

Name: _____

The Go-Far Car

DOES POTENTIAL ENERGY AFFECT HOW FAR A CAR WILL GO?

Problem

Does changing the starting height of a car on a ramp change the distance that the car will travel across the floor?

Research

Answer the following True or False questions about energy:

True/False A book sitting on a shelf has kinetic energy.

True/False A book sitting on a shelf has potential energy.

True/False A ball thrown through the air has kinetic energy.

True/False A ball thrown through the air has potential energy.

True/False Energy can be created and destroyed.

Identification of Variables

Identify the **Independent Variable**, **Dependent Variable**, **Constants** and **Control** of this experiment:

Independent Variable	
Dependent Variable	
Constants	
Control	

Hypothesis

If the car starts higher, then it will go _____ .
(further / the same distance / not as far)

Procedure

1. Use the K'NEX kits and blueprints to build the *Quark Cruiser*.
2. Set the ramp to its lowest setting (10 centimeters).
3. Place the *Quark Cruiser* at the top of the ramp and let it go. Let it roll down the ramp and across the floor until it comes to a complete stop. **DO NOT** push the car down the ramp. Make certain that the car does not scrape against the sides of the ramp on its way down. If the car does scrape against the side of the ramp, throw that trial away and do it over again.
4. Use a tape measure to measure the distance between the bottom end of the ramp and the car. This is how far the car traveled across the floor. Record the distance the car traveled on the **Quark Cruiser - Distance Traveled** data chart.
5. Let the car roll down the ramp two more times. Record how far it travels for each trial.
6. Raise the ramp to its second setting (15 centimeters). Roll the car down the ramp three times, each time recording how far it travels across the floor.
7. Raise the ramp to its third setting (20 centimeters). Roll the car down the ramp three times, each time recording how far it travels across the floor.
8. Calculate the **total distance** and **average distance** the car traveled for each ramp setting.
9. Make a **line graph** showing the **average distance** the car traveled for each ramp setting.

Data Collection and Analysis

Directions: Roll the *Quark Cruiser* down the ramp three times for each of the three ramp heights. Record how far it goes each time. Calculate the **Total Distance** and **Average Distance** it traveled for each of the three ramp heights. Make a **line graph** showing the **Average Distance** the *Quark Cruiser* traveled for each ramp height.

Quark Cruiser - Distance Traveled

10 cm Setting

Trial 1	cm
Trial 2	cm
Trial 3	cm

Total cm

Average cm

15 cm Setting

Trial 1	cm
Trial 2	cm
Trial 3	cm

Total cm

Average cm

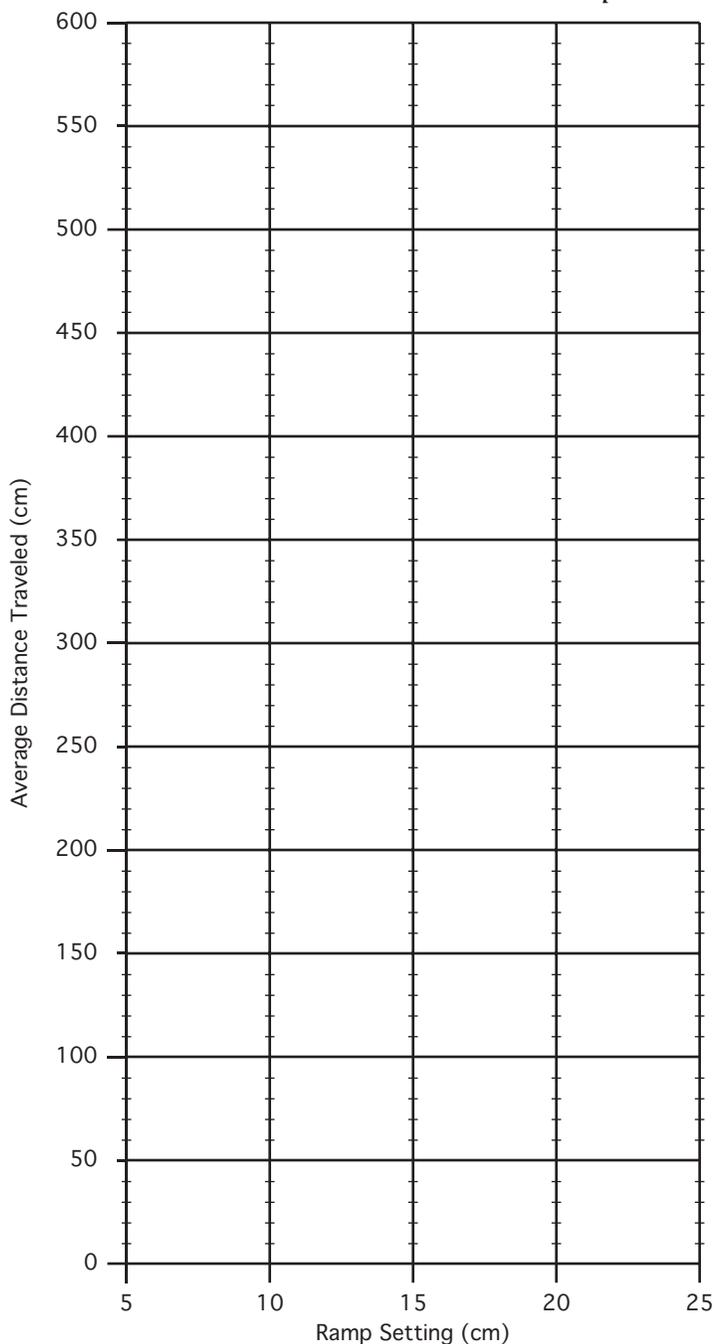
20 cm Setting

Trial 1	cm
Trial 2	cm
Trial 3	cm

Total cm

Average cm

Quark Cruiser Results Graph



Conclusion

THE HIGHER A CAR STARTS, _____.

Application of Conclusion

Use the data you collected to predict how far the *Quark Cruiser* will travel if the ramp is set to its highest setting (25 centimeters).

Quark Cruiser Distance Prediction

My Prediction cm

Actual Distance cm

Difference cm

Questions to Think About

1. What happened to the amount of potential energy the car had as the car traveled down the ramp?
2. What happened to the amount of kinetic energy the car had as the car traveled down the ramp?
3. Where is the car's potential energy the greatest?
4. Where is the car's kinetic energy the greatest?
5. The car eventually came to a stop. Where did all of its kinetic energy go?
6. What could you do to make the car go further?