

Cow-a-Bungee

GOAL

- Create a bungee jump (from the top of a bookshelf or tall cabinet) whose object has the most caroms from one jump.

MATERIALS

- Rubber bands
- Rulers
- Tape
- Graph paper

TIME TO CREATE

- 20 minutes

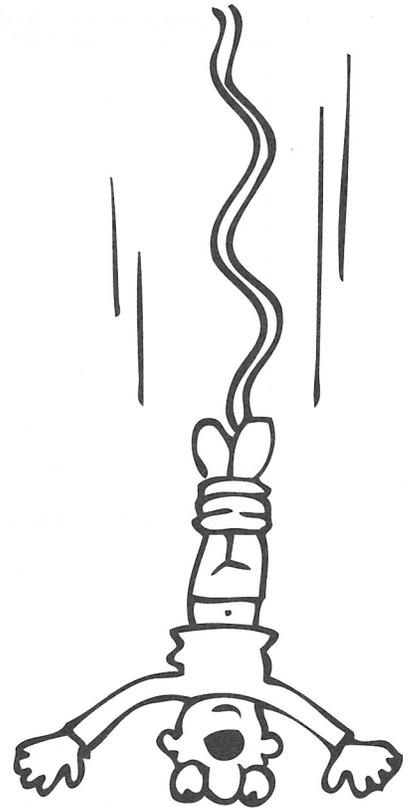
INDIVIDUAL ACTIVITY

Read the following information, highlighting key terms and ideas, and complete the activities.

The word bungee means “thick and squat.” Bungee jumping originated on the Pacific island of Pentecost as a ritual. For centuries, the native men tested their manhood by jumping from tall bamboo towers, approximately 20–30 meters (260–400 yards), with vines tied to their ankles. Bungee jumping arrived in the United States in 1979 when members of the Oxford University Dangerous Sports Club jumped from the Golden Gate Bridge on elastic latex cords.

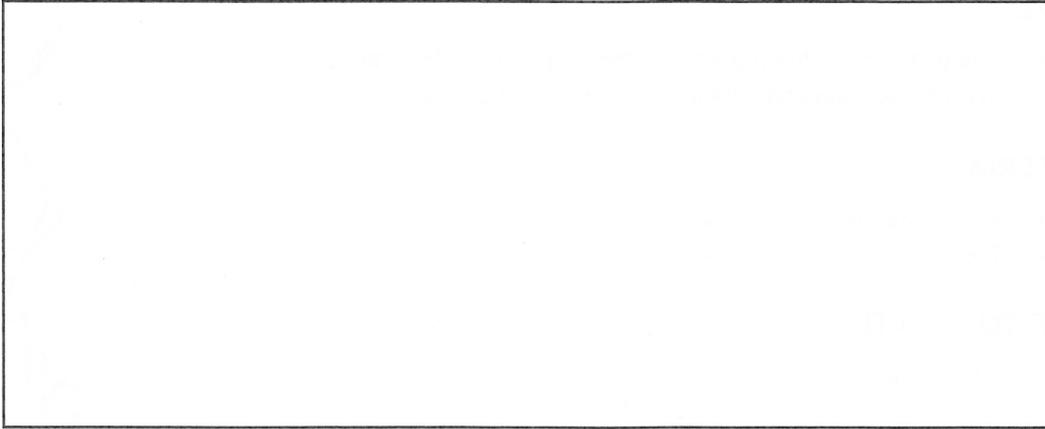
The height of the bungee above the ground creates a certain amount of potential energy. When the jumper jumps off, this potential energy is converted into kinetic energy and will continue to increase the speed during the fall. The bungee cord will kick in during the carom, or rebound, process and will begin transforming the kinetic and potential energy to elastic energy, which is stored in the cord and is the reason it stretches. Once the bungee stops, most of the potential energy and all of the kinetic energy have been converted to elastic energy.

You may already know that a rubber band is an elastic loop of natural or synthetic rubber used to hold objects together. But did you know that the use of rubber has been around for thousands of years? The Olmecs, a pre-Columbian civilization in South America, utilized the natural latex from the Hevea tree around 1500 B.C. Later, the Mayan people used this latex, or rubber, for various purposes. Latex, the sap of certain plants—specifically, the rubber tree—when exposed to the air, hardens and become rubbery. The rubber band was not officially invented until 1845, when a man by the name of Stephen Perry invented the rubber band to hold papers and envelopes together.



Today, we use both natural and synthetic rubber. Natural rubber is the latex that is extracted from rubber trees, similar to how the Mayans accessed rubber. Synthetic rubber is made from refining byproducts of petroleum. Most of the rubber produced today is synthetic.

Place a rubber band on your desk and draw its relaxed shape in the space provided.

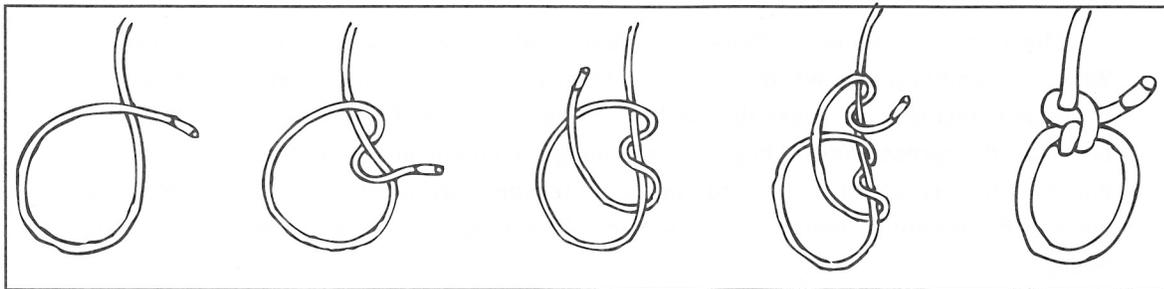


Name two different ways we use rubber today.

1. _____

2. _____

Continue to practice making a slipknot with your rubber band. If you need a reminder about how to make a slipknot, here are some illustrations:



TEAM CHALLENGE

Participants will work in teams of two or three to create a bungee jump for a plastic animal (or a substitute object). The bungee must be designed for the participant (object) to safely bungee from the top of a typical bookshelf or tall structure. No part of the participating bungee-jumper (object) may touch the ground, and neither can it touch any other object (e.g., bookshelf), during the bungee process. The participant must carom (rebound) at least once; however, the challenge is for your bungee to have the most caroms.

The teacher will select groups of two or three for the team challenge and will assign a number to each group. Once teams have been selected, the teacher will record the start time. You will have exactly 20 minutes to get your supplies, make your team's bungee, and record the information. Your goal is to make a bungee jump from the top of a bookshelf or tall cabinet and to have the most caroms from one bungee jump.

A designated plastic participant must carom at least once and must not touch any object or the ground throughout the process.

Start Time ____:____ + 20 Minutes = ____:____ End Time

1. Attach a rubber band to the participant (object) by creating a slipknot, or double loop, to wrap around the object. Securing one rubber band to another with a slipknot will create a double loop.
2. Continue to attach more rubber bands to the first one in order to lengthen the cord. Measure the distance the object falls on the first drop. Repeat the jump two more times and record the distance.

Number of Rubber Bands	3	5	7
Distance in Inches			
Number of Caroms			

3. What is the average for the distance of the three jumps? _____
4. Continue adding rubber bands and measuring the distances. Use graph paper to plot the information. Label the x-axis as Number of Rubber Bands Used, and the y-axis as Distance in Inches.
5. Connect the points.
6. Predict the distance of the drop if you were to use 100 rubber bands. How did you get this prediction? _____
7. Express the equation for how to predict the distance of the drop (y) from how many rubber bands are used (x). _____
8. What is the slope of your equation? _____
9. What is the y-intercept of your equation? _____
10. How many rubber bands did you need for the participant to have a successful bungee? _____
11. What could be done to improve your team's bungee? _____