WEEK 1 Day 1

STEM Investigation 1: Size and Stability

Children roll tennis balls in attempt to knock down objects with different sized bases. Through this Investigation, children will develop an understanding of balance and stability with respect to the size of an object's base.

Big Idea	Through using materials and interacting with them, people learn important concepts and gain skills relating to physical science, engineering and technology, and the arts
Guiding Questions	What processes help people construct structures, ideas, and works of art? How do people use different tools and materials for different purposes?
Vocabulary	**investigate** **size** **base** **stable** **stability**
Materials and Preparation	• 8 - 10 plastic cups (cups with wider rims and small bases) • 8 - 10 plastic water bottles, 16.9 fluid ounce size • 3 tennis balls • painters or masking tape (or other strong tape for marking floor) • writing tools • other everyday materials such as paper towel tubes, paper cups, • cardboard boxes (for further exploration) • chart paper, 3 pieces On one piece of chart paper, write the focus question*, What can we do to investigate how the size of the base of an object affects how easily it falls over?*

	Recreate the STEM Investigation Data Sheets on a second and third piece of chart paper. Identify a clean floor space where children can conduct the Investigation (and the following Investigations). Set up the "bowling space." Use tape to mark two squares on the floor where children will place the objects for each test. In addition, use the tape to mark a line on the floor where children will kneel to roll the balls (approximately 5 feet from the squares). Conduct the Intro to Centers in this "bowling space."
Intro to Centers	[Conduct the Intro to Centers in the "bowling space." Have children sit around the space.] *This week you will investigate this focus question,* ***What can we do to investigate how the size of the base of an object affects how easily it falls over?*** Point to the focus question and read it aloud. *What are some important words that we need to understand in order to answer this question?* Circle the words investigate, size, base, object. Discuss these words *As scientists this week, you will test different materials with bigger and smaller bases. We will see how easy or hard it is to knock them over with a ball.* Show plastic cups and water bottles. *Let's see how our experiment will work.* Place the cup on the floor in the square. *The cup is standing up on the floor, it has* ***stability****. That means it is stable; it does not fall over. Can someone roll a tennis ball to try to knock the cup over?* Have a volunteer kneel on the line and roll the ball to knock the cup over. *What just happened? Why do you think the cup fell over/ didn't fall over?* Invite responses. *You will be exploring construction in a lot of different ways in this unit. Now, as scientists and engineers, you will* ***investigate*** *how to*

	*make constructions as **stable** as possible. We can use this information when we build with blocks and make sculptures with Beautiful Stuff.* *This week in the STEM Center, you will have a chance to test how stable different materials are. Everyone will test two types of materials, plastic cups and water bottles, and record data on a chart.* Show the data charts.
During Centers	Children take turns setting up the cups and water bottles and knocking them over. To set up each turn, children will place a cup right-side-up (smaller base on the floor) in one square on the floor and another cup up-side- down (larger base on the floor) in the other square. Each child will kneel on the line of tape and roll the balls until he/she makes contact with the cups. The experiment is whether, when the ball hits the object, it remains standing or falls over. After each turn, children record the data on the Water Bottle Data Sheet and the Plastic Cup Data Sheet. Children will make an X under the matching picture each time they knock over the object. The same is repeated for the water bottles and any additional items they would like to experiment with.
Facilitation	● Which materials are more stable? ● What do you think makes the materials more/less stable? ● What does the data tell you?
Sharing Our Research	*What can we do to investigate how the size of the base of an object affects how easily it falls over?* Revisit the focus question. Children share their data by counting the X's in each category on each chart. Discuss why there might be more X's in one category. *What did you notice about what makes materials more stable?* Guide children to think about how the size of the base of an object might make a difference in how easily the object falls over when hit by a ball.
Standards	**K-LS1-**1 Use observations to describe patterns of what plants and animals (including humans) need to survive. Further explanation: Examples of patterns could include that animals need to take in food but plants do not,

	the different kinds of food needed by different types of animals, the requirement of plants to have light, and that all living things need water. Examples could include the pattern a bear makes when preparing to hibernate for winter, the seasonal patterns of trees losing and/or keeping their leaves. Analyzing and Interpreting Data, Organization for Matter and Energy Flow in Organisms, Patterns