Activity 1.3 Speed and Energy

Introduction

In this activity you will explore the relationship between the speed and energy of an object. You will document changes to a system that can increase or decrease the speed of an object.

Equipment

- Sheet of poster board
- Masking tape
- VEX IQ® equipment
- Ruler
- Launch Log
- iPad® tablet
- iPad apps:
  - Autodesk® Inventor® Publisher
  - Canvas by Instructure

Procedure

Part 1

1. Build the pendulum by following the directions found on the Autodesk Inventor Publisher application on the tablet.
2. Hold the base of the pendulum. Pull the tire up about halfway to the top and then release.
3. Repeat this step first by raising the tire up as high as possible and then releasing the tire.
4. Raise the tire again, but this time raise it just enough to allow the pendulum to swing.
5. You started the pendulum at three different heights. In your Launch Log draw the pendulum as it looked when it had the most potential energy.
6. How does this sketch show a pendulum with the most potential energy?

Part 2

1. Build the car by following the directions found on the Autodesk Inventor Publisher application on the tablet.
2. Create a ramp by taping two corners of the poster board to a wall or chair as directed by your teacher. The top of the poster board should be about 14 inches off the floor. Tape the other two corners to the floor about18 inches from a wall.

3. Create a table in your Launch Log similar to the one below.

Starting height (inches)	Predict distance from end of ramp (inches)	Trial 1 Distance from end of ramp (inches)	Trial 2 Distance from end of ramp (inches)	Trial 3 Distance from end of ramp (inches)	Average distance from end of ramp (inches)
6					
8					
10					
12					
14					

4. Predict how far the car will travel from the end of the ramp for each of the listed heights. Then, roll the car down the poster board ramp from several different starting heights and record how far the car travels in inches before stopping after it rolls off of the poster board. The starting height is inches off the ground. Repeat each trial 3 times and calculate an average distance traveled for each starting height.
5. What ramp height caused the car to travel the furthest from the end of the ramp? Explain.

Conclusion

1. How does the amount of potential energy, or energy stored in the pendulum just before it is released, affect the motion of the pendulum?

2. How does the amount of potential energy, or energy stored in the car just before it rolls down the ramp, affect the distance traveled by the car?

3. What is the relationship between the speed and energy of an object?