Integrating Computing Across the Curriculum

Title: Learning Measurements and Solving Word Problems

Grade(s): 4

Subject(s): Mathematics

Author: ICAC Team

Overview: Students will learn about Metric and Standard Units of measurements. They will watch a Prezi and answer questions to review the material they learned. Then, they will work in groups to collect data on different types of measurement, and create graphs in Excel to display their data.

Content Standards:

MA(4)	20. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measureable scale. [4-MD2]
TC2 (3-5)	9. Use technology tools to organize, interpret, and display data.

Local/National Standards:

Primary Learning Objectives:

- Using a measuring tape, students will determine the distance that their paper airplanes fly.
- Using a scale, students will compare estimates of weight with actual weight of matchbox cars.
- Using jugs and measuring cups, students will determine how many cups, pints, and quarts are in a gallon.
- Using Microsoft Excel, students will create graphs to display the measurements from the above three activities.

Additional Learning Objectives:

Approximate Duration of Lesson: 2 hours and 30 minutes
Session 1- 1 hour to show Prezi and work in groups to collect data
Session 2- 45 minutes to work in computer lab to create graphs
Session 3- 45 minutes to present their projects

Materials and Equipment: Paper, measuring tape, 5-10 matchbox cars, 1 scale, plastic jug of water, a set of measuring cups, an empty milk jug, an empty milk carton, a funnel, a towel (in case water is spilled) and a quart sized container

Technology Resources Needed: Computers with Internet access and Microsoft Excel software, Promethium Board

Background/ Preparation: Careful recording of data, ability to create graphs using Microsoft Excel, understanding of data and graphing terminology.

Procedures/Activities:

Step 1.	Show students the Prezi on measurements and have them solve the problems on the 4 worksheets attached to the Prezi. After each worksheet, go over

the answers that are given and answer any questions.

Step 2. Next, divide the students into 3 groups to go to three different stations on measuring distance, mass, and volume. Instructions for each station are in the Microsoft Word document attached. Make sure the students write down their data at each station. This will be a hands-on review for students to recap what they have learned.

Step 3. During the next class, have each student make 3 Excel graphs on the data they collected during the stations.

Step 4. Have the students present and explain their findings to the class on the Promethium board.

Attachments: Learning Measurements Instructions
Rubric
Prezi on Measurements

Assessment Strategies: Teacher observation
Presentation using Microsoft Excel- grade with rubric attached

Extension: Have each student create their own word problems on mass, distance, and volume.

Remediation: Review Microsoft Excel, charts, and graph. Give the students a reference sheet that explains the values Standard and Metric Units.

Learning Measurements Instructions

Divide the class into three groups, and have tables set up with different stations for the students to go to.

The first station should have a measuring tape and paper. At this station, each person in the group should make their own paper airplane and take turns throwing their planes in the hallway. Each student will measure the distance that the airplanes flew with the measuring tape, and record the distance each person in the group threw along with the group member's name.

The second station should have five to ten matchbox cars and a scale. Ask the students to first estimate how much one car, two cars, three cars and so on will weigh and record their guesses in grams. Tell students that they will then find the actual weight of one car, two cars, three cars, and so on and record those results next to their guesses. After the groups complete their measurements, they will find the difference between their estimated weights and actual weights.

The third station should have a plastic jug of water, a set of measuring cups, an empty milk jug, an empty milk carton, a funnel, a towel (in case water is spilled) and a quart sized container. Explain to the students that they must work together to discover how many pints, quarts, and cups are in a gallon. If time allows, students should find how many cups are in a pint, how many pints are in a quart, and how many cups are in a quart. Students will record their findings in a notebook.

Measurement Rubric

Student Name: _____

CATEGORY	4	3	2	1
Units	All units are described (in a key or with labels) and are appropriately sized for the data set.	Most units are described (in a key or with labels) and are appropriately sized for the data set.	All units are described (in a key or with labels) but are not appropriately sized for the data set.	Units are neither described NOR appropriately sized for the data set.
Neatness and Attractiveness	Exceptionally well designed, neat, and attractive. Colors that go well together are used to make the graph more readable. A ruler and graph paper (or graphing computer program) are used.	Neat and relatively attractive. A ruler and graph paper (or graphing computer program) are used to make the graph more readable.	Lines are neatly drawn but the graph appears quite plain.	Appears messy and \"thrown together\" in a hurry. Lines are visibly crooked.
Data Table	Data in the table is well organized, accurate, and easy to read.	Data in the table is organized, accurate, and easy to read.	Data in the table is accurate and easy to read.	Data in the table is not accurate and/or cannot be read.
Accuracy of Plot	All points are plotted correctly and are easy to see. A ruler is used to neatly connect the points or make the bars, if not using a computerized graphing program.	All points are plotted correctly and are easy to see.	All points are plotted correctly.	Points are not plotted correctly OR extra points were included.

*Rubric created through rubistar.4teachers.org