Name _____ Earth #_____ Due Date _____ Imperial (Guilderland H.S)

Lab # _____ Deposition of Sediments

General Procedure (do this for each part):

1. Set up a plastic column on a ring stand with clamps.

2. Being sure the bottom cap is on tightly, fill the tube the tube to one inch above the upper tape.

3. Measure the distance between the two tops of the tapes and record here _____ cm.

Part I: Effect of Density:

1. Obtain three samples of particles that are the same size but different density. The steel ball has the highest density, the glass ball has the next highest density, and the plastic ball has the lowest density. Make a hypothesis about the settling times of these objects.

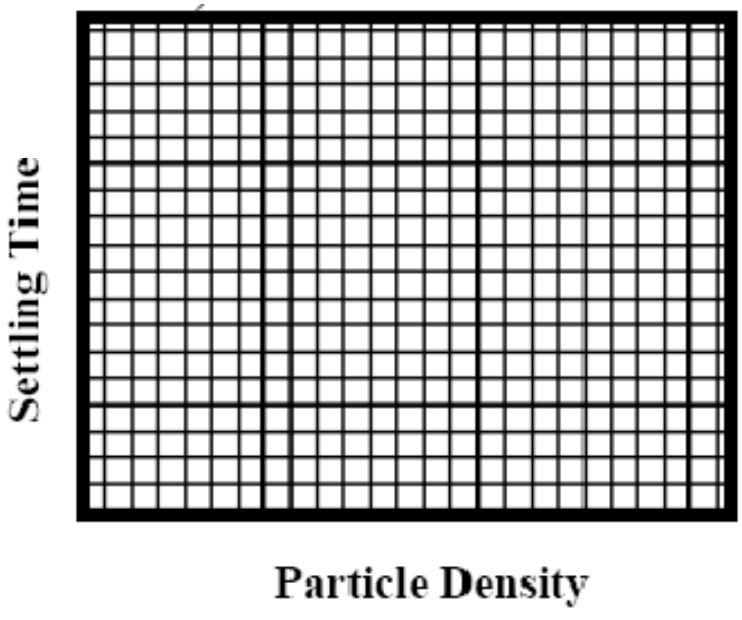
Hypothesis: _____

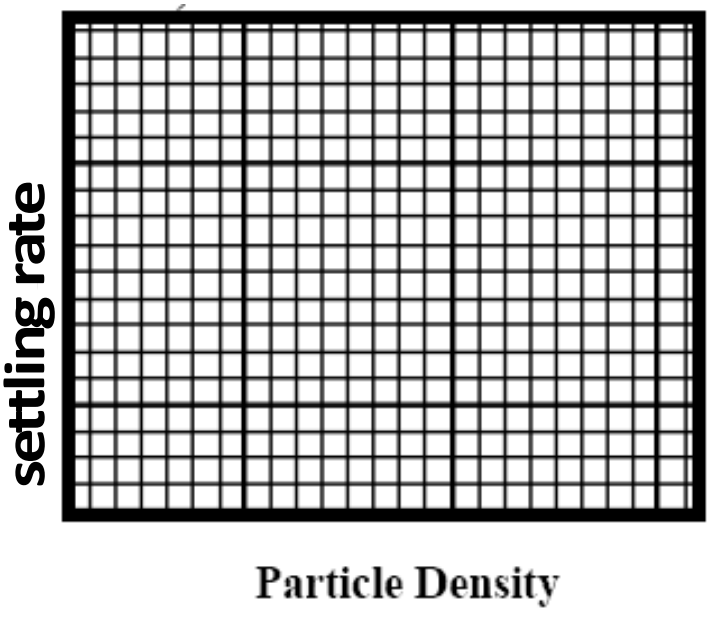
_____.

2. Drop the steel ball into the column and record the settling time. Do the same for the glass ball and the plastic ball.

3. Calculate the settling rates. Graph the data. LINE GRAPH!!

Density	**Settling Time (s)**	**Settling Rate (cm/s)**
High Density (steel)		
Medium Density (glass)		
Low Density (plastic)		





Analysis:

1. What is the relationship between particle density and the *rate* at which particles settle?

Conclusion: Can we accept or reject our hypothesis? Why or why not?

Part II: Effect of Shape:

1. Using clay, shape the samples of the same volume into different shapes ranging from spherical to flat. Start with four spheres of the same size and then flatten each one more than the previous one, with the last one being quite flat. Make a hypothesis about the settling times of these objects.

Hypothesis: _____

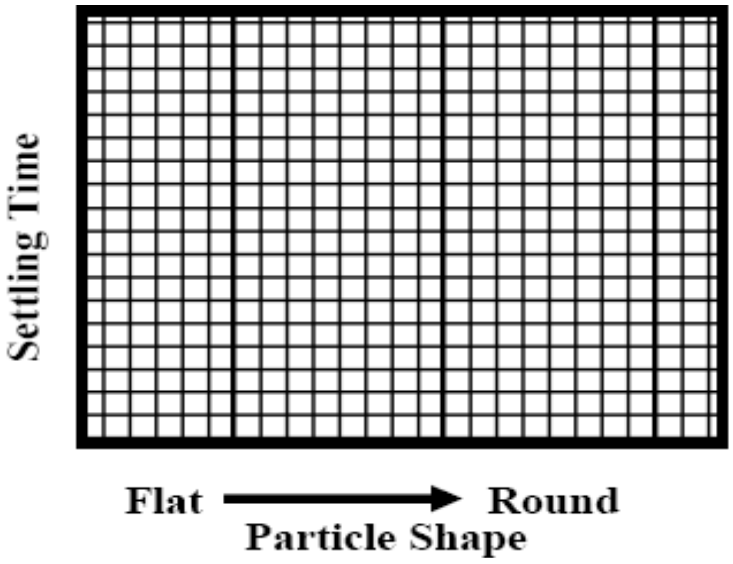
_____

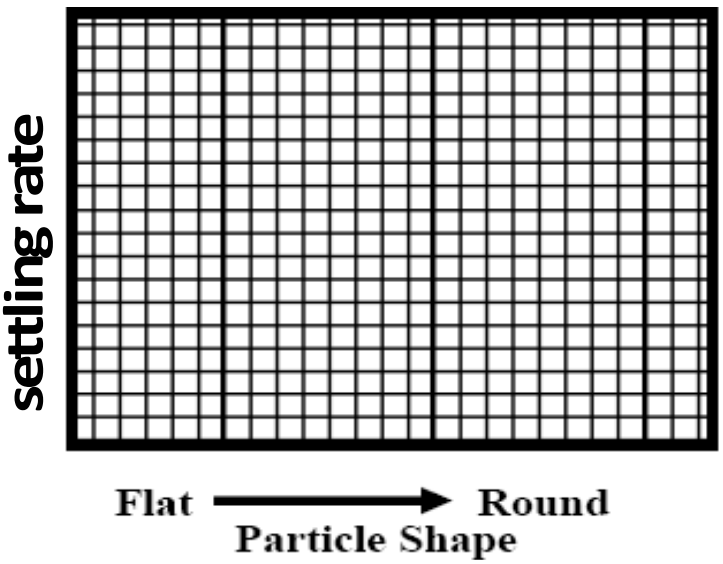
_____.

2. Drop the most spherical in first, record the settling time, and then follow the same procedure for the rest.

3. Calculate the settling rates. Graph the data. LINE GRAPH!!!

Shape	**Settling Time (s)**	**Settling Rate (cm/s)**
spherical		
semi-spherical		
semi-flat		
flat		





Analysis:

1. What is the relationship between particle shape and the *rate* at which particles settle?

2. Compare the densities of these four particles. Explain your answer.

Conclusion: Can we accept or reject our hypothesis? Why or why not?

Part III: Effect of Size:

1. Obtain two different sizes of plastic beads, which "should" have the same shape and density. Make a hypothesis about what will happen when these sediments are dropped in the column.

Hypothesis: _____

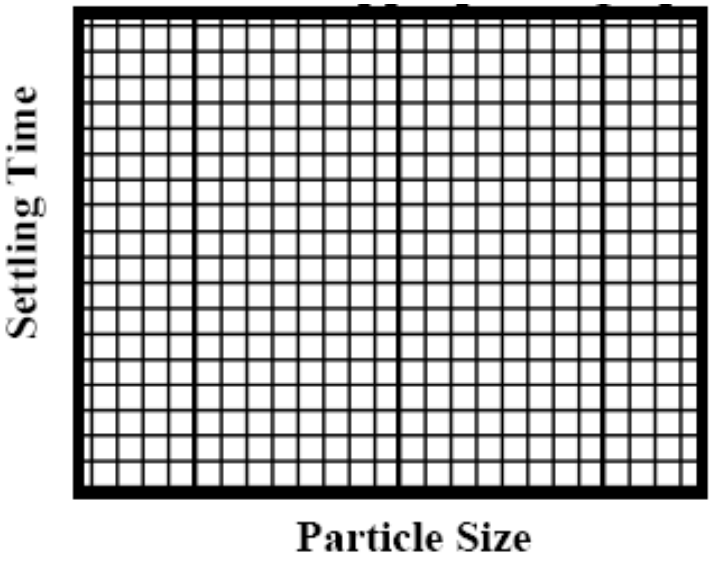
_____

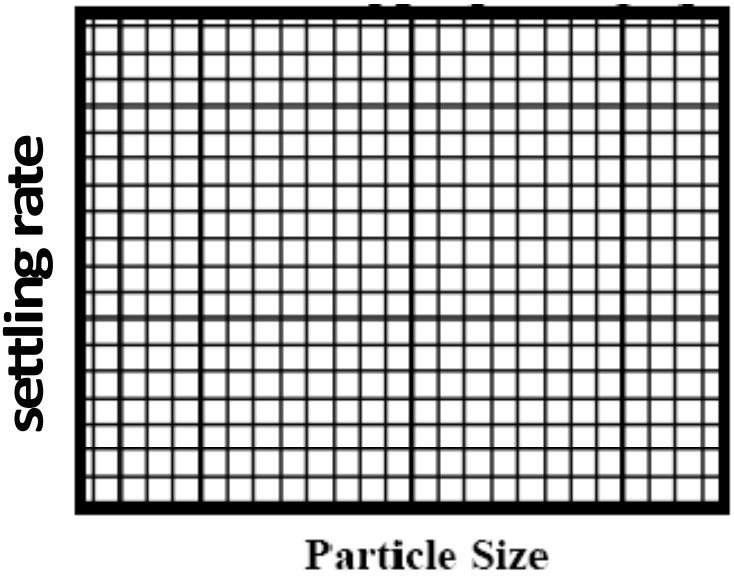
_____.

2. Drop the biggest particle in first, record the settling time. Do two more trials. Follow the same procedure for the smaller particle.

3. Calculate the settling rates. Graph the data. LINE GRAPH!!!

Shape	**Settling Time (s)**	**Settling Rate (cm/s)**
Large Diameter (Trial 1)		
Large Diameter (Trial 2)		
Large Diameter (Trial 3)		
Small Diameter (Trial 1)		
Small Diameter (Trial 2)		
Small Diameter (Trial 3)		





Analysis:

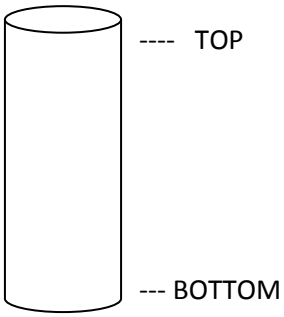
1. What is the relationship between particle size and the ***rate*** at which particles settle?

2. What is the relationship between particle size and the ***time*** it takes for particles to settle?

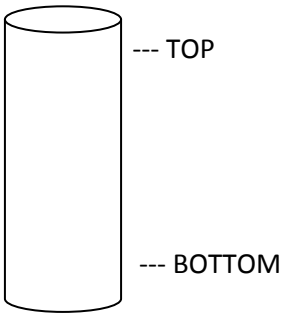
Conclusion: Can we accept or reject our hypothesis? Why or why not?

Part IV: Mixed Sediment

1. Make a hypothesis about what will happen when mixed sediment is dropped through a column of water. Draw your hypothesis on right:



2. After the sediments have been dropped, record the actual settling pattern on right:



Analysis:

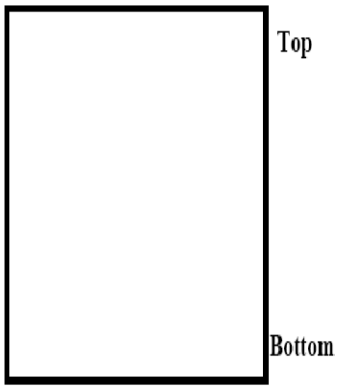
1. The deposition simulated in this lab occurred in “quiet” water. What affect do currents and waves have on the settling rates of sediment that occurs in nature?

2. For Part IV, if the substance in the tube was changed to maple syrup, would your results have changed? Explain.

3. For Part IV, if the temperature of the water was dropped to 4^0C, would your results have changed? Explain.

4. How would you determine the settling rate of a feather?

5. Illustrate graded bedding:



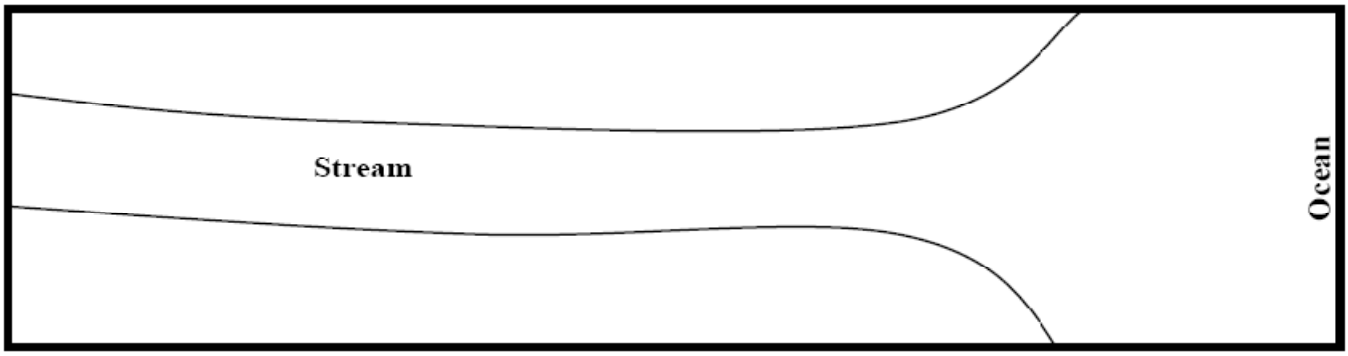
6. Draw what a well-sorted sediment and a poorly sorted sediment looks like:

well

poorly

7. a) When various sized particles are transported in a stream, in what pattern do they generally settle when they reach a large body of water? What size settles first?

b) Illustrate this deposition pattern below (top view).



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c) which particles would settle the furthest from the mouth of the river? What types of rocks are formed in that zone?

d) when would an underwater landslide occur at the mouth? What would be the resulting deposition pattern?

Lab modified from “Settling Rates” by Todd Hembury, Pelham Middle School.