Important Concepts . . .

Preview Review

Mathematics

Grade 5

W1 - Lesson 2: Exploring Proper Fractions

V5-07

Important Concepts of Grade 5 Mathematics

W1 - Lesson 1 .....Number Sense Numbers 0 to 100 000
W1 - Lesson 2 ..... Exploring Proper Fractions
W1 - Lesson 3 ..... Exploring Decimals
W1 - Lesson 4 .....Numbers With Up to 2 Decimal Places
W1 - Lesson 5 ..... Multiplication
W1 - Quiz
W2 - Lesson 1 ..... Division
W2 - Lesson 2 ..... Collecting Data and Analyzing Patterns
W2 - Lesson 3 .....Estimating and Taking Measurements
W2 - Lesson 4 ..... Perimeter and Area Measurements
W2 - Lesson 5 ..... Metric Measurements
W2 - Quiz
W3 - Lesson 1 ..... Volume, Capacity, Mass, and Time
W3 - Lesson 2 ..... 2-D Shapes and 3-D Objects
W3 - Lesson 3 .....Transformations
W3 - Lesson 4 ..... Statistics and Probability
W3 - Lesson 5 .....Chance and Probability
W3 - Quiz

Materials Required

Protractor
Ruler
Calculator

A textbook is not needed.

This is a stand-alone course.

Mathematics Grade 5
Version 5
Preview/Review W1 - Lesson 2

Publisher: Alberta Distance Learning Centre
Author: Leslie Friesen
In-House Teacher: Sue Rees

Project Coordinator: Dennis McCarthy
Preview/Review Publishing Coordinating Team: Nina Johnson, Laura Renkema, and Donna Silgard

Alberta Distance Learning Centre has an Internet site that you may find useful. The address is as follows: **http://www.adlc.ca**

The use of the Internet is optional. Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

Preview/Review Concepts for Grade Five Mathematics

W1 - Lesson 2: Exploring Proper Fractions

OBJECTIVES

By the end of this lesson, you should

- understand the meaning of the numerator and denominator of a fraction
- write fractions and equivalent fractions
- change fractions to their simplest forms

Glossary of Terms

Denominator: The denominator is the number on the bottom of a fraction. 4 is the denominator in the fraction $\frac{1}{4}$. ← denominator

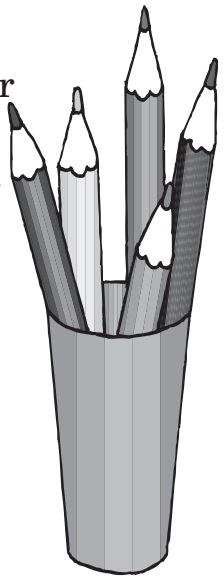
Equivalent Fractions: Two fractions of the same value are equivalent.

Fraction: A fraction is a way to show part of a whole number. A fraction has two parts: the numerator and the denominator.

$\frac{3}{4}$ ← numerator (top)
← denominator (bottom)

Numerator: The numerator is the number on top. 1 is the numerator in the fraction $\frac{1}{4}$. ← numerator

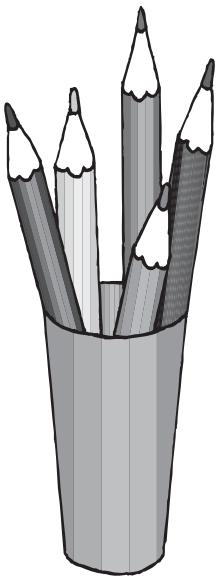
Proper Fraction: In a proper fraction, the numerator is the smaller number and the denominator is the larger number.



Simplest Form:

When a fraction is in its simplest form, the numerator and denominator are the least whole numbers possible.

Example: $\frac{3}{4}$ is the simplest form of $\frac{6}{8}$.



W1 - Lesson 2: Exploring Proper Fractions

Concepts:

- Numerator and Denominator
- Representing Fractions with Pictures
- Equivalent Fractions
- Changing a Fraction to its Simplest Form

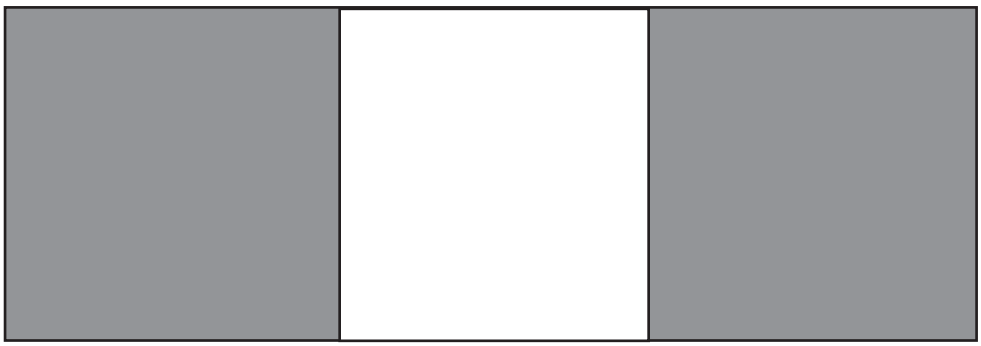
Numerator and Denominator

The **numerator** is the top number. The numerator answers the questions *How many equal parts are left*? or *How many equal parts are being used?*

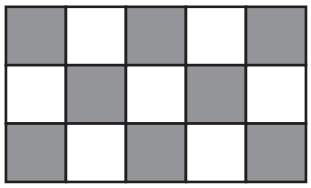
The **denominator** is the bottom number. The denominator answers the question *How many equal parts was it divided into?*

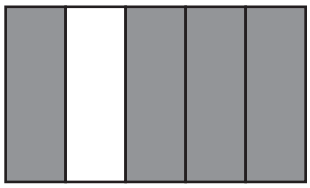
Therefore, $\frac{2}{3}$ means two equal pieces are left or two equal pieces are used, but the item had been divided into three equal parts.

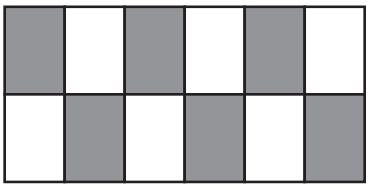
Here are three equal parts, and two parts are coloured grey. Therefore, $\frac{2}{3}$ of the parts are grey.

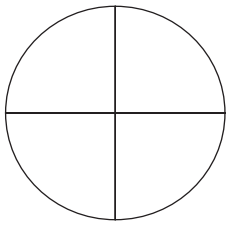


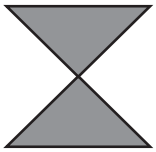
Fill in the missing numerator and denominator for the following questions. The grey parts represent the amount of parts left. Your fraction will show the amount that is grey.

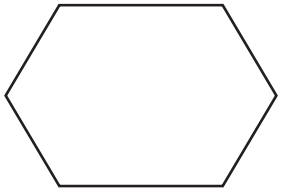






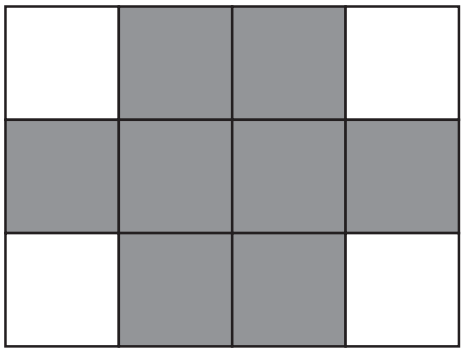






Allan cut an apple into 8 equal parts. He ate 6 pieces. What fraction of the apple does Allan have left?

John finished reading the 4th book of a 5 book series. What fraction of books has John read?



What fraction of squares are grey?

What fraction of squares are white?

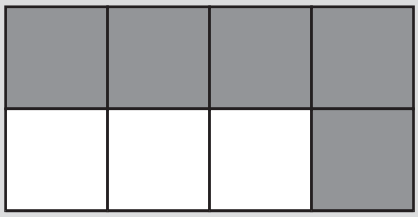
Representing Fractions with Pictures

To understand fractions, we must be able to draw a picture of the fraction, or write a fraction by looking at a picture.

Remember, all fractions must be made up of parts of equal size!

Example: $\frac{5}{8}$ can be shown by

$\frac{5}{8}$ =



Draw pictures for the following fractions.

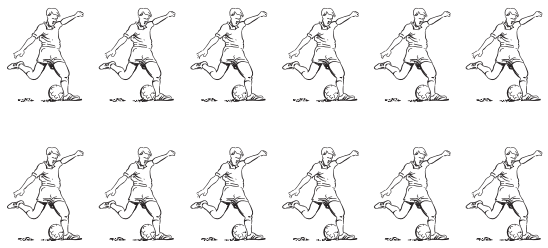
$\frac{3}{10}$	$\frac{6}{12}$
$\frac{5}{5}$	$\frac{2}{6}$
$\frac{1}{2}$	$\frac{2}{8}$
$\frac{8}{10}$	$\frac{1}{3}$

$\frac{3}{4}$	$\frac{9}{12}$

Write a fraction with four as the denominator and one as the numerator.

Jessica made a peach pie. She gave one tenth to her aunt. Draw a picture of the pie with one tenth gone.

Circle $\frac{5}{12}$ of the soccer players.



Draw one set of six faces.

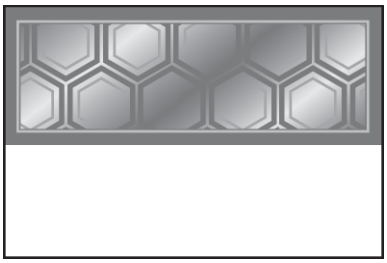
Make $\frac{1}{2}$ of them happy and $\frac{1}{3}$ of them sad.

Equivalent Fractions

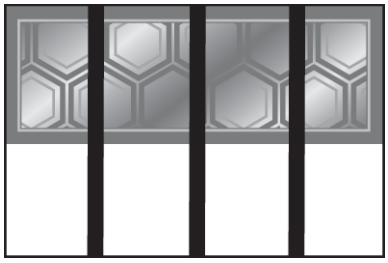
Equivalent fractions are fractions that have the same value.

Example: James and Bertha each had a chocolate bar.

James ate $\frac{1}{2}$ of his bar.



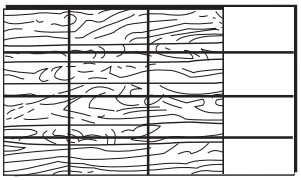
Bertha ate $\frac{4}{8}$ of her bar.



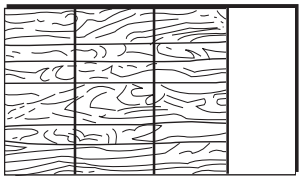
You can see from looking at what is left of each chocolate bar that they each ate the same amount. This is because $\frac{1}{2}$ and $\frac{4}{8}$ are **equivalent fractions**.

Example: Martha and Herbert are painting wood panels for walls in new houses.

Amount Martha has done $\frac{12}{16}$



Herbert has completed $\frac{3}{4}$

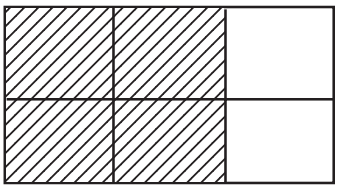


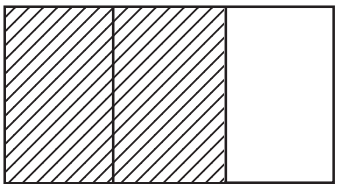
From looking at the amount of each panel that has been completed, you can 'see' that the amount of painting is the same for each person.

So, $\frac{12}{16}$ and $\frac{3}{4}$ are the same amount, so they are **equivalent fractions**.

Changing a Fraction to its Simplest Form

Look at the following diagrams

a. 

b. 

Both shaded areas are the same size. We know that $\frac{4}{6}$ is the same as $\frac{2}{3}$, or we can say that $\frac{4}{6}$ and $\frac{2}{3}$ are **equivalent fractions**.

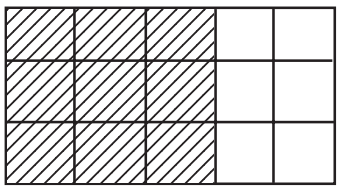
Simplest Terms

Many times we can simplify a fraction and express it in its simplest terms. We do this by finding **numbers** that will divide into both the numerator and the denominator. With $\frac{4}{6}$, we know that 2 will divide evenly into both the numerator and denominator. $\frac{4}{6} \div \frac{2}{2} = \frac{2}{3}$

We can say that $\frac{2}{3}$ is the simplest form of $\frac{4}{6}$.

Examples of Changing Fraction into Simplest Form

$$\frac{9}{15}$$

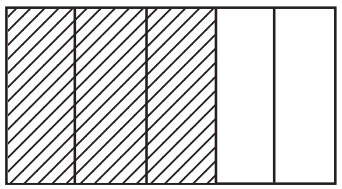


A number that will divide into 9 and 15 is 3.

$$\frac{9}{15} \div \frac{3}{3} = \frac{3}{5}$$

Therefore, $\frac{9}{15}$ in it simplest form is $\frac{3}{5}$.

$\frac{3}{5}$ may be represented by this diagram:



You can see that $\frac{9}{15}$ and $\frac{3}{5}$ are **equivalent fractions**.

Change Each Fraction to its Simplest Form

1. $\frac{2}{4} =$

2. $\frac{8}{12} =$

3. $\frac{5}{20} =$

4. $\frac{4}{12} =$

5. $\frac{7}{21} =$

6. $\frac{18}{24} =$

7. $\frac{14}{28} =$

8. $\frac{9}{12} =$

9. $\frac{8}{16} =$

10. $\frac{16}{20} =$

11. $\frac{11}{22} =$

12. $\frac{5}{40} =$

13. $\frac{15}{35} =$

14. $\frac{10}{30} =$

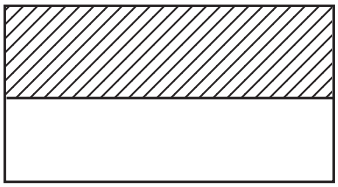
15. $\frac{12}{18} =$

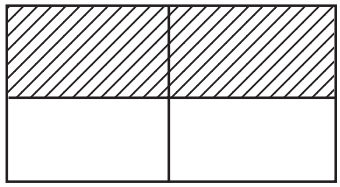
Making Equivalent Fractions

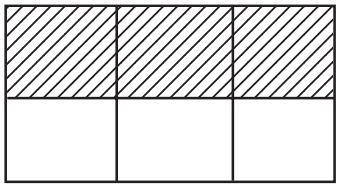
You have learned to simplify fractions. This was done by dividing the numerator and denominator by the same number. You can make **equivalent fractions** by **multiplying** the numerator and denominator by the same number.

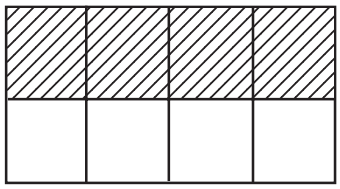
Example 1:

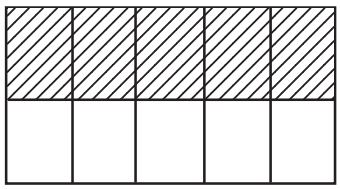
Fraction Diagram

$\frac{1}{2}$ 

$\frac{1}{2} \times \frac{2}{2} = \frac{2}{4}$ 

$\frac{1}{2} \times \frac{3}{3} = \frac{3}{6}$ 

$\frac{1}{2} \times \frac{4}{4} = \frac{4}{8}$ 

$\frac{1}{2} \times \frac{5}{5} = \frac{5}{10}$ 

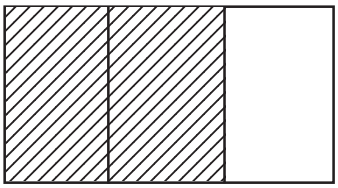
You can see that we have created 4 equivalent fractions that are the same value as $\frac{1}{2}$. They are $\frac{2}{4}, \frac{3}{6}, \frac{4}{8}, \text{and } \frac{5}{10}$.

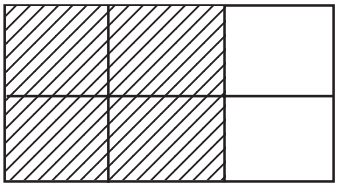
Of course, we could add many more!

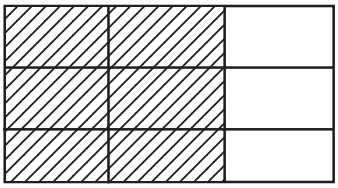
Example 2:

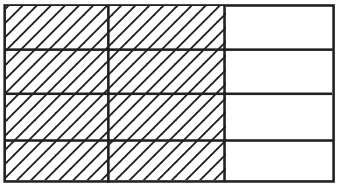
Look at the equivalent fractions we can make from $\frac{2}{3}$

Fraction Diagram

$\frac{2}{3}$ 

$\frac{2}{3} \times \frac{2}{2} = \frac{4}{6}$ 

$\frac{2}{3} \times \frac{3}{3} = \frac{6}{9}$ 

$\frac{2}{3} \times \frac{4}{4} = \frac{8}{12}$ 

We can write $\frac{2}{3} = \frac{4}{6} = \frac{6}{9} = \frac{8}{12}$ because all these fractions are equal. (We call them **equivalent fractions**.)

Example 3:

How many 12ths are equivalent to $\frac{2}{3}$?

Here you are being asked to to find an equivalent fraction. The question could be $\frac{2}{3}=\frac{?}{12}$

Step One - Find the number that the denominator (3) must be multiplied by to make the result of 12

$\frac{2}{3}\times 4=12$ You must multiply 3 by 4 to get 12.

Step Two - After you find the number, use it to multiply the numerator.

$\frac{2}{3}\times\frac{4}{4}=\frac{8}{12}$ Then multiply the numerator by 4. The result is $\frac{8}{12}$

So, we know that $\frac{2}{3}=\frac{8}{12}$. Therefore, these are equivalent fractions.

$\frac{3}{5}=\frac{?}{20}$ $\frac{3}{5}\times 4=\frac{\quad}{20}$ $\frac{3}{5}\times\frac{4}{4}=\frac{12}{20}$

Thus, $\frac{3}{5}=\frac{12}{20}$. These are equivalent fractions.

Example 4:

$\frac{3}{7}=\frac{12}{?}$ $\frac{3}{7}\times\frac{4}{4}=\frac{12}{28}$

Therefore, $\frac{3}{7}=\frac{12}{28}$. These are equivalent fractions.

Complete the following exercise on equivalent fractions.

a. $\frac{2}{9}=\frac{\quad}{18}$ b. $\frac{5}{6}=\frac{\quad}{12}$ c. $\frac{8}{10}=\frac{\quad}{40}$

d. $\frac{9}{10}=\frac{\quad}{100}$ e. $\frac{7}{8}=\frac{\quad}{24}$ f. $\frac{4}{7}=\frac{\quad}{21}$

g. $\frac{3}{8} =$ h. $\frac{5}{7} =$ i. $\frac{6}{7} =$

j. $\frac{4}{8} =$ k. $\frac{4}{14} =$ l. $\frac{3}{8} =$

2. Give two equivalent fractions for each of the following.

a. $\frac{4}{5}$ b. $\frac{2}{9}$

Points to Remember

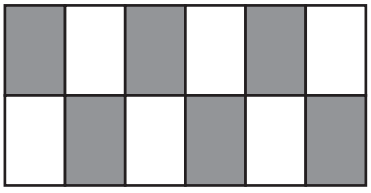
1. **Equivalent fractions** have the same values.

2. When fractions are reduced to their **simplest form**, the original fraction and the fraction in simplest form are equivalent.

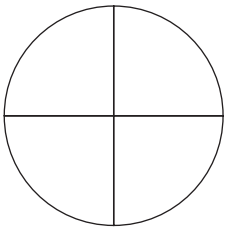
3. Fractions can be written as words, as pictures, or as numbers.

Which fraction of each shape is grey?

a.

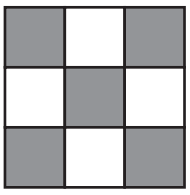


b.



c.

d.



Write these fractions in number form.

1. Five-sixths
2. Four-twelfth
3. Nine-tenths
4. Three-quarters
5. Eleven-thirteenths
6. One-quarter

Write these fractions in word form.

a. $\frac{7}{12}$ _____

b. $\frac{1}{2}$ _____

c. $\frac{2}{16}$ _____

d. Many skateboarders were at the park today. Five skateboarders were able to complete tricks off the ramp. Three skateboarders were just learning. What fraction of skateboarders were able to complete tricks off the ramp?

3-Step Problem-Solving Process

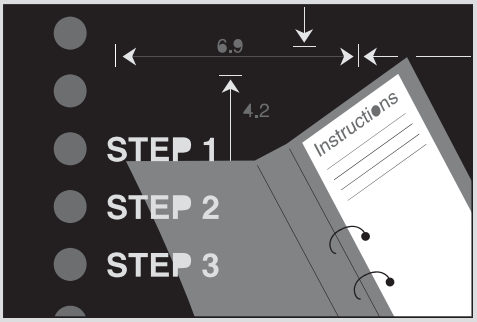
1. Write the problem in a number question.

   $\frac{6}{7} = \frac{?}{?}$

2. Solve the problem. SHOW YOUR WORK!

3. Reduce your fractions to their simplest form where possible.

4. Write a sentence with the answer.



Mary had twenty pieces of candy. Her brother ate five pieces. What fraction of Mary's candy did her brother eat?

About one-third of the students in Mrs. Friesen's class are wearing blue jeans. If Mrs. Friesen has 24 students, how many students are wearing blue jeans?

Joy is sewing buttons on a shirt. She has sewn four of the six buttons on the shirt. What fraction of buttons does she have left to sew?

Shellie baked a dozen muffins. One-quarter were blueberry, one-quarter were banana, and the rest were chocolate chip. What fraction were chocolate chip?

Draw a picture showing a chocolate bar with one-sixth eaten by Mrs. Friesen. What fraction has she eaten, and how much remains to be eaten?

Two-thirds of Mark's soccer team had scrapes and bruises. Draw a picture showing how many students had scrapes and bruises if there were fifteen players on Mark's soccer team.

James wants to share some left-over pizza with his friends. James has two-thirds of his pizza left. If he gives one piece to each of his six friends and this leaves no pieces, how many pieces did the pizza originally have? Use an equivalent fraction to help solve your answer.

John spent an hour with his horse on Saturday. John rode his horse for three-quarters of an hour. The rest of the time he spent brushing his horse. What fraction of time did John spend brushing his horse?