

# PAPER WEIGHT

## (STEM ACTIVITY)



**Goal:** Students will make observations and explore phenomena by engaging in the fun engineering activity of testing the strength of paper folded into differently shaped columns. With this exercise, students will see the similarity of how columns are used to support buildings or other structures.

**Materials:** Construction Paper, tape and/or glue, paperback books

**Directions:** Take 3 pieces of construction paper. Fold one piece into the shape of a cylinder (secure with tape or glue), one into the shape of a triangle (secure with tape or glue), and one into the shape of a rectangle (secure with tape or glue). Slowly pile books on top of each shape, identify which shape can hold the most weight and record the data.

**COMMON CORE STANDARDS:** 2.M.6

**GEORGIA STANDARDS:** S2CS2, S2CS3.C, S2CS5.A, S2CS6.B

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### Directions:

1. Take 3 pieces of construction paper.
2. Fold one piece into the shape of a cylinder (secure with tape or glue), one into the shape of a triangle (secure with tape or glue), and one into a rectangle (secure with tape or glue).



3. Slowly pile paperback books on top of each shape and identify which shape can hold the most weight.
4. Record your findings on the Data Sheet

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Data Sheet

1. How many books did the triangle hold? \_\_\_\_\_

2. How many books did the rectangle hold? \_\_\_\_\_

3. How many books did the cylinder hold? \_\_\_\_\_

4. Which shape supported the most books? \_\_\_\_\_

5. Why do you think the shape was able to handle the most weight?

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6. When you consider the columns that you see that support buildings and other structures, are they usually the same as the shape that you identified that was able to support the most books?

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## WHAT'S THE SCIENCE?

Your students should find that the cylinder is the shape that can hold the most books because the walls of the cylinder don't have any edges. Why is this important? It's important because it allows the weight of the books to be distributed evenly as opposed to being concentrated in a particular area. In other words, all parts of the cylinder share the load of the books thereby contributing to the overall strength of the cylinder.

The triangle and the square collapse more easily because the weight of the books is shifted to the edges and corners of each of the shapes. The edges and corners are unable to carry the weight in the same capacity as the edgeless cylinder.