Worksheet 1.4: The Importance of Measurement

1. Identify the following as quantitative or qualitative.

	Qualitative or quantitative
A flame is hot.	
A candle has a mass of 90 g.	
Wax is soft.	
A candle's height decreases 4.2 cm/hr.	

2. Write the following numbers in scientific notation

	In Scientific Notation
72,000,000 meters	
0.000000065 grams	
54,000 L	
0.015 moles	

Unit 1 Packet

Name
Period

1. Three students made multiple weightings of a copper rod, each using a different balance. The correct mass of the cylinder had been previously determined to be 47.32g. Describe the accuracy and precision of each student's measurements.

	Marie	Albert	Ernest
Weigh 1	47.43	47.15	47.95
Weigh 2	47.90	47.39	47.91
Weigh 3	47.83	47.42	47.89
Weigh 4	47.87	47.41	47.93

Marie:

Albert:

Ernest:

2. Three scientists measure the standard meter bar kept at the International Bureau of Standards. Their measurements are 1.09 m, 1.09 m, and 1.08 m. Are their measurements accurate, precise, or both? Why?

3. An archer shoots three arrows at a target and each lands within 1 cm of the others but none of the arrows is within 30 cm of the bull's-eye. Discuss both the accuracy and the precision of the archer.

4. Determine the number of significant figures in each of the following measurements:
   a. 1.0 cm b. 3.05 cm c. 2500 cm
   d. 4050 cm e. 4.050 cm f. 0.0602 cm

5. Why would a measurement be reported as 18.0 mL instead of 18 mL?