**Precision in Measurements—Mini-Lab**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_ Date**

 The measurements for this activity are all to be done individually, but we do not have enough equipment for everyone, so you must take turns. This does mean that there is no particular order to completing the measurements and questions—just make sure you independently do each of these.

**1.** **Diameter of a Marble (use a Vernier Caliper)**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm**

What are some things you need to be careful about when making this kind of measurement?

**2.** **Thickness of a copper wire (no insulation)—**use a Micrometer AND use a Vernier Caliper

 Micrometer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mm

 Vernier Caliper: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm

Which do you believe is the better tool to use for this measurement? Why?

**3.** **Volume of 10 eye droppers full of water**

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mL

Which graduated cylinder did you use?

**4. Width of the classroom**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m**

Which tool did you choose? How confident are you that your answer is accurate?

**5.** **Mass of a block of wood**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kg**

List 4 other masses from your classmates. Determine the average mass of the blocks of wood.

**6.** **Thickness of a sheet of paper (or textbook pages)**

**(circle the tool you used: *Vernier Caliper* or *micrometer*)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = thickness of 1 sheet alone**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = thickness of 20 sheets 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = av. thickness of 1 sheet**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = thickness of 100 sheets 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = av. thickness of 1 sheet**

Which of the above measurements/calculations do you think is the best one to report as the thickness of a single sheet of paper? Why?

**7.** **Mass of the water in a beaker filled (not quite all the way to the spout) with water**

Mass of beaker + water \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mass of beaker \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mass of water alone \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**8. Temperature of water from the tap
(**note: you must wait a few minutes for the thermometer to settle on the correct temperature)

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ °C (using an alcohol thermometer)

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ °C (using a digital thermometer)

Which do you think is more accurate? Why?