Important Concepts . . .

Preview Review

Mathematics   Grade 7

W1 - Lesson 4:   Fractions, Decimals, and Percents

Important Concepts of Grade 7 Mathematics

Materials Required

Math Set
Calculator

No Textbook Required

This is a stand-alone course.

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
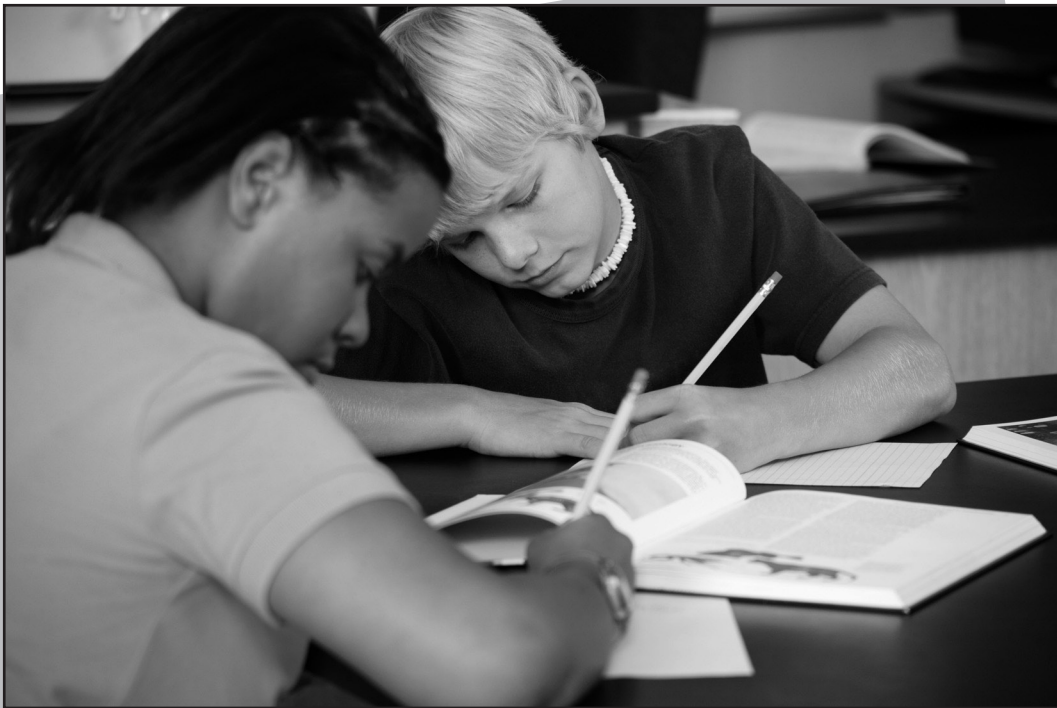# for
Grade Seven Mathematics

W1 – Lesson 4: Fractions, Decimals, and Percents

Objective:

- *I can change an improper fraction to a mixed number and back.*

Mixed number: sum of a whole number and a proper fraction.

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

Improper fraction: when the numerator is greater than the denominator.

Example: $\dfrac{7}{2}$
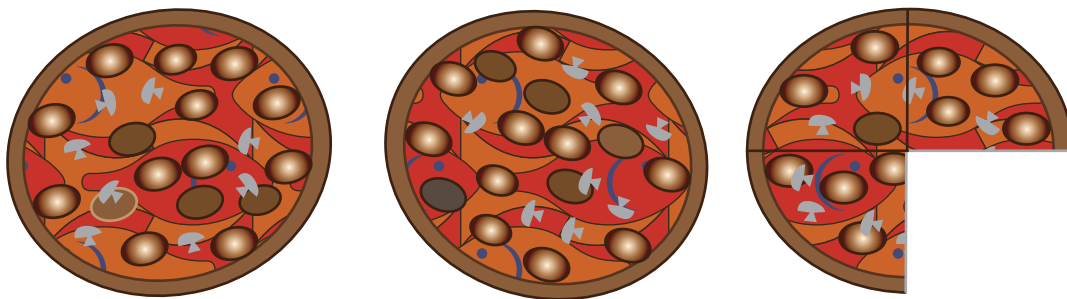
Writing as a mixed number:

Number of whole pizzas: 2

Fraction of remaining pizza: $\dfrac{3}{4}$

The mixed number is written as: $2\dfrac{3}{4}$

Writing as a improper fraction:

Total remaining slices: 11

Number of slices per pizza: 4

The improper fraction then is: $\dfrac{11}{4}$

Converting mixed numbers to improper fractions:

Example: $3\dfrac{1}{4}$

1. Multiply the whole number by the denominator. (3 × 4)

2. Add step 1 to the numerator (12 + 1)

3. Write step 3 as a fraction over the original denominator $\dfrac{13}{4}$

Practice

Express the mixed number as an improper fraction.

a. $2\dfrac{2}{3} =$ b. $3\dfrac{3}{5} =$

c. $1\dfrac{2}{7} =$ d. $6\dfrac{1}{2} =$

e. $2\dfrac{4}{9} =$ f. $3\dfrac{1}{6} =$

Converting improper fractions to mixed numbers:

Example: $\dfrac{13}{3}$

1. Divide the numerator by the denominator (13 ÷ 3)

2. Write step 1 as the whole number and the remainder as a fraction over the original denominator ($4\dfrac{1}{3}$)

Practice

Express the improper fraction as a mixed number.

a. $\dfrac{11}{2} =$ b. $\dfrac{12}{5} =$

c. $\dfrac{23}{7} =$ d. $\dfrac{14}{3} =$

e. $\dfrac{14}{9} =$ f. $\dfrac{15}{6} =$

Objective:

- *I can add and subtract mixed numbers.*

Example 1: $4\dfrac{6}{7} - 2\dfrac{1}{2}$

1. Find a common denominator for the fractions.
2. Subtract the whole numbers.
3. Subtract fractions as usual.

7 and 2 are both factors of **14**.

Change: $\dfrac{6}{7} \longrightarrow \dfrac{12}{14}$

Change: $\dfrac{1}{2} \longrightarrow \dfrac{7}{14}$

Subtract: $4\dfrac{12}{14} - 2\dfrac{7}{14} = 2\dfrac{5}{14}$

Example 2: $1\dfrac{4}{9} + \dfrac{1}{2}$

Common denominator: **18**

Change: $\dfrac{4}{9} \longrightarrow \dfrac{8}{18}$

Change: $\dfrac{1}{2} \longrightarrow \dfrac{9}{18}$

Add: $1\dfrac{8}{18} + \dfrac{9}{18} = 1\dfrac{17}{18}$

Practice:

Solve. Express your answer in lowest terms.

a. $3\dfrac{1}{2} + \dfrac{5}{7} =$

b. $1\dfrac{4}{6} + 5\dfrac{1}{4} =$

c. $5\dfrac{2}{6} + 2\dfrac{1}{2} =$

d. $6\dfrac{1}{2} - 2\dfrac{3}{7} =$

e. $3\dfrac{3}{4} - \dfrac{1}{3} =$

f. $2\dfrac{4}{5} - 1\dfrac{2}{3} =$

Objective:

- *I can convert between fractions and decimal numbers.*

Terminating decimal: a number that is complete after a certain number of digits with no repeats.

Repeating decimal: a decimal number in which a block of one or more digits repeats in a pattern.

Converting fractions and terminating decimals:
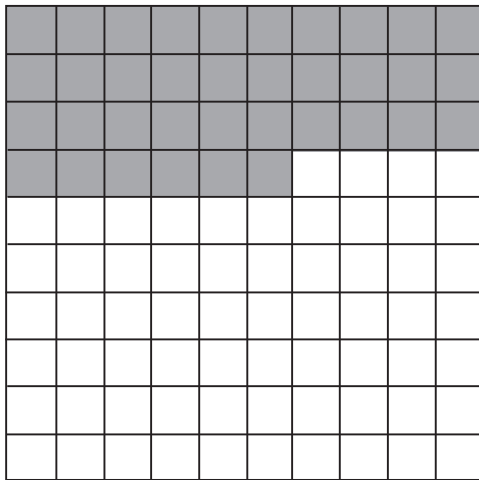
The shaded area of this grid, as a fraction, is: $\dfrac{36}{100}$

The shaded area, written as a decimal, is: 0.36

Fractions with denominators of 10, 100, or 1000 are easy to convert into decimals by using place values.

Examples:

$\dfrac{2}{10} = 0.2$ (tenths place)

$\dfrac{7}{100} = 0.07$ (hundredths)

$\dfrac{4}{1000} = 0.004$ (thousandths)

But consider a fraction like $\dfrac{2}{5}$: What would it look like on a grid?

1. Write 2/5 as a fraction with a denominator of 100: $\dfrac{\rule{1.5em}{0.4pt}}{100}$

2. Shade in the same number of squares as the numerator.

3. Use the place value to determine the decimal: _____

Use your calculator to calculate 2 ÷ 5.
What do you notice?

Example:

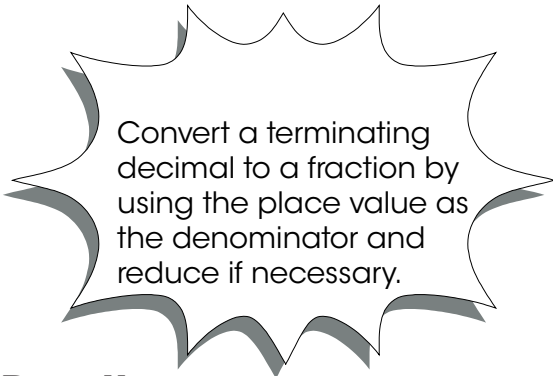Convert a terminating decimal to a fraction by using the place value as the denominator and reduce if necessary.

$$0.25 = \frac{25}{100} = \frac{1}{4}$$

$$0.3 = \frac{3}{10}$$

Practice

Convert the fractions to decimals, and the decimals to fractions.

a. $\dfrac{1}{5} =$

b. $\dfrac{6}{8} =$

c. $\dfrac{3}{20} =$

d. $\dfrac{6}{25} =$

e. $\dfrac{14}{40} =$

f. $\dfrac{9}{24} =$

g. $0.7 =$

h. $0.22 =$

i. $0.12 =$

j. $0.4 =$

k. $0.33 =$

l. $0.54 =$

Converting fractions and repeating decimals:

Bar notation: a method of writing a repeating decimal using a bar above the digits to represent a repeat.

Turn any fraction into a decimal by dividing the numerator by the denominator.

Example 1:

$$\frac{5}{9} = 0.555\ 555\ 555\ 555... \Rightarrow 0.\overline{5}$$

$$\frac{2}{7} = 0.2857142857142857... \Rightarrow 0.\overline{285714}$$

Convert a repeating decimal to a fraction by looking for repeat patterns.
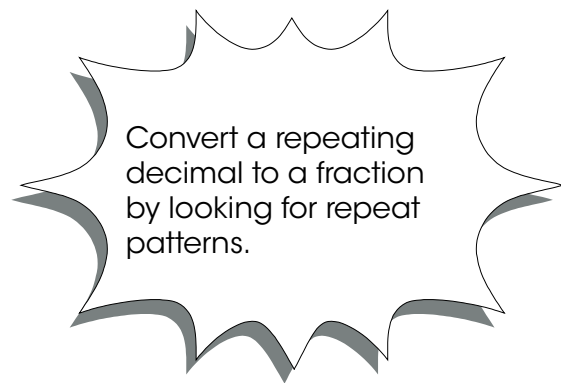
Example 2:

$$\frac{1}{9} = 0.\overline{1}, \quad \frac{2}{9} = 0.\overline{2}, \quad \frac{3}{9} = 0.\overline{3}, \quad \frac{4}{9} = 0.\overline{4}$$

Predict

$$\frac{5}{9} = \underline{\hspace{1cm}}, \quad \frac{6}{9} = \underline{\hspace{1cm}}, \quad \frac{7}{9} = \underline{\hspace{1cm}}$$

Example 3: $\overline{0.27}$

Think: We know 0.3 is $\frac{3}{10}$, so the fraction must be a smaller fraction (smaller numerator or larger denominator) so it may be $\frac{2}{10}$ or $\frac{3}{11}$. Because $\frac{2}{10}$ is non repeating it must be $\frac{3}{11}$

Check: $3 \div 11 = 0.27272727\ldots$

Practice

Convert the fractions to decimals, and the decimals to fractions.

a. $\frac{1}{7} =$

b. $\frac{2}{9} =$

c. $\frac{5}{11} =$

d. $\frac{6}{33} =$
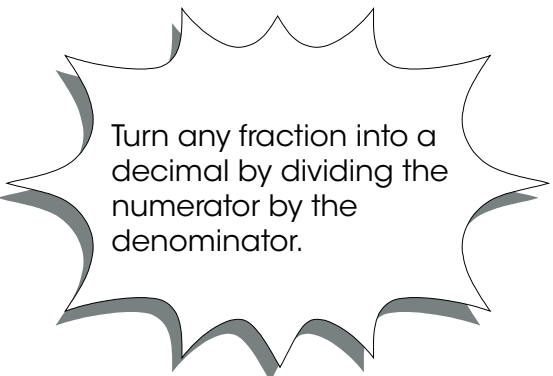
e. $\frac{2}{99} =$

f. $\frac{7}{24} =$

g. $0.\overline{7} =$

h. $0.\overline{72} =$

i. $0.\overline{003} =$

j. $0.\overline{63} =$

k. $0.\overline{28514} =$

l. $0.1\overline{6} =$

Objective:

- *I can express a percent as a decimal number.*

Per cent: means "out of 100"

Convert a percent into a decimal number by dividing by 100.

Examples:

78% = 78 ÷ 100 = 0.78

24% = 24 ÷ 100 = 0.24

Practice

Write the percent as a decimal.

a. 38% =

b. 29% =

c. 2% =

d. 67% =

e. 8% =

Practice

Write the decimal as a percent.

a. 0.281 =

b. 0.458 =

c. 0.894 =

d. 0.676 =

e. 0.073 =

Convert a decimal to a percent by multiplying by 100. Remember to round the answer if necessary.

Examples:

$0.777 = 0.777 \times 100 = 78\%$

$0.542 = 0.542 \times 100 = 54\%$

Objective:

- *I can express a percent as a fraction*

Convert a percent into a fraction by putting the percent as the numerator over a denominator of 100. Simplify.

Example:

$75\% = \frac{75}{100} = \frac{3}{4}$

$35\% = \frac{35}{100} = \frac{7}{20}$

Practice

Write the percent as a fraction.

a. 88% =

b. 27% =

c. 12% =

d. 6% =

e. 48% =

Practice

Write the fraction as a percent.

a. $\frac{25}{62} =$

b. $\frac{34}{53} =$

c. $\frac{19}{20} =$

d. $\frac{7}{85} =$

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

Convert a fraction to a percent by first converting the fraction to a decimal and multiply by 100. Remember to round the answer.

Example: $\frac{28}{36}$

$28 \div 36 = 0.777 \times \mathbf{100} = 78\%$

Converting mixed numbers to improper fractions:
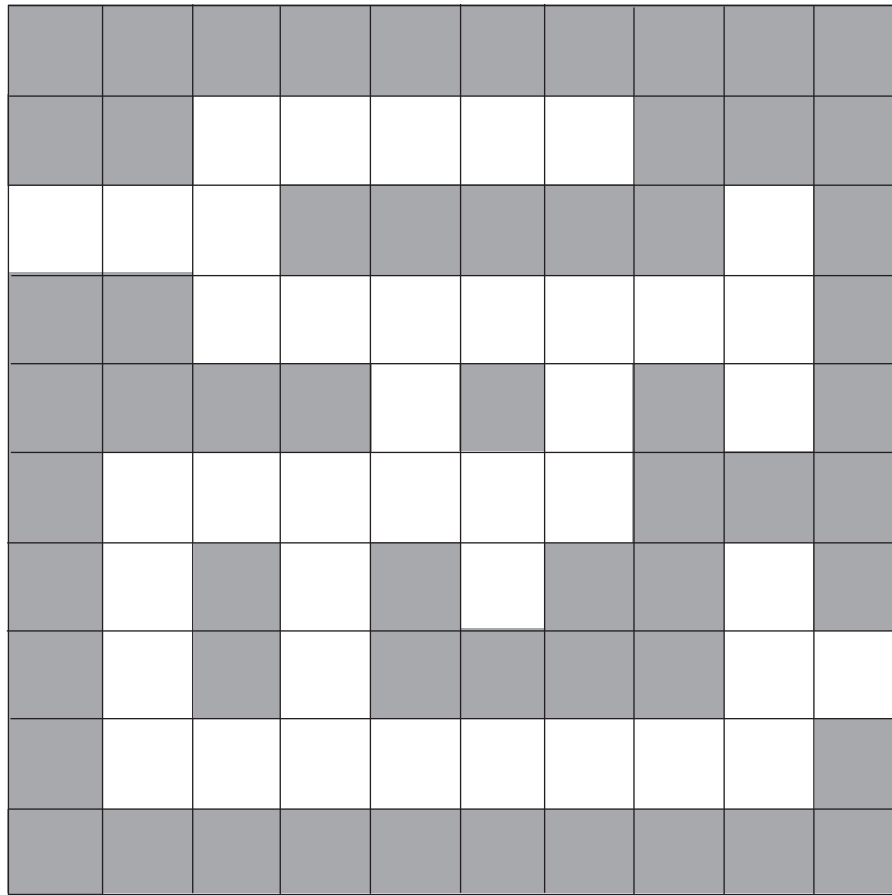
1. How many squares are shaded: _____　　2. How many squares are white: _____

   a. Write as a fraction: _____　　　　　　a. Write as a fraction: _____

   b. Write as a decimal: _____　　　　　　b. Write as a decimal: _____

   c. Write as a percent: _____　　　　　　c. Write as a percent: _____

3. Add the percent of shaded to the percent of white. What do you notice?

   _____

Objective:

- *I can use percents to solve problems.*

Proportion: two equivalent ratios or fractions ($\frac{1}{4}$ is proportional to $\frac{5}{20}$).

Practice

To calculate a percent of a number, multiply the number by the decimal equivalent of the percent.

a. 25% of 44 =

b. 3% of 70 =

c. 29% of 11 =

d. 48% of 63 =

e. 21% of 89 =

Example: 40% of 60

$$= 0.40 \times 60$$

$$= 24$$

Calculating a number from a percent:

Create two proportional fractions to find the missing number.

Example:

25% of ____ = 10 $25\% = \frac{25}{100} = \frac{1}{4}$ $\frac{1}{4} = \frac{10}{?}$ the only answer that will fit in the blank and remain proportional is 40!

Practice

Convert the fractions to decimals, and the decimals to fractions.

a. 12% of _____ = 54   b. 20% of _____ = 45

c. 30% of _____ = 27   d. 4% of _____ = 24

Problem solving with percents:

Example 1:

45% of a class with 20 students is boys. How many girls are there?

Method 1:   45% of 20 = number of boys

$\quad\quad\quad\quad$ $0.45 \times 20 = 9$ boys

$\quad\quad\quad\quad$ 20 students – 9 boys = 11 girls

Method 2:   45% are boys, which means 100% - 45% are girls

$\quad\quad\quad\quad$ = 55% girls

$\quad\quad\quad\quad$ $0.55 \times 20 = 11$ girls

Example 2:

How much would a 15% tip be on a meal costing $48.50?

15% of 48.50 = $0.15 \times 48.50 = \$7.28$

A 15% tip would be $7.28.

Example 3:

35% of a sport shop's income is from hockey equipment. Last year the shop sold $4970 in hockey equipment. What was the shop's total income?

35% of total income = hockey income

$$\frac{35}{100} = \frac{4970}{?} \quad\quad\quad \frac{7}{20} = \frac{4970}{?} \quad\quad 4970 \div 7 = 710 \quad\quad 20 \times 710 = \$14\ 200$$
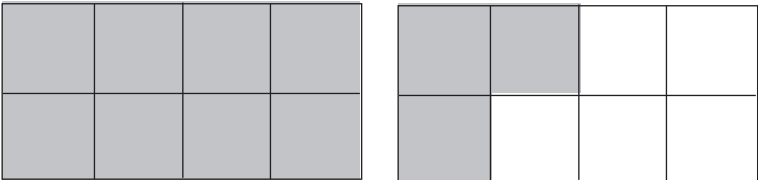
The shop made $14 200 last year.

Practice

Solve the word problem.

a. Steven got $\dfrac{14}{20}$ on a science test and $\dfrac{36}{50}$ on a math test. On which test did he score a higher mark?

b. 18 adults and 30 children go on a field trip. What percent of the group are children?

c. A pair of jeans advertised for $34.97 is 35% off. What is the sale price of the jeans?

d. Calculate the total price of a CD for $9.65, plus 5% tax.

Summary and Practice:

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

1. Complete the chart.

Mixed number	Improper fraction	Model
$2\dfrac{1}{6}$		
	$\dfrac{26}{3}$	

2. Solve.

a. $1\dfrac{2}{5} + 4\dfrac{1}{2} =$

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

c. $5\dfrac{4}{5} - 1\dfrac{2}{3} =$

d. $9\dfrac{5}{6} - 2\dfrac{1}{4} =$

3. Convert the fractions to decimals. Decide if the fractions are >, <, or =.

a. $\dfrac{9}{11}$ $\dfrac{8}{14}$

b. $\dfrac{3}{13}$ $\dfrac{10}{17}$

4. Complete the table.

	Fraction	Decimal	Percent
a.	$\dfrac{11}{25}$		
b.		0.23	
c.			63%
d.			48%
e.		0.06	
f.	$\dfrac{3}{9}$		

5. Laura's curling team won 9 of 17 games. What percent of the games did her team win?

6. A bag of jelly beans has 32% cherry flavoured, 45% lemon, and the rest are grape flavoured. What percent of the jelly beans are grape flavoured?

7. Bob mixes a punch with 3 parts ginger ale and 5 parts fruit juice. What percentage of the punch is ginger ale?

8. Jessica and Nelly both earn commission (a percent of any sales they make) at a computer store. Last month Jessica earned $825 on sales of $5500 and Nelly earned $800 on $5100 sales. Who has the better commission percent?

9. A drum set usually costs $548.00. A set is on sale at Drummers Dream for 40% off. Drum Discounters offers the same set at 20% off, plus a further 20% off the discounted price. Which store would have the lowest price?