STEM 101
Powered by THE STEM ACADEMY

Name: _____
Period: _____

UNIT: MEASUREMENT

RULER RUNWAY

GOAL:

Investigate how the height of a ramp affects the speed and distance of a moving object (toy car or marble). Learn how height, speed, and kinetic energy are connected!

MATERIALS:

- ✓ Ramp (build with a binder, clipboard, or stack of books)
- ✓ Toy car or marble
- ✓ Ruler or measuring tape
- ✓ Stopwatch or timer (a phone works)
- ✓ Notebook or worksheet to record your data

STUDENT DIRECTIONS:

Step 1: Build Your Ramp

1. Use 1 book to start. Lay a ruler, clipboard, or flat board on top to make a ramp.
2. Place the **bottom of the ramp on the floor** and the top on the book stack.

Step 2: Test Run

1. Place the toy car or marble at the top of the ramp.
2. **Let it go—don't push it!** Start your timer as it begins to move.
3. Stop the timer when the car reaches the bottom of the ramp.

Step 3: Measure

1. Use the ruler to measure how far the car or marble travels after it leaves the ramp (distance).
2. Record how long it took (time).
3. Repeat the run **2 times for each ramp height** to get an average.

Step 4: Change Ramp Height

1. Add one more book under the ramp. Repeat the test steps above.
2. Do the same again with 3 books.

Name: _____
Period: _____

What to Record:

Use a table like this in your notebook:

Ramp Height (Books)	Distance Traveled (cm)	Time (s)	Speed = Distance ÷ Time (cm/s)
1 Book			
2 Books			
3 Books			

- What did you notice when the ramp got taller?

  _____

  _____

Reflection & Discussion:

- What happened to the distance and speed as the ramp got taller?

  _____

  _____

- What does this tell you about energy and motion?

  _____

  _____

- If we used a heavier object, what might happen? Why?

  _____

  _____

STANDARDS ALIGNMENT

NGSS: MS-PS3-1, MS-PS3-5, 2-PS1-1 **STEL:** STEL 1E, STEL 2E, STEL 6F, STEL 7F, STEL 11F **CCSS:** CCSS.MATH.CONTENT.HSN.Q.A.1, CCSS.MATH.CONTENT.HSN.Q.A.2, CCSS.MATH.CONTENT.HSN.Q.A.3, CCSS.MATH.PRACTICE.MP4, CCSS.MATH.PRACTICE.MP5