Directions: As the professor lectures on proper lab technique check the professor demonstration boxes. When the lecture completes you and your lab partner will show proper lab technique by completing the techniques and recording data as directed (in bold). When you have completed the technique check the respective box. The professor and lab technicians will be walking around to help. If you need help DO NOT hesitate to ask!

You will be handing in this worksheet for your first lab grade, if you feel that you need more space to write feel free to staple extra pages to this worksheet.

1. Common Lab Equipment
   a. **Retrieve each of the pieces of equipment**
   b. When you are ready for a quiz raise your hand
2. How to label glassware
   a. Professor Demonstration

   b. Label a 250 mL beaker as WASTE with label tape or a Sharpie

   c. Is it important to label your glassware? Explain

3. Waste disposal
   a. Always start lab with a large beaker labeled WASTE so that you can collect your waste throughout lab
   b. When lab is completed empty your WASTE in the properly labeled brown waste bottle

   c. When you are in doubt about how to dispose of chemical waste what should you do?

   d. Is it proper safety procedure to pour chemicals down the sink? Explain

   e. What do you do if there is a chemical spill?

4. Using an electronic balance
   a. Professor Demonstration

   i. Weigh a weighing paper

   ii. Tare the weighing paper

   iii. Weigh and record mass ~0.500 g Na₂SO₄

1. Place sample in a labelled 50 mL beaker and retain for #6
iv. Why do we fold the weighing paper before using it to weigh a powder? What could happen if you don’t?

v. Why is it important to tare the balance before using it?

vi. Is it important to use the same scale throughout the lab period? Explain

vii. While weighing a powder you spill a small amount on the balance and the bench, what do you do?

5. Measuring Volume of a Liquid
a. Professor Demonstration

b. Measure the volume of 7.50 mL of ethanol in a 10 mL graduated cylinder
   i. Record the volume to ±0.05 mL ____________ mL. □
      1. Retain 7.50 mL ethanol sample for #6
   ii. Out of a 25 mL graduated cylinder, 150 mL beaker, and a 50 mL Erlenmeyer flask which has the least uncertainty (most accurate volume)? Explain
iii. If you had to accurately measure 20 mL of a liquid which of the three pieces of glassware would you use, 25 mL graduated cylinder, 150 mL beaker or a 50 mL? Explain

c. Buret
   i. Half fill a 50 mL buret with DI water, do not forget to dispense some water so that tip is full.
   ii. Record the volume to ±0.05 mL  __________ mL
   iii. Dispense about 10 mL of water from the buret into your waste container and then
   iv. Record the volume to ±0.05 mL  __________ mL

6. Transferring a Liquid
   a. Professor Demonstration
      i. Place 50 mL of DI water in a small beaker
      ii. Transfer 5 mL of DI water from the beaker to your waste container using a volumetric pipet
      iii. Transfer 5 mL of DI water from the beaker to your waste container using a graduated pipet
      iv. Add the 7.50 mL of ethanol from #5 to the 0.500g Na$_2$SO$_4$ from #4 in the labelled 50 mL beaker
         1. Na$_2$SO$_4$ is a drying agent and should absorb any water that may be in the ethanol. It is now dry ethanol.
      v. Decant the ethanol from the Na$_2$SO$_4$ into your waste container
      vi. You are measuring 15 mL of a 1M HCl in a 25 mL graduated cylinder but while pouring the solution you accidently deliver 20 mL. Can you just pour the extra 5 mL back into the source bottle? Explain
7. Density of a liquid (use 5 mL ethanol)
   
   a. Weigh a 50 mL beaker
       __________ g
   
   b. Measure 5 mL of ethanol with a 10 mL graduated cylinder, record the volume to ±0.05 mL
       __________ mL
   
   c. Transfer the ethanol to the beaker
   
   d. Re-weigh the beaker which contains the ethanol
       __________ g
   
   e. The mass of the liquid = Mass_{final} - Mass_{initial} __________ g
   
   f. Density = m/V
      i. Calculate the density of ethanol __________ g/mL

8. Hot plate (Never use a flammable liquid directly on)
   
   a. Professor Demonstration
   
   b. Place a stirring bar in a 150 mL beaker and add 100 mL of DI water
   
   c. Place the beaker on the middle of the hot plate and turn on the stirrer
   
   d. Why do you add the stirring bar before the liquid?

   e. Do you want a super-vigorous stir? Explain
9. Hot water bath using a hot plate
   a. Professor Demonstration
   
   b. Make a hot water bath and record the temperature of boiling water to \( \pm 5^\circ C \)
      \[ \text{___________}^\circ C \]

10. Ice bath
    a. Professor Demonstration
    
    b. Make an ice water bath and record the temperature to \( \pm 5^\circ C \)
       \[ \text{___________}^\circ C \]

11. How to clean general glassware
    a. Professor Demonstration
    
    i. Clean a dirty piece of general glassware that you have used for this lab
       \[ \square \]
    
    ii. How clean does a piece of glassware have to be before you can place it on the dirty glass cart?
    
    iii. How can you tell when a piece of glassware is clean?
    
    iv. Can you place a labeled piece of glassware on the dirty glass cart?
    
       Explain
    
    v. What do you do if you break a piece of glassware while cleaning it?