Tetrahedron

Instructor Guide

Math concepts/skills:

- Properties of polyhedra
- Faces, edges, & vertices
- Surface area

Objective:

- Students will fold a tetrahedron and determine the number of faces, edges, and vertices.
- Student will calculate the surface area for their tetrahedron.

Vocabulary:

- **Area:** The size a surface takes up and is measured in square units.
- **Edges:** The line segment where two faces of a solid meet.
- **Equilateral triangle:** A triangle with 3 equal sides and 3 equal angles.
- **Faces:** A plane figure that serves as one side of a solid figure.
- **Polygon:** A two-dimensional shape with straight sides and is closed.
- **Polyhedron:** A 3-dimensional figure in which all the surfaces are polygons.
- **Surface Area:** Total area of the faces of a three-dimensional object and is measured in square units.
- **Vertices:** The point at which two line segments, lines, or rays meet to form an angle.

Supplies:

- 6 x 6 paper for model, students need 2 sheets in two different colors
- Origami tool
- Student handout
- Origami notebook
- Glitter glue
- Kite string

Note: Surface area is asked about on the student handout. You may need to modify this based on your students.

*****Please have students keep their tetrahedron model. It will be used in the next lesson*****

Video:

https://www.youtube.com/watch?v=RV75XWXHUYw

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Procedure:

Have students select two different colors of 8 x 8 origami paper.

Guide students through the folding process step by step.

When each student has successfully assembled their tetrahedron, hand out the student handout. Student should work together in small groups to answer the questions.

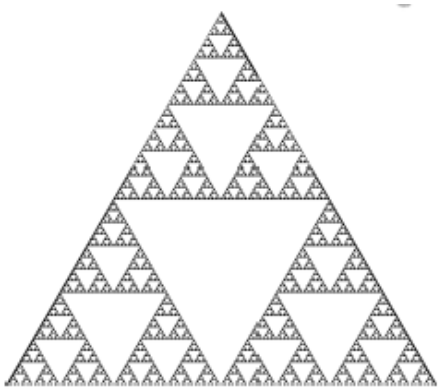
When groups have finished, close with a class discussion.

If time permits:

- Students can decorate their tetrahedron with glitter glue
- String a piece of kite string through two vertex to hang

Extension:

1. Students can build a Sierpinski Tetrahedron with their models.
    - A Sierpinski Triangle is a fractal based on an equilateral triangle, made by dividing the triangle into four smaller triangles, removing the central triangle and then repeating for each of the three remaining triangles. If you repeat this process, you get a fractal.



    - You can make a 3D version of the Sierpinski Triangle with a tetrahedron.