

SIGNIFICANT FIGURES

GRADE LEVEL/SUBJECT: Appropriate for grades 9-12.

OVERVIEW:

Students traditionally have a very difficult time understanding which digits are significant, especially zeroes, in a number that represents something that has been measured. This activity was designed so that students will explore and truly understand which digits are significant when dealing with numbers that represent measured values.

OBJECTIVE(s): Students will be able to:

- 1. use a measuring instrument to the limit of its precision.**
- 2. determine which digit in a measured value is the most certain.**
- 3. determine which digit in a measured value is the first uncertain value.**
- 4. understand when zeroes are significant when determining the number of significant digits in a measured number.**

RESOURCES/MATERIALS:

***** Teacher Materials ***(For each pair of students):**

**1 blue paper ruler described below
1 red paper ruler described below
1 yellow paper ruler described below
several strips of green paper of different lengths (make sure some of them come out to where zeroes will show up in the measurements)**

***** Student Materials *** (For each pair of students):**

**1 writing utensil,
1 piece of paper to record results.**

ACTIVITIES:

- 1. Using a blue paper ruler with marks of 0 on one end and 10 on the other end, measure several smaller pieces of green paper strips recording the results.**

2. Using a red paper ruler the same length as the blue one up above but divided into 10 equal spacings with only marks of 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 on it, measure the same green paper strips you measured in activity 1 and record your results.

3. Using a yellow paper ruler the same length as the red one up above but with 10 additional marks between each mark found on the red ruler, measure the same green paper strips you measured in activity 1 above and record your results.

4. Have students analyze the results and discuss which digit in a measurement is the most certain.

5. Have students analyze the results and discuss which digit in a measurement is the first uncertain digit.

6. Discuss with students those measurements with zeroes in them to get students to understand when those zeroes are significant and when they are not.

TYING IT ALL TOGETHER:

Many students have a very difficult time understanding significant digits and why they are important in future calculations just by memorizing rules.

Using carefully selected green paper strips for students to measure, the students themselves can come up with the rules for which digits are significant and their importance in future calculations. This activity can be referred to when discussing significant figures in calculations.