Bird Tetrahedron

Instructor Guide

Math concepts/skills:

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

Objective:

- Students will fold a bird tetrahedron and determine the geometric properties of their model, including the number of faces, edges, and vertices.
- Students will determine the surface area for their model.
- Students will compare the properties of the bird tetrahedron to those of a regular 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.
- **Isosceles triangle:** A triangle that has at least two congruent sides.
- **Polyhedron:** A 3-dimensional figure in which all the surfaces are polygons.
- **Right triangle:** A triangle that has one 90° angle.
- **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 3 squares per model in three different colors
- Origami tool
- Student handout
- Regular tetrahedron model from previous lesson
- Origami notebook
- Glitter glue

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

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Video:

Folding the unit:

https://www.youtube.com/watch?v=TKGW2W168H0

Assembling the model:

https://www.youtube.com/watch?v=SyH--QiOieo

Procedure:

Give each student three different colors of paper.

Guide students through the folding process step by step.

When each student has successfully assembled their box, hand out the student handout.

Students should work together in small groups to answer the questions.

When groups have finished, close with a class discussion.

Have the students try calculating the surface area with the following scenario:

- If the length of the base on one face is three units, and the height is one unit, what is the surface area of the whole figure?

  Area = 1/2bh
  A = ½ (3 x 1)
  A = ½ (3)
  A = 1.5 square units

  1.5 x 6 (faces) = 9 square units

If time permits:

- Students can decorate their bird tetrahedron with glitter glue