

COCOA AND WATER EXPERIMENT

Cocoa Powder is made by roasting cacao beans.



Have you ever wondered why it is so maddeningly difficult to get cocoa powder to dissolve? Try this experiment and find out why cocoa powder and water find it hard to get along.

Equipment

Glass of tap water

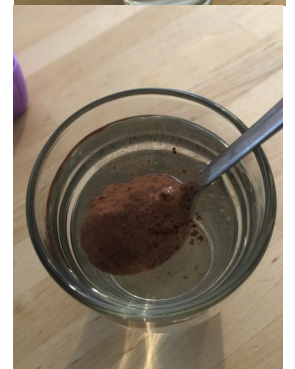
Cocoa powder

Spoon

Toothpick

Method

1. Place the spoon in the cocoa powder and get a heaped spoonful of cocoa powder.
2. Dip the cocoa powder into the glass of water.
3. Raise the cocoa powder above the surface of the water. It looks wet all over.
4. Take a toothpick and poke it into the cocoa and observe what happens to the powder.



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So what's going on here?

Cocoa powder is hydrophobic which means it does not dissolve easily in water. It repels water and attracts air.

When a substance wants to be near water molecules, we call it hydrophilic, meaning water-loving.

When a substance does not want to be near water molecules, we call it hydrophobic, meaning water-repelling.

Why does cocoa do this? The answer lies in the structure of the powder. Each grain contains some cocoa fat, and fat does not mix well with water. All other things being equal, oils and fats would much rather float on top of water than mix with it.

There is surface tension in the water around the cocoa forming a skin. When you pop this surface layer of water with the toothpick, it pops like a balloon revealing the dry powder underneath.

What's next?

We know particles have different properties at different temperatures.

How would heat affect the outcome of this experiment?

Try heating up your liquid and trying it again.

Try mixing cocoa powder with cold water, and then warm water.

