

's

STEM Journal

Dear Students,

Today, we are going to conduct an investigation to explore how and why different objects move. We can design things to change the **speed** and **energy** of objects.

In the story, Roll, Slope, Slide, we can see the way familiar objects move. We see how ramps can impact the way things move.

We can use **ramps** to explore the speed of different objects.

You will use the idea of ramps to create your own roller coaster using simple materials. Then you will test your roller coaster to observe the speed and energy of a marble as it moves through your design.

During which parts of your design does the marble have **potential energy**?

Where does it have **kinetic energy**?

Materials:

- paper plates
- tape
- toilet paper and paper towel rolls
- plastic or paper cups
- paper
- marbles

Name: _____

ASK



What is the problem you are trying to solve?

IMAGINE



Imagine the best way to solve the problem on your own.
Sketch out your design and brainstorm a list of ideas.

Ideas

Sketch Space

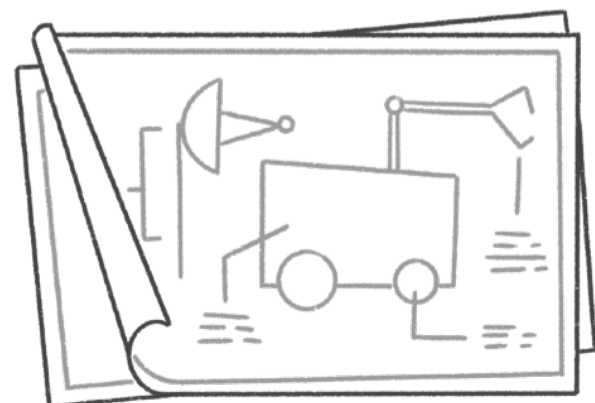
Name: _____

PLAN

With your group, sketch out your plan to solve the problem.

Ideas

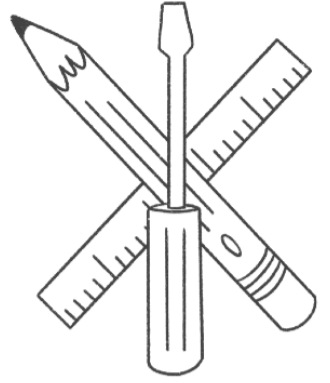
Sketch Space



Name: _____

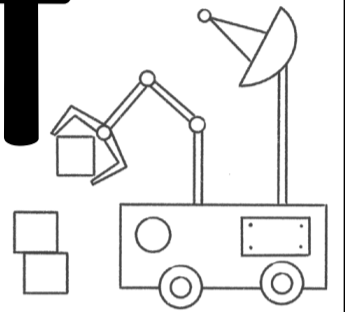
CREATE

Build your Prototype.



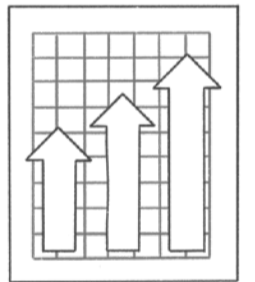
EXPERIMENT

Test your Design. Take Notes.



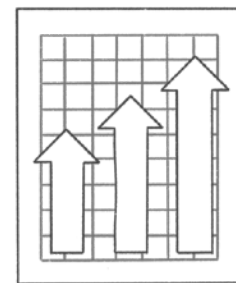
IMPROVE

What could you do to improve your design?



Sketch Space

Name: _____



Reflection

Use the template below to explain the models you created including any improvements you made after sharing your models with others.

My Roller Coaster Design

Research notes:

Design Feedback and Improvements:

Check the following statements you completed.	Circle one
I planned and constructed a roller coaster design.	Yes / No
I understand how speed and energy are related.	Yes / No
I worked well with my partner.	Yes / No
I enjoyed this investigation.	Yes / No

Name: _____

Date: _____

STEM Skills Rubric

4	3	2	1	Score
Idea Generator				
I can brainstorm a variety of creative solutions to different problems by writing, talking and sketching.	I can generate my own ideas to problems.	I can think about ways to solve a problem but may need assistance from others.	Coming up with ideas is challenging for me.	
Productive Planner				
I can develop a clear plan to solve a problem or create something new.	I can create a plan to solve a problem.	I need support to create a plan and solve a problem.	I have trouble creating my own plan and following it through to completion.	
Data Analyst				
I can collect data from multiple sources and investigate information, then use this information in my learning.	I can gather information and use this to help me solve problems.	I can review data that is given to me and talk about what the information means.	I need support to gather data and fully understand what it means.	
Materials Master				
I can think about combining tools and materials in innovative ways.	I can combine tools and materials to complete a task or challenge.	I know how to use most of the materials in my space but may need assistance to use them appropriately.	I need guidance and support to use materials how they are intended.	
Detailed Designer				
I can design and test prototypes and look critically at multiple iterations.	I can design and test a model.	With support and guidance, I can design and test a model.	I need support to work through multiple steps of the engineering design cycle.	
Creative Communicator				
I can share my creativity through my words, actions, and ideas to complete tasks.	I can communicate with others in creative ways.	I need support and guidance to communicate creatively with others.	I need multiple prompts and guidance to communicate creatively with others.	
TOTAL				