

# 2D to 3D Additive Shapes

This activity is the first part of a 3D printing curriculum.

## **Goal:**

The idea of additive building processes must be introduced to explain 3D printing. Additive processes include building with legos, or stacking objects together. Whereas subtractive processes include carving, CNCing, or machining.

## **Activities:**

First the idea of shapes and 3D geometry must be introduced. This can be done in many ways depending on the students' previous experience with 3D shapes. The goal of the activity is to have students create several 3D shapes out of 2D shapes stacked on each other.

Simplifying additive processes into easy to understand concepts is key. Several 3D shapes can be broken down into layers or slices which are the same as the 2D version of the shape. Such as: Cubes-Squares, Spheres-Circles, Pyramids-Triangles. The 3D shapes can be built by adding small slices of the base shape. As an example in class, pieces of paper or cardboard, small 1x1 lego blocks, and playdoh can be used to make 3D shapes via lots of small layers.

To introduce the idea of 3D geometry have students name several 2D and 3D shapes. Then have them connect the related shapes to create 3D shapes. Introduce the idea that the size of the 2D shape can change to produce different 3D shapes. For example the size of a square shrinks as the height of a pyramid increases.

After introducing the idea of additive 3D shapes give each student a tub of playdoh or other materials. Task them with creating various shapes such as spheres, cubes, rectangular prisms, square and triangular pyramids by creating the base 2D shapes needed to build the 3D shape.

Give the students plenty of time to play with the materials and ask them to make many different shapes over the course of the class.