

Activity 1.1

Mysterious M&M's

What happens when one M&M is placed in water?

In this introductory activity, students will see that when an M&M is placed in water, the sugar and color coating dissolves and spreads out in a circular pattern around the M&M. When students compare their results, they will discover that every color of M&M dissolves in a similar way. The way the sugar and color dissolve in water is a *property* of M&M's. This introductory activity provides a basis for students to ask questions and to learn more about dissolving, identifying and controlling variables, and designing a fair test.

Materials needed for each group

1 M&M
1 White plastic or foam dessert plate
Room-temperature water
Crayons or colored pencils
Bucket or large bowl
Paper towels

Notes about the materials

- Be sure you and the students wear properly fitting goggles.

Activity sheet



Copy *Activity sheet 1.1—Mysterious M&M's*, pp. 26–28, and distribute one per student when specified in the activity.

Assessment

An assessment rubric for evaluating student progress during this activity is on pp. 52–53. For this formative assessment, check a box beside each aspect of the activity to indicate the level of student progress. Evaluate overall progress for the activity by circling either “Good”, “Satisfactory”, or “Needs Improvement”.

Activity 1.1

Mysterious M&M's

Question to investigate

What happens when one M&M is placed in water?

Take a closer look

1. Have students read the introductory story on *Activity sheet 1.1* and describe the properties of an M&M.



Distribute an M&M to each student or group of students along with *Activity sheet 1.1*. As students begin to explore the characteristics of an M&M, listen to the conversations that student groups are having. Students should identify properties such as the following:

- Size, shape, color, and texture
- Different colored layers on the inside

Explain to students that their descriptions of M&M's are all *properties* of M&M's. In the story on *Activity sheet 1.1*, the student noticed that the color came off of an M&M when it fell in the water. Ask students if they ever had their M&M's get wet and start to lose their color. Tell students that in the *Try this* activity, they will see what happens to the sugar and color coating of an M&M when it is placed in a plate of water.

Try this!

2. Have students place an M&M in a dish of water and observe.

Giving students an opportunity to observe an M&M in water will give them the context and motivation to want to find out more about how M&M colors look when they dissolve in water. From this experience, you can get them to ask questions that they can investigate. Students will conduct the following procedure and record their observations.



Procedure

1. Pour enough room-temperature water into a white plastic or foam plate so that the water is deep enough to completely cover an M&M.
2. Once the water has settled, place 1 M&M in the center of the plate. Be careful to keep the water and M&M as still as possible. Observe for about 1 minute.

3. Have students compare their results.

Ask students what they notice about the movement of the color from their M&M.

Expected results: Each colored coating of M&M will dissolve in a circular pattern around the M&M. Students may also mention the white streaks in the water from the sugar coating. If anyone notices differences such as “the color moved over to one side more than the other,” check to see that the plate is level.

Point out to students that because the water makes the colored coating come off the M&M and mix into the water, the water is *dissolving* the sugar and color. Because the colored coating on M&M’s dissolves in a similar pattern each time one is placed in water, this is a characteristic *property* of the M&M coating.

Empty the plate of water and M&M into a bucket, bowl, or sink. Dry the plate with a paper towel.

4. Have students write questions they could investigate for each of the variables listed on Activity sheet 1.1.

Remind students that they have tested *one* M&M of a certain *color* in a plate of *water* that is at *room-temperature*. The number of M&M’s, the color, the type of liquid the M&M’s are placed in, and the temperature of the water are variables that can be changed to do new experiments. Tell students that they should write at least one question to investigate for each variable. Encourage students to think of other variables and questions they might want to investigate.

What’s next?

5. Compile the questions students write for each variable on chart paper.

Point out particularly well-written questions and identify some of the ones that can be investigated using the materials in your classroom. You may want to select one question for each variable that the entire class can investigate together. Tell students that they will have a chance to investigate some of these questions.

Sample procedures for the following questions are included in this investigation.

- Do some M&M colors dissolve in water faster than others? (*Activity 1.2*, pp. 30–31)
- What would the colors look like if we placed two or more M&M’s in a plate of water? (*Activity 1.3*, pp. 34–35)
- Is the “line” that forms when two colors meet a special property of M&M’s? (*Activity 1.4*, pp. 38–39)
- Does the temperature of the water affect how fast the colored coating dissolves from an M&M? (*Activity 1.5*, pp. 44–45)
- Does the amount of sugar already dissolved in water affect how fast an M&M coating dissolves? (*Activity 1.6*, pp. 48–49)