**Roller Coaster Questions:**

*Please give the definition of the following concepts in no more than two sentences:*

1. Inertia
2. Friction
3. Gravity
4. Mass and Weight.
5. Kinetic Energy
6. Potential Energy

*Please answer the following questions:*

1. The more energy a roller coaster has at the beginning of the ride, the more successful the ride. That means it needs to begin with a lot of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Does a roller coaster have an engine? Does it need an engine? Explain.
3. The passenger train of a roller coaster is moved by gravity and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. When the coaster speeds up, the seat in the cart pushes you forward, accelerating you forward. When the cart slows down, your body wants to keep going at its original speed. The harness in front of you accelerates your body backward, slowing you down. This is an example of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

*Answer the following questions about your design:*

1. How high is your first hill?
2. What is the shape of your first hill?
3. Is your exit path a low slope, medium slope or angled slope?
4. What is the height of the second hill?
5. What shape do you think the loop should be? (Parabola, elliptical, square,..etc)

*While testing your roller coaster design on the simulator, answer the following questions:*

1. What happens when you increase the speed of the car?
2. What happens when there is no gravity?
3. What happens when there is no friction?
4. Does the roller coaster work if the initial hill is less than half of the maximum possible height?
5. What factor do you think affects the amount of potential energy the roller coaster will have?

***Extra credit questions:***

1. What are the roles of Force, Momentum and Energy in the working of the roller coaster?
2. Roller coasters don't have engines, accelerators or brakes, So what makes roller coaster cars speed up, slow down and loop upside down?

FINAL ROLLER COASTER DESIGN:

*Please draw your final design in the section below this line*

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