**Debriefing/Discussion Notes - Pick's Theorem Activity**

**Ohio's Learning Standards**

**Grade 6 - Critical Areas 3 and 5**

**6.EE.2** Write, read, and evaluate expressions in which letters stand for numbers.

**6.EE.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

**6.EE.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

**6.G.1** Through composition into rectangles or decomposition into triangles, find the area of right triangles, other triangles, special quadrilaterals, and polygons; apply these techniques in the context of solving real-world and mathematical problems.

**Grade 7 - Critical Areas 2 and 3**

**7.EE.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

**7.G.6** Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and

right prisms.

**Grade 8 - Critical Areas 1 and 2**

**8.F.4** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (*x*, *y*) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

**Standards for Mathematical Practice**

1. Make sense of problems and persevere in solving them.

2. Reason abstractly and quantitatively.

3. Construct viable arguments and critique the reasoning of others.

4. Model with mathematics.

5. Use appropriate tools strategically.

6. Attend to precision.

7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

**NCTM Process Standards (2000):** Problem solving, Reasoning and Proof, Communication, Connections, Representations

**Some Characteristics of the Pick's Theorem Investigation**

Problem-motivated - "real life" setting, student interest, motivates the learning of content

Illustrates multiple approaches and tools - concrete, pictorial, abstract - geoboard, grid paper, formula

Illustrates the use of a graphic organizer (tables) to organize information

Illustrates problem-solving strategies such as drawing a picture, making a table, looking for a pattern, approaching the solution systematically, and writing an algebraic representation for the pattern

Illustrates the mathematical/scientific process of making a conjecture and testing (although we have not actually proved Pick's Theorem)

Gives students the opportunity to "create" mathematics - development of mathematical power

Illustrates an inductive approach to the topic

Connects math history to the learning of mathematics - makes the mathematics more "personal"

Illustrates the teacher as facilitator

Shows an activity with potential for differentiated instruction

Provides opportunity for mathematical thinking and reasoning

Integrates mathematics topics - connections (geometry, measurement, algebra, functions)

Illustrates Standards for Mathematical Practice.

Other observations?