

Converting Between Bitmaps and Drawn Images

The points to be noted in this section:

- Most drawing programs offer several file formats for saving your work and you can convert a drawing that consists of several vector drawn objects into a bitmap when you save the drawing.
- Converting bitmaps to drawn objects is more difficult.
- Autotracing: Programs and utilities that will compute the bounds of a bitmapped image or the shapes of colors within an image and then derive the polygon object that describes the image. This procedure is called autotracing and is available in vector drawing applications.
- Flash has a Trace Bitmap menu option that converts a bitmapped image into a vector image.
- Caution: the size of your Flash file may actually balloon because the bitmapped image is replaced by hundreds or even thousands of tiny vector-drawn objects, leading to slow processing and display.
- WARNING: Some bitmap applications allow vector images to be pasted into them. Be careful to save your vector drawing separately because you will not be able to edit the curves when they are bitmapped.

3-D Drawing and Rendering

- Creating objects in three dimensions on a computer screen can be difficult for designers comfortable with squares, circles, and other x (width) and y (height) geometries on a two-dimensional screen.
- Dedicated software is available to help you render three-dimensional scenes, complete with directional lighting and special effects.
- Each application will demand study and practice before you are efficient and comfortable with its feature set and power.
- Flat and colorless 2-D screens are no longer sufficient for a successful commercial multimedia project. 3-D-rendered graphic art and animation has become commonplace providing more lifelike substance and feel to projects.

- For effective 3-D designing, inexpensive desktop PCs and excellent software have made 3-D modeling attainable by most multimedia developers.

Example products—

- Daz3D (www.daz3d.com) and form•Z (www.formz.com)—are touted as essential tools for illustration, animation, and multimedia production.
- NewTek’s Lightwave (www.newtek.com/lightwave) and Autodesk’s Maya (www.autodesk.com/Maya) are industry-standard, high-end animation programs used for everything from multimedia programs and game designs to special effects in films and even feature-length movies.
- For experimenting with 3-D, Google’s SketchUp (sketchup.google.com) provides a simple (and free) cross-platform tool.
- To delve deeply into 3-D, the open-source Blender (www.blender.org) is a powerful tool.

For 3-D, the depth (z dimension) of cubes and spheres must be calculated and displayed so that the perspective of the rendered object seems correct to the eye.

Most 3-D software packages provide adjustable views so that you can see your work from the top, bottom, or sides

To display a 3-D scene.

- Scenes consist of objects that in turn contain many small elements such as blocks, cylinders, spheres, or cones (described using mathematical constructs or formulas).
- The more elements contained in an object, the more complicated its structure will be and the finer its resolution and smoothness.
- Objects and elements in 3-D space carry with them properties such as shape, color, texture, shading, and location.
- A scene contains many different objects. Imagine a scene with a table, chairs, and a background. Zoom into one of the objects.

EXAMPLE—the chair. It has 11 objects made up of various blocks and rectangles. Objects are created by modeling them using a 3-D application.

To model an object that you want to place into your scene, Various steps are:

1. You must start with a shape. You can create a shape from scratch, or you can import a previously made shape from a library of geometric shapes called primitives, typically blocks, cylinders, spheres, and cones.
2. In most 3-D applications, you can create any 2-D shape with a drawing tool or place the outline of a letter, then extrude or lathe it into the third dimension along the z axis.
3. When you extrude a plane surface, its shape extends some distance, either perpendicular to the shape's outline or along a defined path.
4. When you lathe a shape, a profile of the shape is rotated around a defined axis (you can set the direction) to create the 3-D object.

Other methods for creating 3-D objects differ among the various software packages. Once you have created a 3-D object, you can **apply textures and colors** to it to make it seem more realistic, whether rough and coarse or shiny and smooth.

- You can also apply a color or pattern, or even a bitmapped picture, to texture your object.
- You can build a table, apply an oak finish, and then stain it purple or blue or iridescent yellow. You can add coffee cup rings and spilled cheese dip with appropriate coloring and texturing.
- In modeling your scene, you can also set up one or more lights that will create diffuse or sharp shades and shadows on your objects and will also reflect, or flare, where the light is most intense.
- Then you can add a background and set a camera view, the location and angle from which you will view the final rendered scene.

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