



Bridge Metal

STEM Sims

Lesson 1: Filing Fun

Bridges are structures that need to carry a lot of weight and last for a long time. It is important to determine which bridge metal is strong, reliable, and durable. To do so, you must test different materials for strength in order to find the best bridge metal. Strap a hard hat on, and test those bridge metals!

Doing the Science

1. Start the Bridge Metal Simulation by clicking on the “Sim” tab.
2. Click on the “File Center” button.
3. Click the “New Sample” icon and choose “Sample #1.”
4. Record the 10-digit sample code beside the Sample # in Table 1 below.
5. Click on “File Sample” on the table to cut the material.
6. Click on the magnifying glass that says “View Sample” to look at the indentation.
7. Drag the ruler to the indentation. Measure the width of the cut and record the width in Table 1 below.
8. Drag the ruler downward to change the direction of the ruler to be vertical. Measure the depth of the cut with the ruler and record the value in the table.
9. When finished, click on the red “X” button to return to the File Center.
10. Click on “New Sample” and repeat steps 4-9 for all seven samples.
11. Based on the depth and width of the file indentations, rank the metals based on strength (1 being the strongest and 7 being the weakest) and record them in Table 1.

Table 1.

Sample #	10-Digit Sample Code	Width of Cut (Millimeters)	Depth of Cut (Millimeters)	Rating
1				
2				
3				
4				
5				
6				
7				

Do You Understand?

1. Which of the metals was the hardest? Explain.
2. Which of the metals did you expect to be hardest? How did it perform in comparison to the other materials?
3. What other ways are there to test the strength of materials?