Name: _____

Teacher:_____

Density Lab: 6th Grade Weather Unit

Safety Rules:

1. Carefully follow all instructions given by the teacher.
2. Be careful with science tools, equipment, and supplies. Use them according to instructions.
3. Conduct yourself in a respectful and responsible manner.
4. Report any accidents or spills to the teacher.
5. Be sure to return all science supplies to the teacher at the end of the activity.

Materials:

Split tanks
Warm Water
Cold Water

Two different colors of food coloring
Stir stick
Density Cubes (set of 4)

Density Bottles with beads
Spill trays
Scales (optional)
red/blue pens (optional)

Vocabulary:

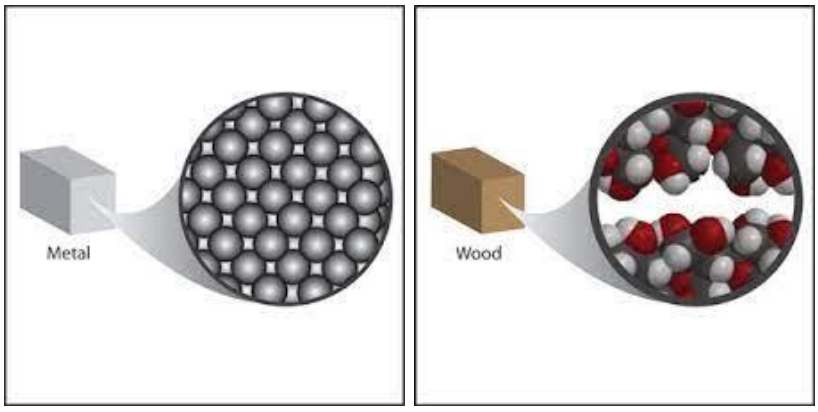
Mass: amount of matter in an object, usually measured in grams
Volume: the amount of space occupied by an object
Density: amount of matter packed in a space.

Step 1 Question:

How does density affect weather patterns?

Step 2 Research:

Every object on earth is made of atoms. Gravity pulls these atoms to the earth. You can measure the pull of gravity on an object. We call that measurement weight. A molecule is a group of atoms bonded together. Density is how close together the molecules of a substance are or how much mass a substance has in a given space.



Part 1: Density Cubes

1. Feel density cubes and arrange them in order from most to least dense in a column

2. Consider this information:
   Try to identify each metal by their symbol (letter or number).

	Aluminum	**Steel**	**Brass**	**Copper**
Density	2.7 g/cm3	7.85 g/cm3	8.73 g/cm³	8.96 g/cm³
Symbol				

3. Use math and computation thinking to put each metal on this chart below.

Part 2: Density Tank Demonstration

1. Pour warm water into one side of the density tank and cold water into the other side.
2. Add food coloring to each side, blue for cold and warm for hot.
3. Make cause and effect observations:

	Cause	**Effect**
Cold Side		
Warm Side		

4. **Predict what will happen when the center divider is released.**

5. **Release the center divider.**
   Observe patterns.

6. **Put the center divider back in the tank. Stir one side but not the other side.**
   Predict what will happen When the center divider is released again.

7. **Hypothesis: Draw a model for what could cause an inversion in Utah**
   (bad air trapped in the valley).

Part 3: Density Beads

1. **Shake the density bottle and observe what happens.**
2. **LIst the Objects in your bottle from least to most dense**

	Claim (color bead)	**Reason**	**Evidence**
1 (least)			
2			
3			
4 (most)			

3. **Consider this information: Isopropyl alcohol is a little less dense than water. Isopropyl alcohol has a density of about .79 g/cc at standard temperature and pressure compared to 1.0 g/cc for water. Salt water has a density of about 1.03 g/cc.**
4. **Which is more dense salt water or alcohol.**

Claim	**Reason**	**Evidence**

5. **Experiment. Predict, what will happen when ice is added to the bottle ?**

6. **Watch ice added to bottle**

   Patterns observations

7. **Use math and computation to estimate the density of these items.**
   Consider that salt water is 1.03 g/cc and rubbing alcohol is .79 g/ c

	Density
Fish	
Ice	
Salt Water and Vinegar Mixed	
Green Beads	
White Beads	
Blue Foam	