Diet or Regular

What is Needed

1 large container of water
1 can of diet root beer
1 can of regular root beer

What to Do

Take one of the cans in your left hand and one of the cans in your right.
They probably feel about the same
-- same size, same weight.
Now, set both of the cans in your large container of water.
What happens?
What does this happen?

What is Happening

One of them sinks and one of them floats. Do you know why?
The reason has to do with relative densities of materials.
The desity of water is 1 gram/cm^3. If the density of an object is less than 1gram/cm^3, then the object floats in water. If the density of an object is more than 1gram/cm^3, the object will sink in water.

Now we know that the density of one of the cans is greater than 1 gram/cm^3.
What could account for the difference?
Let's assume that there is the same amount of liquid and air inside each of the cans.
Let's also assume that there is the same amount of aluminum in each of the cans.
Now can you think of what would make the difference in densities?

The answer is that there is a difference in density between the two cans because of the difference in density
between sugar and the sugar substitute used in diet soft drinks.