Important Concepts . . .

Preview Review

Mathematics Grade 7

W1 - Lesson 3: Fractions and Mixed Numbers

Important Concepts of Grade 7 Mathematics

Materials Required

Math Set
Calculator

No Textbook Required

This is a stand-alone course.

Mathematics Grade 7
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Preview/Review W1 - Lesson 3
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Preview/Review Concepts for Grade Seven Mathematics

W1 – Lesson 3:

Fractions and Mixed Numbers

W1 – Lesson 3: Fractions

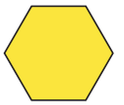
Warm-up:

- *I can use pattern blocks to model fractions.*

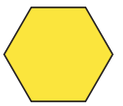
Fraction Tiles

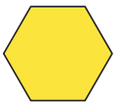
How many?

1.  are in  ? _____

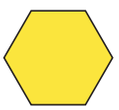
2.  are in  ? _____

3.  are in  ? _____

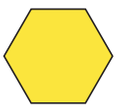
4.  are in  ? _____

5.  are in  ? _____

Based on the relationships above,

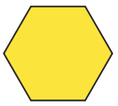
1. If  = 1.  = _____

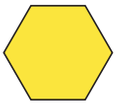
2. If  = 1.  = _____

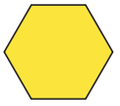
3. If  = 1. =  _____

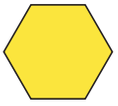
4. If  = 1. =  _____

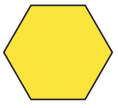
Now, try some really fun shapes.

1. If  +  = 1, what is  ? _____

2. If  +  = 1, what is  +  ? _____

3. If  +  = 1, what is  +  ? _____

4. If  +  = 1, what is  ? _____

5. If  -  = 1, what is  +  ? _____

Review:

- *I understand fraction basics.*

Practice

vinculum → $\frac{3 \longrightarrow \text{numerator or dividend}}{7 \longrightarrow \text{denominator or divisor}}$

proper fraction: a fraction in which the numerator is **less than** the denominator

Example: $\frac{2}{3}$

improper fraction: a fraction in which the numerator is **greater than** the denominator

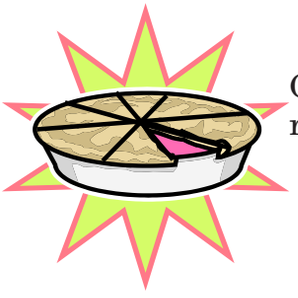
Example: $\frac{7}{2}$

mixed number: the sum of a whole number and a proper fraction

Example: $4\frac{6}{7}$

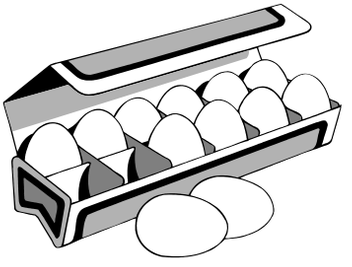
vinculum: the line between the numerator and the denominator, showing that the two numbers are connected

Example 1: What fraction of the pie has been removed?



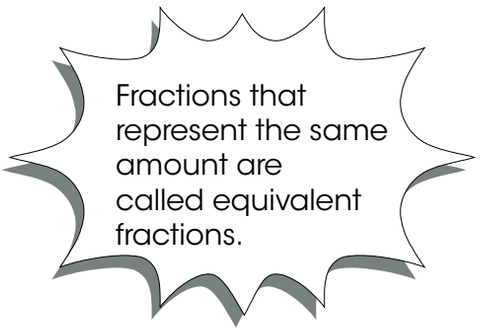
One of eight pieces has been removed; therefore, $\frac{1}{8}$ has been removed.

Example 2: What fraction of the eggs is left in the carton?



Ten of twelve eggs are still in the carton; therefore $\frac{\boldsymbol{10}}{\boldsymbol{12}}$ or $\frac{5}{6}$ is left in the carton.

Equivalent Fractions



Example: Write three equivalent fractions for $\frac{2}{3}$.

$$\frac{2}{3} \overset{\times 2}{=} \frac{4}{6} \qquad \frac{2}{3} \overset{\times 3}{=} \frac{6}{9} \qquad \frac{2}{3} \overset{\times 4}{=} \frac{8}{12}$$

$\frac{4}{6}$, $\frac{6}{9}$, and $\frac{8}{12}$ are all equivalent fractions of $\frac{2}{3}$.

Multiplying or dividing the numerator **and** denominator by the **same number** can generate an unlimited number of equivalent fractions.

Practice

Fill in the blanks to complete the equivalent fractions.

a. $\frac{2}{3} = \frac{\quad}{15}$

b. $\frac{1}{7} = \frac{\quad}{21}$

c. $\frac{4}{8} = \frac{1}{\quad}$

d. $\frac{5}{12} = \frac{10}{\quad}$

e. $\frac{7}{11} = \frac{\quad}{33}$

f. $\frac{6}{18} = \frac{\quad}{9}$

g. $\frac{8}{20} = \frac{\quad}{5}$

h. $\frac{33}{99} = \frac{1}{\quad}$

i. $\frac{2}{\quad} = \frac{4}{10}$

j. $\frac{3}{\quad} = \frac{21}{28}$

Reducing Fractions to Simplest Form

A fraction in simplest form is the fraction that cannot be divided to find an equivalent fraction.

Example: Write the fractions in lowest terms.

a. $\frac{9}{12} = \frac{3}{4}$ (÷3 above and ÷3 below)

9 and 12 are both divisible by 3.

The simplest form of $\frac{9}{12}$ is $\frac{3}{4}$.

b. $\frac{7}{12}$

Because 7 and 12 do not have any numbers by which they are **both** divisible, the fraction is already in its simplest form.

A fraction in **simplest form** is also known as a **reduced fraction** or a fraction expressed in **lowest terms.**

Answers should always be given in **lowest terms.**

Practice

Express each fraction in lowest terms.

a. $\frac{2}{4} = —$

b. $\frac{4}{12} = —$

c. $\frac{6}{9} = —$

d. $\frac{5}{15} = —$

e. $\frac{7}{21} = —$

f. $\frac{10}{18} = —$

g. $\frac{8}{24} = —$

h. $\frac{50}{100} = —$

i. $\frac{3}{12} = –$

j. $\frac{5}{25} = —$

Objective:

- *I can add and subtract fractions with the same denominators..*

Adding fractions with the same denominator

Keep the denominator the same; add the numerators.

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

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

Subtracting fractions with the same denominator.

Keep the denominator the same; subtract the numerators.

Example: $\frac{7}{12}-\frac{3}{12}=$

$7-3=4$ Therefore, $\frac{7}{12}-\frac{3}{12}=\frac{4}{12}$

Practice

Solve. Express your answers in lowest terms..

a. $\frac{1}{3}+\frac{1}{3}=$ b. $\frac{1}{7}+\frac{5}{7}=$ c. $\frac{2}{9}+\frac{4}{9}=$ d. $\frac{5}{10}+\frac{3}{10}=$

e. $\frac{1}{6}+\frac{3}{6}=$ f. $\frac{11}{20}+\frac{5}{20}=$ g. $\frac{3}{8}+\frac{2}{8}=$ h. $\frac{10}{12}-\frac{8}{12}=$

i. $\frac{17}{21}-\frac{8}{21}=$ j. $\frac{13}{15}-\frac{3}{15}=$ k. $\frac{9}{10}-\frac{5}{10}=$ l. $\frac{7}{9}-\frac{2}{9}=$

Objective:

- *I can add and subtract fractions with the different denominators..*

Example 1: $\frac{7}{8}-\frac{2}{10}=$

You need a common denominator.
8 and 10 are both factors of 40.

Change: $\frac{7}{8} \longrightarrow \frac{35}{40}$

Change: $\frac{2}{10} \longrightarrow \frac{8}{40}$

Subtract: $\frac{35}{40}-\frac{8}{40}=\frac{27}{40}$

Example 2: $\frac{1}{4}+\frac{3}{12}=$

Common denominator: 12

Change: $\frac{1}{4} \longrightarrow \frac{3}{12}=$

Add: $\frac{3}{12}+\frac{3}{12}=\frac{6}{12}=\frac{1}{2}$

Or
Common denominator: 4

Change: $\frac{3}{12} \longrightarrow \frac{1}{4}$

Add: $\frac{1}{4}+\frac{1}{4}=\frac{2}{4}=\frac{1}{2}$

Practice

Solve. Express your answers in lowest terms..

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

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

c. $\frac{1}{2}+\frac{4}{9}=$

d. $\frac{6}{10}+\frac{3}{8}=$

e. $\frac{5}{20}+\frac{5}{8}=$

f. $\frac{3}{21}+\frac{2}{3}=$

g. $\frac{10}{12}-\frac{1}{4}=$

h. $\frac{17}{21}-\frac{5}{7}=$

i. $\frac{9}{10}-\frac{3}{20}=$

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

Objective:

- *I can model the addition and subtraction of fractions.*

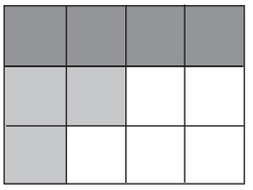
Grid Model

Note: Use the columns and rows of a grid to represent different denominators.

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

1 of 3 rows = $\frac{1}{4}$

colour in 4 squares



Total squares = 12

Number of shaded squares = 7

Answer = $\frac{7}{12}$

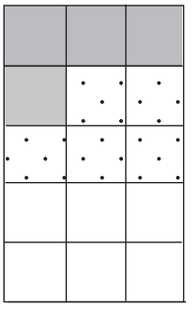
1 of 4 columns = $\frac{1}{3}$

colour in 3 squares

Example 2: $\frac{3}{5}-\frac{1}{3}=$

3 of 5 rows = $\frac{3}{5}$

colour in 9 squares



Total squares = 14

Number of shaded squares left = 4

Answer = $\frac{4}{15}$

1 of 3 columns = $\frac{1}{3}$

erase 5 squares

Practice

Draw the grid that represents best the solution. For this activity you do not need to simplify the fraction.

a. $\frac{1}{3}+\frac{1}{3}=$

b. $\frac{1}{7}+\frac{5}{7}=$

c. $\frac{2}{9}+\frac{4}{9}=$

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

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

f. $\frac{1}{3}+\frac{3}{10}=$

g. $\frac{3}{4}-\frac{1}{3}=$

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

i. $\frac{6}{7}-\frac{2}{6}=$

j. $\frac{8}{9}-\frac{4}{6}=$

k. $\frac{7}{8}-\frac{1}{2}=$

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

Summary and Practice:

- *Using what you learned answer the following questions.*

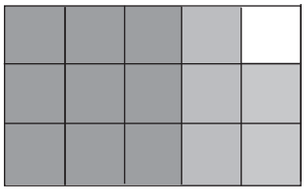
1. On the chart below, summarize the steps needed to add or subtract fractions with the same denominator and fractions with different denominators.

	Same Denominators	Different Denominators
Steps to add fractions		
Steps to subtract fractions		

2. Express the fractions in lowest terms.

a. $\frac{6}{18}$ b. $\frac{9}{54}$ c. $\frac{16}{48}$ d. $\frac{14}{21}$

3. Using the grid below, write an addition equation represented by the grid.



4. Model using a grid.

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

   b. $\frac{9}{10}-\frac{3}{4}$

5. $\frac{1}{3}$ of entries in a pet show are cats. $\frac{1}{2}$ of the entries are dogs.

   What fraction of the animals is not a cat or a dog?

6. George spent $\frac{2}{8}$ of his spare time playing video games, $\frac{2}{6}$ practising basketball, $\frac{1}{4}$ practising guitar, and the remainder watching TV. What fraction represents the time he spent watching TV?

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