Architects and engineers have designed many clever ways to support the walls and roof of a building. In ancient Greece, the most common supports were columns. For a column to work properly, it must withstand the force of compression created by the weight of the building above it. Nearly all Greek columns had circular cross sections. Did they select this geometry because they preferred the appearance or was the reason practical and functional?

Activity: Testing the Shape of a Column

Supplies:
- 3 sheets of typing paper
- Clear tape
- Ruler
- Scissors
- Books (or something to use as units of weight to test the columns)

Part 1: Making the Columns

Square - Fold a piece of standard typing paper along lines as shown below:

Fold into the shape of a square, so that the 1” tab overlaps the first panel. Tape along entire seam and stand on open end to create the “Square Column.” Set aside.

Triangle – Fold the 2nd piece of paper along the lines as shown cut the portion of paper as indicated:

Fold the paper into the shape of a triangle so that the 1” tab overlaps the first panel. Tape along entire seam and stand on open end to create the “Triangle Column.”
Circular - Using the 3rd sheet of paper, draw lines at 8” and 9” from one end as shown below:

Cut along 9” line, then roll into tube so that 1” of the paper overlaps, aligning the end with the 8” line. Tape along the entire seam.

Part 2: Testing the Column Strength

- Stand each column up so that the open cross section end is flat on the table. (Make sure each column “bottom” is even so that the column stands steadily.)
- Starting with the Square Column, gently place one book on top of the column and observe what happens.
- Add additional books one at a time until the column collapses under the weight.
- Record the number of books that the column successfully supported BEFORE it collapsed.
- Repeat this procedure with the triangular column, and finally the circular column.

Tips:
Ask open ended questions. Remember there are no right or wrong answers.
- Which shape do you think will be the strongest?
- Why do you think that shape will be the strongest?
- How many books do you think the square, triangle, circular column will hold?
- Why do you think this shape was stronger?