Welcome to NSTA's Daily Do
Teachers and families across the country are facing a new reality of providing opportunities for students to do science through distance and home learning. The Daily Do is one of the ways NSTA is supporting teachers and families with this endeavor. Each weekday, NSTA will share a sensemaking task teachers and families can use to engage their students in authentic, relevant science learning. We encourage families to make time for family science learning (science is a social process!) and are dedicated to helping students and their families find balance between learning science and the day-to-day responsibilities they have to stay healthy and safe.

What is Sensemaking?
Sensemaking is actively trying to figure out how the world works (science) or how to design solutions to problems (engineering). Students do science and engineering through the science and engineering practices. Engaging in these practices necessitates students be part of a learning community to be able to share ideas, evaluate competing ideas, give and receive critique, and reach consensus. Whether this community of learners is made up of classmates or family members, students and adults build and refine science and engineering knowledge together.
Introduction
Dancing stick figures made out of dry erase marker ink?! In today’s task, Why is the drawing floating?, students plan and conduct investigations and use the thinking tools of patterns and cause and effect to explain why dry erase marker stick figures float and in water.

Experience the Phenomenon
Tell students you have an intriguing phenomenon to share. Play the Magic Water Marker Trick video for students and watch the stick figures float and dance! Watch the video again and this time ask students to write observations and question they have.

Have students share their observations with a partner. Then, asks students to share their observations with the class. Create a class list of observations.

Add a column next to the observations for questions, then ask students to choose one question to share with the class. Students might ask:
- How can that happen?
- Why does the ink “lift” to the top of the water?
- Why do the stick people stay together?
- Why didn’t the stick figures dissolve in the water?
- Does this work with words and other drawings?
- Do all the colors float?
- Does the water temperature matter?
- Does the type of writing surface make a difference?
- Can this work with other markers/pens?
- Do other inks come off in water and stay in one piece?

Continue the conversation about what they are wondering. You might say many of us are wondering if other inks “come off in water” and stay in one piece? Do you think we should investigate this question first?

Investigation: Removing the m's from M&M's
Materials (per student pair)
- Room-temperature water
- Bowl
- 4-5 M&M's

Note: Other materials may be required. These materials will vary based on investigation plans designed by students.

The M&M® investigation will answer the question, “Do other inks come off in water and stay in one piece?” Students will see how “easy” it is to remove the m’s from M&M’s®.

Give each student one or two M&M’s. In the Alone Zone (independent thinking time) have students predict if the m’s will come off in water and stay in one piece like the dry erase marker ink. Why do
think so? Ask students to record their prediction and explain their thinking using words, pictures and/or symbols. Then, ask students to set their predictions aside/put them away. Be sure to tell them they will return to their predictions later.

Next, tell students they will conduct an investigation with the M&M’s®. Ask students to create a data table to record observations of the M&M’s® at three points in the investigation: before water is added to the bowl of M&M’s®, while water is being poured into the bowl, and after the water is added. See example data table at right.

Share the following procedure with students:

1. Place a few M&M’s®, m-side up, in the bowl.
2. Slowly pour room-temperature water into the bowl. Add enough water to cover the M&M’s®.

Ask each pair of students to join another student pair and share observations. Consider asking students to place a check mark next to observations most students in the group noticed and circle observations that only one or two students noticed. You might ask the groups to share two common observations and one less common observation with the class.

Ask students to then generate questions they have from this activity. Record student questions on a class list. Student questions might include:

- Does the color of M&M’s® matter?
- What will happen if the m is facing down?
- Does the temperature of water matter?
- Would the results be different if the water was poured quickly?
- What if another liquid was used?
- Does the same thing happen with other candy that has letters (like Skittles®)?
- Why does the m float and not sink?

Next, ask students to work with their group to identify which questions might have answers that help explain the phenomenon of the dancing dry erase marker ink. Tell students to be prepared to share how they might investigate the question and the data they would need to collect.

Students will likely identify the following questions (bold) as having answers that might help explain the dancing dry erase marker ink phenomenon:
• Does the color of M&M’s® matter?
• What will happen if the m is facing down?
• **Does the temperature of water matter?**
• Would the results be different if the water was poured quickly?
• **What if another liquid was used?**
• Does the same thing happen with other candy that has letters (like Skittles®)?
• Why does the m float and not sink?

Consider grouping students by the question they want to investigate. You may have multiple groups investigating the same question. This is OK. Allow groups time to plan their investigation. You might have groups investigating the same question share their plans and provide each other feedback.

Provide students time to conduct their investigations.

Have groups share their data with the class. They might post their data around the room or on a shared digital space. Ask students to look for patterns in group data as well as patterns in the class data (across group data sets). What patterns do they observe? You might create a class list of observed patterns in data. Patterns students might observe include:

• The candy coating dissolves faster in warmer water than colder water (as water temperature increases, the rate the candy coating dissolves increases)
• The candy coating dissolves faster in water than other liquids
• The candy coating dissolves in liquids that contain water (the higher the water content of the liquid, the faster the candy coating dissolves)
• The substance the m’s (and other edible “letters” on candies tested) are made of do not dissolve or appear to change in any of the liquids
• The substance the m's (and other edible "letters" on candies tested) are made of do not dissolve or appear to change even when the water temperature changes
• The m's are less dense than water (if you break it up into pieces, the pieces still float to the top

**Reach Consensus**

Ask students to return to their predictions about the M&M’s. Allow students independent thinking time to explain why the m’s came off of the candy and stayed in one piece using words, pictures and/or symbols. Encourage students to support their ideas with relevant evidence from (class) data and share why this data counts as evidence using scientific ideas, principles or theories. What claim can they make?

Ask students to share their explanation in small groups. As you move around the room, listen for students to share ideas about solubility and polar nature of water molecules. When you bring the students back together, ask these students to share their ideas first.
Consider leading a consensus discussion with students using the following prompts:

- How are our explanations similar? How are they different?
- What ideas are we in agreement about?
- I'm hearing X idea and Y idea. Why X? Why Y?
- Where should we go next to help us with areas where we are not sure about/not in agreement?

Students will likely reach consensus on the idea the candy coating is soluble in water but the “m” ink is not.

To help the class figure out where to go next, ask students to work in their small groups to complete the Venn diagram below.

![Venn Diagram](image)

Refer students back to their initial questions about the dancing dry erase marker stick figures. What questions can they now answer? What new questions do they have? Based on what the stick figures don’t have in common with M&M’s, what should we investigate next?

**NSTA Collection of Resources Today's Daily Do**

NSTA has created a *Why is the drawing floating?* collection of resources to support teachers and families using this task. If you're an NSTA member, you can add this collection to your library by clicking Add to My Library (near top of page).

**Check Out Previous Daily Dos from NSTA**

The NSTA Daily Do is an open educational resource (OER) and can be used by educators and families providing students distance and home science learning. Access the entire collection of NSTA Daily Dos.