Gold Seal Lesson

Author(s):			*Lesson Title:*			
Marsha Kucker			*Measuring Distance*			
Grade Span			*ICLE Application Model*			
K-4	*5-8*	*9-12*	*A*	*B*	*C*	*D*
X						*X*

Instructional Focus:

Problem-Solving and Mathematical Reasoning Students apply a variety of problem-solving strategies to investigate and solve problems from across the curriculum as well as from practical applications.
Number Operations and Concepts Students use number, number sense, and number relationships in a problem-solving situation. Students communicate the reasoning used in solving these problems.
Measurement Students use a variety of tools and techniques of measurement in a problem-solving situation. Students communicate the reasoning used in solving these problems.
Tools and Technology Students use appropriate tools and technologies to model, measure, and apply the results in a problem-solving situation. Students communicate the reasoning used in solving these problems.
Geometry Students apply geometric concepts, properties, and relationships in a problem-solving situation. Students communicate the reasoning used in solving these problems.
Speaking Students speak for a variety of purposes and audiences with sophistication and complexity appropriate to the grade level.
Listening Students listen for a variety of purposes appropriate to the grade level.

Performance Task

This lesson is an introductory look at calculating, estimating, and measuring distances.

1. Ask students to estimate the length of their pace. You may have to discuss what is meant by a pace or pacing. Now have the students use an appropriate measurement tool to measure the length of their pace. This activity should be done in pairs.
2. Discuss with students how they might go about estimating the dimensions of the school playground. Then, discuss with them methods they might use to actually measure the dimensions of the school playground with some degree of accuracy.
3. Take the class outside and have them first "pace off" the dimensions of the playground and then have them measure the dimensions using an appropriate measurement tool. Students should again work in pairs. Have them compare their pacing estimate with the actual measure?
4. You may want to have the students estimate and measure the length of the playground first, checking their methods and accuracy, before having them estimate and measure the width of the playground.
5. Have the students select other items to measure. Examples might include the length and width of the school building, the distance from the school's entrance door to the bus area, the length and width of the sidewalk, etc. Have them work in pairs to estimate and measure these items. You may want to give the students a worksheet to record their data or, if appropriate, the students could develop their own data-recording sheet.
6. For upper grade levels, have the students calculate the:

a. area of the school playground
b. area of the school building
c. difference between the area of the school playground and the school building

7. As a full class activity, have the students compare their answers.

ICLE Essential Skills

Perform operations with signed (positive and negative) numbers, including decimals, ratios, percents, and fractions (m1)
Compute the perimeter and area of two-dimensional figures. (m13)
Use the technique of dimensional analysis to convert units of measure (e.g., convert km/hr to m/min) including drawing to scale and applying ratios. Understand and use various techniques for estimating, making and converting measure; and use these to perform dimensional analysis. (m33)
Follow oral or written directions. (ela4)
Give oral or written directions that are clear and are understood by another person. (ela2)
Use brainstorming, role playing, and standard problem solving strategies to define a problem and suggest solutions. (ela19)
Gather information such as data, facts, ideas, concepts, and generalizations from oral sources. (ela51)

Scoring Guide:

4 The student:
- selects and applies appropriate mathematical procedures and makes no mathematical errors;
- explores alternate solutions or uses additional approaches.

3 The student:
- completes all parts of task;
- correctly selects and applies mathematical processes with minor errors;
- uses basic mathematical ideas and procedures appropriately.

2 The student:
- incompletely selects and applies appropriate mathematical procedures;
- makes some errors in mathematical processes.

1 The student:
- lacks understanding of process and/or uses inappropriate procedures;
- makes major errors in mathematical processes and calculations.
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0 The student:
- makes no attempt or provides an off-topic response.

Keywords

English Language Arts	Mathematics	Science
Reading	**Algebra** **Computation** **Estimation** **Problem Solving** **Number Theory** **Math in Daily Life**	**Earth Science**
Writing	**Geometry** **Area** **Geometric Shapes** **Surface Area** **Problem Solving** **Geometry in Daily Life**	**Life Science**
Communications **Discussion** **Listening** **Integration**	**Statistics** **Measurement** **Simulations** **Problem Solving** **Hypothesis Testing**	**Chemistry**
Literature	**Calculus**	**Physics**
Other	**Trigonometry**	**Other**
	Other	