Name _____
Coaster Project Lab

The Law of Conservation of Energy Applied to your Coaster

1. Calculate the Potential Energy at the highest point in your coaster. SHOW ALL OF YOUR WORK BELOW:

Max height (m) _____

Mass of marble (kg) _____

PE = _____

2. Calculate the Kinetic Energy at the lowest point in your coaster. Assume no loss of energy to friction. SHOW ALL OF YOUR WORK BELOW:

KE = _____

3. Choose (4) drops (not loops) in your coaster and calculate the potential energy at the top of the drop and the kinetic energy and velocity at the bottom of the drop. Use a piece of paper and tape and label the drops so they can be identified later. SHOW ALL OF YOUR WORK BELOW AND ASSUME MARBLE ALWAYS STARTS FROM REST.

Drop #1

Total height of drop (m) _____

Mass of marble (kg) _____

PE (at top of drop) = _____

Work:

KE (at bottom of drop) = Difference in PE

Work

Speed at bottom of drop: _____

Work

Drop #2

Total height of drop (m) _____

Mass of marble (kg) _____

PE (at top of drop) = _____

Work:

KE (at bottom of drop) = Difference in PE

Work

Speed at bottom of drop: _____

Work

Drop #3

Total height of drop (m) _____

Mass of marble (kg) _____

PE (at top of drop) = _____

Work:

KE (at bottom of drop) = Difference in PE

Work

Speed at bottom of drop: _____

Work

Drop #4

Total height of drop (m) _____

Mass of marble (kg) _____

PE (at top of drop) = _____

Work:

KE (at bottom of drop) = Difference in PE

Work

Speed at bottom of drop: _____

Work

Questions:

1. If you could use a motion detector to measure the actual speed of the marble at the bottom of a drop, do you think it would be close to the calculated value? Why or why not?

_____

_____

2. Many parts of the track are angled and curved. Why is this necessary? _____

_____

3. Describe the potential and kinetic energy changes as the “coaster” enters and exits a loop. ____

_____

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