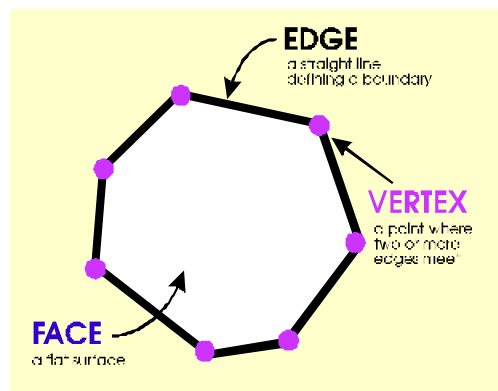


About Polygons...

Polygons

A polygon is a flat surface with three or more straight edges.



Polygons can be classified by the number of vertices, the lengths of edges and the inside angles. A triangle is a polygon with three sides. A quadrilateral is a polygon with four sides.

Amazing Angle Facts:

The sum of all the inside angles of a triangle is always 180 degrees!

The sum of all the inside angles of a quadrilateral (4-sided polygon) is always 360 degrees.

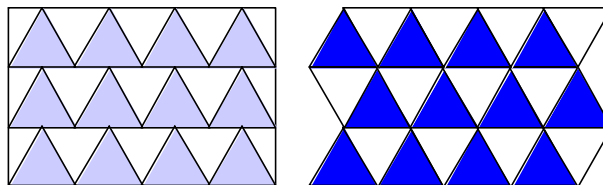
Regular Polygons

When all the edges are the same length, the polygon is called a “regular” polygon. When all the edges are the same, all the inside angles are also the same. This “Math Byte” shows how to make a regular triangle (equilateral triangle), hexagon. All regular polygons are convex polygons.

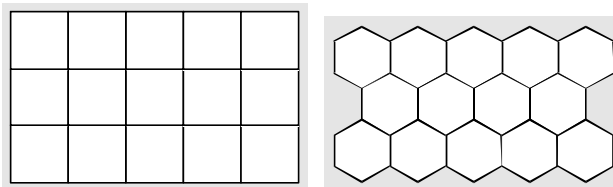
Tiling with Regular Polygons...

Suppose you wanted to make a pattern on a piece of paper by using only one kind of regular polygon. There are three regular polygons that can be fitted together on a piece of paper with no space left: the triangle, square, and the hexagon (6 sides). Tiling with these shapes is shown in the picture. You can make fun puzzles with these patterns.

Tiling with triangles.



Tiling with squares. Tiling with hexagons.



Can you prove that of the regular polygons, only the triangles, squares, and hexagons can form tiles composed of only one type of polygon? Think. At each vertex the total of the inside angles must be exactly 360 degrees in order to be flat.

References

This is common geometry information. Look in: “Math Wizardry for Kids,” By Margaret Kenda and Phyllis S. Williams, Barron’s, 1995.

Lunchbox Math Bytes

easy to digest mathematics for your lunchbox

Paper Plate Math (“Plate-onics”)

Regular Polygons

Part I: Triangles and Hexagons

You will need to pack:

- 3 Paper plates or Coffee Filters or Circular papers
- 1 Pencil

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Regular polygons cut from paper are great for craft projects. To create polyhedra from paper, cut out circles and fold up the flaps along a polygon border. Then glue the flaps together. Here is an easy way to make a regular polygon that just fits inside a given circle.

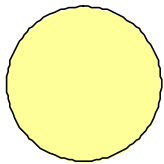
You need:

A pencil

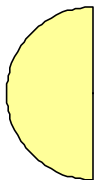
Two Paper Circles (Paper Plate, Coffee Filter, cut paper, etc.)

To make the triangle or hexagon shape

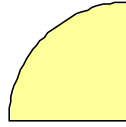
First we need to know the length of the *radius* of the circle. The *radius* is the distance from the center of the circle to any point on the circle. Start with one paper circle.



Fold the circle in half to get this shape:



Fold the shape in half again to get one fourth of the circle. The length along one of the sides of the quarter circle is the *radius*.

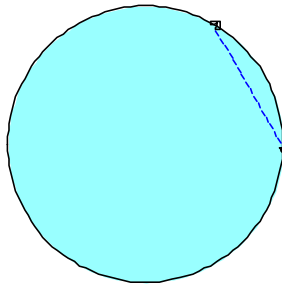


This length is the radius.

Now trace a second circle on another sheet of paper. Draw a point somewhere on the circle.

Now draw a second point on the circle at a distance the length of the radius.

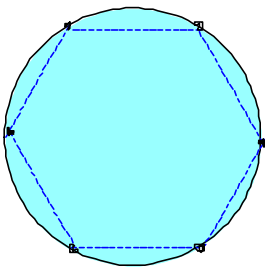
Draw another point on the circle at the length of the radius.



First mark a single point.

Now mark that distance off 6 times around the circumference of the circle.

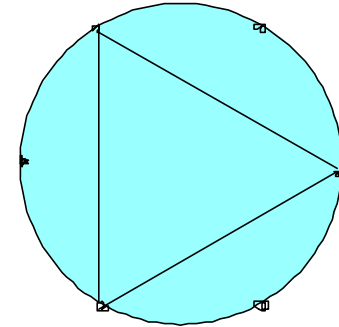
Continue from each point to mark off 6 points.



To make the triangle:

Use a straight edge to connect every other point or simply fold a line. Now you have an equilateral triangle!

Connect every other dot to make an equilateral triangle.



To make the hexagon:

Use a straight edge to connect every point or simply fold a line. Now you have a hexagon!

Connect every dot to make a hexagon.

