

Safety: Wear safety glasses or goggles, and be sure to follow all safety instructions given by your teacher. Wash your hands after completing the activity.

ACTIVITY

Question to investigate:

What happens to an M&M when it is placed in water?

Materials

- Different colored M&Ms
- Room temperature water
- 2 small plastic plates
- Room temperature water

Procedure

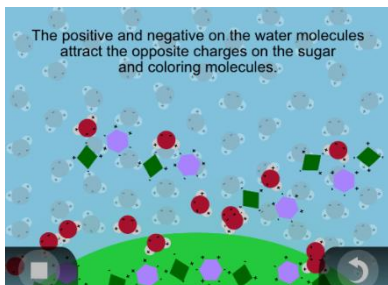
1. Place enough water in the plate so that it will cover an M&M.
2. Place 1 M&M in the center of the plate. Do not swirl or stir.
3. Observe for about 2 minutes.



1. When you put an M&M in water, what did you observe?

The coating came off the M&M. It made a round area of color around the M&M. After a few minutes, you could see the chocolate.

2. You saw an animation of water dissolving the M&M. Describe how the water molecules make the sugar and coloring on the M&M coating dissolve.



Water molecules have an area of positive and negative charge. The coloring and the sugar molecules also have areas of positive and negative charge. Since opposites attract, the water molecules attract the sugar and coloring until they go into the water and dissolve.

ACTIVITY

Question to investigate:

Will an M&M dissolve as well in a sugar solution as it does in plain water?

Materials

- 2 small white plastic plates
- 2 M&Ms
- Sugar
- Tablespoon
- Cup
- Room temperature water

Procedure

1. Make a sugar solution by dissolving 1 tablespoon of sugar in $\frac{1}{4}$ cup of water.
2. Pour the sugar solution in one plate and an equal amount of fresh (plain) water in a second plate.
3. At the same time, place one M&M in the center of each plate. The M&Ms should be the same color.
4. Observe the M&Ms for 1–2 minutes.



WHAT DID YOU OBSERVE?

3. When you looked at the M&M in the water and the sugar water, what did you observe?

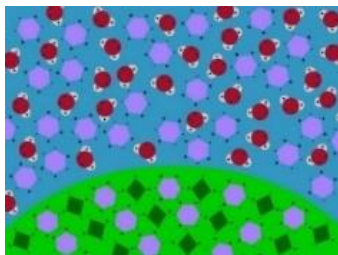
The coating of the M&M seemed to dissolve more in the water than in the sugar water.

4. In the investigation to compare how well an M&M dissolves in fresh water and sugar water, why did you use the same color M&M in your investigation?

It's possible that different color M&Ms dissolve differently. So if you want to see if water or sugar solution is a better dissolver, you should use the same color M&M so that you are comparing the water and the sugar solution the same way.

EXPLAIN IT WITH ATOMS AND MOLECULES

5. Based on your observations, the animation, and the illustration, explain why you think the sugar solution doesn't dissolve the M&M as well as fresh water does.



M&M in sugar solution

The water molecules are already attached to sugar molecules so they can't attract and connect to the sugar on the M&M. Also, the sugar that's already in the water could block some water molecules from reaching the M&M.

TAKE IT FURTHER

Question to investigate:

What happens when two or more M&Ms are dissolved in the same plate?

Procedure

1. Place enough water in a plate to cover an M&M.
2. Place 3 or 4 M&Ms of different colors near each other in the water as shown.
3. Observe for 2–3 minutes.



WHAT DID YOU OBSERVE?

6. When you looked at the M&Ms in the water, what did you observe?

The color and sugar came off the M&Ms and formed a straight line where the colors met. The dissolved color and sugar from one M&M didn't seem to mix with the color and sugar from another.

7. Based on what you saw when you tried to dissolve an M&M in a sugar solution, why do you think the colors formed a kind of "line" when they met?

Maybe the water is able to dissolve the sugar and color from the M&Ms but when the water already has sugar and color in it from the M&M, it doesn't attract or interact as much so the colors just meet and stay there.