Lab Activity: Erosion and Deposition

INTRODUCTION:

Streams that are moving quickly can carry larger amounts of sediment and larger fragments. When a stream enters a quiet body such as a lake or shelter lagoon they no longer have the ability to transport sediment. This is the point at with erosion stops and deposition begins.

OBJECTIVE:

You will see the different factors that contribute to the varying settling rates of particles.

VOCABULARY:

Deposition -

Sediment -

Horizontal Sorting -

Vertical Sorting -

Suspension -

EQUIPMENT SETUP:

1. Take the clear plastic tube and secure a stopper into the bottom.
2. Using a ring stand and test tube clamps, secure the plastic tube with the stopper vertically.
3. Fill the tube with water using a beaker to transfer the water from the sink to the clear plastic tube. Make sure that the top marking line is below the surface of the water.

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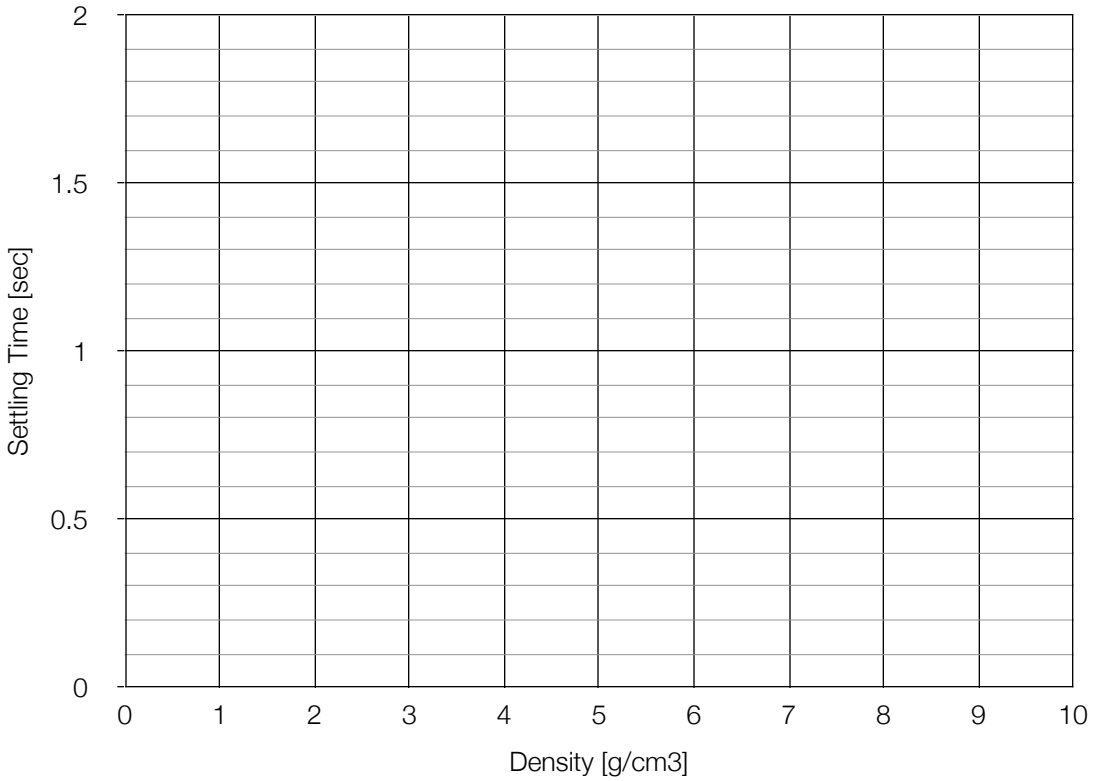
PROCEDURE A:

1. Using the different density spheres provided, drop the glass and steel spheres separately into the column of water. Start the watch when the particle passes the top line and stop the watch as it passes the bottom line. Record your time on Data Chart A.
2. Calculate the settling rate by dividing the distance between the lines by the settling time.
3. On Graph A, plot your results.

DATA CHART A

Composition	Density [g/cm^3]	Settling Time [sec]	Settling Rate [cm/sec]
Glass	2.5		
Steel	7.5		

GRAPH A



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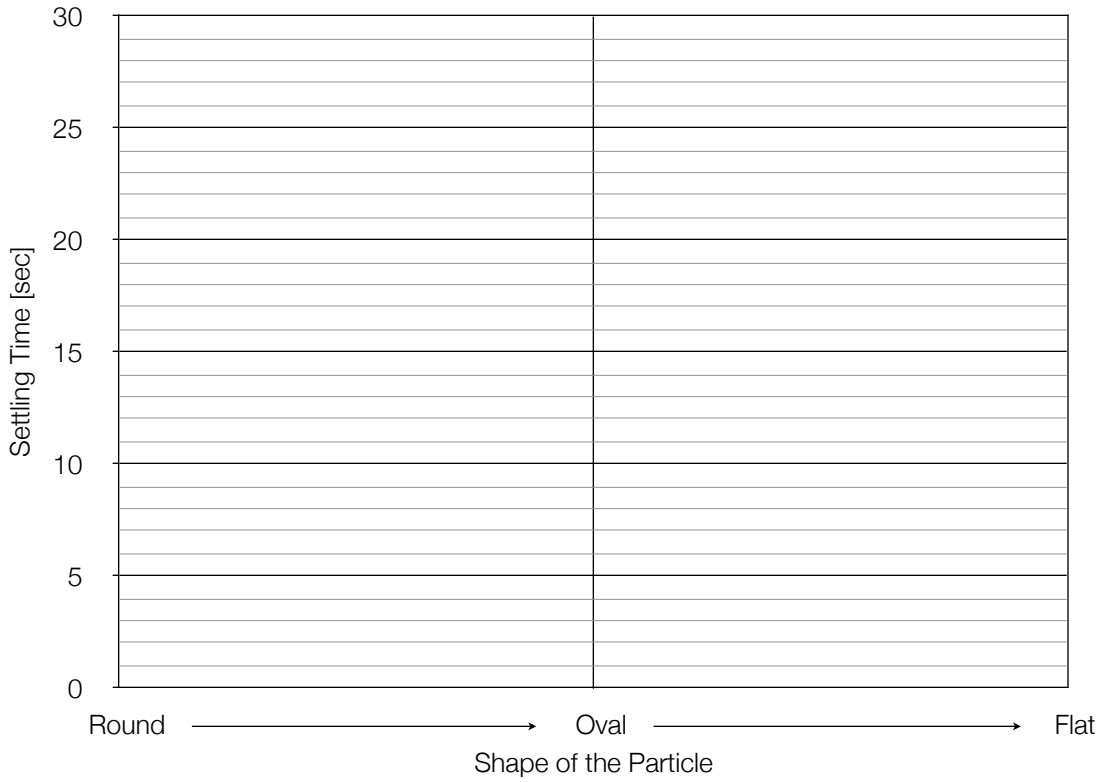
PROCEDURE B:

1. Measure three separate pieces of clay. Each individual one should have a mass of 1.0 g. Take one of the pieces and mold it into a flat disk, another into an oval, and the other into a sphere.
2. Using the different shaped particles created, drop the them separately into the column of water. Start the watch when the particle passes the top line and stop the watch as it passes the bottom line. Record your time on Data Chart B.
3. Calculate the settling rate by dividing the distance between the lines by the settling time.
4. On Graph B, plot your results.

DATA CHART B

Shape	Mass [grams]	Settling Time [sec]	Settling Rate [cm/sec]
Round	1.0		
Oval	1.0		
Flat	1.0		

GRAPH B



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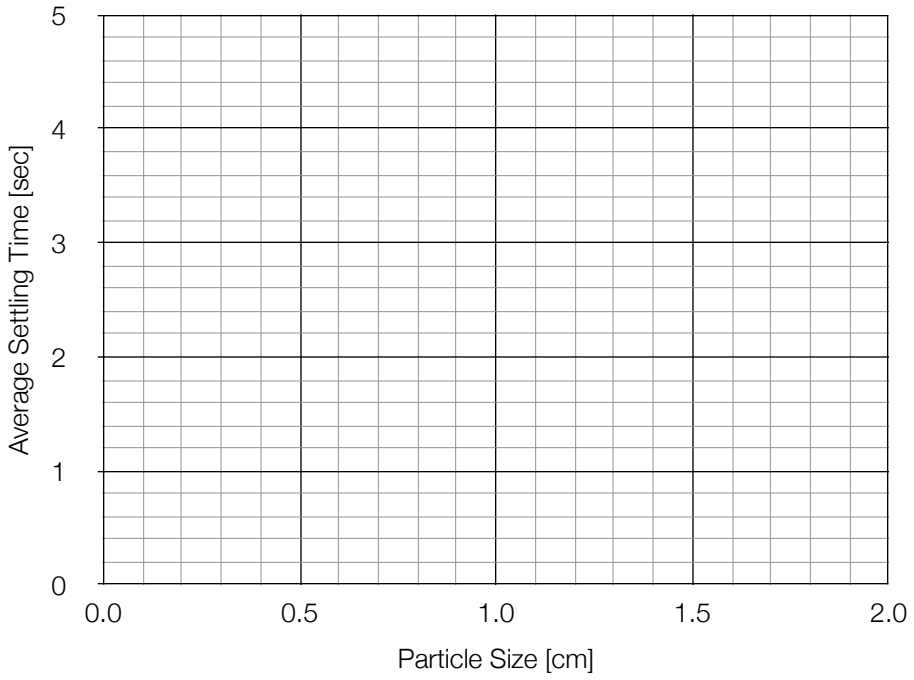
PROCEDURE C:

1. Using clay, create three particles for each trial size - three small particles [0.5 cm], three medium particles [1.0 cm], and three large particles [1.5 cm].
2. Beginning with the smallest particle, drop the three trials individually into the column of water. Start the watch when the particle passes the top line and stop the watch as it passes the bottom line. Record your times for the trials on Data Chart C. Repeat for the medium and large size particles.
3. Calculate the settling rate by dividing the distance between the lines by the average settling time.
4. On Graph C, plot your results.

DATA CHART C

Size	Settling Time [sec]				Settling Rate [cm/sec]
	Trial 1	Trial 2	Trial 3	Average	Calculation
Small [0.5 cm]					
Medium [1.0 cm]					
Large [1.5 cm]					

GRAPH C



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DISCUSSION QUESTIONS:

1. What is the relationship between the density and the settling time of a particle in quiet water?

2. What is the relationship between the shape and the settling time of a particle in quiet water?

3. What is the relationship between the size and the settling time of a particle in quiet water?

4. Using the sedimentation tube, describe the appearance of the particles from bottom to top.

5. Besides the properties of the particle itself, what other factors can affect the settling rate?

CONCLUSION: List the factors which determine the rate at which sediments are deposited.