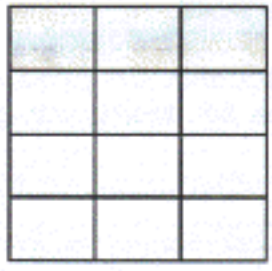
Activity 3.2a **Subtract like fractions**

1. Discuss **p. 46** in the textbook.
   - Lead students to see that since the size of the parts (the denominator) is the same for both fractions, we can subtract the numerators to get the difference in the number of parts. The denominator in the answer is the same.
   - Draw a rectangle and divide it into twelfths. This can be a pan of brownies again.
     - Tell students you have a whole pan of brownies. Write "1" below the rectangle. Say that this "1" means the whole pan. Shade in 3 pieces and say this was how much you ate. Ask them for the fraction of the whole pan of brownies that you have eaten $\left(\frac{3}{12}\right)$ and the fraction left $\left(\frac{9}{12}\right)$. Write the equation. Lead students to see that if they are subtracting twelfths, then they can think of 1 as $\frac{12}{12}$ and subtract the numerator from 12.



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

     - Ask them to simplify the fraction left. Remind them that they should always write their answers in simplest form.

2. Discuss **tasks 1-3, textbook pp. 46-47.**

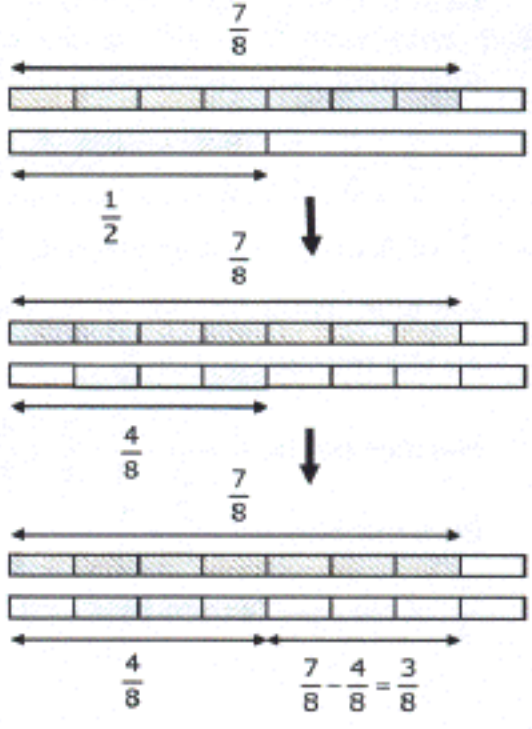
3. Have students do **task 4, textbook p. 47** and then share their answers.

Workbook Exercise 19

Activity 3.2b **Subtract unlike fractions**

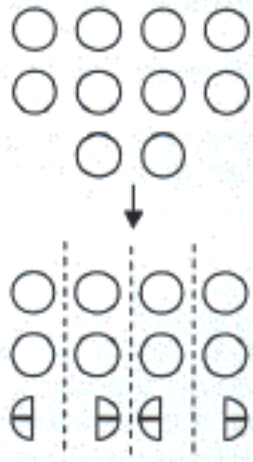
1. Discuss **task 5, p. 48** in the textbook.
   - Lead students to see that before we can subtract $\frac{1}{8}$ from $\frac{1}{2}$, we have to know how many eighths are in $\frac{1}{2}$ by finding the equivalent fraction $\frac{4}{8}$.

2. Discuss **tasks 6-9, pp. 48-49** in the textbook.
   - You can draw two fraction bars for task 6 to make the process clearer.
   - Draw one bar for task 7(a) on the board. Divide it into fourths, shade three fourths, and point out that to subtract one eighth, you first need to divide each fourth in half, giving you six eighths (which are shaded). They can then subtract one eighth, and see their answer.



Activity 3.5d **A fraction times a whole number**

1. Discuss finding a fraction of a set where the answer is not a whole number.
   - Draw or display 10 circles and discuss ways to find $\frac{1}{4}$ of 10.
     We can put 8 of them into 4 equal groups, but that leaves two left over. We can divide each of these into halves and put one half into each group. There are now $2\frac{1}{2}$ in each group. $\frac{1}{4}$ of 10 = $2\frac{1}{2}$



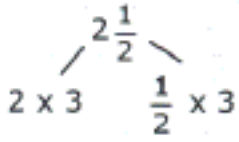
$\frac{1}{4}$ of 10 = $2\frac{1}{2}$

   - Discuss $\frac{3}{4}$ of 10. Since $\frac{1}{4} \times 10 = 2\frac{1}{2}$, then $\frac{3}{4} \times 10 = 3 \times 2\frac{1}{2}$.
     By looking at the drawing, we can see that it is 6 wholes plus 3 halves. So we multiply both the whole number part of the mixed number and the fractional part by 3. Then we need to simplify.

$\frac{3}{4}$ of 10 = $3 \times 2\frac{1}{2}$

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

= $7\frac{1}{2}$



2. Discuss **task 5, p. 60** in the textbook.

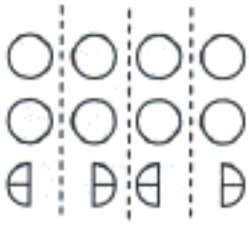
2. Provide plenty of other problems for practice, where the answer is not a whole number. Start with the unit fraction, and then a multiple of it. For example, ask students to first find $\frac{1}{5}$ of 8 and then $\frac{3}{5}$ of 8. Have students draw pictures when working out their solutions.

Workbook Exercise 30, problem #1

Activity 3.5e **A fraction times a whole number**

1. Discuss methods of finding the fraction of a whole number using cancellation when the product is not a whole number.
   - Remind students that we can think of $\frac{1}{4} \times 8$ as putting 8 into 4 equal groups. So $\frac{1}{4} \times 8 = \frac{8}{4} = 2$.

   - Show the example of $\frac{1}{4} \times 10 = 2\frac{1}{2}$ again using fraction circles.
   - Write $\frac{1}{4} \times 10 = \frac{10}{4}$. Ask students to simplify $\frac{10}{4}$ into a mixed number. $\frac{10}{4} = 2\frac{1}{2}$. So we can use the same method to find the answer when it is not a whole number.



$\frac{1}{4} \times 10 = \frac{\cancel{10}^{5}}{\cancel{4}_{2}} = \frac{5}{2} = 2\frac{1}{2}$

- Explain that since $\frac{1}{4} \times 10 = \frac{10}{4} = \frac{5}{2}$, then $\frac{3}{4} \times 10 = 3 \times \frac{5}{2}$. We can also solve this using the short-cut method.

$$\frac{3}{4} \times 10 = \frac{3 \times \cancel{10}^{5}}{\cancel{4}_{2}} = \frac{3 \times 5}{2} = \frac{15}{2} = 7\frac{1}{2}$$

2. Have students do **task 6, textbook p. 60**. They can use the short-cut method to solve these, and then verify with drawings.

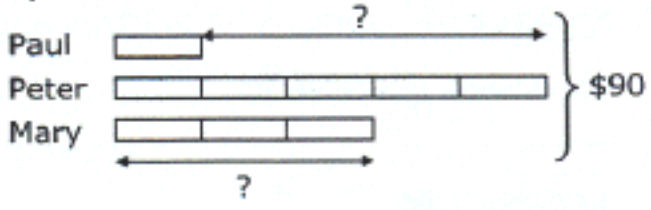
3. Provide other problems for practice.

Workbook Exercise 30, problem #2

Activity 3.5f **Fractions and units in part-whole diagrams**

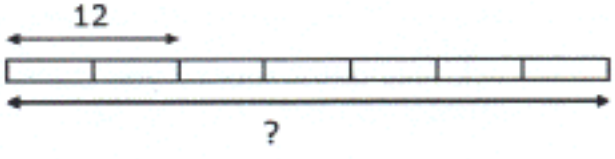
1. Review a few word problem involving units. For example:

➢ Peter had 5 times as much money as Paul. Mary had 3 times as much money as Paul. Altogether they had \$90. How much money did Mary have? How much more money did Peter have than Paul?
  - Guide students in drawing a model of this problem. Lead them to see that they can draw 1 unit for Paul's money, 3 for Mary's money, and 5 for Peter's money. That makes a total 9 units total, which we are told is \$90.
  - Lead them to see that if they can find the value of 1 unit, they can use that to find the answers to the questions.



9 units = \$90
1 unit = \$90 ÷ 9 = \$10
Mary has 3 units.
3 units = \$10 x 3 = \$30.
Mary has \$30.
Peter has 4 more units than Paul.
4 units = \$30 x 4 = \$120
Peter has \$120 more than Paul.

➢ A grocer had 7 boxes of apples. All the boxes had the same number of apples. Two boxes had a total of 12 apples. How many apples were there altogether?
  - Guide students in diagramming this problem. Since all the boxes have the same number of apples, a unit is a box of apples, and there are 7 units.
  - Lead them to see that again, once they find the value of one unit, they can solve the problem.



2 units = 12
1 unit = 12 ÷ 2 = 6
7 units = 6 x 7 = 42
There are 42 apples.

2. Discuss fraction problems in relation to the part-whole model. Tell students that since fractions are equal parts, each part can be a unit in a part-whole model. So they can use diagrams to solve problems involving fractions. For example: