

 **Texas Essential Knowledge and Skills**

- (5.3)(E) model situations using addition and/or subtraction involving fractions with like denominators using concrete objects, pictures, and numbers.
- (5.14)(A) identify the mathematics in everyday situations.
- (5.14)(C) select the problem-solving strategy looking for a pattern to solve a problem.
- (5.15)(A) explain observations using objects.
- (5.15)(B) relate informal language to mathematical language.

• Adding and Subtracting Fractions with Common Denominators

Power Up

facts

Power Up F

mental math

- Measurement:** The ceiling is 380 cm high. Round 380 cm to the nearest hundred centimeters.
- Time:** One week is how many hours? (*Think:* 24×7 .)
- Number Sense:** 8×800
- Money:** $10\text{¢} \times 25$
- Fractional Parts:** $\frac{1}{2}$ of 15
- Percent:** 50% of 10¢
- Percent:** 10% of 10¢
- Calculation:** $6 \times 7, - 2, \div 5, + 1, \div 3, - 3$

problem solving

Choose an appropriate problem-solving strategy to solve this problem. In 2006 postage rates for first-class mail were as follows:

1 ounce	39¢
2 ounces	63¢
3 ounces	87¢
4 ounces	\$1.11
5 ounces	\$1.35
6 ounces	\$1.59

Look for a pattern in the rates. How much was charged for each ounce over the 1st ounce? At this rate, what do you think the postage for an 8-ounce item would have been?

New Concept

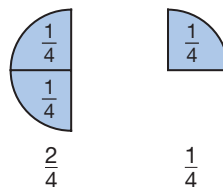
We may use fraction manipulatives to help us add and subtract fractions.

Example 1

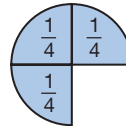
Model Use your fraction manipulatives to illustrate this addition. Then write a number sentence for the addition.

$$\frac{2}{4} + \frac{1}{4}$$

Using the manipulatives, we form the fractions $\frac{2}{4}$ and $\frac{1}{4}$.



To add the two fractions, we combine them. We see that $\frac{2}{4}$ plus $\frac{1}{4}$ makes $\frac{3}{4}$.



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

two fourths + one fourth = three fourths

Notice that the denominators of the fractions we added, $\frac{2}{4}$ and $\frac{1}{4}$, are the same. Fractions with the same denominators are said to have **common denominators**. When fractions have common denominators, we can add or subtract the fractions by simply adding or subtracting the numerators. We do not add or subtract the denominators.

$$\frac{2}{4} + \frac{1}{4} = \frac{3}{4} \quad \begin{array}{l} \text{Add the numerators.} \\ \text{Leave the denominators unchanged.} \end{array}$$

Example 2

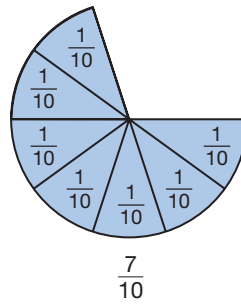
Reading Math

We can write this expression using decimals:
 $0.7 - 0.4$

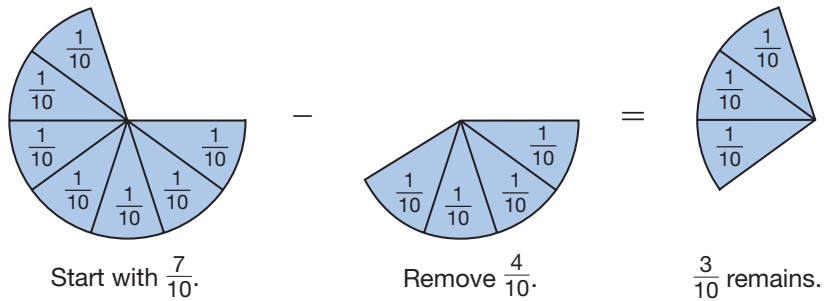
Model Use your fraction manipulatives to illustrate this subtraction. Then write a number sentence for the subtraction.

$$\frac{7}{10} - \frac{4}{10}$$

We form the fraction $\frac{7}{10}$.



Then we remove $\frac{4}{10}$. We see that $\frac{3}{10}$ remains.



$$\frac{7}{10} - \frac{4}{10} = \frac{3}{10}$$

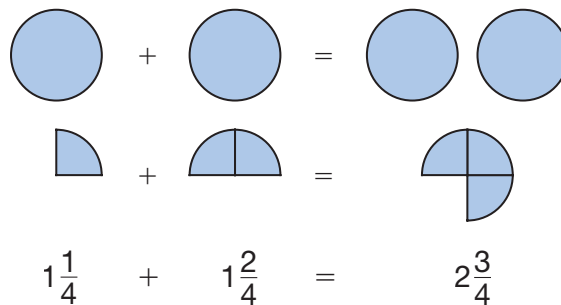
seven tenths – four tenths = three tenths

Connect Use decimal numbers to write a subtraction equation and a related addition equation for these fractions.

Example 3

Bach Yen mixed $1\frac{1}{4}$ cups of juice concentrate with $1\frac{2}{4}$ cups of water. Find the total amount of juice by adding $1\frac{1}{4}$ and $1\frac{2}{4}$.

To add mixed numbers, we add whole numbers to whole numbers and fractions to fractions. The whole numbers in this addition are 1 and 1. We add them and get 2. The fractions are $\frac{1}{4}$ and $\frac{2}{4}$. We add them and get $\frac{3}{4}$.

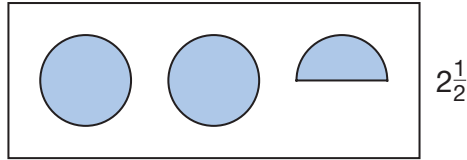


Bach Yen made $2\frac{3}{4}$ cups of juice.

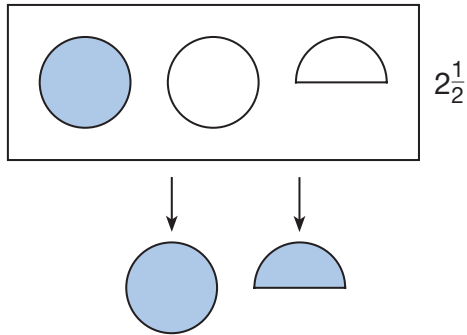
Example 4

There were $2\frac{1}{2}$ chicken potpies in the refrigerator. Tupac ate $1\frac{1}{2}$ potpies. To find the number of potpies left in the refrigerator, subtract: $2\frac{1}{2} - 1\frac{1}{2}$.

We start with $2\frac{1}{2}$.



We take away $1\frac{1}{2}$. What is left is 1.



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

There is **1 chicken potpie** left in the refrigerator.

Example 5

Federico estimates that it will take $2\frac{1}{2}$ hours to finish reading a book and $1\frac{1}{2}$ hours to write a book report. To find the amount of time he needs to finish the assignment, add: $2\frac{1}{2} + 1\frac{1}{2}$.

The sum is $3\frac{2}{2}$. The fraction $\frac{2}{2}$ is two halves, which is one whole. So $3\frac{2}{2}$ is $3 + 1$, which is 4. Federico will need **4 hours** to complete his assignment.

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

Justify Explain why the answer is reasonable.

Lesson Practice

Illustrate each addition or subtraction and write a number sentence for each problem. You may use your fraction manipulatives.

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

b. $\frac{3}{4} - \frac{2}{4}$

c. $1\frac{1}{2} + 1\frac{1}{2}$

d. $3\frac{4}{10} - 1\frac{1}{10}$

Written Practice

Distributed and Integrated

*** 1. Represent** Draw a pair of horizontal parallel line segments. Make the upper segment longer than the lower segment. Connect the ends of the segments to form a quadrilateral.
(31, 32)

2. If a spinach pie is cut into 10 equal pieces, then what is one piece written as a fraction and as a decimal?
(30)

3. What year was two centuries after 1492?
(28)

Formulate For problems 4–6, write an equation and find the answer.

4. The population of Colville was 340 less than the population of Sonora. The population of Colville was 4360. What was the population of Sonora?
(35)

5. Jayne bought vegetable plants for her garden. She bought three flats of plants. There were six plants in each flat. How many plants did Jayne buy?
(21)

*** 6.** Leah is traveling 805 kilometers from Alaska to Washington state. She has already traveled 250 kilometers of that distance. How many kilometers must Leah still travel?
(16)

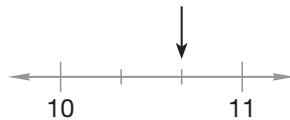
7. $3\frac{3}{10} - 1\frac{2}{10}$
(41)

8. $\frac{5}{10} + \frac{4}{10}$
(41)

9. $\frac{1}{2} - \frac{1}{2}$
(41)

10. $2\frac{1}{4} + 3\frac{2}{4}$
(41)

11. Represent To what mixed number is the arrow pointing?
(38)



12. $3784 + 2693 + 429 + 97 + 856 + 907$
(6)

13. $3106 - 528$
(9)

14. $\$80.00 - \77.56
(13)

15. 804×700
(29)

16. $60 \times 43 \times 8$
(18, 29)

17. $4w = 4008$
(26, 34)

18. $4228 \div 7$
(34)

19. $9635 \div 8$
(34)

20. $\$7.98 \div 6$
(26)

21. $\$10 - (\$4.56 + \$3 + \$1.29)$
(13, 24)

22. Round 98 to the nearest ten.
(33)

23. **Represent** Draw an obtuse triangle.
(36)

24. One fifth of the 30 students in the class were left-handed. How many of the students were left-handed?
(Inv. 3)

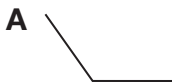
25. Xavier is learning to play the piano. Yesterday he began practice at 5:36 p.m. and finished 30 minutes later. What time did Xavier finish playing the piano?
(28)

* 26. Four friends entered a nine-mile relay race. Each person ran one fourth of the distance. How many miles did each person run?
(40)


* 27. **Represent** Draw two circles of the same size. Shade $\frac{1}{2}$ of one circle and $\frac{2}{3}$ of the other circle. Then compare these fractions:
(39)

$$\frac{1}{2} \bigcirc \frac{2}{3}$$

* 28. **Multiple Choice** Which of these angles appears to be a 90° angle?
(31)



29. Compare: $\frac{1}{4}$ of 100 \bigcirc $100 \div 4$
(Inv. 2)

30.  **Estimate** A distance of 2 feet is about the same distance as 61 centimeters. What whole number of centimeters is a reasonable estimate of the number of centimeters in 1 foot? Explain your estimate.
(34)