

## Fun with Pi

### Concepts:

- Pi as Ratio of C and d
- Area of a Circle
- Error

### Skills:

- Estimation
- Measurement
- Conversion
- Calculating percentages
- Using Trigonometry and Sequences

### Activities:

- Physical estimation of Pi
- Quasi-Calculus Trigonometric proof of Pi
- Physical estimation of the Area of a Circle
- Quasi-Calculus Geometric proof of Area of a Circle

### Materials:

- Chalk
- String and rope

- Construction paper
- Pencil
- Calculator with trigonometric functions

Activity 1: Measure C and d to estimate Pi to three decimal places; calculate percentage error from Pi.

Activity 2: Derive Pi from successive halving of a 60 degree angle, using the Tangent of the resulting chord.

Activity 3: Estimate the area of a circle by drawing unit squares on the ground with chalk, then drawing a circle using a set radius, and finally adding up estimates of shares of squares inside the circle.

Again, calculate the percentage of error from the actual value of  $(\text{Pi}) * (\text{radius}^2)$ .

Activity 4: Derive the formula for the area of a circle by adding up the areas of a series of right triangles that cover the circle.

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