

# Step 1: State the Question (Part 1)

Imagine that you're enjoying a package of M&M's when your little sister spills a glass of water on the table, drenching your candies. As you scramble to save them, you notice the color starts to run off many of the M&M's. This makes you wonder why the candy is reacting in such a way. You decide to get scientific and experiment with your favorite candy!

All experiments begin with a testable research question. This question often stems from an experience you've had or observations you've made in the past. Your research question must be testable. This means you can design an investigation, make observations, and gather evidence to answer the question. Scientific questions CANNOT be based on opinions or personal judgments.

Testable Research Question: Will M&M color dissolve faster in water or in vinegar?

Non-Testable Question: Which color M&M tastes better?

1. List at least four other testable research questions you can think of to investigate M&M's.

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As mentioned above, scientific questions don't just come to you from out of nowhere. Instead, questions come from experiences you've had or observations you've made in the past.

2. Think of times that you have observed something unusual or unexpected. Write those observations on the lines below. Then list a research question that could be used to investigate each observation. An example has been done for you.

**Example:**

Observation: I noticed the crickets were chirping very loudly outside my window last night.

Research Question: Do crickets chirp louder when the temperature is higher?



Observation: \_\_\_\_\_

Research Question: \_\_\_\_\_

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Observation: \_\_\_\_\_

Research Question: \_\_\_\_\_

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## Step 1: State the Question (Part 2)

Remember that the key to a good research question is that it can be tested. An experiment could be designed to find an answer to the question. If the question is based on opinions or personal preferences, then it is not testable.

Read each research question below. If it is testable, circle "YES." If it cannot be tested, circle "NO."

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| 1. Does the amount of fertilizer affect how tall a flower grows?         | YES | NO |
| 2. Are roses prettier flowers than tulips?                               | YES | NO |
| 3. How can we make cut flowers stay fresher for a longer period of time? | YES | NO |
| 4. Can daisies grow in different types of soil?                          | YES | NO |
| 5. Do daffodils smell better than carnations?                            | YES | NO |



Read each situation below. Then write the testable research question for the researcher. An example has been done for you.

**Example:**

Aaron and Sam want to grow some tomato plants this summer. They're trying to decide where to plant them so the plants receive the right amount of sunlight to produce the most tomatoes.

Research Question: What amount of sunlight makes tomato plants produce the most tomatoes?

6. Andre and Marie love popcorn, but they don't have much money to spend. They want to decide if more expensive brands of popcorn really pop better than others.

Research Question: \_\_\_\_\_  
\_\_\_\_\_

7. Sheri is tired of buying light bulbs. She wants to find out whether Brand A or Brand B light bulbs will last longer in her lamp.

Research Question: \_\_\_\_\_  
\_\_\_\_\_

8. Jerome's brother told him to fill the ice cube trays with warm water instead of cold water because warm water freezes faster. Jerome wants to find out if this is true.

Research Question: \_\_\_\_\_  
\_\_\_\_\_

**Challenge Activity:** Write your own scientific situation on a separate piece of paper. Trade papers with a classmate and have him or her write the research question that goes with your scientific situation.