DENSITIES OF THE 7-UPS

• Can we use a physical property to distinguish between diet and regular soda?
  – We shall see........

• What are our hypotheses? You choose - record on pg 3 of report
  – 7-Up is more dense than Diet 7-Up
  – Diet 7-Up is more dense than 7-Up
  – Both sodas have the same density

• Can we collect accurate enough data to test our hypotheses?
  – Everyone collects their own individual data today
  – We will be pooling data to maximize our chance of success
  – Everybody’s data will influence the results – be careful!!
THE HIDDEN AGENDA:
SIG FIGS AND UNCERTAINTY

- Make sure you to record the uncertainty for each measurement you make today
  - This means you understood what we were doing in lab last week
  - The uncertainty for each measurement device is ± 1 unit of the estimated (last) digit of your measurement – unless it is written on the device (like the beakers: ±5%)
  - All measurements and calculations must be written with the correct number of sig figs. Ask if you are not certain.

SUMMARY OF THE LAB

- To determine density, we need to measure the weight of a measured volume of soda
- We will measure the weight of 3 separate 25 mL samples of soda using the analytical balances
- The 25 mL samples will be measured out using 3 different types of glassware for measuring volume:
  - A 100 mL graduated cylinder
  - A 25 mL volumetric pipet
  - A buret
- For each sample, we will weigh our empty plastic jar and cap and then weigh the jar/cap with the sample in it on the same balance
- Soda used for rinsing glassware and weighed samples are discarded in the sink
PROCEDURES FOR TODAY’S LAB

**First steps:** Obtain equipment from stockroom and wash with soap and water
Get 150 mL of your assigned soda in a clean, dry 250 mL Erlenmeyer

**100 mL graduated cylinder sample:**
- Rinse clean 100 mL cylinder with 5-10 mL of sample (Do 2 times)
- Carefully measure 25 mL of sample into the cylinder
- Weigh your plastic jar on the balance and record weight
- Pour the 25 mL soda sample into the plastic jar and re-weigh (same balance)

**25 mL volumetric pipet sample:**
- Re-weigh the empty plastic jar (any balance) and record this weight
- Using the 25 mL volumetric pipet and a pipet bulb, carefully pipet 25 mL of soda into the plastic jar
- Weigh jar with sample again, (same balance used for the 2nd empty weighing)

**Buret sample:**
- Re-weigh the empty plastic jar (any balance) and record this weight
- Rinse your clean buret with 5-10 mL of sample and then fill it with about 30 mL
  (Remember how to read the buret – from the top down)
- Run a few mL into beaker to make sure tip is filled; record reading to 2 dp.
- Carefully add 25 mL of sample to your jar and record final reading to 2 dp
- Cap and reweigh jar (same balance)

**Clean up:** Discard any extra soda in sink; clean glassware & benchtop; return items to stockroom. Complete calculations and report to me.

PROCEDURES: THE REALITY

• First, you get to practice waiting in line again:
  – Check these items out at the stockroom:
    50 mL buret
    Pipet pump (bulb)
    Small plastic jar with cap
    25 mL volumetric pipet

• Now you get to “do the dishes”. Wash the buret, pipet, a 100 mL graduated cylinder and 250 mL Erlenmeyer flask with soap and water.

• Next you get to use an analytical balance for the first time (Refer to Appendix B for instructions)
  – These balances are very sensitive: Handle with care!
  – No chemicals directly on the balance pan
  – Keep the balance area clean at all times (use brush to clean pan)
USING THE BALANCES

• Turning balance on: briefly press control bar
• When 0.0000 is displayed the balance is ready to use
• Zero the balance by pressing the control bar
• Open the door and place your empty plastic jar on pan.
• Close door; wait for display to stabilize (green light off)
• Read mass from the display and record (“tare mass”)
• Carefully remove plastic jar from balance and note which balance you used.
• Always weigh the filled capped jar on the same balance you weighed the empty jar for that particular sample

GROUP DATA COLLECTION

• Once you’ve calculated your 3 densities, check with me
• Before leaving lab today, the Diets and the Regulars will gather together to pool their data and create a table for graphing their group’s results.
• Each person must individually prepare a graph and bring their completed graphs to next Tuesday’s lab session
• The group can then examine the data for outliers and discuss which points may need to be omitted on Tuesday
• Then we will compare the groups’ data together and work through the follow up questions.
EXAMPLE OF DATA GRAPH

FOR TUESDAY

- Bring completed graphs of your groups data to Lab – I will be checking.
- Follow instructions for good graphing in Appendix A
- Turn in Nomenclature Worksheet