Answers

1. What happened?

The can of regular soda will sink to the bottom of the bucket.

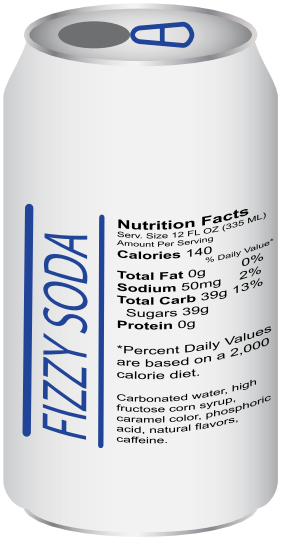
The can of diet soda will float in the bucket of water.

2. Why do you think this happens? (Hint: look at the nutritional values on each of the cans of soda.)

This happens because the regular soda has a lot of sugar that increases the mass of the soda while the volume stays the same.

3. Can you think of where you might have seen something like this happen before?

You may have seen a situation similar to this at a picnic or a party. If you look at the contents of a cooler after the ice has melted, you will notice that the diet sodas are floating on the top of the water and the regular sodas are at the bottom of the cooler.



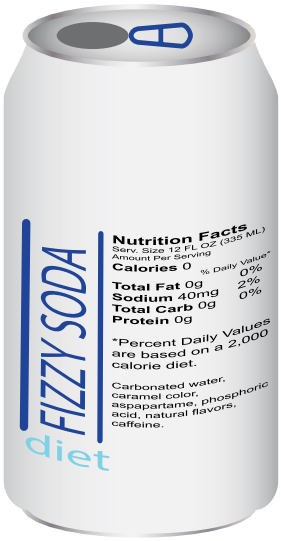
Objects less dense than water float, and those denser than water sink.

The main difference between the two cans is the amount of sugar in the soda. The regular soda is made up not only of the soda molecules but also of sugar molecules. In fact, most regular cans of soda have about 39 grams of sugar. This makes the regular soda denser than water, causing it to sink. (Thirty-nine grams equal about 10 packets of sugar!)

Now let's check out the ingredients on the diet soda can.

The diet soda has aspartame in it. Aspartame is an artificial sweetener. Aspartame is concentrated, and only a small amount is needed to give something a sweet taste.

All things equal (including the can), there are many more molecules packed into the can of regular soda than the diet soda.



Review Answers

1. Can two objects with the same volume have different masses?

Yes, our two soda cans are an example of this scenario. If both cans are placed on a scale, the regular soda will weigh more (due to the sugar) than the diet soda, yet the cans take up the same amount of space and contain the same amount of soda.

2. What two things does density depend on?

Mass and volume.

3. What do you think it means when an area is densely populated?

There are a lot of people living in that particular area.

4. Fill in the definitions in the vocabulary box.

Vocabulary	
density	How close together the molecules of a substance are.
mass	Mass is a measure of the number of **atoms** in an object.
volume	The amount of space something takes up.
atom	The basic building block of all matter.
molecule	Two or more atoms attached together.