



# Gold Seal Lesson

<b>Author(s):</b> Susan Goss			<b>Lesson Title:</b> <i>The Hand is Quicker than the Eye???</i>			
<b>Grade Span</b>			<b>ICLE Application Model</b>			
K-4 X	5-8	9-12	A	B	C X	D

**Instructional Focus: these are the standards**

**Number Operation 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.

**Statistics and Probability**

Students use statistics and probability to analyze given situations and the results of experiments. Students communicate the reasoning used in arriving at a conclusion.

**Performance Task**

Introduce the idea of reaction time with a demonstration. Hold a dollar in one hand hanging it between you thumb and forefinger. When you drop it, you will be able to catch it easily. Then ask for a student volunteer to catch it, and student will notice that he/she cannot catch the bill if you drop it.

The students will work in pairs. Each pair will receive a stopwatch and a ruler.

One student holds ruler while the other student waits with ruler between thumb and forefinger at 0 cm. First student drops the ruler and second tries to catch as quickly as possible. Record the cm.

Naturally, the number of cm depends on reaction time. Find reaction time in seconds by solving the equation "time =  $0.045 \sqrt{\text{distance}}$ " Students may use calculator and should round to tenth place.

Students compile all reaction times a) on a number line or b) by students lining up in order them from slowest to fastest. Find mean, median and mode of all the reaction times. Find mean, median and mode of girls vs. boys, students with glasses vs. students without, etc.

Students write a list of 5 algebraic statements using the data i.e.  $3.5 < 3.7$ , or 3.5 is .2 more than 3.7, etc. using at least 3 different "math verbs."

**ICLE Essential Skills**

Perform operations with signed (positive and negative) numbers, including decimals, ratios, percents, and fractions. (m1)

Understand the use of variables in expressions such as  $4x$ ,  $x+2$ , and  $2x-1$ , solve for the variable, and know how to represent expressions such as "twice the number" or "four more than the number" using variables. (m7)

Understand the correct order of operations for performing algebraic computations. (m8)

Use addition and multiplication to simplify an algebraic expression by identifying the order of operations and techniques necessary to carry out the operations (e.g.,  $5-3(x-2) = 5-3x+6 = 11-3x$ ). (m11)

Understand the characteristics of measures of central tendency (i.e., mean, median, and mode). (m15)

**Scoring Guide:**

Answer each of the following questions yes or no.

- |  |     |    |
|--|-----|----|
| 1. Did the students work cooperatively with partner?                           | YES | NO |
| 2. Did the students correctly read cm measurement on the ruler?                | YES | NO |
| 3. Did the students substitute "d" into the given equation?                    | YES | NO |
| 4. Did the students correctly evaluate "time"?                                 | YES | NO |
| 5. Did the students correctly order all the reaction times?                    | YES | NO |
| 6. Did the students correctly find measures of central tendencies?             | YES | NO |
| 7. Did the students write true algebraic expressions using the reaction times? | YES | NO |

7 correct = A    6 correct = B    4 or 5 correct = C    3 correct = D

**Keywords**

<b>English Language Arts</b>	<b>Mathematics</b>	<b>Science</b>
<b>Reading</b>	<b>Algebra</b> <b>Algebraic Operations</b> <b>Expressions</b> <b>Computation</b> <b>Inequalities</b> <b>Equations</b> <b>Problem Solving</b> <b>Manipulatives</b> <b>Central Tendency</b> <b>Math in Daily Life</b> <b>Data Collection</b> <b>Data Display</b> <b>Measurement</b>	<b>Earth Science</b>
<b>Writing</b>	<b>Geometry</b>	<b>Life Science</b>
<b>Communications</b>	<b>Statistics</b>	<b>Chemistry</b>
<b>Literature</b>	<b>Calculus</b>	<b>Physics</b>
<b>Other</b>	<b>Trigonometry</b>	<b>Other</b>
	<b>Other</b>	