Soaring Straws Activity

Today you will be working in small groups to explore the relationship between potential and kinetic energy. You will be launching straw rockets into the air and measuring how high they travel. Safety is important. If you shoot a rocket at a classmate you will not be allowed to participate and will lose credit for the activity!

Predict:

How will amount of stretch in the rubber band effect the gravitational potential energy and kinetic energy of the rocket?

Instructions:

1. Caution: Aim the rocket into the air and not at classmates!
2. Using a beam balance, measure the mass of your group's rocket and record in the space under the data table.
3. Have someone hold a meter stick so that its zero end is even with the top of the rocket. Measure the height in meters to which the rocket rises. If the rocket goes higher than a single meter stick, use two.
4. Measure the amount of stretch of the rubber band by noting where the markings on the bottom of the rocket line up with the bottom of the launching cylinder. Launch the rocket using five different amounts of stretch and record in data table.
5. For each amount of stretch, find the average height to which the rocket launches and record in data table.
6. Find the gravitational potential energy for each amount of stretch: Gravitational potential energy = mass x gravitational acceleration x height.
7. As a group answer the questions on the data table sheet and be prepared to discuss.

Data Table Names:

Amount of Stretch (cm)	Height Trial 1	Height Trial 2	Height Trial 3	Average Height	Gravitational Potential Energy (mJ)
1.0					
2.0					
3.0					
4.0					
5.0					

Mass of Rocket =

Gravitational Potential Energy = Mass (g) x 9.8m/s^2 x Average Height (m)

Questions:

1. Every time you launch a rocket potential energy is transformed to kinetic energy. At which point in flight is the kinetic energy the greatest, when is it the least?

2. What type of potential energy is stored in the rubber band?

3. How does the elastic potential energy of the rubber band relate to the gravitational potential energy of the rocket?

4. If your rocket is traveling at 5meters/second and has a mass of 3 grams, what is its kinetic energy? Hint: Kinetic Energy=1/2Mass x Velocity^2.

5. Was energy created or destroyed in this activity?