



Thinking Like a Scientist: I Notice, I Wonder, It Reminds Me Of

Learn how these three questions can help you make deeper and more meaningful observations.

Overview: Knowing how to make meaningful observations is the first step to training your mind to think like a scientist. These three prompts can guide individuals to make focused observations and form connections to their prior knowledge that will help them answer their own questions.

Lesson Characteristics:

Use the table below for lesson planning purposes:

Grade	K-5
Time Required	30 minutes
Key Science Practices	Observation Skills
Key Concepts/Terms	Observation
Setting	Inside and outside
Materials	Two toilet paper rolls, sting, scissors, tape or glue, and anything they would like to use to decorate (examples: marker, paint, colored pencils, construction paper, stickers)

Next Generation Science Standards:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Asking questions and defining problems.		Patterns
Engaging in argument from evidence.		Cause and Effect

Learning Objectives

Students will...

...make and decorate toilet paper roll binoculars.

...learn about the power of observation by engaging with three questions that will lead them to deep and meaningful observations.

...get outside and use the prompts and their binoculars to explore their own backyard.

Preparation:

Gather materials

Get ready to spend time outdoors. Make sure to check the weather and be appropriately prepared.

Background Information:

Vocabulary:

Term	Definition
Observation	The action or process of obtaining information about something or someone by carefully watching or examining it.

Procedure:

Follow the steps in the table below to conduct the activity.

Sentences in bold are suggestions for what an educator might say to students.

Items in italics are possible student answers to questions.

Step	Action
	5E's: Engage Learning Cycle: Invitation
1	<p>How do you know a pencil is a pencil? Have you always known a pencil is a pencil? Do you remember when you first learned what the function of a pencil is? Pretend you don't know what a pencil is. Make a list of things you notice about your pencil, include only observations you can make with your five senses.</p> <p><i>It's yellow, it's made of wood, it has a pointy end and a soft end.</i></p> <p>What would you wonder about a pencil if you didn't know what it was?</p> <p><i>I would wonder what it's used for. What possible function does the sharp end and the soft end have?</i></p> <p>Does a pencil remind you of anything else you have encountered in your life?</p>

	<p><i>It is the same shape as a pen or a marker.</i></p> <p>Now that we have used the power of observation, we could now make a Hypothesis, or educated guess, and perform an experiment. We could hypothesize since a pencil looks like a pen, its function is a writing utensil. We could test our hypothesis by trying to write with it.</p>
<p>5 E's: Explore Learning Cycle: Exploration</p>	
2	<p>Watch Thinking like a Scientist: I notice, I wonder, It Reminds me of</p> <p>Pause after binoculars have been created.</p> <p>Today we will be using the prompts “I notice”, “I wonder”, and “it reminds me of” to think like a scientist and make careful and meaningful observations. Scientists also need the right tools. We will first be making binoculars using toilet paper rolls.</p> <p>Instructions:</p> <ol style="list-style-type: none"> 1. Gather your supplies. <ol style="list-style-type: none"> a. Two empty toilet paper rolls b. Scissors c. Sting d. Glue or Tape e. Something to decorate your binoculars (eamples: marker, paint, colored pencils, construction paper, stickers) 2. Decorate the two empty toilet paper rolls 3. Stick the two rolls together horizontally so they resemble the shape of binoculars. 4. Use the scissors to carefully poke one hole in the outer edge of each roll. 5. Cut a piece of string long enough to fit around your neck and feed the sting through each hole and tie a knot.
<p>5 E's: Explain Learning Cycle: Concept Invention</p>	
3	<p>Watch the rest of the video Thinking like a Scientist: I Notice, I Wonder, It Reminds Me of.</p>
<p>5 E's: Elaborate Learning Cycle: Application</p>	

4	<p>Time to take your binoculars outside! Find a location outside in your backyard or a nearby park. Sometimes when we look at nature it all sort of blends together into one big green blur. Now take a look through your binoculars. See how they help cut down your field of vision and allow you to focus? Take a few minutes to explore. Remember to think like a scientist by using the prompts I notice, I wonder, it reminds me of.</p>
<p style="text-align: center;">5 E's: Evaluate Learning Cycle: Reflection</p>	
5	<p>Use the attached observation data sheet to record three things you notice, three things you wondered and three things you were reminded of by your observations.</p>