Algebra/Geometry Institute Summer 2008

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School: W. A. Higgins Middle School
Grade Level: Pre-Algebra/8
Name of Lesson: Mini-Metric Olympics

1 Teaching objective(s)

MEASUREMENT

4. a. The student will solve real-world application problems that include length, area, and volume using standard measurements.

4. c. The student will use formulas and/or appropriate measuring tools to find length measures (to appropriate levels of precision), area, and volume of composite or irregular figures.

2 Instructional Activities

1. Bellringer—The following question will be written on the dry erase board for the student to complete upon entering the classroom:

   Circle the BEST metric unit for each:
   a. The length of an eyelash *mm* *cm* *m* *km*
   b. The height of a flagpole *mm* *cm* *m* *km*
   c. The length of a strand of spaghetti *mm* *cm* *m* *km*
   d. The distance from Chicago, IL, to Peoria, IL *mm* *cm* *m* *km*

   The teacher will review the answers upon completion by each student.

2. The teacher will review notes on the measurement from the previous day.
3. The teacher will instruct the students to work in small groups of four including a team captain. The teacher will inform the students that these groups and the captains are pre-selected by the teacher, and the groups will consist of mixed abilities of students.
4. The teacher will issue each student a score sheet (Attachment 2). The teacher will explain that there are a total of six stations with a different task at each station. Each station should have a task card (Attachment 1) with complete instructions and materials available. Each group is assigned to one station.

5. The teacher will explain that each captain may read the instructions to his/her team. The teacher will also explain that it is extremely important that before each activity begins, the students must estimate and record their estimates on the student score sheet. Captains should check all the team members' estimates before beginning any activity.
6. The teacher will explain that after each team member performs the activity, he/she will measure and record his/her actual length, mass, volume, or area.
7. After all of the stations have been completed by all of the teams, the teacher will instruct the student to find the score, which is the difference between the estimates and the actual measurement for each event. This should be entered in the last column. The student will then total the numbers in the score column. The winner is the one with the lowest score. The teacher will discuss how a low score shows accuracy when estimating..
8. The teacher will collect all worksheets and determine which students will receive medals. The teacher will present awards to the winners. A gold medal should be presented to the first place winner, a silver medal should be presented to the second place winner, and a bronze medal should be presented to the third place winner. (Use Print Shop or PrintMaster to create medals.)
9. Closure—Journal Writing—The students will take out their notebooks and turn to the journal section and record the following entry and begin writing—Estimate the distance of a trip to school and back home in metric units. Draw a map to scale that illustrates how far you walk or ride to school.

3 Materials and Resources

Bellringer

- Whiteboard
- Dry erase marker(s)
- Pencil (1 per child)
- Notebook (1 per child)

Mini-Metric Olympics

- 2-3 paper plates or pie pans
- 3-5 paper or plastic drinking straws
- 2 bags of marbles
- 3 meter sticks and meter tapes
- Cotton puff balls
- Large sponge
- Large mixing bowl or bucket
- Liter measuring set
- Centimeter graph paper
- Balance scale with weights
- Calculator (one per station)
- Student score sheet (1 per child) (Attachment 2)
- Station task cards (Attachment 1)

Journal Writing

- Pencil (1 per child)
- Notebook (1 per child)
- Smartboard
- Projector

Adapted from:
Mini-Metric Olympics, AIMS Education Foundation,
http://www.uark.edu/~k12info/teacher/workshops/AIMS- lessons/mini-metrics.pdf

References:
Glencoe McGraw-Hill, *Mississippi Pre-Algebra*; 2008. pp. 45-60.

Grober, Keith, ed. *Mississippi MCT2 Coach, Gold Edition, Mathematics*, Grade 8. New York: Triumph Learning, 2008. pp. 64-70.

4 Assessment

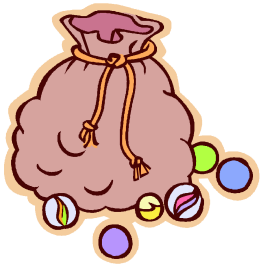
- Teacher observation—The teacher will observe the students' participation in this activity ensure that they stay on task at every station.
- Student participation—The student must participate in this activity, and the score sheet will be evaluated for participation.
- Peer evaluation—Each student is required to make sure that his/her peers stay on task.

Attachment 1

COTTON BALL SHOT PUT–TASK CARD

1. Place feet on 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. Record.

RIGHT-HANDED MARBLE GRAB–TASK CARD



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

Attachment 1

PAPER STRAW JAVELIN THROW–TASK CARD

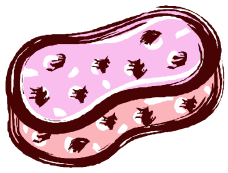
1. Place your feet on the starting line. Throw the "javelin". (One throw only.)
2. Measure the distance from the starting line to the position of the "javelin". Record.

PAPER PLATE DISCUS–TASK CARD

1. Place your 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. Record

Attachment 1

LEFT-HANDED SPONGE SQUEEZE–TASK CARD



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

BIG FOOT WAS HERE!–TASK CARD

1. Remove one shoe from your foot. Trace around your foot on a sheet of square centimeter graph paper.
2. Figure the area of your footprint. Record.

Attachment 2

MINI-METRIC OLYMPICS SCORE SHEET

EVENT	ESTIMATE	ACTUAL MEASUREMENT	SCORE (ACTUAL - ESTIMATE = DIFFERENCE)
Paper Plate Discus 	_____cm	_____cm	
Straw Javelin 	_____cm	_____cm	
Cotton Ball Shot Put	_____cm	_____cm	
Right-Hand Marble Grab 	_____g	_____g	
Left-Hand Sponge Squeeze 	_____ml	_____ml	
Big Foot Was Here! 	_____cm^2	_____cm^2	
		TOTAL	