

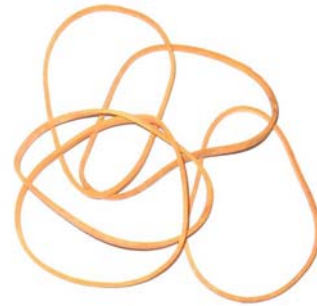
Exploration 1

Making the Familiar Strange: Analyzing an Object

Examining an object can enhance our powers of observation, generate new perspectives, and lead us to think in new directions.

Materials:

- 10 or so rubber bands
- Something to write and draw on
- Something to write or draw with
- Freezer (optional)
- Hair dryer (optional)



Objectives:

After an investigation of the history and characteristics of a rubber band students will apply their new knowledge to the content areas of science, mathematics, social studies, economics, and the arts.

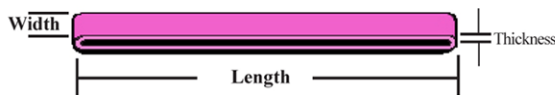
Standards:

- Arts: VA 2; NA 2, 8
- English: NL-ENG-4, 5, 6, 8
- Mathematics: NM-MEA: 1, 2; NM-PROB: 1, 2, 3, 4, 5; NM-GEO: 1, 2, 3, 4; NM-CONN: 1, 2, 3
- Science: NS 2, 3, 5, 6
- Social Studies: USH 12; NSS-G 5, 6; EC 5

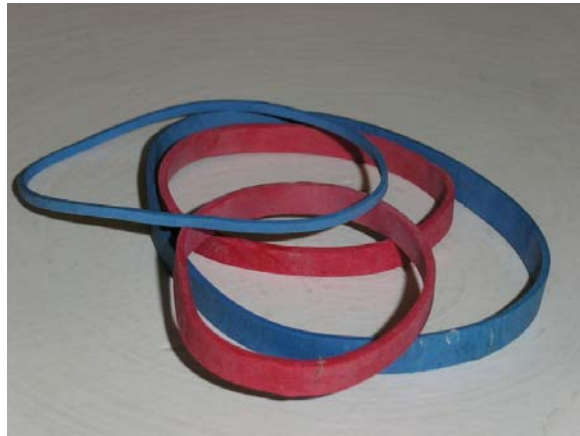
Procedures:

1. Take 5 rubber bands and look at them for a few minutes. Then put them out of site and sketch one from memory. How does your drawing compare to the real rubber band? How are they alike? How are they different?
2. Imagine that you are speaking with someone who has never seen a rubber band. Describe it to him or her out loud.
3. Describe a rubber band to a friend without telling or showing him or her what it is—can they guess what you are describing?
4. Look at your rubber bands again. Are they all exactly the same? Choose one and write a description so that someone could pick your rubber band out of the group of five. See if a friend can actually do so.
5. Look at the rubber band with a magnifying glass. What other details can you see?

6. What is the shape of a cross section of the rubber band? How does the shape change depending on where you take the cross section? Depending on how you pull the rubber band?
7. What is important about the size and shape of the rubber band?
8. List different words for shapes and forms that apply to the rubber band.
9. How can you tell an old rubber band from a new one?
10. What is the rubber band made of? What are some characteristics of the material? Where does this material come from? Does it have a "memory"—does it return to its original shape after it has been stretched?
11. How far can you shoot the rubber band? Does it make a difference if it is thick or thin? Make a knot in the middle of the rubber band and now shoot it again. What happens? What if you move the knot in the rubber band?
12. What happens if you put the rubber band in the freezer for a few hours or overnight? Does its elasticity change?
13. What happens if you warm it with a hair dryer? Does it smell differently? Is it stretchier?
14. How resilient is the rubber band? How many times and how far can you stretch it before it breaks?
15. What are some things that are more resilient? What are some things that are less resilient?
16. List things that are made out of the same material as rubber bands.
17. How many inches of material are needed to make a rubber band? Measure it and see.
How many rubber bands could be made out of one mile of material?
18. How much do you think 100 rubber bands weigh? How does your estimate compare with the actual weight?
19. How many rubber bands can be made out of 100 pounds of material?
20. How many rubber bands could you mail to a friend using just one first class stamp?
21. Make a list of things that are smaller than a rubber band. Make a list of things that weigh less than a rubber band.
22. What are some other ways people hold things together? What are advantages and disadvantages of each method?
23. Do you think rubber bands have been around very long? Why or why not? How long is "very long" in your thinking?



24. What do you think people did before the rubber band was invented?
25. How could you find out who invented the rubber band? When? Where?
26. Have rubber bands changed from when they were invented until now? If so, how?
27. What things do people use rubber band for besides holding things together? Think of as many as you can and then interview friends and family to add to your list. Which idea is the most unusual? The funniest? The prettiest? The most imaginative? The most dangerous? The most. . .?
28. If someone dropped in from another planet and knew nothing about rubber bands, what do you think they might think they were used for?
29. Would rubber bands make good units for measuring the weight of things? Why or why not?
30. Would rubber bands be suitable for use as money? Which would be worth more—a thin one or a thick one? A red one or a blue one? Why or why not?
31. Could you wear rubber bands? If so, how? Where? What if the rubber bands were very tiny? What if they were very big?
32. What is the smallest rubber band you can find? What is the biggest?
33. What if you changed the scale of the rubber band? What if you could walk on it? What if you could see the molecules that made the rubber band—what would they look like?
34. How do you think rubber bands are made?
35. If someone told you each rubber band is made by hand, what evidence would you have to support or refute that statement?
36. Are rubber bands disposable? Recyclable? Reusable?
37. What is the average life span of a rubber band? How long do they last? How could you find this out?
38. Are rubber bands expensive? Are they common? What does this tell you about the material from which they are made? About the society which produced them?
39. Do you think archeologists one thousand years from now will find evidence of rubber bands in our society? Where? Why?



40. How many rubber bands are manufactured in our country each year? How could you find out?
41. How do you think rubber bands might be improved?
42. Which do you think is more important to us—rubber bands or paper clips? Why?
43. How many words can you make out of the letters in “rubber band”?
44. Create a piece of art using rubber bands.
45. Invent a game to play with rubber bands. What would it be? How would you play it? What would you call your new game?
46. If you were stranded on a desert island with a handful of rubber bands, how would you use them?
47. Take your 5 rubber bands and make them into a ball. How high does it bounce? Add a rubber band. Does it bounce any higher?
48. Make a musical instrument using your rubber bands. Compose a song. Do you know any songs that include rubber bands?
49. Write a story about the imaginary travels of a rubber band through its lifetime.
50. Write a haiku about your rubber band.

Reinforcement Exercise:

Choose another everyday object. Have the students come up with their own list of questions to make this familiar object strange.