

Algebra/Geometry Institute Summer 2008

Title: Mini-Metric Olympics

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School: Carver Upper Elementary School

Grade Level: 5-8

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- 1 Teaching objective(s)
 - Select and apply the appropriate units and tools to measure length, area and capacity. (3c)
- 2 Instructional Activities
 - a. After informing the students that they will be participating in a Mini-Olympics they will be given a worksheet and asked to estimate their expected performance in each event and write it with a blue coloring pencil. Then they will be asked to perform the task and take the actual measurement in metric units and write this with a green pencil. The pencils will be taken up after each recording.
 - b. The students will work in groups (teams) for the activities. The students will be paired in four groups. Each student will pull a number (1-4) from a cup/bag and will be seated at the table that corresponds with the number they pulled. Each group will have a captain who ensures that they record their answers accurately and honestly. The students at each table will roll a number cube and the one who rolls the highest number will be the captain. The other members of the group will assist with the actual measurements at each event.
 - c. Activity (50 minutes)
 1. Give captains and their groups sets of instructions.
(Instructions: You will move to each station, where you will find a card explaining how to perform the event. The captain will read the card (see Attachment 1); each member will perform the event, measure it, record the measurement, and subtract it from their estimate). Read the directions and model what the teams are expected to do. They will receive only one try for each event (no do overs).

2. In the paper plate discus, they will stand on the starting line (which will be marked by tape for the first three events), throw the plate, measure the distance (record it), and then subtract to find the difference between the estimate and actual measurement.
3. In the straw javelin throw, the students also will stand on the starting line, throw the straw, measure the distance (record it), and then subtract to find the difference between the estimate and actual measurement.
4. With the cotton ball shot put they will stand on the starting line, throw the cotton ball, measure the distance (record it), and then subtract to find the difference between the estimate and the actual measurement.
5. In the right hand marble grab they will grab one handful (with right hands), place on a balance scale, weigh them (record), and then find the difference between the estimate and actual measurement.
6. When performing the big foot they will trace one foot on centimeter graph paper, find the actual measurement, and then find the difference between the estimate and actual measurement.
7. In the sponge squeeze they will take a water filled sponge, squeeze the liquid into a liter container (using their left hand), measure it, and then find the difference between the estimate and actual measurement.
8. After the students have finished these exercises they will total their differences using a red coloring pencil. The captains will be asked to find the paper in their group with the smallest total. After the teacher has the papers the students will be told that the ones with the smallest number (from each group) will win. Explain that they will win because their total estimation was the closest to their actual measurement. The winners will receive medals for their efforts.

3 Materials and Resources

a. Materials

Paper Plate Discus:

2-3 paper plates

meter stick / meter tape

Straw Javelin:

3-5 paper or plastic drinking straws

meter stick / meter tape

Cotton Ball Shot Put:

cotton puff balls

meter stick / meter tape

Right Hand Marble Grab:

2 bags of marbles/ colored stones

large mixing bowl

balance scale with weights

Left Hand Sponge Squeeze:

large sponge

bucket

water

liter measuring set

Big Foot Contest:

centimeter graph paper

All Events:

Instruction card for each station

coloring pencils (red, green, blue)

Student Worksheets

Bought or made medals

b. Resource(s):

Fuys, D.J., & Tischler, R.W. (1979). *Teaching Mathematics in the Elementary School*. Glenview, IL: Scott Foresman and Company.

Mini-MetricOlympics.

<http://www.uark.edu/~k12info/teacher/workshops/AIMS-lessons/mini-metrics.pdf>

4 Assessment:

- a. Observation of students participating and working during the games. Ask the students to discuss their strategies of working together as a team to finish each event.
- b. Check and grade completed projects (mini Olympics).
- c. Calculate and find which team member has the lowest total score by subtracting the actual measurements from their estimates to find the difference, then by adding all the differences to get the total. The winner with the lowest overall score will receive gold medal, second place a silver medal, and third place a bronze medal.

5. Adaptation: This exercise could also be performed by giving pairs of students various objects to estimate their weight or length and then record it. The students will record each others answers. They will then find the actual measurement, record it, and find the difference between the estimate and the actual measurement.

Instructions:



Plastic Straw Javelin Throw

1. Place feet on starting line. Throw “javelin.” (One throw only)
2. Measure the distance from the starting line to the position of the “javelin.”
3. Record.



Paper Plate Discus

1. Place feet on the starting line. Throw the “discus.” (One throw only)
2. Measure the distance from the starting line to the position of the paper plate.
3. Record.



Cotton Ball Shot Put

1. Place feet on the starting line. Throw the “cotton ball shot.” (One throw only)
2. Measure the distance from the starting line to the position of the cotton ball.
3. Record.



Right-Handed Marble Grab

1. With the right hand only, grab a fistful of marbles from the container.
2. Place marbles on a balance scale.
3. Measure the mass of the marbles.
4. Record.



Left-Handed Sponge Squeeze

1. Have sponge soaking in large bucket of water. Observe.
2. Squeeze sponge into separate container. (One squeeze only)
3. Measure the amount of water that you squeezed.
4. Record.



Big Foot was Here

1. Remove one shoe. Trace around your foot on square centimeter graph paper.
2. Figure the area of your foot print.
3. Record.



Mini-Metric Olympics

Competitor_____

Captain_____

Event	Estimate	Actual	Score (Difference)
1. Paper Plate Discus 	_____cm	_____cm	_____
2. Straw Javelin 	_____cm	_____cm	_____
3. Cotton Ball Shot Put 	_____cm	_____cm	_____
4. Right Hand Marble Grab 	_____g	_____g	_____
5. Left Hand Sponge Squeeze 	_____ml	_____ml	_____
6. Big Foot Contest 	_____cm ²	_____cm ²	_____