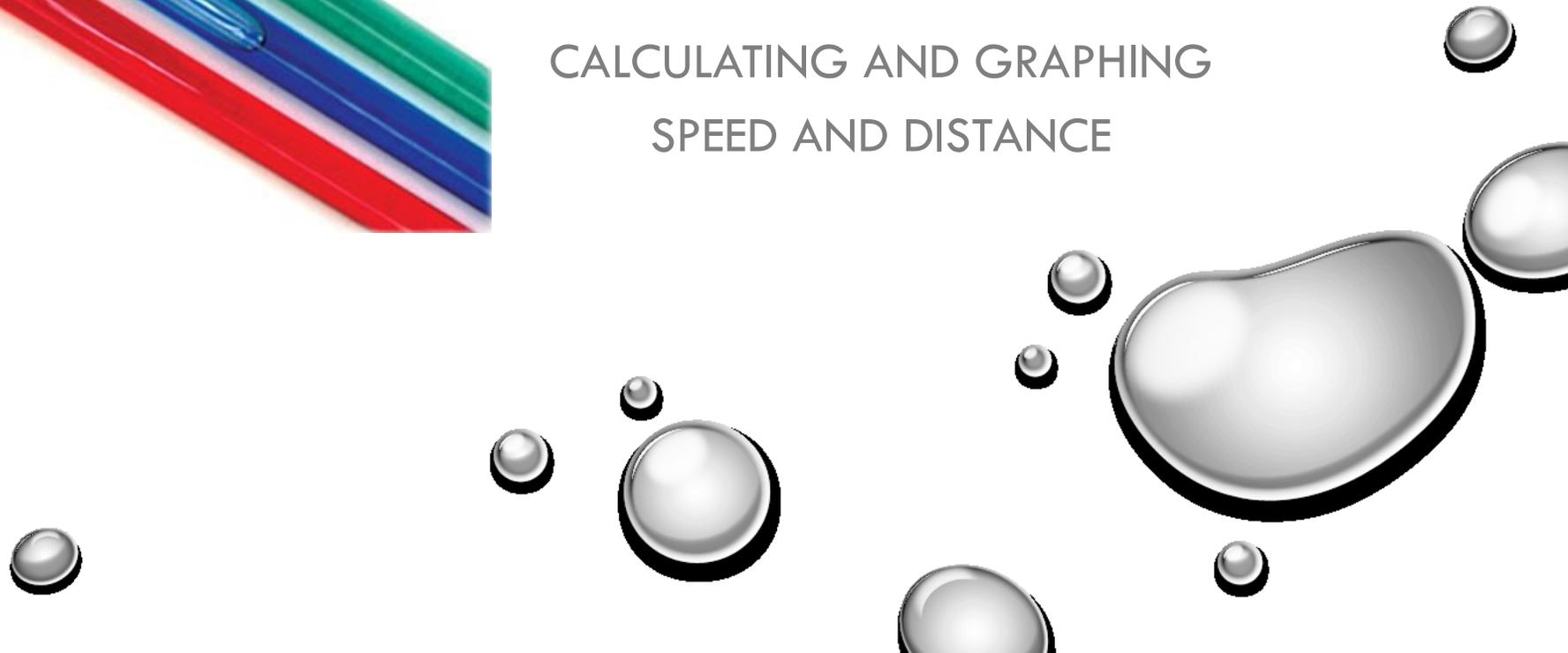# BUBBLE SPEED

CALCULATING AND GRAPHING

SPEED AND DISTANCE

PROBLEM:

- DOES THE VISCOSITY OF A LIQUID AFFECT THE BUBBLE'S SPEED?

DATA TABLE

Tube Color	
Time (Sec)	Distance (Cm)
2	
4	
6	
8	
10	
12	

Tube Color	
Time (Sec)	Distance (Cm)
2	
4	
6	
8	
10	
12	

Tube Color	
Time (Sec)	Distance (Cm)
2	
4	
6	
8	
10	
12	

PROCEDURE

1. SELECT ONE COLOR TUBE. HOLD IT VERTICAL AND WATCH THE BUBBLE RISE.

2. HOLD THE TUBE NOT QUITE HORIZONTAL, SO THE BUBBLE IS AT ONE END. PLACE THE METER STICK WITH THE ZERO-END EVEN WITH THE BUBBLE.

3. THE PERSON TIMING WILL SAY "GO" AND START THE TIMER AS THE PERSON HOLDING THE TUBE QUICKLY TURNS THE TUBE UPRIGHT. MOVE ONE FINGER ALONG THE TUBE, KEEPING IT NEXT TO THE BOTTOM OF THE BUBBLE.

4. WHEN THE TIMER SAYS, "STOP", STOP MOVING YOUR FINGER.

5. KEEP YOUR FINGER ON THIS SPOT AND MEASURE THE DISTANCE THE BUBBLE HAS TRAVELED DURING THE SET TIME. RECORD IN THE DATA TABLE.

6. REPEAT THE PROCEDURE UNTIL YOU HAVE MEASURED THE DISTANCES OF THE 6 DIFFERENT TIMES.

7. REPEAT STEPS 1-6 FOR EACH COLOR TUBE.

1

Make a triple line graph to show the relationship between the distance the bubble traveled and the bubble's time.

GRAPH

2

Summarize your graph in paragraph form (qualitative and quantitative)

— "The graph shows the effect of (IV) on (DV)" Discuss highs/lows ("the fastest time was . . ." / "the slowest time was . . .")

— Trends/Patterns: positive (both increase together), negative (as one increases, the other decreases), no trend (no real pattern is evident.

GRAPH ANALYSIS

CONCLUSION QUESTIONS

1. In which colored tube did the bubble have the greatest speed?

2. In which tube did the bubble have the slowest speed?

3. Give a reason why the speed of the bubble in each tube was different.

4. If the liquid's viscosity (resistance to flow) was greater would the bubble rise faster or slower?

5. Explain why the size of the bubble in the tube would change the speed of the bubble as is rises up through the tube.

6. Would the diameter of the tube affect the speed of the rising bubble? Why?

7. How would the length of the tube affect the speed of the bubble?

8. If you tilted the tube at an angle what would happen to the speed of the bubble?

9. Explain your answer to question #8 above

10. What would the speed of the bubble be if the tube were laid flat on the table perpendicular to the force of gravity?

11. What force opposes the force of gravity and causes the bubble to rise upward in the tube when it is tilted up?

12. If the density of the fluid were greater what would happen to the speed of the bubble?