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Mathematics 6

First Quarter – Module 1: Week 1

Addition and Subtraction of Fractions and Mixed Numbers and Problem Solving

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SUPPORT MATERIAL FOR INDEPENDENT LEARNING ENGAGEMENT (SMILE)

Mathematics – Grade 6
Support Material for Independent Learning Engagement (SMILE)
Quarter 1 – Module 1, Week 1: Addition and Subtraction of Fraction and Mixed Numbers and Problem Solving
First Edition, 2020

What I Need to Know

Addition involving fractions corresponds to combining or putting things together, just like what you do in adding whole numbers. On the other hand, subtraction involves taking away or deducting things, just like subtracting whole number.

Similar Fractions are fractions with the same denominators.

    i.e., ⅜, ⅝, ⅞

Dissimilar Fractions are fractions with different denominators.
        i.e. ½, ⅓, ¼

Mixed Numbers or Fractions are fractions that have a whole number and a proper fraction part such as 1 ½ and 10 ¼.

Fractions in simplest form or lowest term are those fractions whose Greatest Common Factor is 1 such as ½, ¼, ⅓, ⅜, ⅔.

The Greatest Common Factor (GCF) is the biggest divisor that can divide both the numerator and the denominator.

The Least Common Denominator (LCD) is the least common multiple of the denominators.

After going through this module, you are expected to:

1. Add and subtract simple fractions and mixed numbers without or with regrouping.

2. Solve routine and non-routine problems involving addition and/or subtraction of fractions using appropriate problem solving, strategies and tools.
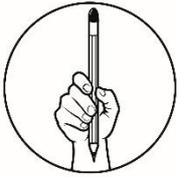
What I Know

DIRECTIONS: Read and answer each item carefully. Write the letter of your choice.

A. What is the sum of $\frac{5}{6} + \frac{3}{10} + \frac{1}{5} = -$?

  A. $1\frac{1}{2}$ B. $1\frac{1}{3}$ C. $1\frac{1}{4}$ D. $1\frac{1}{5}$

B. Find the sum of $11\frac{5}{8} + 15\frac{3}{4} + 8\frac{1}{2} = -$.

  A. $35\frac{1}{8}$ B. $35\frac{3}{8}$ C. $35\frac{5}{8}$ D. $35\frac{7}{8}$

C. $3\frac{1}{2} + 4\frac{1}{3} + 5\frac{1}{4} = -$ is equal to _____.

  A. $13\frac{1}{2}$ B. $13\frac{1}{3}$ C. $13\frac{1}{4}$ D. $13\frac{1}{5}$

D. Which of the following is the sum of $4\frac{2}{3} + 7\frac{7}{8} = -$?

  A. $12\frac{10}{24}$ B. $12\frac{11}{24}$ C. $12\frac{12}{24}$ D. $12\frac{13}{24}$

E. Find the difference of this equation : $45\frac{1}{2} - 23\frac{1}{4} = -$

  A. $22\frac{1}{2}$ B. $22\frac{1}{3}$ C. $22\frac{1}{4}$ D. $22\frac{1}{5}$

F. What is the answer when $\frac{8}{9}$ is subtracted from $\frac{19}{21}$?

  A. $\frac{7}{63}$ B. $\frac{5}{63}$ C. $\frac{3}{63}$ D. $\frac{1}{63}$

7. What is the difference between $16\frac{2}{3}$ and $9\frac{5}{8}$?

    A. $7\frac{7}{24}$ B. $7\frac{5}{24}$ C. $7\frac{3}{24}$ D. $7\frac{1}{24}$

8. Valerie bought $4\frac{1}{6}$ kg of mangoes, $3\frac{5}{9}$ kg of bananas, and $2\frac{1}{2}$ kg of rambutans. How many kilograms of fruits did she buy in all ?

    A. $10\frac{1}{9}$ B. $10\frac{2}{9}$ C. $10\frac{3}{9}$ D. $10\frac{5}{9}$

9. In a factory, the weight of a bar of dark chocolate is $5\frac{3}{8}$ kgs. while the weight of a bar of white chocolate is $11\frac{1}{2}$ kgs. How much heavier is the bar of white chocolate than the bar of dark chocolate ?

    A. $5\frac{1}{8}$ B. $6\frac{1}{8}$ C. $7\frac{1}{8}$ D. $8\frac{1}{8}$

10. Mr. De Guzman bought $7\frac{4}{5}$ kilograms of meat. He used $2\frac{1}{5}$ kilograms for afritada , ⅓ kilograms for menudo, and the rest for pochero. How many kilograms of meat did he use for pochero?

    A. $8\frac{4}{15}$ B. $7\frac{4}{15}$ C. $6\frac{4}{15}$ D. $5\frac{4}{15}$

Addition and Subtraction of Similar Fractions

What's In
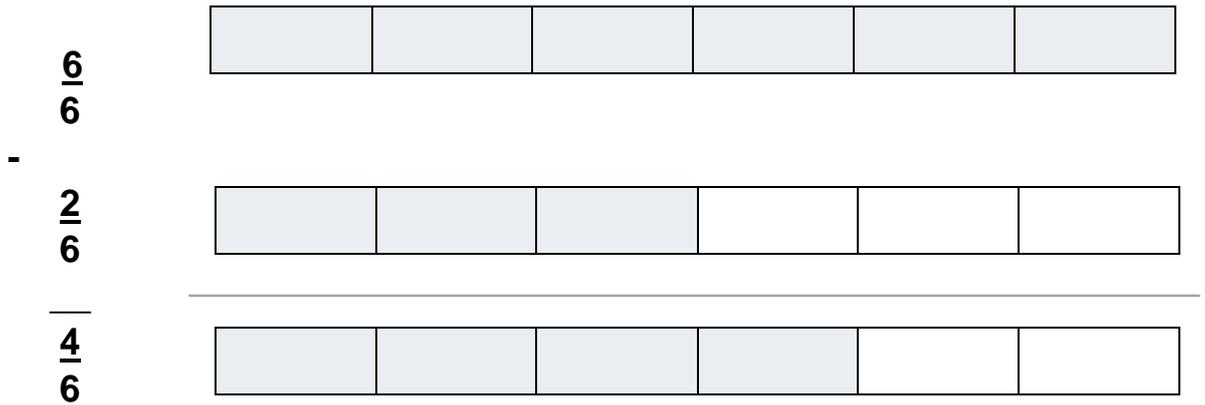
A. **Similar Fractions** are fractions whose denominators are the same.   Examples are $\underline{1}$, $\underline{3}$, $\underline{5}$.
$\qquad\qquad\qquad\qquad\quad$ 8 8 8

B. **Dissimilar Fractions** are fractions whose denominators are different. Examples are $\underline{3}$, $\underline{2}$, $\underline{1}$.
$\qquad\qquad\qquad\qquad\qquad$ 5 3 4

What's New

Addition and subtraction of similar fractions can be shown below:

$\dfrac{1}{5}$

+

$\dfrac{2}{5}$

$\dfrac{3}{5}$

$\dfrac{6}{6}$

$-$

$\dfrac{2}{6}$

$\overline{}$

$\dfrac{4}{6}$

What is It

To add or subtract similar fractions, add or subtract the numerators. Next, place the sum or difference over the common denominator.

Look at the examples below:

$$\frac{6}{15} + \frac{7}{15} = - \qquad \longrightarrow \frac{6}{15} + \frac{7}{15} = \frac{13}{15}$$

$$\frac{9}{10} - \frac{8}{10} = - \qquad \longrightarrow \frac{9}{10} - \frac{8}{10} = \frac{1}{10}$$

Simplify the resulting action when necessary. To simplify means to reduce the answer to simplest form or lowest term. To do this, divide both the numerator and the denominator by their GCF or Greatest Common Factor.

Look at more examples below:

| | | | | GCF | Answer in Lowest Term |

$$\frac{5}{12} + \frac{3}{12} = \frac{8}{12} \longrightarrow \frac{8}{12} \div \frac{4}{4} = \left(\frac{2}{3}\right)$$

$$\frac{9}{18} - \frac{6}{18} = \frac{3}{18} \longrightarrow \frac{3}{18} \div \frac{3}{18} = \left(\frac{1}{6}\right)$$

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If the sum is an improper fraction, we have to rename it. To do this, simply divide the numerator by the denominator. Write the fractional part the quotient beside the whole number.

Look at the examples below:

$$\frac{9}{10} + \frac{4}{10} = \frac{13}{10} \text{ or } \boxed{1\ 3/10} \longleftarrow \longrightarrow \begin{array}{r} 1 \quad 3/10 \\ 10)\overline{\quad 13} \\ \underline{10} \\ 3 \end{array}$$

$$\frac{15}{17} + \frac{13}{17} = \frac{28}{17} \text{ or } \boxed{1\ 11/17} \longleftarrow \longrightarrow \begin{array}{r} 1 \quad 11/17 \\ 17)\overline{\quad 28} \\ \underline{17} \\ 11 \end{array}$$

What's More

Activity 1

DIRECTIONS: Write the names of the fractional parts shown below. Then, add or subtract the fractions. Express the answer in simplest form or lowest term.

1.

+

2.

+

3.

1.
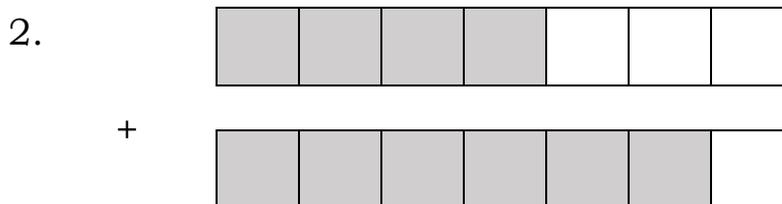
Activity 2

DIRECTIONS: Add or subtract the fractions. Write the answers in simplest form or lowest term.

1. $\dfrac{8}{18} + \dfrac{7}{18} = -$

1. $\dfrac{3}{15} + \dfrac{9}{15} = -$
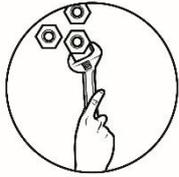
2. $\dfrac{3}{28} + \dfrac{4}{28} + \dfrac{7}{28} = -$

3. $\dfrac{17}{21} - \dfrac{3}{21} = -$

4. $\dfrac{25}{30} - \dfrac{15}{30} = -$

What I Have Learned

- How do you add or subtract similar fractions?

What I Can Do

Activity 3

DIRECTIONS: Add the following fractions. Simplify the answers.

1. $\dfrac{7}{10} + \dfrac{9}{10} = -$

2. $\dfrac{9}{11} + \dfrac{8}{11} = -$

3. $\dfrac{13}{16} + \dfrac{6}{16} = -$

4. $\dfrac{3}{20} + \dfrac{15}{20} = -$

5. $\dfrac{12}{15} + \dfrac{4}{15} = -$

Activity 4

DIRECTIONS: Subtract the following fractions. Write the answers in simplest form or lowest term.

1. $\dfrac{17}{20} - \dfrac{12}{20} = -$

2. $\dfrac{15}{21} - \dfrac{8}{21} = -$

3. $\dfrac{25}{36} - \dfrac{10}{36} = -$

4. $\dfrac{18}{30} - \dfrac{6}{30} = -$

5. $\dfrac{14}{18} - \dfrac{5}{18} = -$

Assessment

DIRECTIONS: Add or subtract the following fractions. Simplify the answers to simplest form or lowest term.

1. $\dfrac{6}{14} + \dfrac{2}{14} = \underline{\quad}$

2. $\dfrac{9}{12} + \dfrac{5}{12} = \underline{\quad}$

3. $\dfrac{8}{10} + \dfrac{4}{10} = \underline{\quad}$

4. $\dfrac{11}{18} + \dfrac{10}{18} = \underline{\quad}$

5. $\dfrac{7}{16} + \dfrac{5}{16} = \underline{\quad}$

6. $\dfrac{20}{27} - \dfrac{11}{27} = \underline{\quad}$

7. $\dfrac{16}{21} - \dfrac{10}{21} = \underline{\quad}$

8. $\dfrac{19}{30} - \dfrac{7}{30} = \underline{\quad}$

9. $\dfrac{25}{28} - \dfrac{15}{28} = \underline{\quad}$

10. $\dfrac{30}{32} - \dfrac{14}{32} = \underline{\quad}$

Additional Activities

DIRECTIONS: Find the sum or difference of the fractions. Simplify your answers whenever possible.

1. $\dfrac{9}{25} + \dfrac{12}{25} = \underline{\quad}$

2. $\dfrac{16}{36} + \dfrac{8}{36} = \underline{\quad}$

3. $\dfrac{21}{42} + \dfrac{15}{42} = \underline{\quad}$

4. $\dfrac{40}{49} - \dfrac{12}{49} = \underline{\quad}$

5. $\dfrac{35}{56} - \dfrac{14}{56} = \underline{\quad}$

Addition and Subtraction of Dissimilar Fractions

What's In

DIRECTIONS: Add or subtract the fractions. Express the answer in simplest form or lowest term whenever possible.

1. $\dfrac{3}{5} + \dfrac{5}{10} = \underline{}$

2. $\dfrac{8}{13} + \dfrac{6}{16} = \underline{}$

3. $\dfrac{5}{12} + \dfrac{7}{12} + \dfrac{8}{12} = \underline{}$

4. $\dfrac{10}{18} - \dfrac{4}{18} = \underline{}$

5. $\dfrac{15}{20} - \dfrac{3}{20} = \underline{}$

What's New

Addition of dissimilar fractions can be shown below:
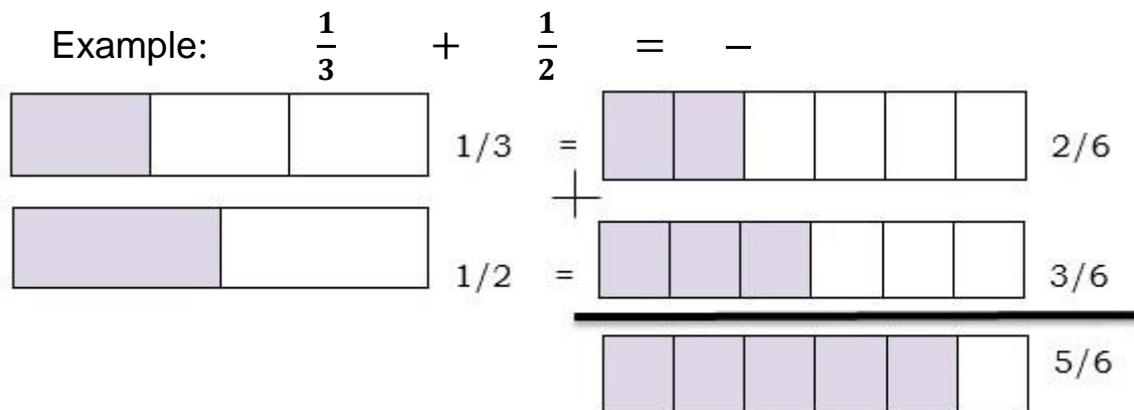
Example: $\dfrac{1}{3} + \dfrac{1}{2} = \underline{}$

That is, $\dfrac{1}{3} + \dfrac{1}{2}$ $\qquad$ $\dfrac{2}{6} + \dfrac{3}{6} = \dfrac{5}{6}$

Subtraction of dissimilar fractions can be also be shown below:

Example: $\dfrac{1}{2} - \dfrac{1}{3} = -$

$\dfrac{1}{2} =$

$\dfrac{3}{6}$

$\dfrac{1}{3} =$

$\dfrac{2}{6}$

$\dfrac{1}{6}$
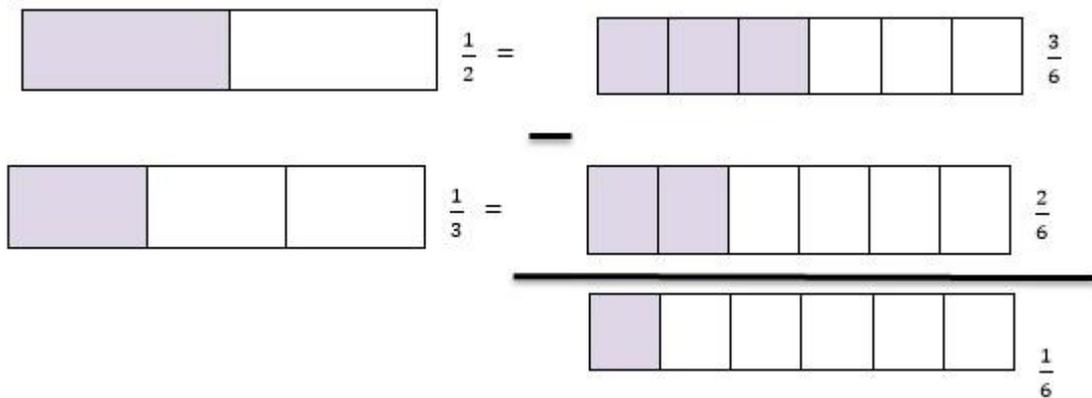
That is, $\dfrac{1}{2} - \dfrac{1}{3} = \qquad \dfrac{3}{6} - \dfrac{2}{6} = \dfrac{1}{6}$

What is It

To add or subtract dissimilar fractions, first change the fractions to similar using their Least Common Denominator (LCD). Next, add or subtract the fractions. Then, simplify the answer by reducing it to simplest form or lowest term whenever possible.

Example 1: $\dfrac{1}{3} + \dfrac{3}{5} = -$

Step 1: $\dfrac{1}{3} = \left(\dfrac{5}{15}\right) \quad \dfrac{3}{5} = \left(\dfrac{9}{15}\right) \longleftarrow$ equivalent fractions

Step 2: $\dfrac{5}{15} + \dfrac{9}{15} = \left(\dfrac{14}{15}\right) \longleftarrow$ answer

Example 2 : $\dfrac{5}{6} - \dfrac{3}{4} = -$

Step 1: $\dfrac{5}{6} = \left(\dfrac{10}{12}\right) \quad \dfrac{3}{4} = \left(\dfrac{9}{12}\right) \longleftarrow$ equivalent fractions

Step 2: $\dfrac{10}{12} - \dfrac{9}{12} = \left(\dfrac{1}{12}\right) \longleftarrow$ answer

More Examples:

$\frac{4}{5} + \frac{1}{2} = -$ $\frac{4}{5} = \frac{8}{10}$ $\frac{1}{2} = \frac{5}{10}$ ***Thus,*** $\frac{8}{10} + \frac{5}{10} = \frac{8+5}{10} = \frac{13}{10}$ *or* $1\frac{3}{10}$

$\frac{7}{8} - \frac{3}{6} = -$ $\frac{7}{8} = \frac{21}{24}$ $\frac{3}{6} = \frac{12}{24}$ ***Thus,*** $\frac{21}{24} - \frac{12}{24} = \frac{21-12}{24} = \frac{9}{24}$ *or* $\frac{3}{8}$
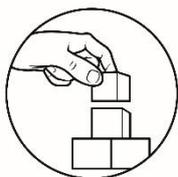
What's More

Activity 1

DIRECTIONS: Add the following fractions. Write the answer in simplest form or lowest term.

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

2. $\frac{8}{9} + \frac{1}{2} = -$

3. $\frac{3}{7} + \frac{1}{3} = -$

4. $\frac{4}{5} + \frac{1}{4} = -$

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

Activity 2

DIRECTIONS: Subtract the following fractions. Write the answer in simplest form or lowest term.

1. $\frac{8}{10} - \frac{1}{3} = -$

2. $\frac{9}{12} - \frac{5}{8} = -$

3. $\frac{7}{15} - \frac{3}{5} = -$

4. $\frac{6}{9} - \frac{2}{4} = -$

5. $\frac{15}{18} - \frac{4}{9} = -$

What I Have Learned

- How do you add or subtract dissimilar fractions?
- How you simplify the answer to simplest form or lowest term?
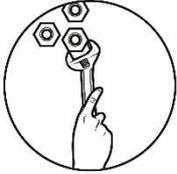
What I Can Do

Activity 3

DIRECTIONS: Add or subtract the fractions. Express the answer in simplest form or lowest term.

1. $\frac{5}{9} + \frac{1}{3} =$ ___

2. $\frac{4}{5} + \frac{3}{10} =$ ___

3. $\frac{5}{12} + \frac{2}{6} =$ ___

4. $\frac{1}{2} + \frac{5}{6} =$ ___

5. $\frac{4}{5} + \frac{1}{2} =$ ___

6. $\frac{3}{8} - \frac{1}{4} =$ ___

7. $\frac{3}{4} - \frac{1}{6} =$ ___

8. $\frac{5}{6} - \frac{2}{3} =$ ___

9. $\frac{5}{7} - \frac{1}{3} =$ ___

10. $\frac{6}{7} - \frac{1}{2} =$ ___

Assessment

A. DIRECTIONS: Add or subtract the fractions. Write the answers in simplest form or lowest term.

1. $\dfrac{5}{10} + \dfrac{1}{2} = \underline{}$

2. $\dfrac{7}{16} + \dfrac{1}{8} = \underline{}$

3. $\dfrac{3}{18} + \dfrac{2}{9} = \underline{}$

4. $\dfrac{2}{7} + \dfrac{1}{4} = \underline{}$

5. $\dfrac{8}{14} + \dfrac{1}{7} = \underline{}$

B. DIRECTIONS: Add or subtract the fractions. Write the answer in simplest form or lowest term.

1. $\dfrac{5}{7} - \dfrac{2}{5} = \underline{}$

2. $\dfrac{4}{6} - \dfrac{3}{5} = \underline{}$

3. $\dfrac{6}{9} - \dfrac{1}{4} = \underline{}$

4. $\dfrac{4}{5} - \dfrac{2}{9} = \underline{}$

5. $\dfrac{1}{2} - \dfrac{3}{7} = \underline{}$

Additional Activities

DIRECTIONS: Add or subtract the following fractions. Write your answers in simplest form or lowest term.

1. $\dfrac{8}{18}$ + $\dfrac{2}{3}$ =   —

2. $\dfrac{9}{15}$ + $\dfrac{1}{5}$ =   —

3. $\dfrac{7}{12}$ + $\dfrac{5}{6}$ =   —

4. $\dfrac{25}{32}$ − $\dfrac{5}{8}$ =   —

5. $\dfrac{28}{36}$ − $\dfrac{4}{9}$ =   —

<table>
<tr><td>**Lesson**
3</td><td># Addition and Subtraction of Mixed Numbers</td></tr>
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What's In

A mixed number is a combination of a whole number and a proper fraction. Examples are $5\frac{1}{2}, 9\frac{1}{4}, 8\frac{2}{3}, 2\frac{3}{8}$.

A proper fraction is a fraction wherein the numerator is less than the denominator. Examples are $\frac{1}{2}, \frac{1}{3}, \frac{3}{4}, \frac{4}{5}$, .

What's New

Addition of mixed numbers can be shown using the figures below:
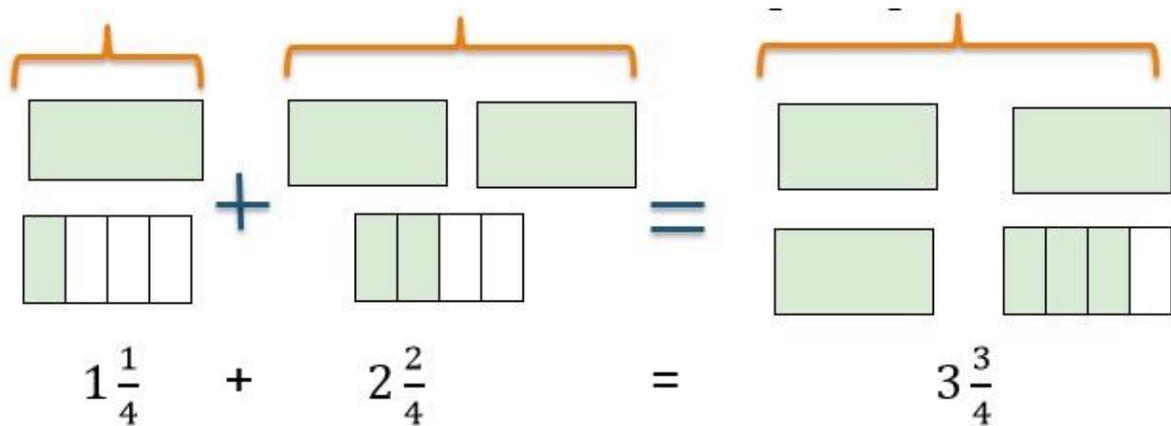
$$1\frac{1}{4} \quad + \quad 2\frac{2}{4} \quad = \quad 3\frac{3}{4}$$

Subtraction of mixed numbers can also be shown below:

$$3\frac{4}{5} \quad - \quad 1\frac{3}{5} \quad = \quad 2\frac{1}{5}$$
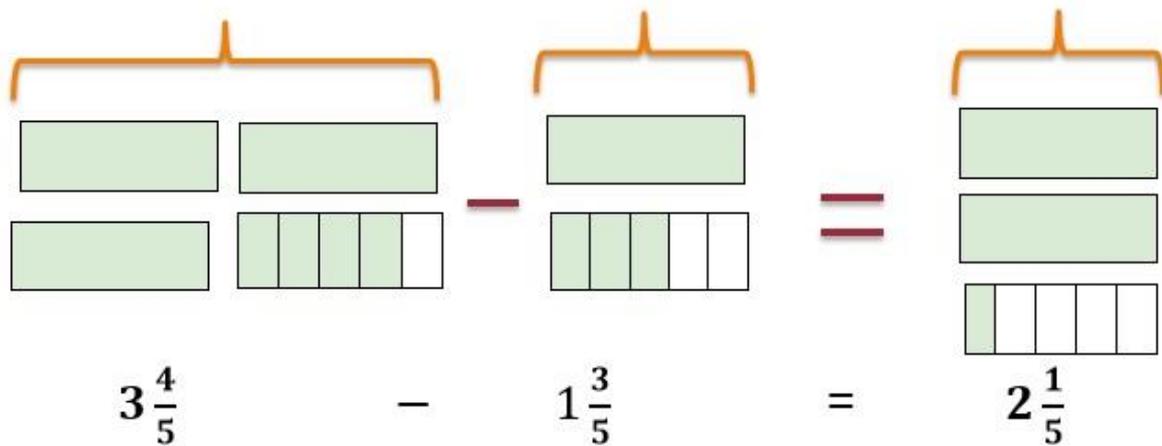
What is It

To add or subtract similar mixed numbers, first, add or subtract the whole numbers. Next, add or subtract the numerator and write the answer over the common denominator. Then, add the whole number and the fractional part. Lastly, simplify the answer whenever possible.

Example 1 : $3\frac{1}{3} + 2\frac{1}{3} = -$

Step 1 : $\quad 3 + 2 = 5$

Step 2 : $\quad \dfrac{1 + 1}{3} = \dfrac{2}{3}$

Step 3 : $\quad 5 + \dfrac{2}{3} = 5\dfrac{2}{3}$

Example 2 : $9\frac{3}{4} - 6\frac{1}{4} = -$

Step 1: $\quad 9 - 6 = 3$

Step 2: $\quad \dfrac{3 - 1}{4} = \dfrac{2}{4}$

Step 3: $\quad 3 + \dfrac{2}{4} = 3\dfrac{2}{4} \ or \ 3\dfrac{1}{2}$

More Examples:

$$5\frac{1}{2} \quad + \quad 4\frac{1}{2} \quad = \quad 5 + 4 = 9\frac{1 + 1}{2 + 2} \quad = \quad 9\frac{2}{2} \quad or \quad 10$$

$$8\frac{3}{8} \quad + \quad 7\frac{3}{8} \quad = \quad 8 + 7 = 15\frac{3 + 3}{8} \quad = \quad 15\frac{6}{8} \quad or \quad 15\frac{3}{4}$$

$$10\frac{7}{8} \quad - \quad 3\frac{5}{8} \quad = \quad 10 - 3 = 7\frac{7 - 5}{8} \quad = \quad 7\frac{2}{8} \quad or \quad 7\frac{1}{4}$$

$$12\frac{3}{4} \quad - \quad 8\frac{1}{4} \quad = \quad 12 - 8 = 5\frac{3 - 1}{4} \quad = \quad 5\frac{2}{4} \quad or \quad 5\frac{1}{2}$$
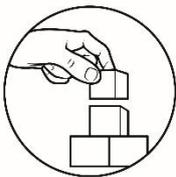
What's More

Activity 1

DIRECTIONS: Write the fraction name of each illustration. Then, add or subtract. Simplify the answer when possible.

1.

_____ + _____ = $\frac{\square}{\square}$

2.

_____ + _____ = $\frac{\square}{\square}$

3.

_____   +   _____ = $\frac{\square}{\square}$

4.

_____   -   _____ = $\frac{\square}{\square}$

5.

_____   -   _____ = $\frac{\square}{\square}$
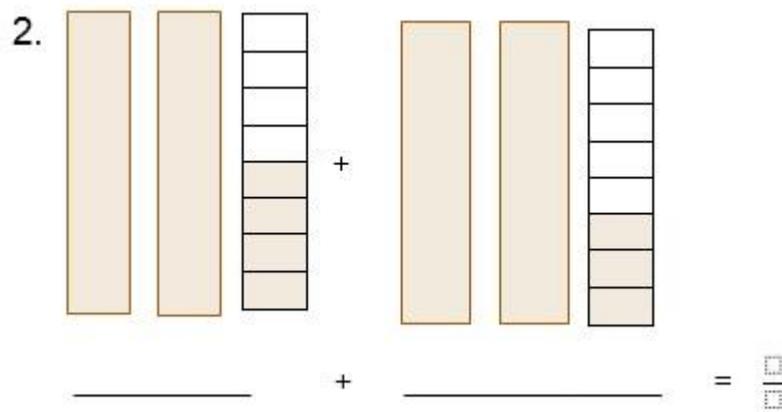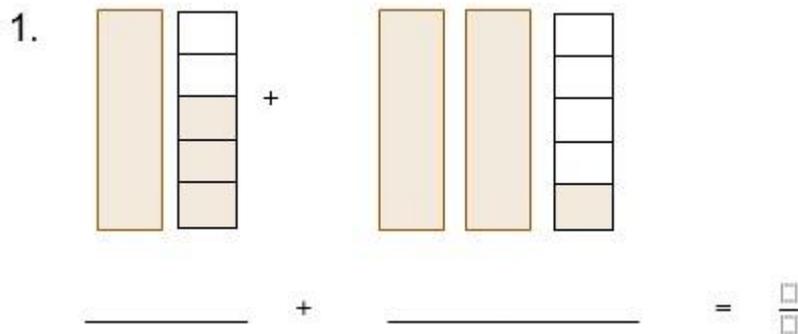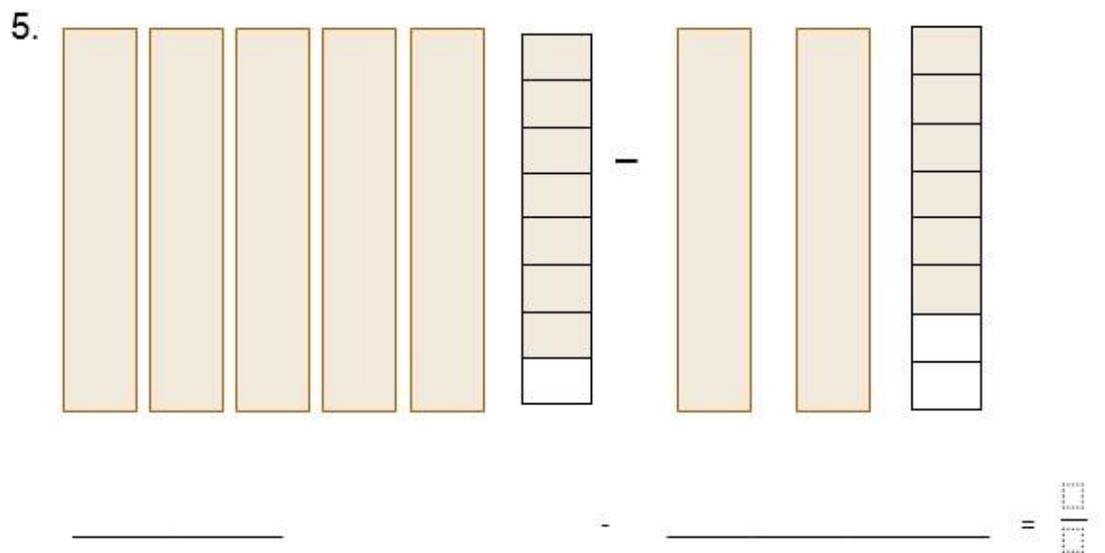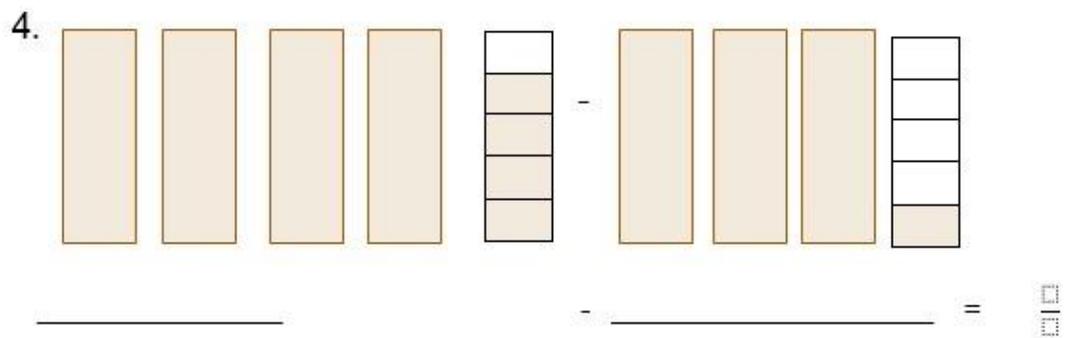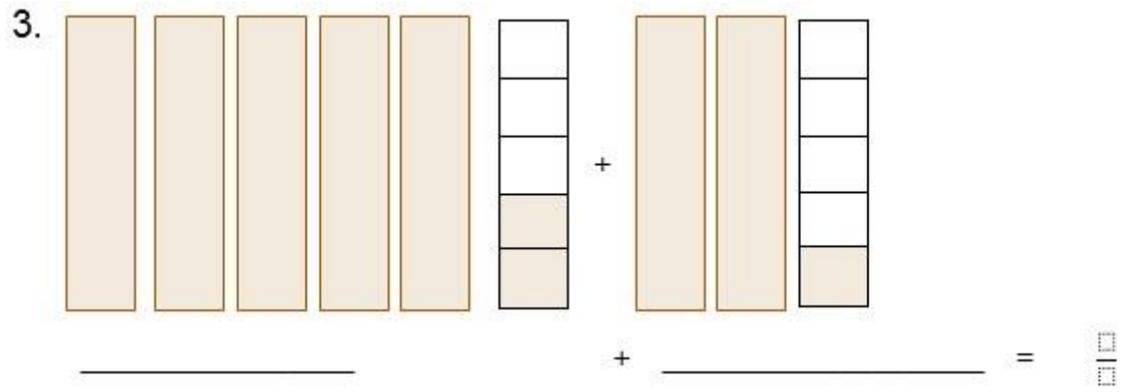
Activity 2

DIRECTIONS: Perform the indicated operations. Write the answer in simplest form or lowest term.

1. $15\frac{1}{4} + 9\frac{1}{4} = \underline{\quad}$

2. $12\frac{1}{6} + 8\frac{3}{6} = \underline{\quad}$

3. $7\frac{2}{9} + 10\frac{4}{9} = \underline{\quad}$

4. $16\frac{7}{8} - 5\frac{3}{8} = \underline{\quad}$

5. $18\frac{7}{10} - 11\frac{1}{10} = \underline{\quad}$

What I Have Learned

- How do you add or subtract similar mixed numbers.
- How do you reduce or simplify the answers to simplest form or lowest term?
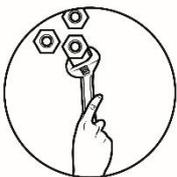
What I Can Do

Activity 3

DIRECTIONS: Find the sum or difference of the mixed numbers. Write the answer in simplest form or lowest term.

1. $7\frac{5}{13} + 2\frac{3}{13} = \underline{\quad}$

4. $15\frac{9}{15} - 8\frac{4}{15} = \underline{\quad}$

2. $9\frac{7}{11} + 4\frac{3}{11} = \underline{\quad}$

5. $18\frac{8}{14} - 9\frac{1}{14} = \underline{\quad}$

3. $6\frac{5}{6} + 5\frac{1}{6} = \underline{\quad}$

 Assessment

A. DIRECTIONS: Find the sum of the following mixed numbers. Express the answer in simplest form or lowest term whenever possible.

1. $10\frac{4}{7}$ + $3\frac{2}{7}$ = — 4. $9\frac{2}{6}$ + $14\frac{1}{6}$ = —

2. $12\frac{1}{9}$ + $4\frac{2}{9}$ = — 5. $7\frac{3}{10}$ + $15\frac{8}{10}$ = —

3. $13\frac{2}{8}$ + $6\frac{4}{8}$ = —

B. DIRECTIONS: Find the difference of the following mixed numbers. Express the answer in simplest form or lowest term whenever possible.

1. $25\frac{8}{9}$ − $13\frac{2}{9}$ = —

2. $30\frac{9}{10}$ − $11\frac{5}{10}$ = —

3. $17\frac{7}{8}$ − $9\frac{5}{8}$ = —

4. $19\frac{10}{12}$ − $8\frac{2}{12}$ = —

5. $28\frac{5}{16}$ − $15\frac{1}{16}$ = —
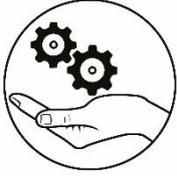
DIRECTIONS: Find the sum or difference of the following mixed numbers. Write the answer in simplest form.

1. $5\frac{3}{5} + 2\frac{4}{5} =$ ___

2. $3\frac{2}{4} + 4\frac{3}{4} =$ ___

3. $6\frac{2}{3} + 7\frac{2}{3} =$ ___

4. $9\frac{1}{9} - 3\frac{2}{9} =$ ___

5. $8\frac{2}{7} - 1\frac{3}{7} =$ ___

Addition and Subtraction of Dissimilar Mixed Numbers

What's In

Find the sum or difference of the following mixed numbers. Reduce the answer to lowest term. How many can you do orally?

1. $10\frac{2}{5} + 15\frac{1}{5} = \underline{\quad}$

6. $15\frac{7}{10} - 10\frac{4}{10} = \underline{\quad}$

2. $2\frac{3}{7} + 8\frac{1}{7} = \underline{\quad}$

7. $18\frac{5}{12} - 9\frac{4}{12} = \underline{\quad}$

3. $9\frac{4}{9} + 1\frac{3}{9} = \underline{\quad}$

8. $10\frac{9}{18} - 5\frac{4}{18} = \underline{\quad}$

4. $5\frac{3}{4} + 5\frac{1}{4} = \underline{\quad}$

9. $14\frac{7}{8} - 7\frac{2}{8} = \underline{\quad}$

5. $8\frac{2}{10} + 4\frac{5}{10} = \underline{\quad}$

10. $12\frac{6}{15} - 6\frac{1}{12} = \underline{\quad}$

![What's New icon]

What's New

Addition of dissimilar mixed numbers can be shown below:
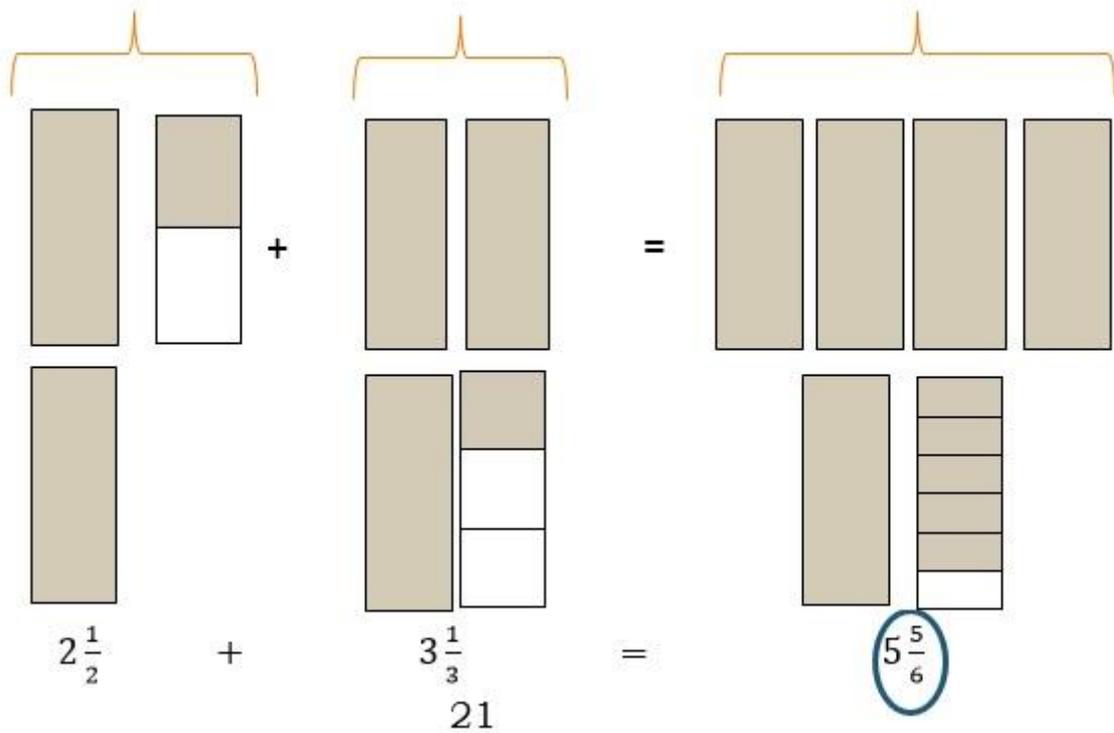
$$2\frac{1}{2} \quad + \quad 3\frac{1}{3} \quad = \quad 5\frac{5}{6}$$

21

Subtraction of dissimilar mixed numbers can also be shown below:

$$3\frac{1}{2} \quad - \quad 2\frac{1}{4} \quad = \quad 1\frac{1}{4}$$
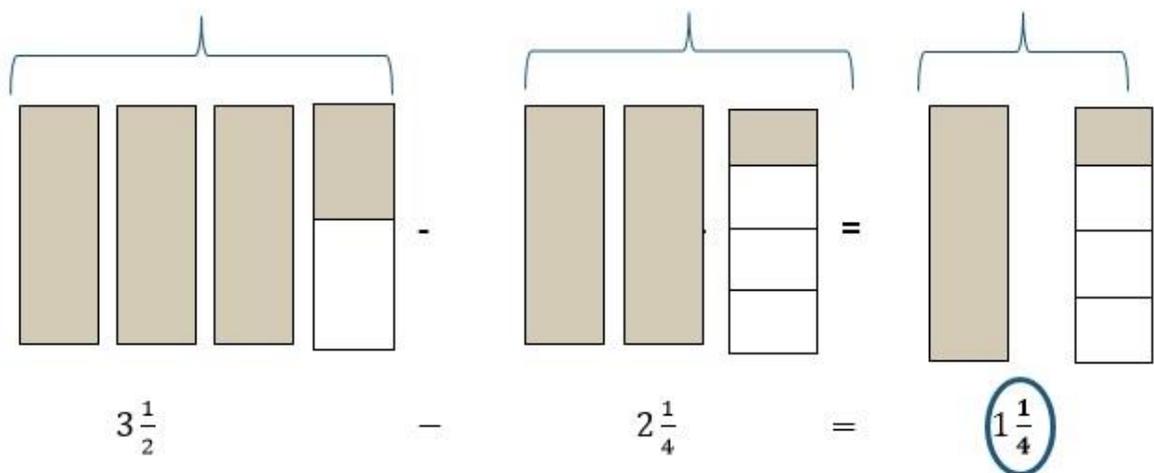
What is It

To add or subtract dissimilar mixed numbers, first make the fractional parts of the mixed numbers to their equivalent fractions using their Least Common Denominator (LCD).   Next, add or subtract the numbers and the fractional parts separately. Then, add the whole number and the fractional part to form the mixed number. Lastly, reduce the answer to lowest term whenever possible

Example 1   : $2\frac{1}{2}$ + $3\frac{1}{3}$ =   —

Step 1: $\frac{1}{2} = \frac{3}{6}$ $\frac{1}{3} = \frac{2}{6}$ ← equivalent fractions

Step 2:   2   +   3   =   5   ← whole numbers

Step 3: $\frac{3}{6}$ + $\frac{2}{6}$ = $\frac{5}{6}$ ← fractional parts

Step 4:   5   + $\frac{5}{6}$ = $5\frac{5}{6}$ ← answer

Example 2   : $3\frac{1}{2}$ − $2\frac{1}{4}$ =   —

Step 1: $\frac{1}{2} = \frac{2}{4}$ $\frac{1}{4} = \frac{1}{4}$ ← equivalent fractions

Step 2:   3   −   2   =   1   ← whole numbers

Step 3: $\frac{2}{4}$ − $\frac{1}{4}$ = $\frac{1}{4}$ ← fractional parts

Step 4:   1   + $\frac{1}{4}$ = $1\frac{1}{4}$ ← answer

An alternative solution to add or subtract dissimilar mixed numbers is first to change the mixed numbers to improper fractions. Next find the equivalent fractions of the improper fractions. Then, add or subtract the fractions. Lastly, simplify the answer whenever possible.

Example 1: $1\frac{3}{4}$ $+$ $3\frac{1}{2}$ $=$ $-$

Step 1: $1\frac{3}{4} = \frac{7}{4}$ $\frac{1}{2} = \frac{7}{2}$ ⟵ improper fractions

Step 2: $\frac{7}{4} = \boxed{\frac{7}{4}}$ $\frac{7}{2} = \boxed{\frac{14}{4}}$ ⟵ equivalent fractions

Step 3: $\frac{7}{4}$ $+$ $\frac{14}{4}$ $=$ $\frac{21}{4}$ ⟵ answer

Step 4: $\frac{21}{4} =$ $21 \div 4 = \boxed{5\frac{1}{4}}$ ⟵ answer in lowest term

Example 2: $4\frac{3}{8}$ $-$ $2\frac{1}{2}$ $=$ $-$

Step 1: $4\frac{3}{8} = \frac{35}{8}$ $1\frac{1}{2} = \frac{7}{2}$ ⟵ improper fractions

Step 2 $\frac{35}{8} = \boxed{\frac{35}{8}}$ $\frac{3}{2} = \boxed{\frac{12}{8}}$ ⟵ equivalent fractions

Step 3: $\frac{35}{8}$ $-$ $\frac{12}{8}$ $=$ $\frac{23}{8}$ ⟵ answer

Step 4: $\frac{23}{8} =$ $23 \div 8 = \boxed{2\frac{7}{8}}$ ⟵ answer in lowest term

Try This:

1. $7\frac{1}{2}$ $+$ $1\frac{7}{8}$ $=$ $-$ 4. $18\frac{5}{6}$ $-$ $11\frac{4}{5}$ $=$ $-$

2. $3\frac{3}{5}$ $+$ $2\frac{3}{4}$ $=$ $-$ 5. $15\frac{5}{8}$ $-$ $8\frac{2}{5}$ $=$ $-$

3. $17\frac{1}{3}$ $-$ $9\frac{1}{8}$ $=$ $-$
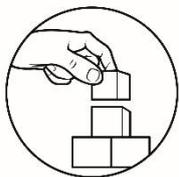
 What's More

Activity 1

DIRECTIONS: Find the sum of the mixed numbers. Simplify the answer whenever possible.

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

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

3. $3\frac{2}{5}$ $+$ $1\frac{1}{2}$ $=$ $-$

Activity 2

DIRECTIONS: Find the difference of the mixed numbers. Simplify the answer whenever possible.

1. $5\frac{1}{2} - 2\frac{1}{3} = \underline{\quad}$

4. $4\frac{7}{8} - 2\frac{3}{4} = \underline{\quad}$

2. $6\frac{3}{5} - 3\frac{1}{4} = \underline{\quad}$

5. $5\frac{5}{9} - 1\frac{1}{3} = \underline{\quad}$

3. $8\frac{2}{3} - 1\frac{2}{6} = \underline{\quad}$

What I Have Learned

- How do you add or subtract dissimilar mixed numbers?

- How do you change a mixed number to an improper fraction?

What I Can Do

Activity 3

DIRECTIONS: Find the sum or difference of the mixed numbers. Reduce the answer to simplest form.

1. $9\frac{2}{5} + 8\frac{1}{2} = \underline{\quad}$

4. $16\frac{5}{6} - 9\frac{1}{2} = \underline{\quad}$

2. $7\frac{2}{7} + 2\frac{1}{3} = \underline{\quad}$

5. $13\frac{8}{9} - 8\frac{2}{3} = \underline{\quad}$

3. $6\frac{2}{4} + 3\frac{3}{8} = \underline{\quad}$

Assessment

DIRECTIONS: Add the following mixed numbers. Reduce the answer to lowest term.

1. $7\frac{1}{8} + 6\frac{1}{4} = $ ___   4. $9\frac{1}{9} + 6\frac{2}{3} = $ ___

2. $5\frac{1}{7} + 4\frac{1}{5} = $ ___   5. $8\frac{1}{3} + 4\frac{1}{2} = $ ___

3. $8\frac{2}{6} + 3\frac{1}{5} = $ ___

DIRECTIONS: Subtract the following mixed numbers. Reduce the answer to simplest form or lowest term.

1. $29\frac{5}{9} - 16\frac{1}{2} = $ ___   4. $20\frac{3}{7} - 13\frac{1}{4} = $ ___

2. $25\frac{6}{7} - 11\frac{1}{3} = $ ___   5. $32\frac{4}{6} - 12\frac{3}{7} = $ ___

3. $18\frac{6}{8} - 7\frac{2}{3} = $ ___

Additional Activities

DIRECTIONS: Add or subtract the mixed numbers. Simplify the answer when necessary.

1. $2\frac{1}{5} + 3\frac{3}{4} = $ ___

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

3. $9\frac{1}{3} + 6\frac{1}{9} = $ ___

4. $8\frac{3}{5} + 5\frac{1}{2} = $ ___

5. $7\frac{5}{6} + 7\frac{2}{3} = $ ___

6. $15\frac{1}{2} - 6\frac{1}{8} = $ ___

7. $22\frac{3}{4} - 14\frac{1}{3} = $ ___

8. $34\frac{1}{5} - 13\frac{2}{3} = $ ___

9. $25\frac{2}{7} - 10\frac{5}{8} = $ ___

10. $19\frac{1}{9} - 8\frac{1}{2} = $ ___

Lesson 5

Solving Routine and Non-Routine Problems Involving Addition and Subtraction of Fraction

What's In

DIRECTIONS: Read and solve the following word problems.

1. What is the sum of $\frac{5}{8}$ and $\frac{1}{5}$?

2. Find the sum of $4\frac{1}{9}$ and $5\frac{3}{9}$.

3. Add $1\frac{1}{3}$ and $3\frac{1}{2}$.

4. Subtract $2\frac{4}{6}$ from $9\frac{5}{6}$.

5. What is the difference of $13\frac{3}{4}$ and $6\frac{1}{2}$?

What's New

Problem solving requires an imaginative mind to be able to arrive at an answer easily and systematically. We can solve problems by following the steps below:

Understand
Plan
Solve
Check

Example 1

Mrs. Santos bought 1 ¾ meter of material to make a blouse and 2 ¼ meter of the same material to make a dress. How much material did she buy altogether?

Understand
a. What is asked?
   ➢ Amount of material bought altogether
b. What are the given facts?
   ➢ $1\frac{3}{4}$ meter, $2\frac{1}{4}$ meter

Plan

a. What operation shall we use to solve the problem?
   ➢ addition

b. What is the number sentence?
   ➢ $1\frac{3}{4}$ + $2\frac{1}{4}$ = N

Solve

a. What is the solution?
   ➢ $1\frac{3}{4}$ + $2\frac{1}{4}$ = —
   ➢ $1 + 2 =$ 3 $\frac{3}{4}$ + $\frac{1}{4}$ = $\frac{4}{4}$
   ➢ 3 + $\frac{4}{4}$ = $3\frac{4}{4}$ or 4

b. What is the answer**?**

   ➢ There are 4 meters of material bought altogether.

Check

You may work backward by subtracting one of the given fractions from the answer and you will get the other given fraction.
   ➢ $3\frac{4}{4}$ − $2\frac{1}{4}$ = $1\frac{3}{4}$ or $3\frac{4}{4}$ − $1\frac{3}{4}$ = $2\frac{1}{4}$

What is It

Example 2:

Mang Jose changed the color of his tricycle. He consumed $4\frac{7}{8}$ liters of blue paint and $2\frac{2}{8}$ liters of red paint. How much more blue paint did Mang Jose use than red?

Understand
a. What is asked?
  ➢ Amount of blue paint used than red paint
b. What are the given facts?
  ➢ $4\frac{7}{8}$ liters, $2\frac{2}{8}$ liters

Plan
a. What operation shall we use to solve the problem?
  ➢ subtraction
b. What is the number sentence?
  ➢ $4\frac{7}{8} - 2\frac{2}{8} = N$

Solve
a. What is the solution?

  ➢ $4\frac{7}{8} - 2\frac{2}{8} = -$

  ➢ $4 - 2 = 2$ $\frac{7}{8} - \frac{2}{8} = \frac{5}{8}$

  ➢ $2 + \frac{5}{8} = 2\frac{5}{8}$

b. What is the answer?
  ➢ There are $2\frac{5}{8}$ liters of blue paint used than red paint.

Check
You may work backward by adding the difference to the subtrahend and you will get the minuend.
  ➢ $2\frac{5}{8} + 2\frac{2}{8} = 4\frac{7}{8}$

Try This:

DIRECTIONS: Solve for the answer by following the correct steps.

1. The width of the doormat is $\frac{2}{3}$ meter. The doorway is $\frac{5}{6}$ meter. What is the difference in their widths?

2. Rex read $\frac{1}{8}$ of a book on Monday, $\frac{1}{4}$ on Tuesday and $\frac{1}{2}$ on Wednesday. What fraction of the book did he read in three days?

What's More

Activity 1

DIRECTIONS: Read the problems and answer the questions that follow.

1. Jan has $\frac{2}{5}$ kilo of lanzones. Jam has $\frac{1}{5}$ kilo of the same fruit, and Jack has $\frac{3}{5}$ kilo. Together, how many kilos of lanzones do the three children have?

   ➢ What is asked?
   ➢ What are the given facts?
   ➢ What operation shall you use to solve the problem?
   ➢ What is the number sentence?
   ➢ Write the solution.
   ➢ What is the answer?

2. Before cooking, a hamburger weighed 75 ¾ grams but after cooking it weighed 73 $\frac{2}{4}$ grams. How much weight was lost?

   ➢ What is asked?
   ➢ What are the given facts?
   ➢ What operation shall you use to solve the problem?

> ➢ What is the number sentence?
> ➢ Write the solution.
> ➢ What is the answer?

Activity 2

DIRECTIONS: Read and solve the following problems. Write the solution
and answer.

1. How much paint was used if $\frac{7}{8}$ gallon was used for the living room, $\frac{3}{8}$ gallon in the hallway and $1\frac{5}{8}$ gallon for the bedrooms?

2. Mrs. Lim spends $\frac{1}{4}$ of her income for rent and $\frac{1}{3}$ of it for food. What part of her income goes to food and rent?

3. A roll of cloth contains $25\frac{5}{6}$ meters. If $4\frac{2}{6}$ meters are cut from the roll, how much cloth remains?

4. The interest rate of an auto loan in June was $32\frac{1}{5}$ percent. By November, the rate was up $35\frac{1}{2}$ percent. By how much did the interest rate increase over the period?

5. Jacob traveled $1\frac{1}{2}$ km while Jasmin $1\frac{1}{2}$ km more than the distance covered by Jacob. How many kilometers did the two travel altogether?

What I Have Learned

- How do you solve word problems involving addition and subtraction of fractions?
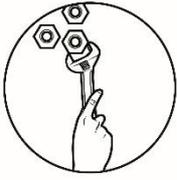
What I Can Do

Activity 3

DIRECTIONS: Read each problem and write the solution and answer.
Simplify the answer whenever possible.

1. Charles' weight is $37\frac{1}{4}$ kilograms. If William weighs $43\frac{3}{4}$ kilograms, what is the difference of their weights?

2. Meghan bought $12\frac{1}{2}$ kilos of pork and $15\frac{1}{4}$ kilos of beef. How many kilos of meat did she buy in all?

3. Katherine traveled with 3 luggage on her trip to Paris. The biggest one weighed $11\frac{2}{3}$ kilos, while the second biggest weighed $9\frac{1}{3}$ kilos. The smallest luggage weighed only $6\frac{1}{3}$ kilos. How many kilos are her three luggage?

4. Marissa needed to lose $3\frac{1}{2}$ kilos of her present weight. If the required weight is $48\frac{1}{3}$ kilos she should maintain, what is her present weight?

5. How many more clothing material will I need to cover my table that is $5\frac{1}{2}$ meters long if I already have $2\frac{1}{5}$ clothing materials?

6. The school where Angelina goes is $5\frac{1}{3}$ km away from her house. She rides $4\frac{1}{4}$ km and walks the rest of the way. How far does she walk to school?

Assessment

DIRECTIONS: Read each problem and write the solution and answer.
Simplify the answer whenever possible.

1. Liz has $\frac{8}{9}$ of her homework left to be done over the weekend. On Saturday, she plans to do $\frac{1}{3}$ of the assignment. What portion remains to be done on Sunday?

2. Joy walks $\frac{3}{4}$ of a km to a friend's house, $\frac{1}{4}$ km to a mall and $\frac{1}{4}$ km home. What is the total distance that Joy covers?

3. Fred used $3\frac{1}{2}$ liters of gasoline for a trip to the farm and $1\frac{1}{3}$ liters for a trip to the beach. How much gasoline did Fred use for his trip to the farm?

4. Ruth ran for $\frac{1}{6}$ hour on her first day and $\frac{2}{6}$ hour on her second day. What part of an hour did Ruth run on the two days?

5. David picked $20\frac{5}{6}$ dozen starapples on Monday and $14\frac{1}{6}$ dozen on Wednesday. How many more dozen starapples did David pick on Monday than on Wednesday?

6. Karen has $1\frac{1}{3}$ kilograms of chicken and $5\frac{1}{2}$ kilograms of beef in her refrigerator. How many kilograms of meat does she have in all?

7. The weight of a carabao is $10\frac{1}{4}$ kilograms more than the weight of a cow. If the weight of a cow is $50\frac{5}{8}$ kilograms then what is the weight of the carabao?

8. A tailor used $2\frac{1}{4}$ meter of cloth for a pair of jogging pants and $1\frac{1}{3}$ meter for a T-shirt. How many meters of cloth were used in all?

9. Ted and Fred have $20\frac{8}{9}$ meters of rope. Fred has $10\frac{2}{3}$ meters of rope. How many meters of rope does Ted have?

10. One day, Raquel spent $4\frac{3}{4}$ hours studying Mathematics and Science. If she allotted $2\frac{1}{2}$ hours studying Mathematics and the rest for Science, how long did she study Science on that day?

 Additional Activities

DIRECTIONS: Read each problem and write the solution and answer. Simplify the answer whenever possible.

1. Garfield needed $1\frac{1}{2}$ hours to do his assignment, $3\frac{1}{2}$ hours to do her project and $2\frac{1}{2}$ hours to research in the internet. How many hours will she spend in all for her school work?

2. Mother bought $15\frac{3}{4}$ kilos of ground pork for making several dishes. If she needed $6\frac{1}{2}$ kilos for her rellenong bangus, how many kilos were left for the other dishes?

3. Marsha wants to make some glitters to finish her project. Tanya has $\frac{2}{4}$ of a bottle while Anne has $\frac{3}{5}$ of a bottle. How many more glitters does Anne have than Tanya to share with Marsha?

4. Leighton has $1\frac{4}{5}$ meter of red ribbon and $1\frac{3}{4}$ meters of blue ribbon. How many meters of ribbon does she have in all?

5. Elena spent $\frac{2}{3}$ of an hour baking and $\frac{7}{8}$ of an hour watching television. Mow much more time did she spend watching television than baking?

References

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