












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 
--	--	---	--	---	--	---	--	---	--	--

Materials:

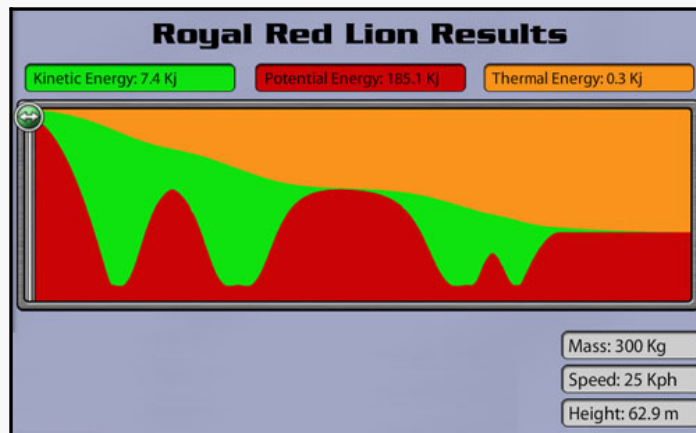
For this activity, you will need:

- One regular pencil
- Completed copy of your Coaster Creator-Prelab
- Access and log in to: www.jason.org (Go to Operation: Infinite Potential>>Digital Labs>>Coaster Creator)
- Three colored pencils, markers, or crayons:
 - Red
 - Green
 - Orange

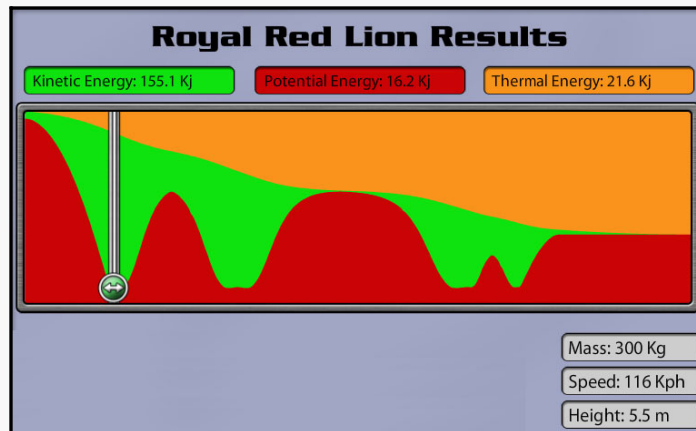
Before answering questions about your own successful roller coaster, respond to the following questions:

1. Compare two different points on the same "Results" graph:

First Point



Second Point



A. Write down the correct numbers for the corresponding values of the *First Point*. Don't forget to label your units.

PE

Height

KE

Speed

B. Write down the correct numbers for the corresponding values of the *Second Point*. Don't forget to label your units.

PE

Height

KE

Speed

C. What do you notice about the relationship between *potential energy* and *height*? As height increases, explain what happens to *potential energy*.

D. What do you notice about the relationship between *kinetic energy* and *height*? As height increases, explain what happens to *kinetic energy*.

E. What do you notice about the relationship between *kinetic energy* and *speed*? As *speed* increases, explain what happens to *kinetic energy*.

F. What do you notice about the relationship between potential energy and speed? As *speed* increases, explain what happens to *potential energy*.

2. Once you have built a successful track, go to your results page and recreate the graph found there in the box below using:

Red to represent *Potential Energy*

Green to represent *Kinetic Energy*

Orange to represent *Thermal Energy*



A. Explain what your roller coaster is doing at the point where there is no longer any green. How would this graph be different if your roller coaster *crashed*?

B. Circle the place on the roller coaster you think this represents where your carts were traveling their fastest and write the word "maximum speed" in the circle. Explain how you knew this is where your carts were traveling their fastest.

3. Use the arrow slider on your own "Results" page to help you answer the following questions.

A. Find the area where your *potential energy* was the greatest. Using your regular pencil, circle that area in the results graph you created in question #2 and label "PE" inside that circle along with what your total potential energy is in Joules.

B. Was your *potential energy* greatest at the beginning, towards the middle, or towards the end of your roller coaster?

C. Look at where you expected to see the *greatest potential energy* in question #1D of your prelab. Did you predict that potential energy would reach its maximum at the start, towards the middle, or towards the end of the ride? Now that you have the results in front of you, was your prediction correct?

D. Find the area where your *kinetic energy* was greatest. Using your regular pencil, circle that area in the graph you created in question #2 and label "KE" inside that circle along with what your total potential energy is in Joules.

E. Was your *kinetic energy* greatest at the beginning, towards the middle, or towards the end of your roller coaster?

F. Find where your thermal energy was greatest. Using your regular pencil, circle that area in the graph you created in question #2 and label "TE" inside that circle along with what your total potential energy is in Joules.

G. Was your *thermal energy* greatest at the beginning, towards the middle, or towards the end of your roller coaster?

4. If a much younger student wanted to know the "secret" behind making a successful roller coaster right away, what would you tell that student? Using simple language, write down a brief explanation for how to design a successful roller coaster track. Make sure you use the words, "*height, speed, friction, and energy conversion*" in your explanation.