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Objectives/Outcomes
- Students will know that the base of a 3 sided pyramid is a triangle.
- Students will know that a 3 sided pyramid has 4 faces.
- Students will know that a 3 sided pyramid has 6 edges.
- Students will be able to build a triangular based pyramid.
- Students will be able to use spatial reasoning and problem solving skills to construct a 3 sided pyramid.
- Students will make connection between a geometric shape and a shape in art.

Materials and Resources
Each student will need:
- Stiff tag board patterns
- Cardstock paper
- Tape
- Pencil
- Scissor
**Procedures**  *(Return to Links)*

Students will choose a figure to construct.

1. Students will choose a tag board pattern to construct.
2. Trace pattern on cardstock
3. Trim 2D figure out of cardstock.
4. Fold if necessary
5. Tape edges of planes together to make desired 3D figure.

**Vocabulary**  *(Return to Links)*

**3 sided pyramid** –
A 3 sided pyramid is also called a triangular pyramid or a tetrahedron. It is a pyramid that has an equilateral triangle for a base and 3 equilateral triangles for sides. The base and sides are called the faces of the pyramid. There are 4 total.

**Face** - Any flat side of a solid geometric shape.

**Edge** – The line segment where 2 faces of a shape meet.

**Vertex** – the corners or points at which the sides of a triangle meet.

**Apex** – The vertex that forms the highest point of a triangle or pyramid.

**Equilateral triangle** – A triangle with equal sides and angles

**Line** – The real or implied path made by a moving point.

**Shape** - A two dimensional/flat space bordered by a real or implied line with a regular or irregular geometric shape.

**Form** – A three dimensional form bordered by real lines or edges that encloses volume.

**Criteria for Assessing Student Learning**  *(Return to Links)*

**General statement:** Students will learn how to predict what 2D pattern creates each 3D sculpture.

**Target Learning:** Construct pyramids  
**Assessment Criteria:** Students use fine motor skills to assemble.

**Target Learning:** Prediction of 2D pattern  
**Assessment Criteria:** Oral confirmation
Lesson Content Standards

California Content Standards in Visual & Performing Arts  (Return to Links)
(There are art sub-standards by grade level. These are the high level standards that guide instruction at all grade levels.)

1.0 ARTISTIC PERCEPTION (Learn & Talk)
Processing, Analyzing, and Responding to Sensory Information through the Language and Skills Unique to the Visual Arts.
   Students perceive and respond to works of art, objects in nature, events, and the environment. They also use the vocabulary of the visual arts to express their observations.

2.0 CREATIVE EXPRESSION (Make)
Creating, Performing, and Participating in the Visual Arts.
   Students apply artistic processes and skills, using a variety of media to communicate meaning and intent in original works of art.

5.0 CONNECTIONS, RELATIONSHIPS, APPLICATIONS (Connect)
Connecting and Applying What Is Learned in the Visual Arts to Other Art Forms and Subject Areas and to Careers.
   Students apply what they learn in the visual arts across subject areas. They develop competencies and creative skills in problem solving, communication, and management of time and resources that contribute to lifelong learning and career skills. They also learn about careers in and related to the visual arts.

California Content Standards in Math  (Return to Links)
Measurement and Geometry

1st Grade
2.1 Identify, describe, and compare triangles, rectangles, squares, and circles, including the faces of three-dimensional objects.

2nd Grade
2.1 Describe and classify plane and solid geometric shapes (e.g., circle, triangle, square, rectangle, sphere, pyramid, cube, rectangular prism) according to the number and shape of faces, edges, and vertices.

2.2 Put shapes together and take them apart to form other shapes (e.g., two congruent right triangles can be arranged to form a rectangle).

3rd Grade
2.1 Identify, describe, and classify polygons (including pentagons, hexagons, and octagons).

2.2 Identify attributes of triangles (e.g., two equal sides for the isosceles triangle, three equal sides for the equilateral triangle, right angle for the right triangle).
4th Grade
3.6 Visualize, describe, and make models of geometric solids (e.g., prisms, pyramids) in terms of the number and shape of faces, edges, and vertices; interpret two-dimensional representations of three-dimensional objects; and draw patterns (of faces) for a solid that, when cut and folded, will make a model of the solid.

5th Grade
1.2 Construct a cube and rectangular box from two-dimensional patterns and use these patterns to compute the surface area for these objects.

6th Grade
1.3 Know and use the formulas for the volume of triangular prisms and cylinders (area of base x height); compare these formulas and explain the similarity between them and the formula for the volume of a rectangular solid.

7th Grade
2.2 Estimate and compute the area of more complex or irregular two-and three-dimensional figures by breaking the figures down into more basic geometric objects.

8th Grade
8.0 Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.

Other Resources  (Return to Links)

Beyond the basics… (Return to Links)

1. The basic lesson could be added to by taping several constructed sculptures together.
   • These could be made into a castle, town, vehicles, etc.

2. Choose a specific color scheme and present them together at a classroom sculpture.

3. Decorate cardstock before construction.

Shape templates for copy and use  (Return to Links)
(Below you will find templates that you can copy. These can be used to trace and make cardboard templates that students can then use to trace onto paper and cutout as per the procedures above. In the alternative, you can simply copy and have students work directly from the copies. NOTE: Always cut on solid lines and fold on the broken lines.)
Triangular Pyramid
Square Pyramid
Triangular Prism
Cylinder
Cone