

Marble Empire Learning Activity #5:

What's the Fastest Ramp?

Summary:

In this activity, children will explore how the shape of a ramp influences the speed of the Sphere.

Reference Standards:

Next Generation Science Standards:

[K-PS2-2](#)

[K-2-ETS1-3](#)

Common Core Standards:

[SL.K.3](#)

[K.MD.A.1, K.MD.A.2](#)

[MP.5](#)

Learning Goals:

1. Observe how the shape of the ramp influences the speed of the Sphere.

Materials and Setup:

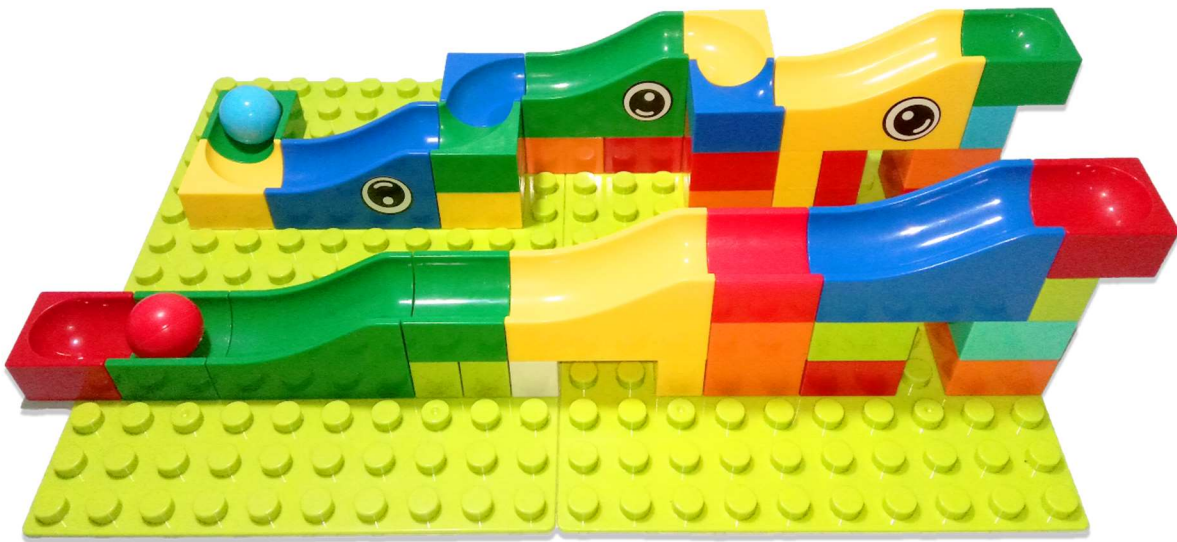
Materials you will need:

1. A stopwatch
2. A Marble Empire Sphere
3. Marble Empire Ramps and Curves
4. Marble Empire Blocks
5. A notebook and writing utensils
6. String and a yardstick or measuring tape



Part One: Building Two Ramps

1. Instruct the child to build two ramps using the Marble Empire pieces available:
 - a. The first ramp should be a straight ramp, with no curved pieces.
 - b. The second ramp should include curved pieces (as many as they like).
2. Tell them that it is very important that the two ramps have the **same height**. They do not need to have the same length.



Part Two: Make a Hypothesis

1. It's time for another experiment! Have the child open to a new page in their journal and explain that they will be conducting a new experiment called "What's the Fastest Ramp?"
2. Explain that the goal of this experiment is to determine whether the Sphere will travel more quickly on the straight ramp or the curved ramp.
3. Ask the child to make a hypothesis in their notebook for which type of ramp will be faster and why.

Part Three: Collect Data on the Ramps

1. If there are multiple children participating, break them into pairs so they can switch off between timing the Sphere and placing it into the Marble Empire. If not, the adult can be the timekeeper.
2. Help the child record how long it takes the Sphere to make it to the bottom of each ramp. Tell them to test each ramp at least three times and ask them why this might be important.
3. Have the children compare their original hypothesis with the data they just collected.
4. Have the child use a piece of string to measure the lengths of the two ramps.
 - a. This can be done by tracing the path of the Sphere from the top to the bottom of the ramp with the string and then cutting the string and measuring its length.
5. Ask them how the length of the ramp influences the time it takes for the Sphere to reach the end.
6. Have the child use their answer from #5 to modify their ramps to make the Sphere move faster or slower. Did it work?
 - a. You can also challenge the child to repeat the experiment to determine how the **height** of the ramp influences the length of time it takes the Sphere to reach the end.

Assessment

1. Can the child explain what could make one Marble Empire faster or slower than another?

