You will need your clickers today. You will also need your notebooks or scratch paper. Let's start out with a lab.

5-3a Activity Lab

Modeling Unlike Denominators

In Lesson 5-2, you added and subtracted fractions with like denominators. To add or subtract fractions such as $\frac{5}{8}$ and $\frac{1}{4}$, first you must write the fractions with like denominators.
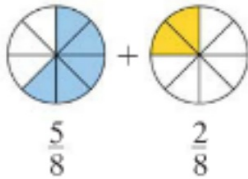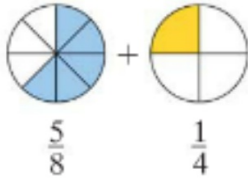
Please draw two circles that are the same size. Mark one into eight equal pieces, and the other one into four equal pieces. Shade in 5 of the 8 pieces on the first circle and shade in 1 of the 4 pieces on the other circle. We will use these models to help us understand the problem 5/8 + 1/4.
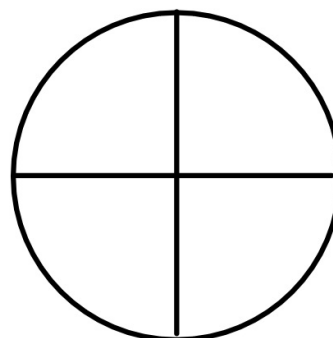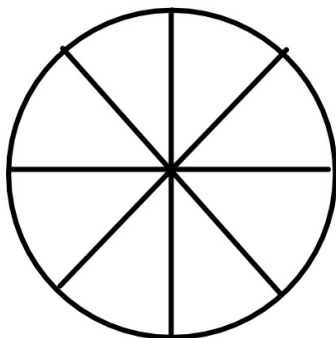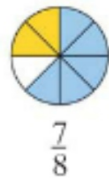
Use models to find each sum or difference.

a. $\frac{5}{8} + \frac{1}{4}$

$\frac{5}{8}$ $\frac{1}{4}$

Change the model for $\frac{1}{4}$ so that it has ← the same number of sections as the model for $\frac{5}{8}$.

$\frac{5}{8}$ $\frac{2}{8}$

← Add $\frac{2}{8}$ to the model for $\frac{5}{8}$.

$\frac{7}{8}$

Quickly draw two more circles. Mark one into 6 equal pieces and shade in 5 sections; and the circle mark into 3 equal pieces and shade in 2 equal pieces.

Use models to find each sum or difference.

b. $\frac{5}{6} - \frac{2}{3}$

$\frac{5}{6}$ $\frac{2}{3}$
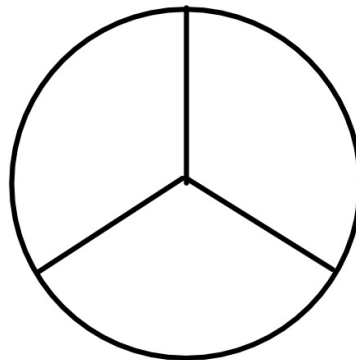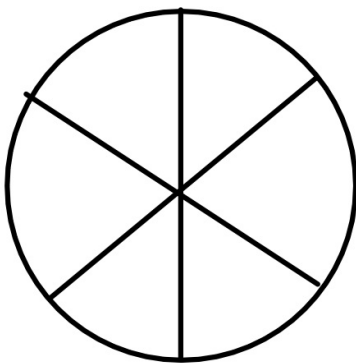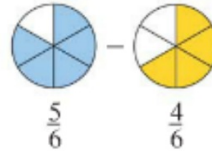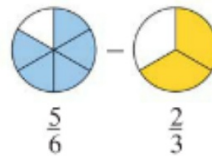
Change the model for $\frac{2}{3}$ so that it has ← the same number of sections as the model for $\frac{5}{6}$.
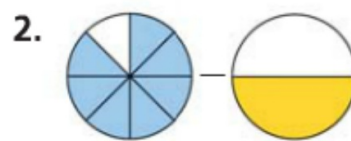
$\frac{5}{6}$ $\frac{4}{6}$

Remove $\frac{4}{6}$ from ← the model for $\frac{5}{6}$.

$\frac{1}{6}$

Use models to find each sum or difference.

1.

2.
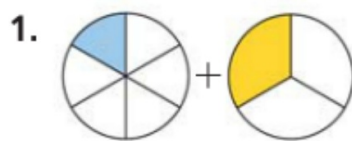
Use models to find each sum or difference.

4. $\frac{1}{8} + \frac{3}{4}$ 　　　　5. $\frac{2}{3} - \frac{1}{6}$ 　　　　6. $\frac{1}{2} + \frac{3}{8}$ 　　　　7. $\frac{5}{6} - \frac{1}{3}$

Drawing models is a good place to start but it takes a lot of time. Here is a better way.

$\frac{1}{4} + \frac{1}{3} = \frac{7}{12}$

Method 2 Use a common denominator.

$$\frac{1}{4} \rightarrow \frac{1 \times 3}{4 \times 3} \rightarrow \frac{3}{12}$$

$$+\frac{1}{3} \rightarrow \frac{1 \times 4}{3 \times 4} \rightarrow +\frac{4}{12}$$

$$\frac{7}{12}$$

The LCD is 12. Write the fractions with the same denominator.

← Add the numerators.
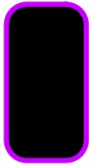
1. Find $\frac{3}{5} + \frac{1}{10}$. Use a model or a common denominator.

   A. $\frac{7}{20}$

   B. $\frac{7}{10}$

   C. $\frac{4}{15}$

   D. $\frac{3}{15}$

EXAMPLE **Application: Surveys**

2 Art students completed a survey about their favorite activity. Ceramics is the favorite of $\frac{2}{5}$ of the students. Drawing is the favorite of $\frac{3}{8}$ of the students. What fraction of the students chose either ceramics or drawing as their favorite activity?

Add $\frac{2}{5}$ and $\frac{3}{8}$ to find the total fraction of the students.

$$\frac{2}{5} \rightarrow \frac{2 \times 8}{5 \times 8} \rightarrow \frac{16}{40}$$

$$+\frac{3}{8} \rightarrow \frac{3 \times 5}{8 \times 5} \rightarrow +\frac{15}{40}$$

The LCD is 40. Write the fractions with the same denominator.

$$\frac{31}{40}$$ ← Add the numerators.

The favorite activity of $\frac{31}{40}$ of the students is ceramics or drawing.
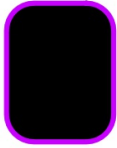
1. You exercise for $\frac{1}{2}$ hour on Monday and $\frac{1}{3}$ hour on Tuesday. How many hours did you exercise on Monday and Tuesday combined?

   A. $\frac{1}{4}$ hour

   B. $\frac{2}{5}$ hour

   C. $\frac{5}{6}$ hour

   D. $\frac{1}{6}$ hour

You can also subtract fractions that have unlike denominators.

EXAMPLE **Subtracting Fractions**

3 **Multiple Choice** A property owner donates $\frac{1}{4}$ acre to a local park. After the donation, the size of the park is $\frac{5}{6}$ acre. Find the area of the park before the donation.

   A $\frac{1}{3}$ acre   B $\frac{2}{5}$ acre   C $\frac{1}{2}$ acre   D $\frac{7}{12}$ acre

Subtract $\frac{1}{4}$ from $\frac{5}{6}$ to find the original size of the park.

$$\begin{array}{ccccc} \frac{5}{6} & \to & \frac{5 \times 2}{6 \times 2} & \to & \frac{10}{12} \\ -\frac{1}{4} & \to & \frac{1 \times 3}{4 \times 3} & \to & -\frac{3}{12} \\ & & & & \overline{\frac{7}{12}} \end{array}$$

The LCD is 12. Write the fractions with the same denominator.

← Subtract the numerators.

The area of the park was $\frac{7}{12}$ acre. The correct answer is choice D.

1. You have $\frac{2}{3}$ yard of felt. You use $\frac{1}{2}$ yard to make a display. How much felt do you have left?

   A. $\frac{1}{4}$ yard

   B. $\frac{1}{3}$ yard

   C. 1 yard

   D. $\frac{1}{6}$ yard

Extra practice.

Find each sum. You may find a model helpful.

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

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

7. $\frac{8}{9} + \frac{5}{6}$

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

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

10. $\frac{3}{5} + \frac{3}{20}$

11. $\frac{3}{10} + \frac{1}{4}$

12. $\frac{3}{5} + \frac{1}{3}$

13. **Pets** You have two baby hamsters. One weighs $\frac{1}{4}$ pound and the other weighs $\frac{1}{5}$ pound. How much do they weigh together?

Find each difference.

14. $\dfrac{13}{16} - \dfrac{1}{4}$ **15.** $\dfrac{17}{20} - \dfrac{2}{5}$ **16.** $\dfrac{9}{10} - \dfrac{3}{5}$ **17.** $\dfrac{3}{4} - \dfrac{1}{12}$

18. $\dfrac{5}{8} - \dfrac{1}{4}$ **19.** $\dfrac{4}{5} - \dfrac{2}{3}$ **20.** $\dfrac{7}{10} - \dfrac{1}{4}$ **21.** $\dfrac{5}{6} - \dfrac{1}{2}$

You have an assignment worksheet, due tomorrow.

Name_____ Class_____ Date_____

Practice 5-3

Write each sum or difference in simplest form.

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

_____

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

_____

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

_____

4. $\frac{5}{8} - \frac{1}{4}$

_____

5. $\frac{7}{8} - \frac{1}{2}$

_____

6. $\frac{3}{10} + \frac{4}{5}$

_____

7. $\frac{5}{6} - \frac{2}{5}$

_____

8. $\frac{5}{12} - \frac{1}{4}$

_____

9. $\frac{7}{16} + \frac{1}{8}$

_____

10. $\frac{11}{16} + \frac{5}{8}$

_____

11. Jeanie has a $\frac{3}{4}$-yard piece of ribbon. She needs one $\frac{3}{8}$-yard piece and one $\frac{1}{2}$-yard piece. Can she cut the piece of ribbon into the two smaller pieces? Explain.

_____

Simplify by using mental math.

12. $\frac{7}{10} + \frac{2}{5} - \frac{1}{10}$

_____

13. $\frac{5}{100} + \frac{20}{100} + \frac{30}{100}$

_____

14. $\frac{3}{8} - \frac{2}{4} + \frac{5}{8}$

_____

15. $\frac{6}{10} - \frac{2}{10} + \frac{1}{2}$

_____