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Model: Biological Science Inquiry Model

Purposes:

Increase student's knowledge of density.

Context:

Students have been studying density. They know how to calculate it and they have some idea of the effects of it. They are not yet aware of a substance exhibiting different densities in under different conditions.

**Phase One: Area of investigation is posed to student**

As students come into the classroom they notice two separate containers of water on the desk. The containers contain two different color liquids which appear to be colored water. They notice some food coloring on the table and conclude it has been used to color the water.

As class begins many students ask about the water. Teacher simply responds “colored water for investigation. Once students are settled in they are told that they are going to observe an experiment in which they are going to try to interpret. With the use of gas collecting jars-clear containers which can be placed open end to open end with out the loss of liquid-the teacher pours two containers full of one color water and then a second set of two with another color water. The containers are now place one on top of the other. [Red water on top of blue water in one experiment and blue water on top of red water in a second experiment] In one case the colors do not mix, but stay one on top of the other. In a second case the colors mix.

**Phase Two: Students structure the problem**

Students identify the tow situations and their characteristics.

One color on top→ stationary color

Same color on bottom→mixing

**Phase Three: Students identify the problem in the investigation**

Students must identify the constants and variables in the two experiments.

What do colors mean? What was different?

**Phase Four: Student speculate on ways to clear up the difficulty**

Hopefully, students will come to see that water does not always have the same density. Temperature can change the density of a substance.