

A State Debate!

Although the three states of matter are solid, liquid, and gas, not all substances seem to fit perfectly into one of these groups. Take a look at the substance below and see if you can decide whether it should be called a solid, liquid, gas, or something in between.

Materials:

- Shaving cream
 - Paper towel
 - Penny
 - Magnifying glass (optional)
- Activity

Procedures:

1. Place a small mound of shaving cream on a paper towel. Look at the shaving cream. Would you call it a solid, liquid, or a gas? Why? One characteristic of a solid is that it keeps its shape without being in a container. Does this make the shaving cream a solid? Why or why not?
2. Very gently place a penny on top of the shaving cream. What do you observe? Does the shaving cream act most like a solid, liquid, or gas?



3. Shaving cream is very light. Look at it very closely or use a magnifying glass if you have one. What do you think makes it so light? Does this make you change your opinion of whether it is a solid, a liquid, or a gas?

4. Rub a little shaving cream between your thumb and index finger. Does it feel like a solid, liquid, or gas?
5. Leave the shaving cream blob out over night. Look at it very closely the next day. How has it changed? Has its state changed? Leave it for a few more days and see if you think it has changed state.



Think about this ...

Another example of a substance with a weird state is a mixture of corn starch and water. In a cup, place 2 tablespoons of corn starch and 1 tablespoon of water. Mix with a popsicle stick. If you mix quickly the material will act more like a solid. If you mix slowly, it will act more like a liquid. Poke it with the Popsicle stick and then press it gently. What do you notice?

Where's the Chemistry?

It's not always so easy to say definitely that a substance is a solid, liquid, or gas. Some materials, like cornstarch mixed with water, can act more like a solid when treated a certain way and more like a liquid when treated a different way. Shaving cream seems to have an unusual state because it is a liquid soap with a lot of gas bubbles mixed in it. The gas makes it so thick and frothy that it keeps its shape and supports light objects like a solid. When you let the liquid from shaving cream evaporate, all that's left is the very light and thin solid soap and the spaces where the gas bubbles were.