Name:_____ **Date:**_____

ADVENTURE ENGINEERING- "Lost in the Amazon"
LESSON 6: Attack of the Raging River

Activity 1: Anchors Away

You are almost to your destination; your body is feeling more and more tired and you don't know if you can walk another step.

Suddenly, you hear Beth, a Marine Engineer, yell from the front, "Guys we have a problem! I think we have strayed slightly from the original route. The GPS unit says our location is 3°S and 60.2°W. It looks like we are going to have to cross a river in order to get to Manaus."

You look at the map and realize Beth is right. How will you cross the river? Will the supplies you have be enough to get everyone across safely?

Procedures:
Before designing a vessel to cross the water safely, you'll first want to better understand how to make something float.

1. Fill the bowl with water approximately ¾ of the way full and mark this level on the cup.
2. Roll the clay into a ball shape in your hand.
3. Using a pan balance measure the mass of the ball in grams and record on the table below under Trial #1.
4. Carefully drop the ball into the water.
5. Record your observations of the clay ball. _____
6. Mark the new level of the water on the cup. Did the water level change, and if so, how?

   _____
7. Take the ball out of the water and use a paper towel to dry it off.
8. Now, try to change the shape of the clay so that it will float on the water.
9. After you get the clay to float, measure the clay's mass and record it under Trial #2.

Trial #1 Mass Before Change (in grams)	**Trial #2** Mass After Change (in grams)

Name:_____ **Date:**_____

Questions: Answer the following in complete sentences.

1. Did the clay float after you changed its shape? Why?

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2. Compare the mass of the clay in Trial #1 and Trial #2. Was the mass of the clay similar or different?

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3. How did the clay change between Trial #1 and Trial #2?

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4. What shape did you change the clay to?

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5. Do you think your clay creation could hold some paperclips inside and still float?

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6. How many paperclips do you think it could hold?

Procedures (cont'd):

10. Write the name of the three materials you were given by your teacher in the data table on the following page.

11. Estimate how many items of each material your clay boat can hold all at once:

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12. Slowly and carefully fill the boat with the materials until it fills with water and sinks. (The items should be placed in one at a time.)

13. Record the number of each item that your clay boat held.

14. Take the boat with the items out of the water and dry them off (be very careful not to deform the boat!).

15. Using the weighing balance measure in grams the weight of the total number of items your clay boat held. Set aside the items, as they will be used again.

Name:_____ **Date:**_____

DATA TABLE:

Material	Mass of Each Item (in grams)	Number of Items Held	Total Mass of Items (in grams)
1.			
2.			.
3.			

Total Mass that Boat Held: _____

Answer the following questions using complete sentences:

1. How much mass (in grams) did it take to sink your boat? (Use the largest value found)

_____

2. What is the ratio of the amount of mass your boat held vs. the mass of the boat itself? (Hint: Divide the total mass that the boat held by the mass of the boat itself.) Show your work.

_____

_____

3. What, if anything, can you do to improve the amount of mass your boat will hold?

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