












Name: \_\_\_\_\_

Period: \_\_\_\_\_

**Forms of Energy** : Highlight all of the energy forms you observe throughout this lab.

Gravitational 	Elastic 	Chemical 	Nuclear 	Magnetic 	Electrostatic 	Mechanical 	Thermal 	Electrical 	Sound 	Electromagnetic 
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Materials:

For this activity, you will need:

- One regular pencil
- Access and log in to: [www.jason.org](http://www.jason.org) (Go to Operation: Infinite Potential>>Digital Labs>>Coaster Creator)
- Three colored pencils, markers, or crayons:
  - Red
  - Green
  - Orange

Getting started: Once you have chosen "Build Coaster Now!" in Coaster Creator, you will be asked to design your roller coaster car and add cars:

1. Write the name of your roller coaster here:

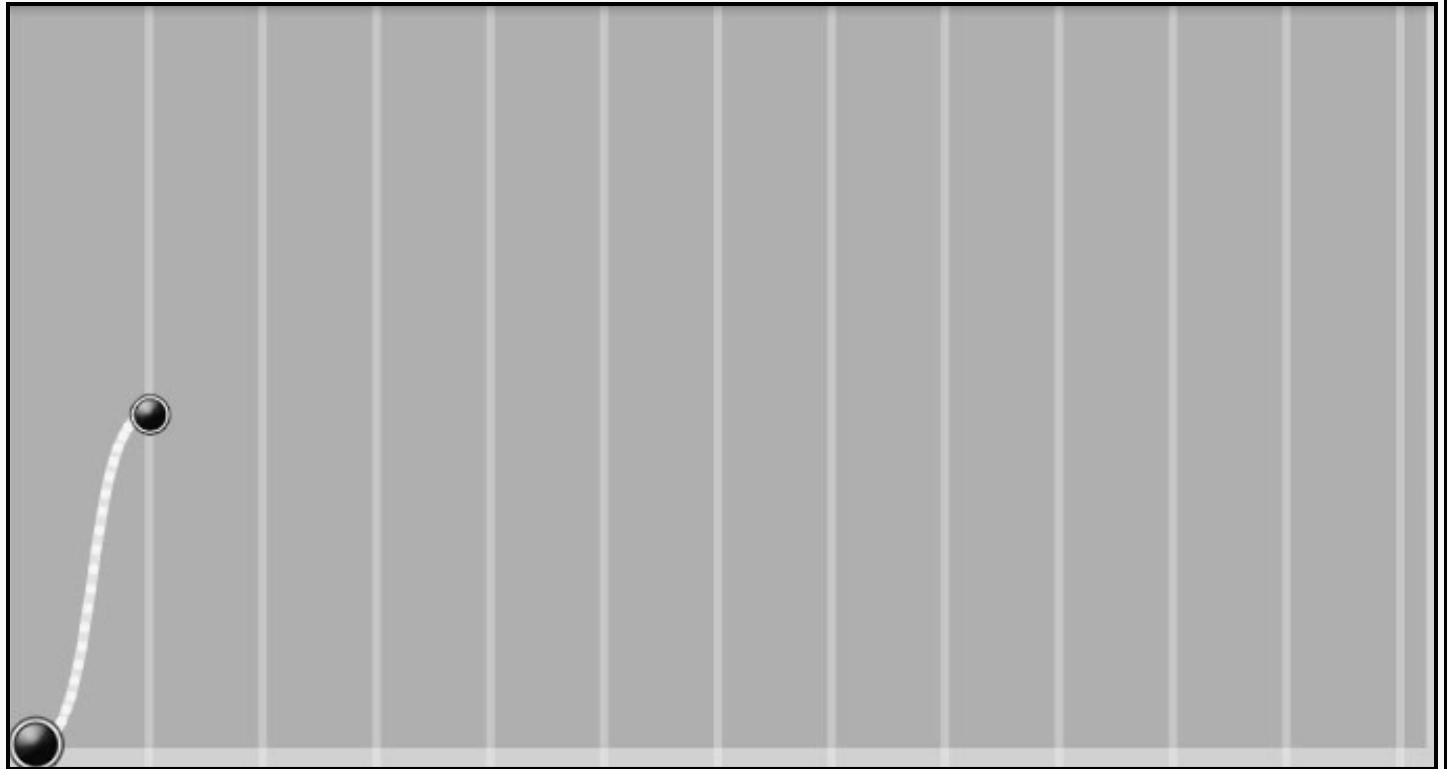
2. How many carts do you have?

3. What is the total mass of your carts? Fill in the appropriate squares below:

<b>PE=</b>		<b>x g x</b>		<b>KE=</b>	<b>1/2</b>		<b>x</b>		<b><sup>2</sup></b>
	Mass		Height			Mass		Velocity	

4. Once you have decided on your total number of cars, it will be time to build your track. With your regular pencil and using the box below, sketch the roller coaster track you have constructed.

*Hint:* It will take some practice and experimentation to make a successful roller coaster track. Learn from your mistakes and have fun!



A) Using the red colored pencil, circle the part of the track where you expect to find the *maximum potential energy*

B) Using the green colored pencil, circle the part of the track where you would expect to find the *maximum kinetic energy*

C) Using the orange colored pencil, circle the part of the track where you would expect to find the *maximum thermal energy*

5. Before you run your roller coaster, click on the very first node (these are the black dots) in your roller coaster. Look at the equation at the top of your screen, and fill in the numbers you see there:

$PE = \text{[ ]} \times g \times \text{[ ]}$   
Mass                      Height

$KE = \frac{1}{2} \text{[ ]} \times \text{[ ]}^2$   
Mass                      Velocity

6. Run your roller coaster. Keep an eye on the bar that will start to fill up at the top and answer the following questions: (*Hint: You can rerun your coaster as many times as you like. When your coaster has finished running, select the "Back" button to go back to the track building screen. If you don't make any changes, clicking on "Next" will let you rerun the same track.*)

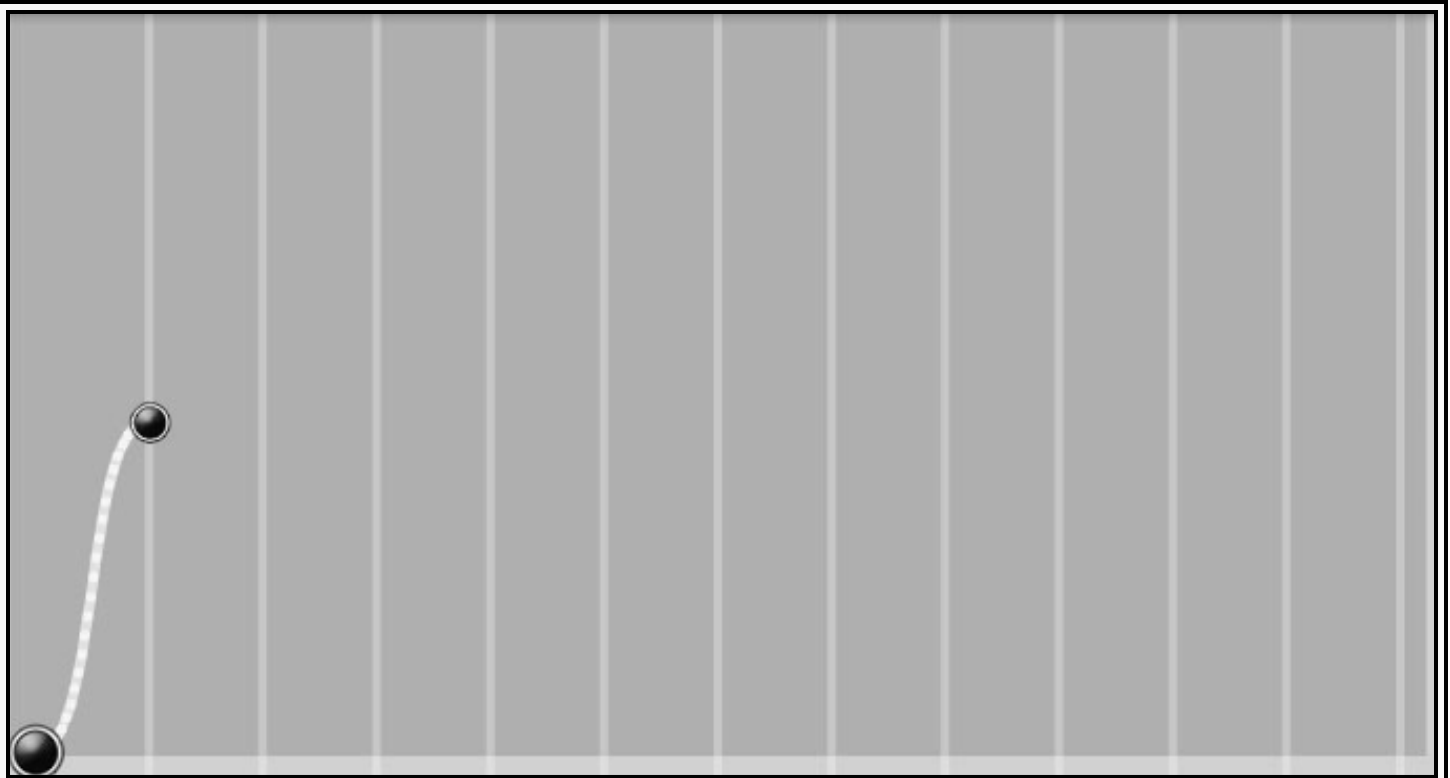
- A) What is the dominant color of your bar when you are at the top of the first hill?
  
  
  
  
  
- B) What type of energy does this represent?
  
  
  
  
  
- C) What is your car doing when the bar is primarily green?
  
  
  
  
  
- D) At what point during this ride is it most desirable to see a lot of orange? What does the orange bar represent?

7. When your coaster reaches the end of its run, circle the ends state of your coaster:

crash                      success                      stuck

If your coaster was *successful*, do not close your game. Keep the game open. Get the post-lab from your teacher in order to proceed.

If your coaster got *stuck* or *crashed*, go back to the track builder and modify your coaster. Record your modifications on the following page.



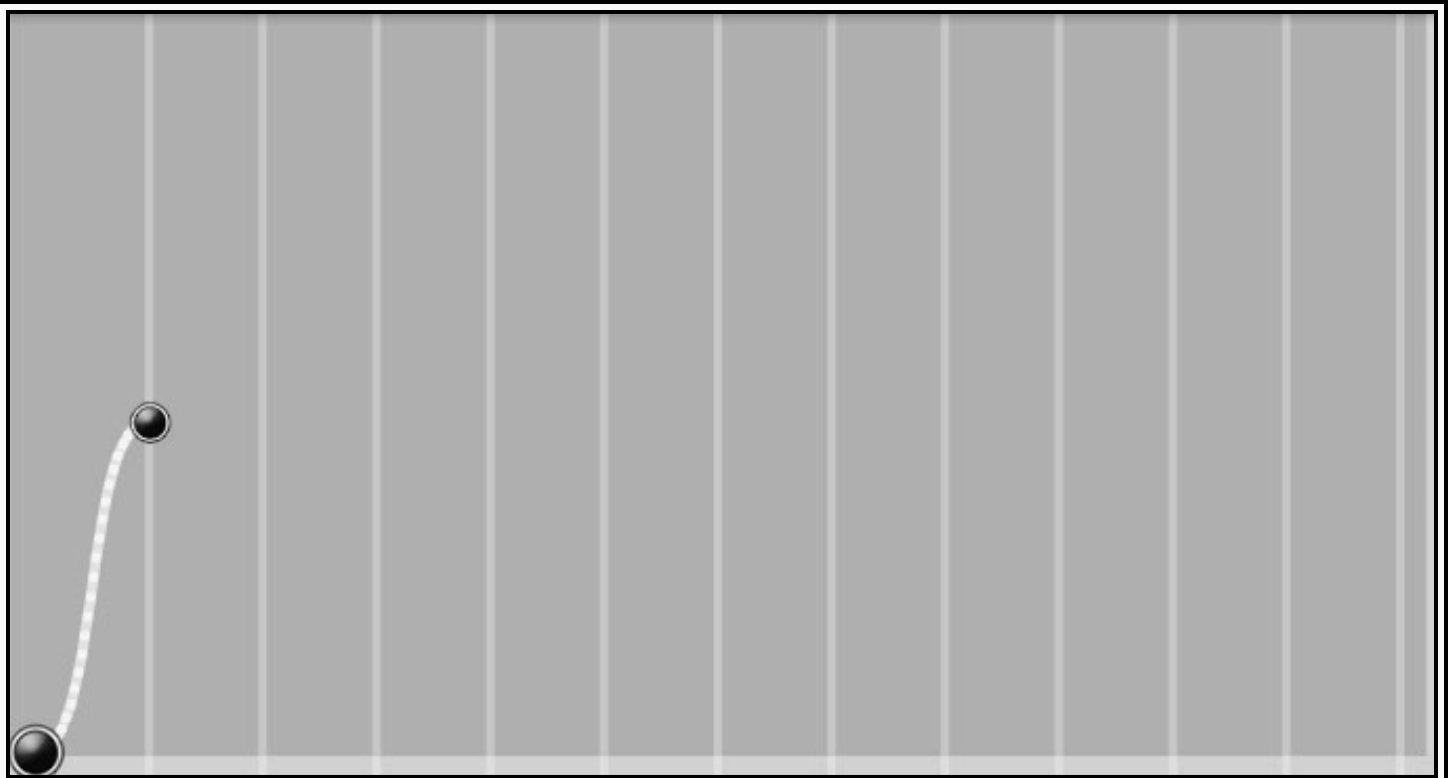
**Explain** why you made the changes you did (how do you think this will increase your opportunity for success?)

**Circle** the end state of this track. If the track is successful, proceed to the post lab. Otherwise try again. Record your modifications

crash

success

stuck



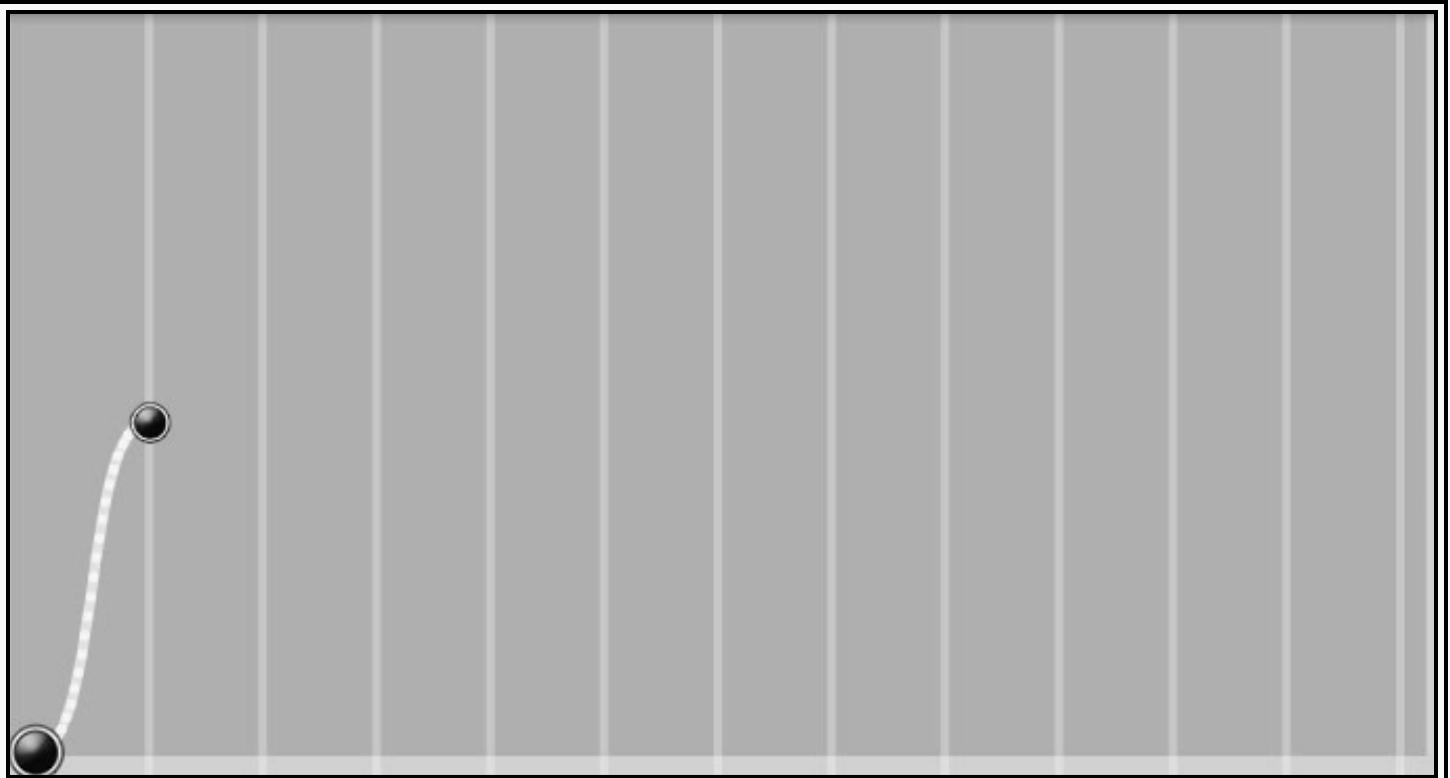
Explain why you made the changes you did (how do you think this will increase your opportunity for success?)

Circle the end state of this track. If the track is successful, proceed to the post lab. Otherwise try again. Record your modifications

crash

success

stuck



Explain why you made the changes you did (how do you think this will increase your opportunity for success?)

Circle the end state of this track. If the track is successful, proceed to the post lab. Otherwise try again. Record your modifications

crash

success

stuck