ASSIGNMENT 3

Extrusion Definition

Look at a macaroni noodle or a cheese puff. How did they ever get these foods into these shapes? Somehow the macaroni ended up with a tube and a curve. And how did that cheese puff get puffy? These foods are made with the same processing that makes a pipe called extrusion.

Extrusion is a process that uses a die in order to get a material with a constant cross-sectional cut. The **die** is what the material is pushed through in order to get the desired shape. Each product has a specific die that will create that shape and characteristics. Extrusion is used with materials such as plastic, aluminum, and dough. These products are either too brittle or too soft to be formed using bending or hammering. So in order to form the desired shapes extrusion is necessary.

Extrusion Process

Extrusion works by forcing the dough or semi-liquid material through a shaft. At the end of the shaft is the die with the particular shape to form the desired cut. For a tube, the die will simply be a circle that the material gets pushed through. To make a curve the die will have a more narrow circle at first, that then gets wider. These designs often use different pressures in order to create the desired shape. Having a more narrow circle at first creates a higher pressure, forcing it to curve.

Think about playing with play dough as a child. You could push the play dough through different shapes in order to create the desired shape. There was a handle that would push the dough through the mold and out would come the desired shape. The use of these play dough molds were simple examples of extrusion. They weren't very intricate designs and so are easier to understand how the shape is formed, but the same idea is used for extruding other products.

Extrusion and the Ideal Gas Law

There are some other key variables that affect the extrusion process. Let's look at a balloon. When you initially blow up a balloon it's fairly large. But as time passes the balloon slowly gets smaller because it is losing air. The air acts as pressure on the balloon giving more volume the more air the balloon has. Also if you were to put that balloon outside on a cold day it would become smaller.

Revolution

The revolution is creating a 3D volume from a 2D shape not by giving it thickness, but rather by extending a path by rotating the shape on the y axis.
After creating the volume, it is possible to vary the angles as is the case with extruded volumes.

To create a 3D volume in revolution, first draw half of an object, then choose in the menu EFFECTS / 3D / REVOLUTION.
In the Revolve Options window, in the Revolve section, choose left edge or right edge, depending on the path you produced.

Angle:
Allows you to create a volume from a partial or complete revolution.

Offset :

Allows you to increase the diameter of the volume.

Surface :
Allows you to define the type of surface, the light intensity of the directional source and ambient light, the intensity and size of highlights, gradation steps, shade color, etc.

Texture:
Allows a symbol to be applied to the surfaces of the volume.

Rotation:

To simulate the rotation of a 2D object, choose in the menu EFFECTS / 3D / ROTATION. and adjust the angle settings as if it were a 3D volume.