

WHAT ARE WE INVESTIGATING?

How strong is a piece of paper?

MATERIALS:

- Paper
- Tape
- Books (paperback)
- Strive Academy's Engineering Design Process Handout (found at www.striveacademy.org)
- Pencil or Pen

EXTENSION:

- * Try this experiment again but make even more shapes out of paper for your columns. What other shapes can you make? How do your results compare?
- * Do some research on how columns were a huge part of Greek and Roman architectural history.

DIRECTIONS:

1. Gather all of your materials. Our materials are just suggestions - feel free to add other things too!
2. On your handout (found at www.striveacademy.org), fill in the title of your experiment (Paper Columns).
3. On your handout, fill in your hypothesis. You want to answer the question: Which column shape do you think will hold the most weight - a circle, triangle, or square?
4. On your handout, sketch a design of how you will make your 3 structures out of paper. You will be using only one piece of paper for each structure. Feel free to use color and label the materials that you will be using!
5. Take your first piece of paper and create a circular column by taping the edges (the 8½" edge) together so it stands up.
6. Take your second piece of paper and create a triangular column by folding your paper into thirds. Then tape the ends together so it stands up.
7. Take your third piece of paper and create a square-shaped column by folding your paper in half (hamburger style). Then take each of the halves and fold them in half. Make your column into a square shape and tape the ends together so it stands up.
8. Under "Data Collection /Observations", draw how your 3 columns turned out.
9. Begin with your circular column. Slowly stack paperback books on top of the column until it is crushed underneath. Each time that you stack a book, make a tally mark under "Results".
10. Repeat Step 9 for both the triangular column and the square-shaped column.
11. Answer the "Analysis" questions on your handout:
 - Which column held the most books? How did your results compare to your hypothesis?
 - When you walk around a city and see columns holding up buildings, which of the 3 shapes do you usually notice? How do your results from this experiment support this?

**** Try the extension activities on the first page for more fun! ****