Name _____ Date _____

I'd Like To

Make A Deposit

Quick Background:

The processes that occur on the Earth's surface are influenced by many factors. Think about how many "aims" we have written so far that start off with: "What factors affect …" Well, this part of our topic is no different. After sediments are weathered and eroded, eventually they get dropped off somewhere. This process is known as deposition. In this experiment, we are going to specifically refer to deposition in water. As a stream slows down and loses energy, it will drop off the sediment it has picked up along the way.

OBJECTIVE:

The objective of the laboratory experiment is to see how particle size, shape, and density affect the rate of deposition in water.

Procedure:

____ 1. Obtain the following materials as needed:

plastic deposition tube and stand	clay
4mm diameter beads (2)	steel spheres (2)
7mm diameter beads (2)	stopwatch
12mm diameter beads (2)	meter stick
marked plastic spheres (2)	plastic particle tray

____ 2. Measure the distance between points A and B on the plastic deposition tube to the nearest whole cm. This distance will be used later to calculate average settling rate.

Distance between A and B (cm)

Part I - Experimenting with Particle Size:

____ 3. Using the stopwatch, time how long it takes for the 4mm bead (smallest) to travel between the two marks (A and B) on the deposition tube.

Simply release the bead at the top of the tube without placing any force behind the drop. Record the settling time on the data chart (to the hundredths place as the stopwatch displays). Repeat this step for the other small (4mm) particle

____ 4. Repeat step 3 using the medium (7mm) and large (12mm) beads.

____ 5. Calculate the average settling times for the small, medium, and large beads, and record the average on the data chart. (Round to nearest hundredths place.)

____ 6. Calculate the average settling rates for the small, medium, and large beads, and record the average on the data chart. (Round to nearest tenths place.)

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Part II - Experimenting with Particle Density: clay v. steel v. plastic

____ 7. Mold 2 pieces of clay into spheres so that they are the same size (volume) as the steel sphere and plastic sphere (marked with a blue "D"). (Each clay ball should have a mass of 1.5 grams.)

____ 8. Using the stopwatch, time how long it takes for the clay sphere to travel between the two marks (A and B) on the deposition tube. Record the settling time on the data chart (to the hundredths place as the stopwatch displays). Repeat this step for the other clay sphere.

____ 9. Repeat step 8 for the steel and plastic spheres.

____ 10. Calculate the average settling times for the different materials and record the average on the data chart. (Round to nearest hundredths place.)

____ 11. Calculate the average settling rates for different materials and record the average on the data chart. (Round to nearest tenths place.)

Part III - Experimenting with Particle Shape:

____ 12. Use the digital scale to get 6 pieces of clay (2 spheres, 2 rectangles, 2 flat) each to measure a mass of 5 grams. Use the shapes already made, just check to see that each still has a mass of 5 grams. If it does not, add or remove a little clay so that it does.

____ 13. As you did in the previous parts, drop each particle into the deposition tube, measure their settling times between points A and B and record on the data chart.

____ 14. Calculate the average settling times for the round, rectangular, and flat-shaped particles dropped. Record the averages on the data chart. (Round to nearest hundredths place.)

____ 15. Calculate the average settling rates for the round, rectangular, and flat-shaped particles dropped. Record the averages on the data chart. (Round to nearest tenths place.)

____ 16. Retrieve all particles from the deposition tube and return them to their proper locations, refill the tube with water, and **thoroughly** clean your work area.

____17. Make sure to put all necessary units in each of the data charts. Remember, the best way to do this is by putting the unit in the heading of the row or column

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DATA CHARTS

Part 1 – Experimenting with Particle Size

	Small Particle 4mm	Medium Particle 7mm	Large Particle 12mm
Trial 1 (sec)			
Trial 2 (sec)			
Average Settling Time (sec)			
Average Settling Rate (cm/sec)			

Part 2 – Experimenting with Particle Density

	Density (g/mL)	Trial 1 (sec)	Trial 2 (sec)	Average Settling Time (sec)	Average Settling Rate (cm/sec)
Plastic Sphere	1.1				
Clay Sphere	1.5				
Steel Sphere	8.3				

Part 3 – Experimenting with Particle Shape

	Round	Rectangular	Flat
Trial 1 (sec)			
Trial 2 (sec)			
Average Settling Time (sec)			
Average Settling Rate (cm/sec)			

Conclusions: Write a relationship statement based on your collected data for particle size v. settling rate, density v. settling rate, and particle shape v. settling rate.

Conclusion for particle size experiment:

_____

Conclusion for particle density experiment:

_____

Conclusion for particle shape experiment:

_____

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