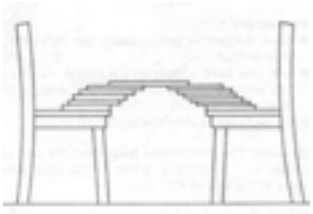
From Janice VanCleave's *201 Awesome, Magical, Bizarre & Incredible Experiments*. (New York: John Wiley & Sons, 1994), 76.

Science Project, Wk. 17 -- Rock Bridge (#138)

Name: _____

Purpose: To demonstrate how natural bridges stand.

Materials: 2 flat chairs of equal height,
13-17 books of about the same size



Procedure:

- Move the chairs about 1 foot apart.
- Lay one book on each chair with the edge of the books even with the edges of the chairs.
- Stack books on top of each other so that each book extends farther over the edge than the one below it.
- Continue stacking the books until the top book overlaps the stack from both chairs to form a bridge.

Hypothesis (CIRCLE): If another book is placed on top of the last book, the bridge will

FALL NOT FALL

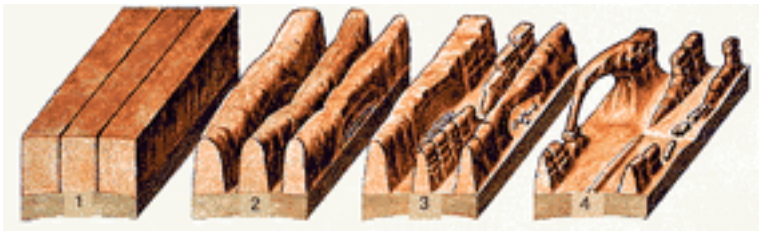
Result (CIRCLE): When another book was placed on top of the last book, the bridge

FELL DID NOT FALL

Conclusion:

Why doesn't it all come crashing down? All objects act as if there is one special spot where all of their weight is located. This spot is called the **center of gravity**. The book bridge is supported because the center of gravity of each side of the bridge is over a chair. Each of the books overlaps the one below. Since the overlapping is *consistent*, the center of gravity stays the same. This allows the bridge to remain balanced without any help.

In nature, natural rock bridges are created over time through **weathering** and **erosion**. These bridges balance themselves the same way that your book bridge did. The particles of a natural bridge overlap in such a way that they place the center of gravity of the structure over the supporting sides of the mountain and other rocky places.



Additional experiments and activities related to center of gravity: "Finding the Center of Gravity," http://teams.lacoe.edu/documentation/classrooms/judi/forces/activities/gravity.html, and "Circus Physics: Center of Mass," www.pbs.org/opb/circus/classroom/circus-physics/center-mass/