

Important Concepts . . .

Preview Review



Mathematics Grade 5 TEACHER KEY

**W2 - Lesson 3: Estimating and
Taking Measurements**

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 W2 - Lesson 3 TEACHER KEY

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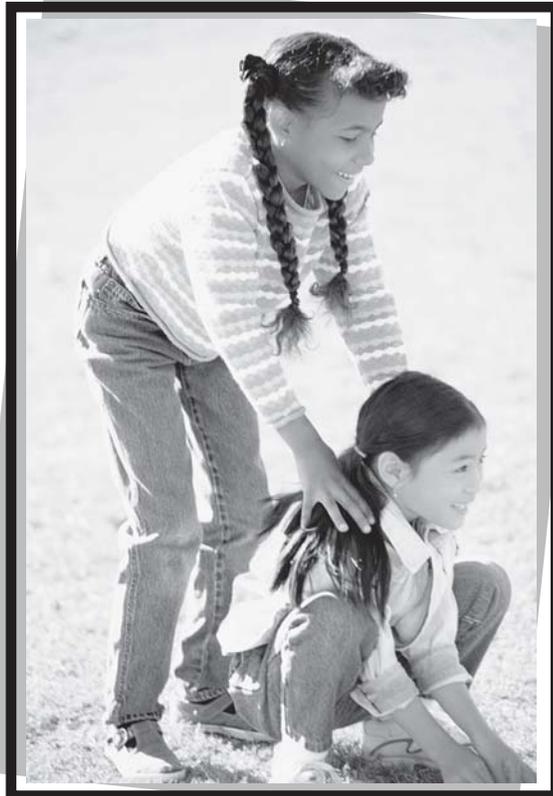
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Preview/Review Concepts for Grade Five Mathematics

TEACHER KEY



*W2 - Lesson 3:
Estimating and Taking
Measurements*

OBJECTIVES

By the end of this lesson, you should

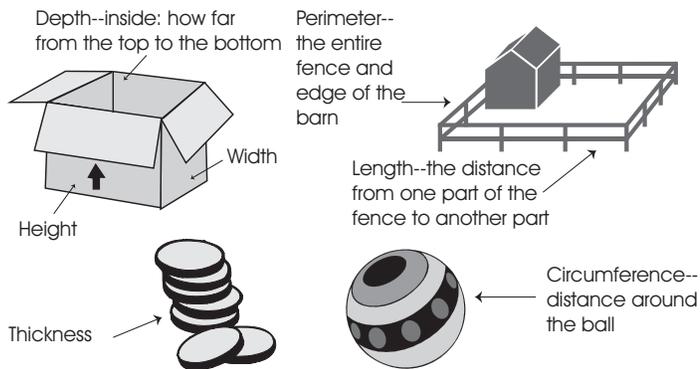
- understand the concepts of measurement including length, width, height, depth, thickness, perimeter, and circumference
- both estimate and measure various items
- use a three-step problem-solving process

Glossary of Terms

Circumference: The perimeter (distance around) of a circle or a round object is the circumference.

Depth: Measurement of the distance from top to bottom or height of an object is its depth. (3-D measurement)

Estimate: An estimate is the best *educated* guess. In this unit, you will be estimating various measurements.



Height: Height is the measurement of *how high* an object is.

Length: Measured in units such as mm, cm, and km, length is often thought of as a measurement of distance or the measurement of *how long* an object is.



Perimeter:

Perimeter is the outside measurement or *distance around* an object. Often people use the image of a fence around a yard to remember perimeter.



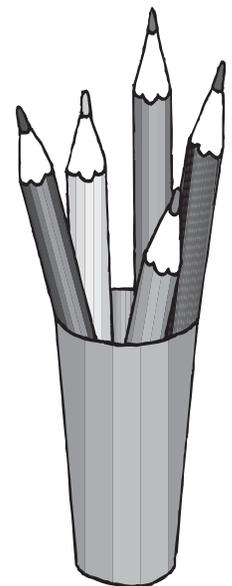
Thickness:

Thickness is the measurement between opposite sides of an object (3-D measurement).



Width:

Width is the measurement between opposite sides of an object.

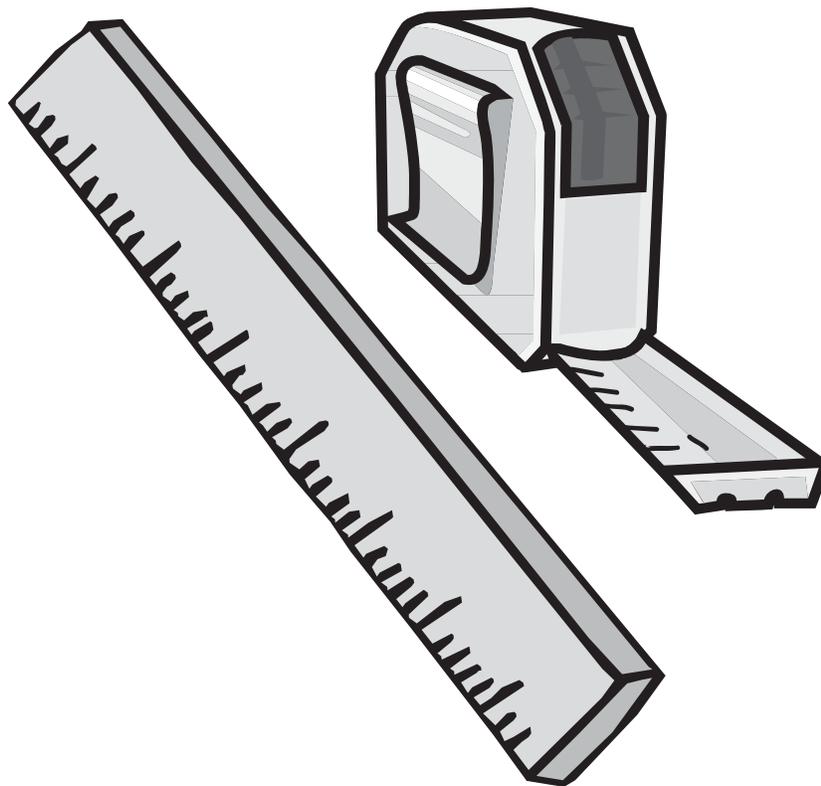


W2 - Lesson 3: Estimating and Taking Measurements

Concepts:

- Length, Width, Height, Depth, Thickness, Perimeter, and Circumference
- Choosing the Best Unit of Measurement
- Estimate and Measure Items in the Room

You need a ruler and measuring tape to complete this lesson.



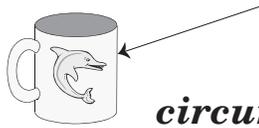
Length, Width, Height, Depth, Thickness, Perimeter, and Circumference

Half the success of taking measurements is knowing **what** to measure! Use the following terms from the glossary to show what needs to be measured.

circumference	thickness	perimeter
length	depth	width
		height

1. Each term can be used more than once.

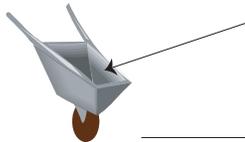
a.



circumference

Hint: the distance around the cup

c.



depth

Hint: how far down inside the wheelbarrow

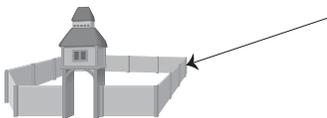
e.



thickness or length

Hint: how big is the hose

g.



perimeter

Hint: the distance around the outside of the wall

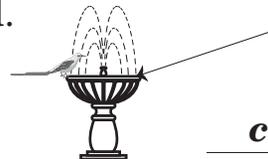
b.



width or length

Hint: the side of the barn

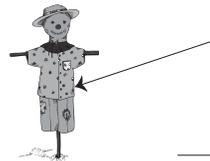
d.



thickness or circumference

Hint: the ledge that the bird is standing on

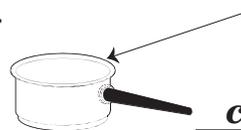
f.



height

Hint: how tall is the scarecrow

h.



circumference

Hint: the distance around the pot

2. Name 3 things that you would measure using millimetres as the units. *Answers will vary, but they must be realistic.*

a. - thickness of a dime

b. - length of a small insect

c. - amount of rainfall

3. Name 3 things that you would measure using centimetres. *Answers will vary, but they must be realistic.*

a. - height of a dog

b. - length of a pencil

c. - width of a picture frame

4. Name 3 things that you would measure using metres. *Answers will vary, but they must be realistic.*

a. - length of a garden

b. - height of a person

c. - long jump

5. Use the chart on the next page to find answers for the following.

a. How many mm are in 1 cm? 10 mm

b. How many cm are in 1 m? 100 cm

c. How many mm are in 1 km? 1 000 000 mm

Choosing the Best Unit of Measurement

Metric Units for Length

mm, cm, dm, m,
dam, hm, km

millimetres
centimetres
decimetres
metres
decametres
hectometres
kilometres

Units can be compared as follows:

kilometres - Km	hectometres - hm	decametres - dam	metres - m	decimetres - dm	centimetres - cm	millimetres - mm
1 000 m	100 m	10 m	1 m	0.1 m	0.01 m	0.001 m

Each unit is best for measuring a particular **length**. For instance, marathons are measured in kilometres, but pencil leads are measured in mm.

Therefore 1 km = 1 000 m
and 1 000 mm = 1 m

1. Which unit would you use to measure the following? km \longleftrightarrow mm

- a.  metres
a garden hose
- c.  metres
or
centimetres
length of a shovel
- e.  metres
or
centimetres
tape measure

- b.  centimetres
or
millimetres
bricks
- d.  centimetres
or
millimetres
screws
- f.  millimetres
or
centimetres
wrench (the amount the mouth can slide open)

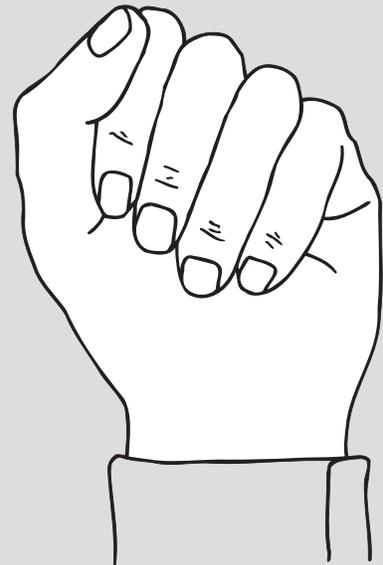
2. Which units would you use to measure the following:

- the distance between cities *kilometres*
- the distance to the moon *kilometres*
- the distance between houses on a city street *metres*

Estimate and Measure Items in the Room

How do I estimate?

- Before you can **estimate**, you must know approximately the size of each unit. The easiest way to do this is to measure yourself. For example, how wide is your fingernail? How long is each of your steps as you walk?
- Guess: The easiest way to estimate is to imagine that you are measuring the object with an imaginary stick. For example, if you need to estimate the length of a wall, you first familiarize yourself with the length of a metre. Next, you start at one end of the wall and mark off one metre just like you would do if you had a metre stick. Continue moving your imaginary metre stick along the wall just as you would a real metre stick.



3. Determining some body measurement is a good starting point.
 Measure the following with a friend:

Answers will vary (approx only given)

a. Length of index finger **9 cm**

b. Width of index fingernail **1 cm**

c. Hand span (tip of thumb to end of pinky while hand is spread as wide as possible) **20 cm**

d. Length from elbow to tip of fingers **33.5 cm**

e. Height from floor to waist **100 cm (1 metre)**

f. Height from floor to chin **154 cm**

g. Width of normal walking pace **80 cm**

h. Length from shoulder to fingertip **70 cm**



Estimate the following items in your classroom.

Answers will vary with circumstances

- a. width of your desk 1 m
- b. height of the classroom door 2.3 m
- c. length of this page 27 cm
- d. perimeter of your desk top 180 cm
- e. length of your ruler 30 cm
- f. circumference of your pencil 2.5 cm
- g. depth of the bookshelf 30 cm
- h. length of the chalkboard 4 m

Measure the following items in your classroom.

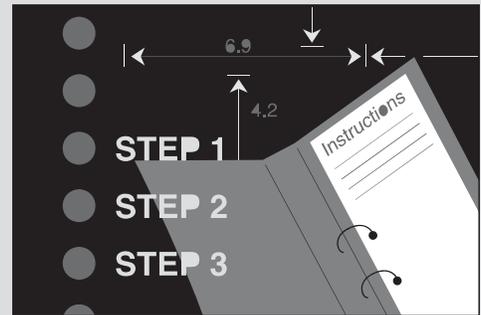
Answers will vary (accept reasonable)

- a. width of your desk _____
- b. height of your desk _____
- c. length of this page _____
- d. perimeter of your desk top _____
- e. length of your ruler _____
- f. circumference of your pencil _____
- g. width of the classroom _____
- h. thickness of your desktop _____

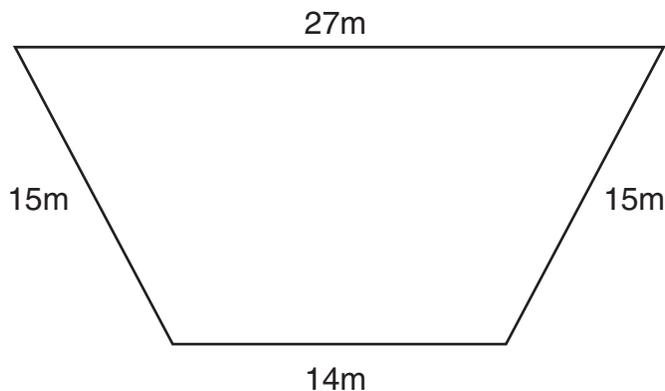


3-Step Problem-Solving Process

1. Write the problem in a number question.
2. Solve the problem. **Show your work.**
3. Write a sentence with the answer.



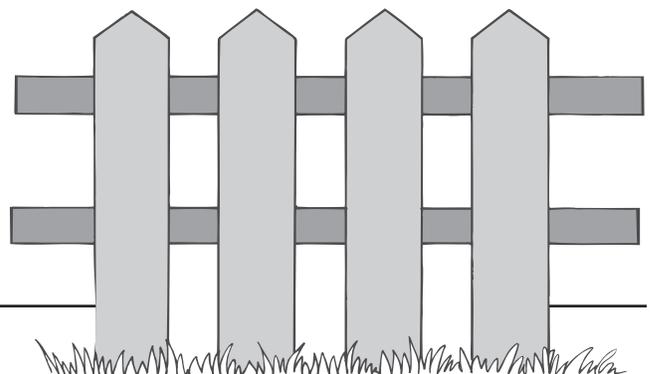
1. Because Mark is building a fence for his yard, he made the following diagram. He needs to know the perimeter of the yard before he can buy the fencing materials. What is the perimeter?



$$P = 27m + 15m + 14m + 15m$$

$$P = 71 \text{ metres}$$

The perimeter of the yard measures 71 metres



-
2. Doug wanted to measure the circumference of a giant beach ball. Unfortunately, he had only a metre stick for measuring. How can Doug measure the circumference and still have a fairly accurate measurement? Think of two ways to go about this task.

1. Roll the beach ball along the ruler one complete rotation.

2. Hold the beach ball, and move the metre stick around the ball.

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3. Estimate the height of the classroom. Give two reasons you chose your answer. Your answers should demonstrate that you have made an educated guess.

***Answers will vary as will reasons.
(Approx = 3 metres or 10 feet)***

