
Measurement Unit Plan

Subject/Grade: Math/5

Dates: January 19 - February 12

Period length: 1 hour

School: Lethbridge Christian School

Teacher: Kayla Meller

Rationale

This unit of math is incredibly practical for students' lives. Students will measure perimeter, area, volume, and capacity. Each of these things can be applied to students' day-to-day lives. This unit will provide hands on experience in measuring, equipping students for basic life skills.

Resources and Materials

Resources:

Math Makes Sense 5, Pro Guide, Unit 4: Measurement, Pearson

Math to the Max, Shape and Space: Measurement: Grade 5, Edmonton Public Schools

Materials:

- Rulers
- Meter sticks
- 1cm grid paper
- Geoboards and elastic bands
- Color tiles or congruent squares
- Small empty boxes and collection of small items to fill boxes
- Centicubes
- Containers of various sizes including 1L bottles/containers
- Sand
- Funnels
- Measuring cups and spoons
- Newspaper

Month-at-a-glance

	Monday	Tuesday	Wednesday	Thursday	Friday
January 19-23	<p>Introduction:</p> <ul style="list-style-type: none"> • A to Z of Measurement terms • KWL chart <p>Start Lesson 1: Measuring Length</p> <ul style="list-style-type: none"> • Explore 	<p>Continue - Lesson 1: Measuring Length</p> <ul style="list-style-type: none"> • Connect • Practice 	<p>Lesson 3: Rectangles with equal perimeters</p> <ul style="list-style-type: none"> • Explore • Connect • Practice 	<p>Lesson 4: Rectangles with equal areas</p> <ul style="list-style-type: none"> • Explore • Connect • Practice 	/
January 26-30	<p>Challenge: Perimeter and Area of rectangles</p> <ul style="list-style-type: none"> • "Seating Arrangement" pg 129-130 • "Fencing Around the Problem" pg 131-132 	<p>Lesson 5: Exploring Volume</p> <ul style="list-style-type: none"> • Explore • Connect • Practice 	<p>Lesson 6: Measuring Volume in Cubic Centimeters</p> <ul style="list-style-type: none"> • Guided Practice pgs 136-140 	<p>Lesson 6 Continued</p> <ul style="list-style-type: none"> • Practice 	/
February 2-6	<p>Lesson 7: Constructing Rectangular Prisms with a given volume</p> <ul style="list-style-type: none"> • Explore • Connect • Practice 	<p>Lesson 8: Measuring Volume in Cubic Meters</p> <ul style="list-style-type: none"> • Explore (with variation) • Connect • Practice 	<p>Lesson 9: Exploring Capacity: The Liter</p> <ul style="list-style-type: none"> • Explore • Connect • Practice 	<p>Lesson 10: Exploring Capacity: The Milliliter</p> <ul style="list-style-type: none"> • Explore • Connect • Practice 	/
February 9-13	<p>Lesson 11: Relating Capacity and Volume</p> <ul style="list-style-type: none"> • Explore • Connect • Practice <p>Challenge: Capacity Assignment</p>	<p>At The Zoo Unit Problem</p>	<p>At The Zoo Unit Problem</p>	<p>Unit Test</p>	/

Outcomes

General Outcome:

Use direct and indirect measurement to solve problems

Specific Outcomes:

1. Identify 90° angles
2. Design and construct different rectangles, given either perimeter or area, or both (whole numbers) and make generalizations
3. Demonstrate an understanding of measuring length (mm) by:
 - Selecting and justifying referents for the unit mm
 - Modeling and describing the relationship between mm and cm units, and between mm and m units
4. Demonstrate an understanding of volume by:
 - Selecting and justifying referents for cm^3 or m^3 units
 - Estimating volume, using referents for cm^3 or m^3
 - Measuring and recording volume (cm^3 or m^3)
 - Constructing right rectangular prisms for a given volume
5. Demonstrate an understanding of capacity by:
 - Describing the relationship between mL and L
 - Selecting and justifying referents for mL or L units
 - Estimating capacity, using referents for mL or L
 - Measuring and recording capacity (mL or L)

Daily Activities

January 19

Introduction

- All students will list letters A – Z in their math journals. Give students five minutes to try to find a word for each letter that relates to measurement.
- After five minutes, share as a class and discuss
- Hand out “Outcomes KWL chart” and ask students to fill in accordingly
- Begin Lesson 1: Measuring Length (pg 122 of student textbook)
- Explore:
 - Students will estimate and then measure various items throughout the room, recording results in table as shown in student textbook
 - Students will share results with the class if time

January 20

Lesson 1 Continued

- Complete “Connect” Portion of lesson
 - Discuss the connection between mm, cm, and m
 - Introduce concept of “referent”
- Complete “Practice” Portion of lesson
 - Select questions will be done as a class, others will be done independently

January 21

Lesson 3: Rectangles with equal perimeters

- Complete “Explore” and “Connect” Portions of lesson
 - Students will use geoboards to calculate perimeter and area of rectangles according to instructions in student textbook

- Students will share results with the class and discuss
- Discuss that different rectangles with the same perimeter have different areas
- Complete “Practice” Portion of lesson
 - Select questions will be done as a class, others will be done independently

January 22

Lesson 4: Rectangles with Equal Areas

- Complete “Explore” and “Connect” Portions of lesson
 - Students will use 36 congruent squares to create as many different rectangles as possible
 - Discuss as a class the different possible combinations as well as any patterns that were discovered in the process
- Complete “Practice” Portion of lesson
 - Select questions will be done as a class, others will be done independently

January 26

Challenge: Perimeter and Area of Rectangles

- Students may choose to work in partners or independently.
- Students will be given “Seating Arrangement” handout to complete.
- Once students have completed “Seating Arrangement,” they will receive “Fencing Around the Problem” handout.

January 27

Lesson 5: Exploring Volume

- Complete “Explore” and “Connect” Portions of lesson
 - Show students a show box and ask how we could find out how much space is inside. What kind of units could we use?
 - Each student will receive a box and a bag of items to fill the box. Students will estimate the number of items they believe would fill the box, and check their answer by filling the box
 - Discuss how they estimated the number of items that would fit in the box.
 - Show building blocks and other small item – which is more accurate for measuring the space inside the box? The blocks because they fill more space
 - Explain and discuss volume
 - Three dimensions (cm^3)
- Complete “Practice” Portion of lesson
 - Select questions will be done as a class, others will be done independently

January 28

Lesson 6: Measuring Volume in Cubic Centimeters – Guided Practice – Pages 136-140 in Math to the Max

- Show labeled boxes and ask students to order boxes based on the amount they believe the boxes will hold, or volume, from greatest to least
- Explain that while yesterday we measured volume using miscellaneous items, today we will measure more accurately, using centimeter cubes. Explain dimensions of centimeter cubes
- Separate students into groups and ask each group to find the volume of one box, using the centimeter cubes
- Discuss how students found the volume of their boxes. Discuss how to properly write volumes (cm^3)

- How can we find the volume without centimeter cubes? (multiply the number of layers times the number of cubes in each layer)

January 29

Continue Lesson 6

- Complete Guided Practice E as a class (pg 139-140 in Math to the Max)
- Students create rectangular prisms from nets provided
- Using the table, students will estimate and find out which box has the largest volume

February 2

Lesson 7: Constructing Rectangular Prisms with a given volume

- Complete “Explore” and “Connect” Portions of lesson
 - Students will construct as many different rectangular prisms as possible with a volume of 24 cubic centimeters. Students will record results in a table as shown in student textbook
 - Discuss the possibilities of multiple prisms for different volumes
- Complete “Practice” Portion of lesson
 - Select questions will be done as a class, others will be done independently

February 3

Lesson 8: Measuring Volume in Cubic Meters

- Complete “Explore” and “Connect” Portions of lesson
 - Discuss using different tools to measure items based on size (what would you use to measure a pencil box? What would you use to measure a classroom?)
 - Students create a square meter using rolled up newspaper. Discuss how many of these cubes students believe it would take to fill the classroom
 - Measure the volume of the classroom
 - What else would we use a cubic meter to measure?
- Complete “Practice” Portion of lesson
 - Select questions will be done as a class, others will be done independently

February 4

Lesson 9: Exploring Capacity: The Liter

- Complete “Explore” and “Connect” Portions of lesson
 - Show students the 1L bottle and ask them how much they think it holds. Introduce the Liter and its symbol
 - Students will then estimate whether various containers are larger or smaller than a liter
 - Students will then estimate how many liters various larger containers will hold.
 - Discuss the process including any difficulty that students had.
- Complete “Practice” Portion of lesson
 - Select questions will be done as a class, others will be done independently

February 5

Lesson 10: Exploring Capacity: The milliliter

- Complete “Explore” and “Connect” Portions of lesson
 - Explain the comparison between a milliliter and a liter
 - Using measuring spoons and cups, have students show their understanding of reading these types of measurements

- Students will then estimate and test the capacity of various containers using measuring cups and spoons and water.
- Discuss the process
- Complete “Practice” Portion of lesson
 - Select questions will be done as a class, others will be done independently

February 9

Lesson 11: Relating Capacity to Volume

- Complete “Explore” and “Connect” Portions of lesson
 - Ask students what they know about capacity and volume. What are the units that each are measured in?
 - In groups, students will explore the connection between capacity and volume using centimeter cubes and a graduated cylinder filled with water. Students will add centimeter cubes to the water and record results in chart as shown in student textbook
 - Discuss displacement and relate volume to capacity – 1 cm^3 is equal to 1mL
 - As a class, find volume of item using displacement
- Complete “Practice” Portion of lesson
 - Select questions will be done as a class, others will be done independently

February 10

At the Zoo Unit Problem

- Review unit goals (KWL chart as a class)
- Turn to page 160 in student textbook and explain the assignment
- Students will design a petting zoo, including different pens for each of the following animals:
 - Rabbits
 - Goats
 - Sheep
 - Pigs
 - Ponies and donkeys
- The total petting zoo is a rectangle 45m by 36m
- Students will make pens different sizes depending on the animals housed within it
- The map must show dimensions, perimeter, and area of each region
- Students must show all work on a separate piece of paper, to be attached to the final map

February 11

At the Zoo Unit Problem

- Students will continue to work on their maps
- If students have not completed maps by end of class, they are for homework. Maps will be handed in by the beginning of the following class.

February 12

Unit Test

- Students will demonstrate their knowledge of the unit through a test. Students will have the entire period to complete their test.

Evaluation & Assessment

Formative	Summative
<ul style="list-style-type: none">• KWL chart/A-Z of measurement• Student Self-assessment – Students will complete a self-assessment based on learning outcomes two to three times throughout the unit• In class discussions – While doing practice questions and “explore” portion of the lesson, I will observe students’ work.• Red, yellow, green cards – while students work independently, they will communicate, using the cards, their understanding of the concept• “Seating Arrangements” and “Fencing Around the Problem” Challenges – Students will demonstrate their knowledge of area and perimeter	<ul style="list-style-type: none">• Daily homework – certain questions from the “practice section” will be assigned for homework• Capacity Assignment – Students will complete this assignment, which includes questions relating to capacity as well as volume• “At the Zoo” Unit problem – students will create a map, demonstrating their knowledge of perimeter, area, and capacity• Unit Test – Students will demonstrate their knowledge of the concepts included in the unit

Extensions

- Student activities from “Math to the Max” (pgs116-125, 146-151, 163-164)
- Strategies Toolkit – pg 126 in student textbook