Measurement Activities Supplemental Unit

Third and Fourth Grade
Updated 2005-2006
Everett Public Schools

Portland Public Schools,2000-2001
Supplemental Instructional Unit
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Supplemental Measurement Unit

1. READ through the <u>entire</u> unit before hand and prepare all materials. Also note the amount of time you have on the calendar.

2. Borrow

Balances

- Each 1st grade has 6 balances
- Each 3rd grade has 4 balances

Liter Measuring Pitchers (each 5th grade has 4)
Measuring tapes (each 5th has 10)
Meter/Yard sticks (each 5th has 12)
Kilogram and 500 gram weight set (each 5th has one set)

3. Decide how you will share/rotate the materials.

4. Gather Materials

Metric Stations:

Weight/Mass Station	5 – 10 Objects to weigh (small objects) Snap cubes, plastic tiles, and pencils for balance scale 3 Balance scales (see first grade and third grade) Student record sheet (1/student)
Length Station	2 – 4 Measuring tapes 2 – 4 rulers or meter sticks Student record sheet (1/student)
Length/Perimeter Station	5 – 6 metric rulers Student polygon sheet (1/person in the group – these stay at the station) Student record sheet (1/student)
Capacity Station	5 – 8 plastic containers labeled A, B, C, etc. (for estimating less than 1 liter, 1 liter, and greater than 1 liter) Water Liter measuring pitchers (see 5th grade materials) Student record sheet (1/student) Bucket or tray to catch spills or do over the sink

You might want to laminate the station directions and the polygon sheets.

WASL Measurement Item Specifications at the end of the unit.

Scavenger Hunt
Rulers, meter sticks and weights will need to be available.
Student record sheets (1/student)

Benchmarks:
1) 1 pencil =6 grams
2) 1 staple remover =32 grams
3) 1 box of small paper clips =65 grams
4) 1 box of 24 crayons =130 grams
5) 4 boxes of staples =600 grams
6) A dictionary =1 kilogram

Metric Olympic Stations
Student record sheets (1/team of 2 students)

Cotton Ball Shot Put: 5 Cotton balls
Meter sticks

Straw Javelin Throw: 5 small plastic straws or stirrers
Meter/yard sticks

Tongue Depressor Weight Lifting:
5 – 6 tongue depressors
plastic tiles
calculator

Paper Clip Karate Blow: 3 -5 paper clips
Measuring tape or meter sticks

100 **Milliliter** Measurement Dash:
5 Plastic containers or jars
Bucket or tray to catch spills or do over the sink
Liter measuring cup marked in 100 milliliter increments

Helpful Hints

- When setting up the stations, you may want to laminate the student directions and post them at the station.
- Each student or pair of students should keep track of their work on the specific Student Record Sheets created for each station.
- Explain the importance of estimation.
- We know that the capacity station can be "messy" but we encourage you to try it so that the students understand capacity. How about setting it up outside?
- Debrief at the end of the session asking students for benchmarks for:

1 meter
10 centimeters
500 grams (hardback book, coffee cup)
1 kilogram (dictionary)
1 liter
1 foot
1 inch
1 pound
1 ounce

Metric Stations
Teacher Directions

Activity	Materials	Directions
Weight/Mass Station ***Remind students to always record the unit measurement**	5-10 objects to weigh Equivalent weights: **1 snap cube = 3 grams 1 plastic tile = 1.5 grams pencil = 1 ounce** Student record sheet Calculators	• *Estimate* the metric/standard weight • *Weigh* each object using a balance scale • Snap cubes & tiles can be used to weigh the objects on the balance scale
Length Station ***Remind students to always record the unit measurement**	Measuring Tapes Rulers and meter/yard sticks Student record sheet	• Measure body parts with measuring tapes (height, width of arm span, leg length, wrist to longest finger, circumference of head)
Length/Perimeter Station ***Remind students to always record the unit measurement**	Metric rulers Student polygon sheet Calculators Student record sheet Students should record to the closest centimeter or .5 centimeter	*Estimate* the perimeter in centimeters of the polygons shown on the student polygon sheet • *Measure* the perimeter in centimeters of the polygons shown on the student polygon sheet
Capacity Station	5 – 8 plastic containers labeled A,B,C, etc. water Liter/cup container for measuring	• *Estimate* which container will hold close to 1 liter and close to a cup, which will hold less, which will hold more Students will record – less, more and same

Weight/Mass Station
Student Instructions

- Estimate the weight of the objects in grams and ounces and write the estimates on the student record sheet.

- Weigh each object using the balance scale.

- Use snap cubes or plastic tiles to balance the scales.

- Write down the exact weight of the objects on the student sheet. Remember to include the units.

1 snap cube = 3 grams
1 plastic tile = 1.5 grams
1 pencil = 1 ounce

gram = g
ounce = oz.

Weight/Mass Station

Student Record Sheet

Name _____

Date _____

Object	Estimation		Actual Weight	
	grams	ounces	grams	ounces

Length Station

- Measure your height, width of your arm span, leg length, wrist to longest finger, and the circumference of your head.

- Record your measurements on the student sheet.

centimeter – cm
inch – in.

Length Station

Student Record Sheet

Name _____

Date _____

Body Part	Length Measurement	
	centimeters	inches
Height		
Width of arm span		
Leg length		
Wrist to longest finger		
Circumference of head		

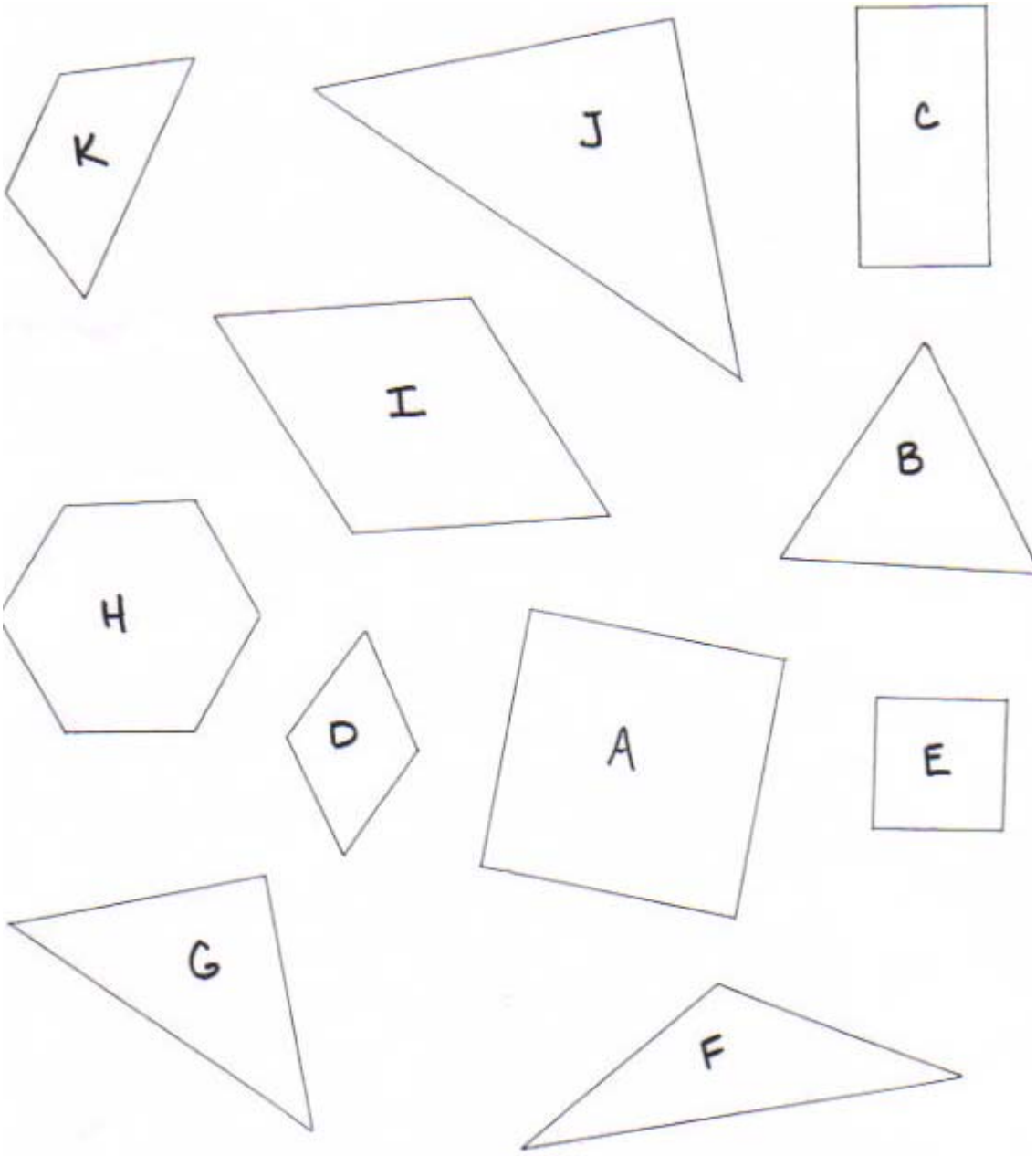
Length/Perimeter Station

- Estimate the perimeter in centimeters of the polygons on the student polygon sheet. Write the estimates on the student sheet.

- Measure the perimeter in centimeters of the polygons shown on the student polygon sheet. Write the measurements on the student sheet.

centimeter - cm

Polygon Sheet



Length/Perimeter Station

Student Record Sheet

Name _____

Date _____

Polygon	Estimate	Actual Measurement

Capacity Station

- Estimate which container will hold close to 1 liter (approx. 1 quart) or a cup, which will hold less, and which will hold more.

- Use water to see if your container will hold close to 1 liter (approx. 1 quart) or a cup, will hold less, and which will hold more.

- Record your answers on the student sheet.

liter - L
cup - c.

Capacity Station

Student Record Sheet

Name _____

Date _____

Container	Estimate	Actual Measurement

Scavenger Hunt

Activity	Materials	Directions
Length	Metric/Standard rulers Student record sheet	Find objects in the room that measure in length: **1 centimeter** **10 centimeters** **1 meter** **1 foot** **1 inch**
Weight *0.5 kilograms or 500g is approximately 1 pound and 1 kilogram is approximately 2 pounds*	500 gram weight 1 kilogram weight (in fifth grade kit) Students should act as the balance to get as close as they can. Student record sheet	Find objects in the room that weigh: **Between 1 and 500 grams 500-1000 grams more than 1 kilogram (use pounds interchangeably)**
Perimeter	Metric rulers Student record sheet	Find objects in the room that have a perimeter between 100 centimeters and 400 centimeters

Scavenger Hunt

Name _____

Date _____

Object	Length Measurement
	1 centimeters
	10 centimeters
	1 meter
	1 foot
	1 inch

Object	Weight Measurement
	between 1 and 500 grams or up to 1 pound
	500 – 1000 grams or between 1 and 2 pounds
	more than 1 kilogram or more than 2 pounds

Scavenger Hunt cont.

Objects that have a perimeter between 100 centimeters and 400 centimeters.

Object	Actual Measurement

Measurement Olympics
Teacher Directions
Cotton Ball Shot Put (metric length)

Materials

- Cotton balls or other very light materials
- Measuring tapes or meter sticks

Activity

- Demonstrate how the shot put is thrown. (Fake it if you don't know.) Ask students to estimate as a group how far they think they can throw it.

- Students work in teams of two. Two teams compete.
  One person on each team shot puts the cotton ball.
  The partners confer to decide how far the cotton is thrown and write down their estimate.
  The second person on the team measures the actual distance in **centimeters**.
  The difference between the estimate and the actual distance is the team's score.
  Lowest total score wins.

Straw Javelin Throw (standard length)

Materials

- Small plastic straws or stirrers
- Measuring tapes or meter/yard sticks

Activity

- Demonstrate how the javelin is thrown. Ask students to estimate as a group how far they think they can throw it.

- Students work in teams of two. Two teams compete.

One person on each team throws the plastic javelin.
The partners estimate how far the straw is thrown and write down their estimate.
The second person on the team measures the actual distance in **inches**.
The difference between the estimate and the actual distance is the team's score.
Lowest total score wins.

Tongue Depressor Weight Lifting

Materials

- Small tongue depressors or wooden popsicle sticks
- Plastic Tiles, 1 tile = 1.5 **grams**
- Calculators

Activity

- Students "weight lift" as many tiles as they can balance on a popsicle stick or tongue depressor. If the tiles fall off, it doesn't count.
- The student will then calculate
  #tiles x 1.5 g
- Team with the most weight wins.

100 Milliliter Measurement Dash (metric capacity)

Materials

- Plastic containers or jars

- Liter measure marked in 100 milliliter increments

Activity

- Student tries to pour exactly 100 milliliters of water, sand, rice, into the plastic container.
  Then the student measures the actual amount. Person or team with the smallest difference wins.

Paper Clip Karate Blow (standard length)

Materials

- Paper Clip
- Meter/yard sticks

Activity

- Students see how far they can blow a paper clip in one breath.

- Students work in teams of two. Two teams compete.

One person on each team blows the paper clip starting at one edge of the desk.
The partners decide how far the paper clip travels and write down their estimate.
The second person on the team measures the actual distance in **inches**.
The difference between the estimate and the actual distance is the team's score.
Lowest total score wins.

Measurement Olympics Student Sheets

Cotton Ball Shot Putt (centimeters)

Team_____

	Estimate	Actual Distance (cm)	Difference
Round 1			
Round 2			
Round 3			

Straw Javelin Throw (inches)

	Estimate	Actual Distance (in.)	Difference
Round 1			
Round 2			
Round 3			

Tongue Depressor Weight Lifting

	Number of Objects	Weight (g)
Round 1		
Round 2		
Round 3		

Paper Clip Karate Blow

	Estimate(cm)	Actual Distance (in.)	Difference
Round 1			
Round 2			
Round 3			

100 Milliliter Measurement Dash

Name	100 Milliliters	Actual Measurement	Difference
	100		
	100		
	100		
	100		
	100		

For Teachers

Based on Tens:
Kilo 1000 x
Hecta 100 x
Deca 10 x
Deci .1 (1/10 of)
Centi .01 (1/100 of)
Milli .001 (1/1000 of)
For example – A centimeter is 1/100 of a meter. There are 100 centimeters in a meter.

Basic Metric Units: Things to remember:
1 liter is a little more than a quart.
1 meter is a little more than a yard.
1 kilogram is a little more than 2 pounds.
100° C = boiling.
37° C = body temperature.
30° C = warm day.
20° C = room temperature.
0° C = freezing.

Measurement - Items assessing understanding of measurement attributes and dimensions may use the following units:		
Attribute	**US Units**	**Metric (SI) Units**
Length	inch (in.), foot (ft.), yard (yd.), mile (mi.)	centimeter (cm), meter (m)
Time	second (s), minute (min.), hour (hr.), day, week (wk), month (mo), year (yr)	
Money	cent/penny (¢), nickel, dime, quarter, dollar ($)	
Weight/mass	ounce (oz.), pound (lb.), ton	gram (g), kilogram (kg)
Capacity (liquid volume)	cup (c), pint (pt.), quart (qt), gallon (gal)	milliliter (mL), liter (L)
Temperature	degree (°F)	degree (°C)

Measurement – items assessing understanding of measurement units and systems may use the following units:		
Attribute	**US Units**	**Metric (SI) Units**
Length	inch (in.), foot (ft.), yard (yd.), mile (mi.)	centimeter (cm), meter (m)
Money	cent/penny (¢), nickel, dime, quarter, dollar ($)	
Weight/mass	ounce (oz.), pound (lb.), ton	gram (g), kilogram (kg)
Capacity (liquid volume)	cup (c), pint (pt.), quart (qt), gallon (gal)	milliliter (mL), liter (L)

Measurement - Students are expected to know the following:	
Attribute	**US Conversions**
Length	1 foot = 12 inches, 1 yard = 3 feet
Money	penny = 1¢, nickel = 5¢, dime = 10¢, quarter = 25¢, $1 = 100¢
Capacity (liquid volume)	1 pint = 2 cups, 1 quart = 2 pints, 1 gallon = 4 quarts

Measurement - Items assessing knowledge of measurement procedures may use the following units:		
Attribute	**US Units**	**Metric (SI) Units**
Length	inch (in.), foot (ft.), yard (yd.), mile (mi.)	centimeter (cm), meter (m)
Time	second (s), minute (min.), hour (hr.), day, week (wk), month (mo), year (yr)	
Money	cent/penny (¢), nickel, dime, quarter, dollar ($)	
Weight/mass	ounce (oz.), pound (lb.), ton	gram (g), kilogram (kg)
Capacity (liquid volume)	cup (c), pint (pt.), quart (qt), gallon (gal)	milliliter (mL), liter (L)
Temperature	degree (°F)	

Measurement - Items assessing for estimated measurements may use the following units:		
Attribute	**US Units**	**Metric (SI) Units**
Length	inch (in.), foot (ft.), yard (yd.), mile (mi.)	centimeter (cm), meter (m)
Time	second (s), minute (min.), hour (hr.), day, week (wk), month (mo), year (yr)	
Money	cent/penny (¢), nickel, dime, quarter, dollar ($)	
Weight/mass	ounce (oz.), pound (lb.), ton	gram (g), kilogram (kg)
Capacity (liquid volume)	cup (c), pint (pt.), quart (qt), gallon (gal)	milliliter (mL), liter (L)
Temperature	degree (°F)	