

COMPLETION OF THIS PAPER IS REQUIRED. SUGGESTED DUE DATE IS: _____

Name: _____ Date: _____ Period: _____

1

Measurements and Calculations (CHEMACTIVITY: Uncertainty of Measurements) How Are Measurements and Calculations Important in the Science of Chemistry?

2 – Mastered

1 – Not Yet Mastered

0 - Incomplete

1. **On your own...**Read sections 5.2A and 5.2B on pp. 133-136 in your textbook

2. Explain the statement: "There is no such thing as a perfect measurement":

3. View the "dart board" graphics provided by your teacher...Create a definition for:

- Accuracy:

- Precision:

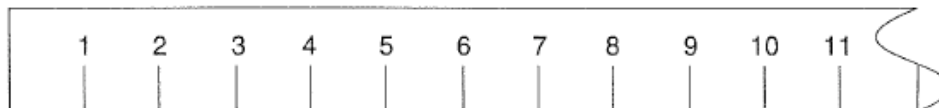
4. What are **Significant Figures** (also known as Significant Digits):

5. **Obtain a paper clip...**Measure the length of the paper clip using each of the rulers below. Record each measurement in the space provided at right:



length of paper clip

_____ cm



length of paper clip

_____ cm



length of paper clip

_____ cm

THINK ABOUT: Which of the rulers above required... the most estimation? ...the least estimation?

6. Describe the relationship between (1) the amount of estimation required to make a measurement and (2) the precision of the instrument being used:

7. How is the precision of each ruler represented in your recorded value for each measurement?

8. Describe the relationship between (1) the precision of the instrument being used and (2) the amount of significant figures recorded for each measurement:

9. Summarize the rules for determining the amount of significant figures in a given number:

- Non-zero integers:

- Leading zeros:

- Captive zeros:

- Trailing zeros:

10. Examine the number given below. For each digit, determine which ones would count as significant figures and which ones would not...and explain why:

0.35040

Essential Content and Skills:

How does uncertainty in measurements arise?

What is the difference between accuracy and precision and how are significant figures and precision related?

How is the correct number of significant figures in a given value determined?

How are the measurements of an object correctly recorded using significant figures?