Subject: H.S. Geometry

**Lesson Plan**

**Discovering the Formula for the Sum of the Measures of the Interior Angles of Polygons**

**Objective:** Students will be able to use the sum of the measures of the interior angles of a triangle to discover the formula for calculating the sum of the measures of the interior angles of a polygon when given only the number of sides of the polygon.

**Standards: 4.8.6** Form generalizations and validate conclusions about geometric figures and their

properties.

**4.12.6** Solve problems using complementary and supplementary angles, congruent angles, vertical angles, angles formed when parallel lines are cut by a transversal and angles in polygons.

**I Can: 1.** I can determine the sum of the measures of the interior angles of a polygon by using the sum of the measures of the angles in a triangle.

**2.** I can calculate the sum of the measures of the interior angles of a polygon given only the number of sides.

**Materials:** Worksheets, pencil, rulers

**Procedure:** **1.** Review the sum of the measures of the interior angles of a triangle is 180º.

**2.** Using the worksheet, “Sum of the Measures of the Interior Angles of Polygons”, students will begin with the quadrilateral and draw in the diagonals.

**3.** Have students count the number of triangles formed.

**4.** Using the number of triangles, have students calculate the sum of the measures of the interior angles of the quadrilateral.

**5.** Repeat steps 2-4 with a pentagon, hexagon, and decagon.

**6.** Have students use the data to predict a formula for finding the sum of the measures of the interior angles of a polygon by using only the number of sides of the polygon.

**7.** Practice using the formula derived in step 6 giving students only the number of sides of a polygon.

NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sum of the Measures of the Interior Angles of Polygons

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| POLYGON | | NUMBER OF SIDES | NUMBER OF TRIANGLES | | SUM OF THE TRIANGLE MEASURES |
| Triangle |  |  |  | |  |
| Quadrilateral |  |  |  | |  |
| Pentagon | http://upload.wikimedia.org/wikipedia/commons/thumb/0/04/Pentagon.svg/588px-Pentagon.svg.png |  |  | |  |
| Hexagon |  |  |  | |  |
| Octagon |  |  |  | |  |
| Formula for finding the sum of the measures of the interior angles of a polygon | |  | | | |
| POLYGON | | NUMBER OF SIDES | | SUM OF THE INTERIOR ANGLES | |
| Decagon | [decagon 1...](http://search.yahoo.com/r/_ylt=A0oGdXAb6ppQJ2UAZWBXNyoA;_ylu=X3oDMTB2ZnA3NGtrBHNlYwNzYwRjb2xvA3NrMQR2dGlkA01TWTAxNF8xMzQ-/SIG=1mridv7kj/EXP=1352358555/**http:/images.search.yahoo.com/images/view?back=http://search.yahoo.com/search?ei=UTF-8&p=decagon&w=400&h=400&imgurl=www.wpclipart.com/education/geometry/decagon_10_sides.png&size=7KB&name=decagon_10_sides.png&rcurl=http://www.wpclipart.com/education/geometry/decagon_10_sides.png.html&rurl=http://www.wpclipart.com/education/geometry/decagon_10_sides.png.html&p=decagon&type=&no=3&tt=115&oid=C03CD55BE61C04F2A43FC7FEC706647683C364E8&tit=decagon+10+sides+-+public+domain+clip+art+image+@+wpclipart.com&sigr=125ghebvp&sigi=11p2dln6r&sigb=11herbtva&fr=yfp-t-701) |  | |  | |
| Dodecagon | [shapes cl...](http://search.yahoo.com/r/_ylt=A0oGdW5T6ppQKmgAkoxXNyoA;_ylu=X3oDMTB2ZnA3NGtrBHNlYwNzYwRjb2xvA3NrMQR2dGlkA01TWTAxNF8xMzQ-/SIG=1l50ipksp/EXP=1352358611/**http:/images.search.yahoo.com/images/view?back=http://search.yahoo.com/search?ei=UTF-8&p=dodecagon&w=582&h=581&imgurl=www.math-salamanders.com/images/shapes-clipart-regular-dodecagon-ns-bw.gif&size=5KB&name=shapes-clipart-regular-dodecagon-ns-bw.gif&rcurl=http://www.math-salamanders.com/shapes-for-kids.html&rurl=http://www.math-salamanders.com/shapes-for-kids.html&p=dodecagon&type=&no=2&tt=115&oid=2039E0CF3361F7E2D48C22DFA01571782F05231B&tit=shapes+clipart+regular+dodecagon+col&sigr=11ksg8mp2&sigi=12a40iro9&sigb=11jc230rv&fr=yfp-t-701) |  | |  | |
| 15-gon  (Pentadecagon) | 15-sided Polygon |  | |  | |