Thomas Haney Secondary School

Science 10: LG 9 Kinetic and Potential Energy Lab

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Name: _____

Title of Investigation: Energy Conversions

Purpose:

To see how the potential energy stored by stationary object can be converted into kinetic energy once the object begins to move.

Introduction:

When an object is at rest (above the surface of the ground) it has potential energy. This stored potential energy due to the objects position above ground is known as gravitational potential energy, or E_{gp}, generally called just potential energy or E_p. This stored energy can be converted into movement known as kinetic energy or E_k if the object is "encouraged" to move (pushed/pulled/dropped/etc.).

YOUR JOB is to take an object at rest (the toy car) and "encourage" it to drop down the race track on an incline and see/record the energy conversions that take place as the car moves down the track. In the course of this lab you will do this three (3) times at different heights of your choice.

Hypothesis: *place your IF/THEN statement here*:

If_____

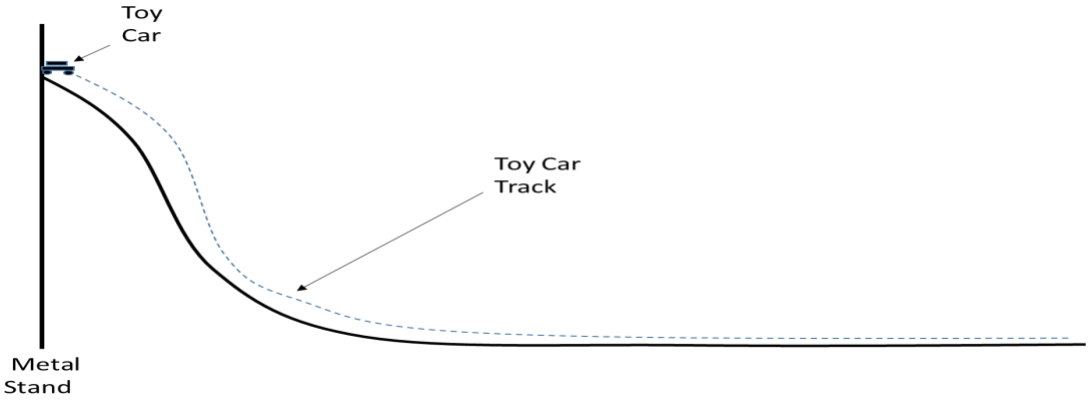
_____th

en_____

Materials:

- A metal stand
- Toy car
- Measuring tape
- Measuring scale
- Lengths of toy race car track (7)
- Stop Watch
- Masking Tape

Diagram of Setup:



Science 10: LG 9 Kinetic and Potential Energy Lab

Procedure:

1) Setup the above diagram using the metal stand, race car track pieces, and toy car provided.
2) Using the masking tape mark the spot on the bottom of the course where the car is moving the fastest.
3) Using the masking tape mark the spot on the end of the course.
4) Measure the distance (along the track) between the two points.
5) Measure and record the weight your toy car using the scale.
6) Measure and record the height of your race course.
7) Using a "timer" (phone), record how long it takes the car to move between the two points.

8) Create a new track with a different height and repeat. (Obviously the toy car does not need to be re weighed).

Observations:

Height One

Height of Track in meters (m)	**_____ m**	
Weight of car in kilograms (kg)…1000g in a kg	**____ g….÷1000 = _____ kg**	
Time between two points (Seconds or s)	**_____ s**	**Final Time – Initial Aka: Time – 0 =**
Speed of moving Car **Distance = _____**	**Speed(v) = Distance (m) / Time (s)** **Speed(v) =** **v =**	
Potential Energy stored in stationary car (E_p)	**E_p = m(mass) x g (gravity constant) x height** **E_p = _____g x 9.81 m/s x _____m** **E_p =**	
Kinetic Energy of moving car (E_k)	**E_k = ½ m(mass) x v^2 (speed^2)** **E_k = ½ x _____g x _____speed^2** **E_k =**	

Science 10: LG 9 Kinetic and Potential Energy Lab

Height Two

Height of Track in meters (m)	**_____ m**	
Weight of car in kilograms (kg)…1000g in a kg	**_____ g….÷1000 = _____ kg**	
Time between two points (Seconds or s)	**_____ s**	**Final Time – Initial Aka: Time – 0 =**
Speed of moving Car **Distance = _____**	**Speed(v) = Distance (m) / Time (s)** **Speed(v) =** **v =**	
Potential Energy stored in stationary car (E_p)	**E_p = m(mass) x g (gravity constant) x height** **E_p = _____g x 9.81 m/s x _____m** **E_p =**	
Kinetic Energy of moving car (E_k)	**E_k = ½ m(mass) x v^2 ($speed^2$)** **E_k = ½ x _____g x _____$speed^2$** **E_k =**	

Height Three

Height of Track in meters (m)	**_____ m**	
Weight of car in kilograms (kg)…1000g in a kg	**_____ g….÷1000 = _____ kg**	
Time between two points (Seconds or s)	**_____ s**	**Final Time – Initial Aka: Time – 0 =**
Speed of moving Car **Distance = _____**	**Speed(v) = Distance (m) / Time (s)** **Speed(v) =** **v =**	
Potential Energy stored in stationary car (E_p)	**E_p = m(mass) x g (gravity constant) x height** **E_p = _____g x 9.81 m/s x _____m** **E_p =**	
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Science 10: LG 9 Kinetic and Potential Energy Lab

Conclusion:

_____

_____

_____

_____

_____.

Analysis:

1. **Were there any energy conversions that occurred during the course of the experiment? Explain.**

_____

_____

_____.

2. **The car eventually stopped after it went down the track. Why? Explain.**

_____

_____

_____.

3. **Were there any energy conversions you did not expect? Explain**

_____

_____

_____.