

Important Concepts . . .

Preview Review



Mathematics Grade 6 TEACHER KEY

**W1 - Lesson 5: Number Operations
with Decimals**

Important Concepts of Grade 6 Mathematics

W1 - Lesson 1	Basic Facts, Basic Operations, and Integers
W1 - Lesson 2	Place Value, Whole Numbers, Decimals, and Common Fractions
W1 - Lesson 3	Improper Fractions and Mixed Numbers
W1 - Lesson 4	Ratios and Percents
W1 - Lesson 5	Number Operations with Decimals
W1 - Quiz	
W2 - Lesson 1	Factors, Multiples, and Prime Factorizations
W2 - Lesson 2	Metric Measurement
W2 - Lesson 3	Perimeter and Area
W2 - Lesson 4	Surface Area and Volume
W2 - Lesson 5	Working with Angles and Drawing Objects and Shapes
W2 - Quiz	
W3 - Lesson 1	Transformations
W3 - Lesson 2	Bar Graphs, Line Graphs, and Circle Graphs
W3 - Lesson 3	Collecting and Analyzing Data
W3 - Lesson 4	Number Patterns, Magic Squares, and Problem Solving
W3 - Lesson 5	Probability and Outcomes
W3 - Quiz	

Materials Required: A textbook is not needed. This is a stand-alone course.

Mathematics Grade 6

Version 5

Preview/Review W1 - Lesson 5 TEACHER KEY

Publisher: Alberta Distance Learning Centre

Author: Elgin Pawlak

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.

ALL RIGHTS RESERVED

Copyright © 2007, by Alberta Distance Learning Centre, 4601-63 Avenue, Barrhead, Alberta, Canada, T7N 1P4. Additional copies may be obtained from Alberta Distance Learning Centre.

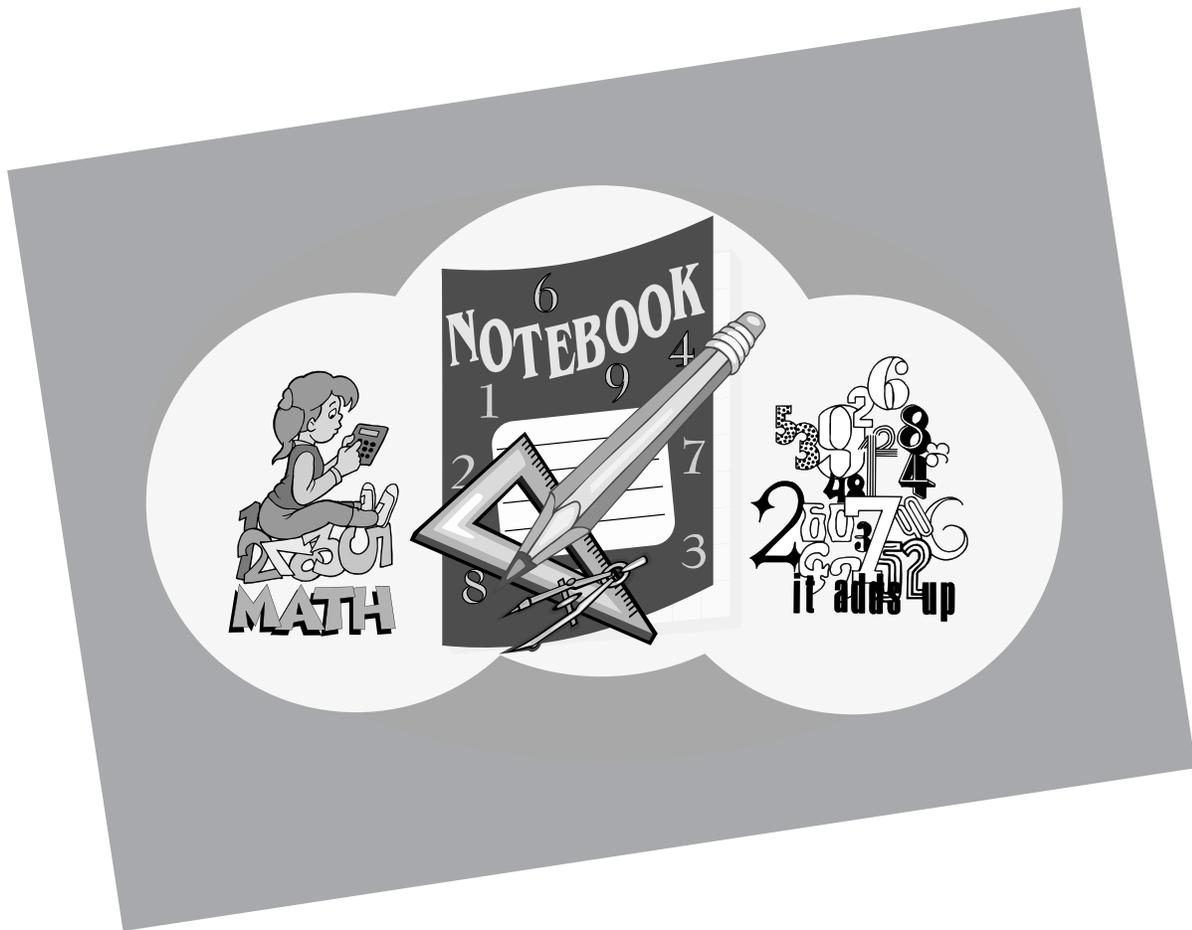
No part of this courseware may be reproduced or transmitted in any form, electronic or mechanical, including photocopying (unless otherwise indicated), recording, or any information storage and retrieval system, without the written permission of Alberta Distance Learning Centre.

Every effort has been made both to provide proper acknowledgement of the original source and to comply with copyright law. If cases are identified where this effort has been unsuccessful, please notify Alberta Distance Learning Centre so that appropriate corrective action can be taken.

IT IS STRICTLY PROHIBITED TO COPY ANY PART OF THESE MATERIALS UNDER THE TERMS OF A LICENCE FROM A COLLECTIVE OR A LICENSING BODY.

Preview/Review Concepts for Grade Six Mathematics

TEACHER KEY



***W1 - Lesson 5:
Number Operations
with Decimals***

OBJECTIVES

By the end of this lesson, you should

- understand the purpose of the decimal point in a number
- add and subtract numbers that have decimal points
- multiply and divide numbers that have decimal points

GLOSSARY

decimal point - separates the whole numbers from the numbers that are less than one

difference - the answer in subtraction

factors - numbers used to form a product

product - the answer in multiplication

quotient - the answer in division

sum - the answer in addition

W1 - Lesson 5: Number Operations with Decimals

Welcome to W1 - Lesson 5! In this lesson you will be doing basic calculations (addition, subtraction, multiplication and division) with decimals. After practicing your skills in the four basic operations, you will be applying your knowledge of decimals in problem solving situations. Most errors committed when working with decimals are in the actual placing of the decimal point. **Remember:** *Check your work to ensure that you are placing the decimal point in the correct position.*

Addition and Subtraction With Decimals

The **decimal point** separates the whole numbers from the numbers that are less than one. The decimal point is located between the ones place value location and the tenths place value location.

When writing numbers in columns to do addition and subtraction, be sure that the **decimals are lined up in a straight vertical line**. Line up the decimals and place the decimal point in your answer before you begin calculations. You may also want to insert zeroes in empty place value locations.

Examples:	$\begin{array}{r} 24.73 \\ + 674.9 \\ \hline \end{array}$	$\begin{array}{r} 24.73 \\ + 674.90 \\ \hline \end{array}$
------------------	---	--

Line up the decimals and put the decimal points in the answers.

Insert place holder zeroes. In subtraction, this is necessary.

$\begin{array}{r} 761.4 \\ - 348.66 \\ \hline \end{array}$	$\begin{array}{r} 761.40 \\ - 348.66 \\ \hline \end{array}$
--	---

Sum - the answer in addition.

Difference - the answer in subtraction.

Questions

1. Calculate the answers. Place the decimal point in the answer before you begin calculations:

$$\begin{array}{r}
 345.6 \\
 56.78 \\
 623.01 \\
 + 129.862 \\
 \hline
 \mathbf{1\ 155.252}
 \end{array}$$

$$\begin{array}{r}
 445.98 \\
 268. \\
 78.3 \\
 + 565.765 \\
 \hline
 \mathbf{1\ 358.045}
 \end{array}$$

$$\begin{array}{r}
 78.84 \\
 - 19.06 \\
 \hline
 \mathbf{59.78}
 \end{array}$$

$$\begin{array}{r}
 0.368 \\
 - 0.2947 \\
 \hline
 \mathbf{0.0733}
 \end{array}$$

2. In the space provided below, write the following addition questions in vertical columns and find the sums. Remember to keep the decimal points in vertical straight lines. Place the decimal point in the answer before you begin calculations.

a. $23.45 + 123.8 + 98.65 + 34.665 =$

$$\begin{array}{r}
 23.45 \\
 123.80 \\
 98.65 \\
 + 34.665 \\
 \hline
 \mathbf{280.565}
 \end{array}$$

b. $98.076 + 6.657 + 543.5 + 102.345 =$

$$\begin{array}{r}
 98.076 \\
 6.657 \\
 543.5 \\
 + 102.345 \\
 \hline
 \mathbf{750.578}
 \end{array}$$

c. $0.639 + 654.2 + 34.561 + 79.949 =$

$$\begin{array}{r} 0.639 \\ 654.2 \\ 34.561 \\ + 79.949 \\ \hline 769.349 \end{array}$$

d. $456.12 + 5.3 + 99.66 + 37.835 =$

$$\begin{array}{r} 456.12 \\ 5.3 \\ 99.66 \\ + 37.835 \\ \hline 598.915 \end{array}$$



3. In the space provided below, write the following subtraction questions in vertical columns and find the differences. Remember to keep the decimal points in vertical straight lines. In subtraction, inserting place-holder zeroes is very important. Place the decimal point in the answer before you begin calculations.

a. $387.56 - 287.62 =$

$$\begin{array}{r} 387.56 \\ - 287.62 \\ \hline 99.94 \end{array}$$

b. $6708.3 - 836.67 =$

$$\begin{array}{r} 6708.30 \\ - 836.67 \\ \hline 5871.63 \end{array}$$

c. $56.789 - 49.78 =$

$$\begin{array}{r} 56.789 \\ - 49.78 \\ \hline 7.009 \end{array}$$

d. $882.34 - 97.184 =$

$$\begin{array}{r} 882.340 \\ - 97.184 \\ \hline 785.156 \end{array}$$

e. $123.903 - 98.98 =$

$$\begin{array}{r} 123.903 \\ - 98.98 \\ \hline 24.923 \end{array}$$

4. Charlie has a summer job working with a landscaping company. He made a list of items he wants to buy when he gets paid: blue jeans \$69.90, wristwatch \$83.50, running shoes \$109.95, CDs \$24.95 each, shorts \$14.99 and T-shirts \$21.69. Use the space below to do your calculations.

a. Charlie purchased the following items: 2 T-shirts, 2 pair of shorts, 4 CDs and one of each of the other items. Calculate how much money he spent.

$$\begin{array}{r}
 \$21.69 \\
 \$21.69 \\
 \$14.99 \\
 \$14.99 \\
 \$24.95 \\
 \$24.95 \\
 \$24.95 \\
 \$24.95 \\
 \$69.90 \\
 \$83.50 \\
 + \$109.95 \\
 \hline
 \$436.51
 \end{array}$$



The cost of all the items is \$436.51.

b. Charlie paid the clerk six \$50.00 bills and seven \$20.00 bills. How much change did he get back?

$$\begin{array}{r}
 \$50.00 \\
 \times \quad 6 \\
 \hline
 \$300.00
 \end{array}
 +
 \begin{array}{r}
 \$20.00 \\
 \times \quad 7 \\
 \hline
 \$140.00
 \end{array}
 =
 \begin{array}{r}
 440.00 \\
 - 436.51 \\
 \hline
 \$3.49
 \end{array}
 \text{ is the change.}$$



5. Use the following table to answer the questions below.

Name	Height (cm)	Weight (kg)	Age (Days)
Anthony	151.91	45.0	4015
Elizabeth	139.83	36.781	4137
Jackie	157.26	54.63	4311
Wilbur	161.42	39.07	4218

a. Calculate the total weight of the 4 students.

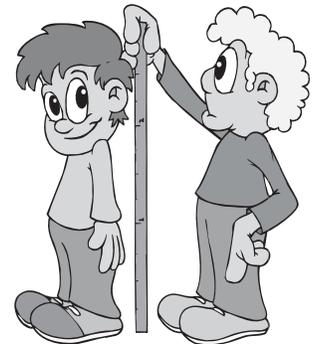
$$\begin{array}{r}
 45.0 \\
 36.781 \\
 54.63 \\
 + 39.07 \\
 \hline
 175.481
 \end{array}$$

Total weight of the students is 175.5 kg.

b. Calculate the total height of the 4 students.

$$\begin{array}{r}
 151.91 \\
 139.83 \\
 157.26 \\
 + 161.42 \\
 \hline
 610.42
 \end{array}$$

Total height of the students is 610.42 cm.



c. Calculate how much taller Wilbur is than Elizabeth.

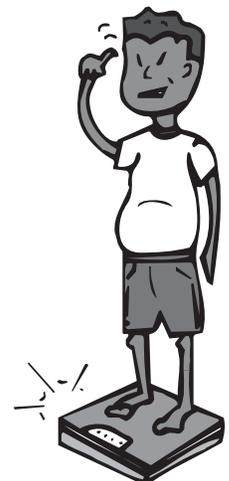
$$\begin{array}{r}
 161.42 \\
 - 139.83 \\
 \hline
 21.59 \text{ cm}
 \end{array}$$

d. How many days older than Elizabeth is Wilbur?

$$\begin{array}{r}
 4218 \\
 - 4137 \\
 \hline
 81 \text{ days older}
 \end{array}$$

e. Calculate how much lighter Anthony is than Jackie.

$$\begin{array}{r}
 54.63 \\
 - 45.0 \\
 \hline
 9.63 \text{ kg lighter}
 \end{array}$$



Multiplying with Decimals

Terms used in Multiplication -

$$\begin{array}{r}
 24 \quad \leftarrow \text{multiplicand} \\
 \times 35 \quad \leftarrow \text{multiplier} \\
 \hline
 120 \\
 720 \\
 \hline
 840 \quad \leftarrow \text{product}
 \end{array}$$

The multiplicand and multiplier are also known as **factors**.

Product - the answer in multiplication.

Multiplying with decimals is the same as multiplying without decimals; you just need to **place the decimal point in the correct location**. Once you have completed the multiplication, you must carefully decide where to place the decimal point. Count the number of digits to the right of the decimal point (called decimal places) in the multiplicand and the multiplier. Then, give the product the same number of decimal places.

$$\begin{array}{r}
 25 \quad \leftarrow 0 \text{ decimal places} \\
 \times 2.4 \quad \leftarrow 1 \text{ decimal place} \\
 \hline
 100 \\
 500 \\
 \hline
 60.0 \quad \leftarrow 1 \text{ decimal place in the answer}
 \end{array}$$

A total of one decimal place is in the multiplicand and multiplier. Therefore, we must have one decimal place in the product.

$$\begin{array}{r}
 0.32 \quad \leftarrow 2 \text{ decimal places} \\
 \times 4.1 \quad \leftarrow 1 \text{ decimal place} \\
 \hline
 32 \\
 1280 \\
 \hline
 1.312 \quad \leftarrow 3 \text{ decimal places}
 \end{array}$$

A total of 3 decimal places is in the multiplicand and multiplier. Therefore, we must have 3 decimal places in the product.

Questions

1. In the space provided below, write the questions in vertical columns and calculate the answers. Remember to count the number of decimal places in the multiplicand and multiplier to have the total number in the product.

a. $3.5 \times 42 = 147$

$$\begin{array}{r} 42 \\ \times 3.5 \\ \hline 210 \\ 1260 \\ \hline 147.0 \end{array}$$

b. $6.7 \times 3.9 = 26.13$

$$\begin{array}{r} 6.7 \\ \times 3.9 \\ \hline 603 \\ 2010 \\ \hline 26.13 \end{array}$$

c. $0.69 \times 0.85 = 0.5865$

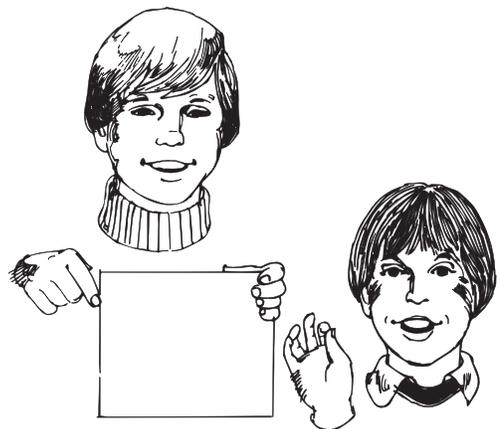
$$\begin{array}{r} 0.69 \\ \times 0.85 \\ \hline 345 \\ 5520 \\ \hline .5865 \end{array}$$

d. $0.78 \times 8.2 = 6.396$

$$\begin{array}{r} 0.78 \\ \times 8.2 \\ \hline 156 \\ 6240 \\ \hline 6.396 \end{array}$$

e. $295 \times 0.145 = 42.775$

$$\begin{array}{r} 295 \\ \times 0.145 \\ \hline 1475 \\ 11800 \\ 29500 \\ \hline 42.775 \end{array}$$



2. The 10th place finisher in a pro golf tournament wins \$17 281.50. The 2nd place winner makes 8 times this amount. How much money does the 2nd place winner receive?

$$\begin{array}{r} \$17281.50 \\ \times \quad 8 \\ \hline \$138252.00 \end{array}$$

The second place winner receives \$138 252.00.

3. A certain racing bicycle wheel travels 2.68 metres in one rotation. In one race, the rider averaged 36 rotations every minute. At this speed, how far did the bicycle travel in 15 minutes?



$$\begin{array}{r} 2.68 \\ \times 36 \\ \hline 1608 \\ 8040 \\ \hline 96.48 \end{array} \qquad \begin{array}{r} 96.48 \\ \times 15 \\ \hline 48240 \\ 96480 \\ \hline 1447.20 \end{array}$$

The bicycle travelled 1 447.20 m.

4. Crystal has \$27.85 and Suhail has \$34.65. Amber has 8.5 times more money than Crystal and Suhail combined. How much money does Amber have?

$$\begin{array}{r} \$27.85 \\ + \$34.65 \\ \hline \$62.50 \end{array} \qquad \begin{array}{r} \$62.50 \\ \times 8.5 \\ \hline 31250 \\ 50000 \\ \hline \$531.25 \end{array}$$

Amber has \$531.25.

Questions

1. In the space provided below answer the following questions by calculating the answers. If the divisor has one-decimal-place, multiply both the divisor and dividend by 10. If the divisor has two-decimal-places, multiply both the divisor and dividend by 100. Check that the decimal is in the correct position in the quotient.

a. $5.76 \div 8 = 0.72$

$$\begin{array}{r} 0.72 \\ 8 \overline{)5.76} \\ \underline{56} \\ 16 \\ \underline{16} \\ 0 \end{array}$$

b. $10.20 \div 12 = 0.85$

$$\begin{array}{r} 0.85 \\ 12 \overline{)10.20} \\ \underline{96} \\ 60 \\ \underline{60} \\ 0 \end{array}$$

c. $8.954 \div 1.1 = 8.14$

$$1.1 \overline{)8.954} = 11 \overline{)89.54}$$

$$\begin{array}{r} 8.14 \\ 11 \overline{)89.54} \\ \underline{88} \\ 15 \\ \underline{11} \\ 44 \\ \underline{44} \\ 0 \end{array}$$

d. $17.25 \div 0.25 = 69$

$$0.25 \overline{)17.25} = 25 \overline{)1725}$$

$$\begin{array}{r} 69 \\ 25 \overline{)1725} \\ \underline{150} \\ 225 \\ \underline{225} \\ 0 \end{array}$$

e. $93.72 \div 22 = 4.26$

$$\begin{array}{r} 4.26 \\ 22 \overline{)93.72} \\ \underline{88} \\ 57 \\ \underline{44} \\ 132 \\ \underline{132} \\ 0 \end{array}$$



2. A row of tiles is 1200 centimetres long. If each tile is 2.5 centimetres long, how many tiles are needed to complete the row?

$$2.5 \overline{)1200} = 25 \overline{)12000}$$

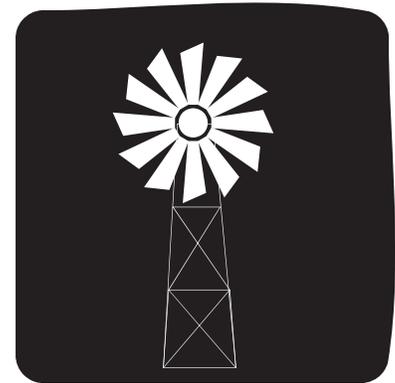
$$\begin{array}{r} 480 \\ 25 \overline{)12000} \\ \underline{100} \\ 200 \\ \underline{200} \\ 0 \end{array}$$

480 tiles are needed.

3. West Edmonton Mall requires 3 037.5 kilowatts of electricity every day. If one wind turbine can supply 22.5 kilowatts of electricity per day, how many wind turbines are required to produce enough electricity for the large mall?

$$22.5 \overline{)3037.5} = 225 \overline{)30375}$$

$$\begin{array}{r} 135 \\ 225 \overline{)30375} \\ \underline{225} \\ 787 \\ \underline{675} \\ 1125 \\ \underline{1125} \\ 0 \end{array}$$



135 wind turbines are required.

4. A cross-country relay race is 172.8 kilometres long. Each runner on a team must run 10.8 kilometres. How many runners are needed for each team?

$$10.8 \overline{)172.8} = 108 \overline{)1728}$$

$$\begin{array}{r} 16 \\ 108 \overline{)1728} \\ \underline{108} \\ 648 \\ \underline{648} \\ 0 \end{array}$$

16 runners are needed.

Homework Assignment

1. Calculate the answers to the following questions. Each statement needs a correct number in the blank to make it a true statement.

Example: $[(6 + 1) \times 3] - \underline{\hspace{2cm}} = 6$

Calculate the $(6 + 1)$ first: the answer is 7

Calculate the $[(6 + 1) \times 3]$ second: the answer is $7 \times 3 = 21$

Then, figure out the answer: $21 - \underline{\hspace{2cm}} = 6$

The answer is **15** because **$21 - 15 = 6$**

a. $[(4.2 + 7.6) \times 2] - \underline{\mathbf{6.2}} = 17.4$

b. $[(9.9 \div 3) + 2.7] \times \underline{\mathbf{0.5}} = 3.0$

c. $(25.16 - 4.28 - 16.3) + \underline{\mathbf{5.25}} = 9.83$

d. $(70.14 + 8.1 + 121.12) \div \underline{\mathbf{3.2}} = 62.3$

Self-Evaluation

Ask yourself some important questions. Write your answers in sentences for your teacher.

1. In this lesson, what part of your work was **excellent**?

2. In this lesson, what part of your work **needs improvement**?

3. If you want help for some of the work in this lesson, ask your teacher in this space.
