \frac{1}{6}$

6. Abigail bicycled for $\frac{5}{6}$ h yesterday. Today she bicycled for $\frac{2}{3}$ h. On which day did she bicycle more, and by how much?

7. Michael and Hari bought a bag of pretzels to share.

a) Michael ate $\frac{1}{4}$ of the bag. Hari ate $\frac{1}{6}$ of the bag. How much of the bag did they eat altogether?

b) If Michael's brother then ate $\frac{1}{3}$ of the bag, what fraction of the bag is left?

4.3 Add and Subtract Mixed Numbers, pages 116–123

8. Write an addition or subtraction statement to represent each diagram. Then determine the solution.

a)
 +

b)
 –

c)
 +

d)
 –
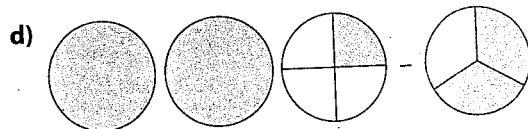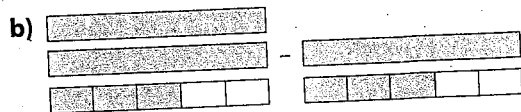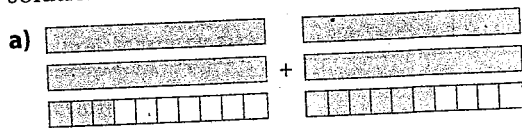
9. Add or subtract. Write your answers in lowest terms.

a) $2\frac{3}{4} + 1\frac{1}{8}$

b) $12\frac{3}{4} - 7\frac{5}{6}$

c) $3\frac{4}{7} + 2\frac{1}{2}$

d) $3\frac{1}{5} - 2\frac{4}{9}$

e) $7\frac{2}{5} + 1\frac{3}{4}$

f) $2\frac{5}{12} - 1\frac{2}{3}$

10. It snowed for $2\frac{3}{4}$ h yesterday. Then it rained for another $1\frac{1}{6}$ h.

   a) How many more hours did it snow than rain?

   b) How long did it snow and rain altogether?

11. Stuart is making cookies. He has $2\frac{1}{4}$ cups of chocolate chips. To make a batch of cookies he adds $1\frac{2}{3}$ cups of chocolate chips to $5\frac{1}{2}$ cups of cookie dough.

   a) What fraction of the total amount of chocolate chips is left after he makes the cookies?

   b) He decides to also add $1\frac{5}{6}$ cups of butterscotch chips to the dough. How many cups of chips does he use in total?

Connect the Concepts
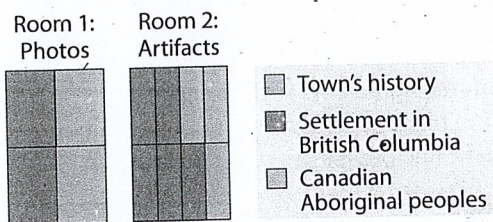
12.

Fruit and Cereal Snack Mix

$2\frac{3}{4}$ cups crunchy cereal

$\frac{7}{8}$ cup raisins

$\frac{2}{3}$ cup gummy fruit snacks

1 cup roasted, unsalted peanuts or other nuts

Mix all ingredients. Store in airtight container for up to 5 days.

   a) Jeannie wants to make some fruit and cereal snack mix in a bowl that holds $5\frac{1}{2}$ cups. Would you recommend she use this bowl? Why or why not?

   b) Jeannie decides she would like to make 6 cups of the snack mix by adding some cranberries. How many cups of cranberries should she add?

13. The sum of each row, column, and diagonal in this magic square must equal $6\frac{2}{3}$. Copy the square and fill in the blanks.

■	■	$3\frac{5}{9}$
■	■	$\frac{4}{9}$
■	$3\frac{1}{9}$	■

14. The diagram shows the two classrooms that history students will be setting up to celebrate British Columbia's 150th anniversary of joining the confederation. Each room is the same size. The legend indicates the area of focus.

Room 1: Photos Room 2: Artifacts

☐ Town's history
▨ Settlement in British Columbia
☐ Canadian Aboriginal peoples

   a) Complete the following chart.

Area of Focus	Fraction of the Two Rooms Used
Aboriginal peoples	
Settlement in British Columbia	
Town history	

   b) Do you think the school wants to encourage local residents to come to the exhibit? What advice would you give them about changing the exhibit to improve the design? Why would you suggest these changes?