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Lac Courte Oreilles Ojibwe School
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Density Demonstrations

Target Grade Level 6-9 (Also appropriate for higher grades to demonstrate to younger students)

3-4 45 minute class periods

Objectives:

- To visualize layering of materials based on density differences
- To observe density increase as water cools and density decrease as water heats
- To observe density increase as a result of additives
- To predict water movement based on temperature and density

Materials:

Ward's "Exploring Convection Currents" Lab Activity 36 H 0735 (Or Alternate Materials)

Ward's "Weather Water Tanks" (Or Alternate Materials)

Pretest (Included in kit, available [here](#), or make from these [questions on-line](#))

Density blocks (or use this [virtual density lab](#) for demonstration)

Can of regular soda

Can of diet soda

Density of soda experiment ([here](#))

Water (hot and cold)

Ice cubes made with blue food coloring

Alternate Materials if kits are not available:

Bottles of red, green, yellow and blue food coloring

Salt

Ice cubes made with blue food coloring

Plastic spoons- 10

Block of wood - 5

Styrofoam cups - 30

Clear 6 quart plastic bins - 5

Water tank(s) with two part separation

[All printables](#) for Density Demonstrations

Procedure:

1. Give students a pretest to determine prior knowledge. Ward's "Exploring Convection Currents" Lab Activity 36 H 0735 includes a [pretest](#).

2. Have students write the definition of density and discuss the meaning in small groups.

Dictionary definition:

The state or quality of being dense; compactness; closely set or crowded condition.

3. Show density blocks (or [virtual density lab](#)) to give students a chance to experiment with objects of same shapes and sizes with different densities.

4. Do the density of a soda can experiment ([here](#))

5. Discuss how cold molecules (air or water) are closer together and move slower, while hot molecules are moving faster and more spread out.

6. Show video clip (1:19) of a 9 Layer Density Tower:

https://www.youtube.com/watch?v=-CDkJuo_LYs

7. Split students into 5 lab groups. Do [Lab Procedure Part 1](#) showing density of warming water (red food coloring) moving up and cooling water (blue food coloring) sinking in a bin of water. Add a blue ice cube to the water to show the cold water movement due to density.

8. Do [Lab procedure part 2](#) showing density of different temperatures and salinity.

9. Complete [Density Demonstrations Water Tank](#) from Ward's kit "Weather Water Tanks" to show the layering of liquids of different densities. Answer the questions at the end of the activity as a class discussion.

10. Show this [simulation of liquid density](#), use predictions as a formative assessment of understanding:

11. Give students a [posttest](#) to determine knowledge growth.