



# 5

## Tutorial

### Welcome



Welcome to the Ray Dream Studio tutorial. This tutorial is designed to introduce all the major features and functions in Ray Dream Studio 5. The main goal of the tutorial is to teach you the techniques you need to know to create 3D illustrations.

Each section of lessons is self-contained so you can start the tutorial at any point. For example, if you already know how to model an object but need assistance on shading, skip the lessons on modeling and start the tutorial at the shading section.

To help you follow along the tutorial, every lesson contains a section called "The Story so Far", which summarizes the procedures that have been covered in the tutorial up to that point. It also tells you where you can get pre-set files to complete the lesson.

## Getting Started

The first thing you need to do is start Ray Dream Studio and create an empty scene.

### *To open a blank scene in Ray Dream Studio:*

- 1 Launch Ray Dream Studio. The **New** dialog appears.
- 2 Click the **Create Empty Scene** button.

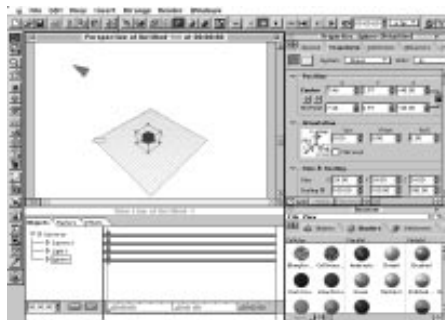
A new document is created and four windows appear: the **Perspective** window, the **Properties** palette, the **Time Line** window and the **Browser** palette.

Before starting any project in Ray Dream Studio, you need to set up the program's interface to help you work the most effectively. Ray Dream Studio's interface is very flexible. You can setup menus, toolbars, and palettes.

## Lesson 1: Setting up your Workspace

When you first open Ray Dream Studio, the palettes and toolbars are displayed in their default positions. If you change these positions or hide elements, Ray Dream Studio saves the new positions and use them the next time you open the application.

The workspace configuration shown below was selected because it allows you to quick access to all the tools you'll need during the course of the tutorial.



*To begin, set up your workspace to look like this.*

### *To setup the workspace:*

Choose **Windows menu** ▶ **Workspace** ▶ **800x640** (Macintosh) / **800x600** (Windows).

For more detailed instructions on workspace settings, refer to "[Setting up your Workspace](#)" on page 25.

### *To setup toolbars:*

- 1 Choose **View menu** ▶ **Toolbars**. The **Toolbars** dialog appears.
- 2 Click the toolbars you want to view.

A toolbar is displayed when a checkmark appears next to its name.

The tools available in the **Tools** toolbar change depending on the window displayed.

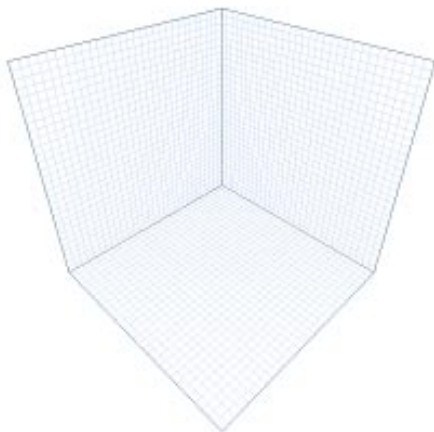
After you setup your toolbars you can set the view of the **Time Line** window. The **Time Line** window displays a textual representation of your scene. This window is where you'll arrange groups of objects and set up the action in your animations. For more on the **Time Line** window, refer to "[Using the Time Line Window](#)" on page 32.

### *To setup the Time Line window:*

- 1 Click the **Time Line** window to select it.
- 2 Choose **View menu** ▶ **Horizontal**. The **Time Line** window changes to **Hierarchy** mode.

The **Perspective** window is where you'll be arranging and positioning objects to create a scene. The window displays three grid

planes called the *Working Box*. The Working Box can help you orient objects in three dimensional space. The planes in the Working Box represent each of the three axes used to define 3D space, namely X, Y, and Z.



*The Working Box has three grid planes for X, Y and Z.*



#### *To display planes:*

- 1 Click the **Perspective** window to make it the active window.
- 2 Click each of the planes on the **Display Plane** tool icon.

You will see the planes appear in the **Perspective** window.



*Click on the Display Plane tool icon to display each plane.*

When all the planes are visible, you'll notice that one of the planes is light blue, while the other two are light grey. The colored plane is called the *active plane*. When you drag an object in the **Perspective** window, it moves parallel to the active plane by default.

Displaying additional planes allows you to see the projections of all the objects in your scene.

The Working Box and the active plane are important reference tools, there are several options you can set for these tools. For more information, refer to "[The Working Box](#)" on page 225.

## Arranging Objects in the Scene



A 3D illustration is made up of a number of 3D objects arranged in an order that is pleasing to eye.

Since you're working in a three dimensional space your scene can be viewed from any angle which can produce a wide variety of different illustrations. A good arrangement of objects makes your scene look good from any angle.

The lessons in this section will help you learn some of the arranging skills you'll need to create 3D illustrations.

### *The Story so Far*

Before starting this lesson you should have your workspace set up to best display all the necessary tools in the available video display.

### *What You'll Need*

To complete this lesson you'll need some objects which you can arrange. The **Arranging Objects** folder contains all the objects you'll need. To start the lesson you will need to add this folder to the **Browser** palette.

Ray Dream Studio's **Browser** palette can be an invaluable utility when arranging objects. The **Browser** palette lets you store Light, Cameras Effects and Objects. For

more information on the **Browser** palette, refer to “Using the Browser Palette” on page 28.



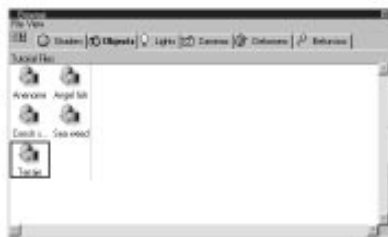
*You can use the Browser palette to store scene items including object, Shaders, Deformers and Links.*



#### *To add folders to the Browser palette:*

- 1 If the **Browser** palette is not already visible, choose **Windows menu**► **Browser**.
- 2 Click the **Objects** tab.
- 3 Choose **Browser palette: File menu**► **Add Directory/Folder**.
- 4 Locate the **Tutorial** folder on the Ray Dream Studio 5 CD. Open the **Arranging Objects** folder within the Tutorial folder and then click **Select Current Directory**.

The folder contains a library with pre-made objects you'll use to create an underwater scene.



*Once you add Arranging Objects, its contents appears in the Browser palette's Objects tab.*

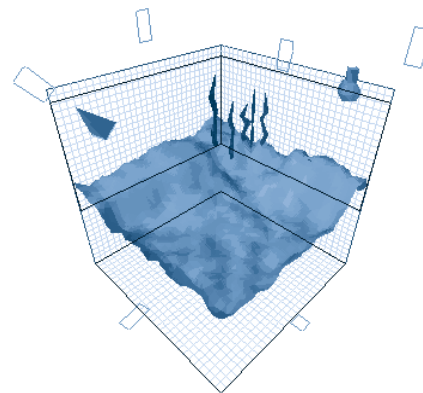
### **Lesson 1: Adding Objects**

The simplest way of creating an illustration is by adding existing objects from various sources and arranging them to create a scene. In fact, most complex scenes consist of a few original objects combined with stock images or library objects.



#### *To add objects from the Browser palette:*

- 1 Click the **Objects** tab.
- 2 Make sure you have the **Selection** tool chosen. Click on the **Sea Terrain** object and drag it into the **Time Line** window.

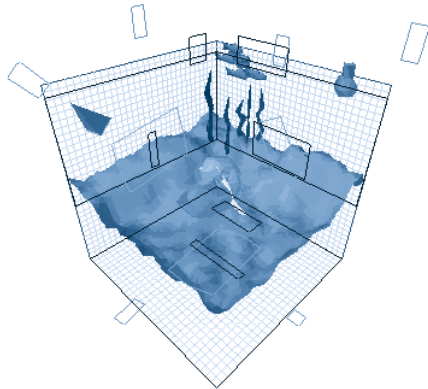


*Drag the Sea Terrain object into the Time Line window.*

When you drag an object into the **Time Line** window, it appears at the origin of your scene (i.e. at coordinates X=0, Y=0, Z=0).

- 3 Drag the objects **Shell** and **Angel Fish** into the **Time Line** window.
- 4 Click the object labeled **School of Fish** and drag it into the **Perspective** window.

Objects dragged directly into the **Perspective** window are positioned at the point where you release the mouse button.



*Add the Shell, Angel Fish and School of Fish to your scene.*

Now that all the necessary objects are in the **Perspective** window, you'll need to position them to create a scene.

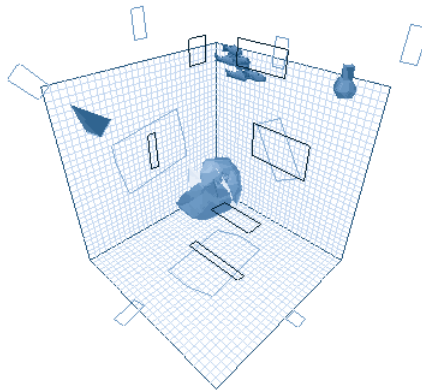
You'll notice that the terrain takes up a lot of the scene. This will probably make positioning difficult. To make it easier to view the other objects you can make the terrain object invisible.



*To make objects invisible:*

- 1 Click the **Sea Terrain** object in the **Time Line** window.

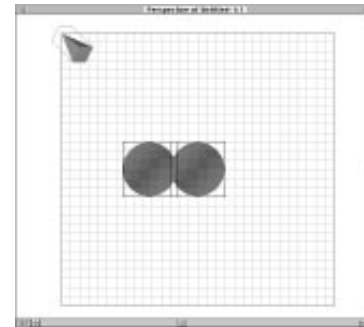
- 2 Choose **View** menu ► **Object Invisible**.



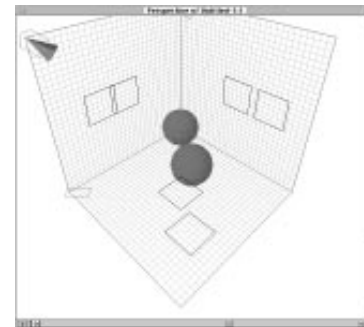
*Hide the Sea Terrain to make it easier to view the other objects.*

## Lesson 2: Positioning Objects

When you drag objects into the **Time Line** window, they appeared at the exact center of your scene, while objects dragged directly into the **Perspective** window appear wherever you released the mouse button. This can make it difficult to tell exactly where objects are in 3D space. For example, in the front view, two spheres can appear to be adjacent. However, when you switch to **Reference** view, it becomes clear that the two objects are at completely different depths.



*When the scene is viewed from the front view, objects can appear to be adjacent.*



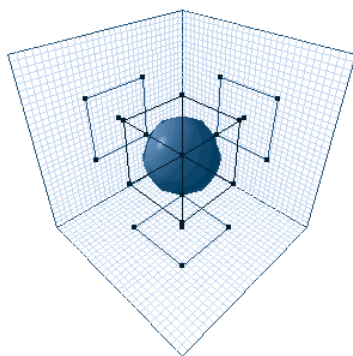
*When the scene is viewed in Reference view, you can see that the same objects are at two different depths.*

To help you position objects in 3D space, objects have projections which indicate their position in each of the planes in the Working Box.

You can tell the exact position of an object in the scene by locating at least two of the object's projections. One projection



indicates the object's vertical and horizontal position and the other indicates its depth in the scene.

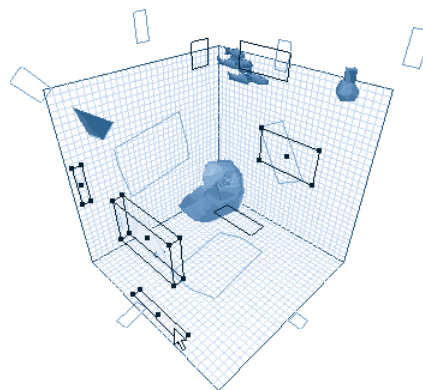


*An object's projections help you determine its position in 3D space.*



#### **To position objects manually:**

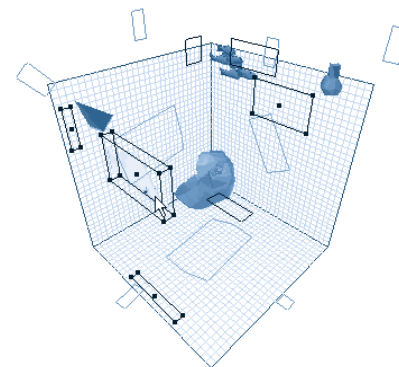
- 1 Click the object labeled **Angel Fish** in the **Time Line** window.
- 2 In the **Perspective** window click the fish's projection on the ground plane and drag it towards the left edge of the working box.



*Click the Angel Fish's projection on the ground plane and drag to position it in the scene.*

- 3 As you drag take notice of the object's projections on the other two planes only move horizontally along the X or Y axis.
- 4 Hold down **Option/Alt** and drag the fish upwards.

**Option/Alt** constrains movement to be perpendicular to the Active plane.



*Hold down **Option/Alt** as you drag the fish to position it vertically.*

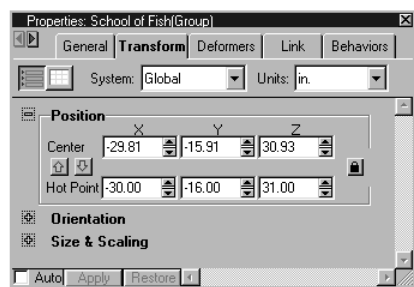
Although you can position objects using their projections, it's not the most precise method. By entering exact values into the **Properties** palette, you can precisely position an object anywhere in your scene.



#### **To position objects numerically:**

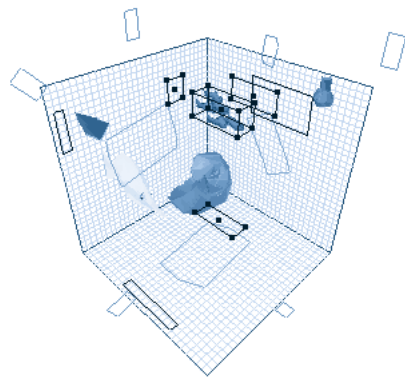
- 1 Click the **School of Fish** object in the **Time Line** window.
- 2 Choose **Windows menu > Properties**.
- 3 Click the **Transform** tab.

- 4 In the top row of **Position** controls, enter **X=30, Y=-16, and Z=31**.



*Enter numerical Position controls in the Properties palette's Transform tab.*

- 5 If **Auto** is not enabled, click **Apply**.



*The School of Fish are positioned numerically.*

### Lesson 3: Rotating Objects

Often, positioning objects vertically and horizontally is not enough. To get objects in just the right position in your scene you'll probably need to rotate them. Like positioning, you can rotate objects both manually, using the **Rotation** tools, or numerically, using the **Properties** palette.

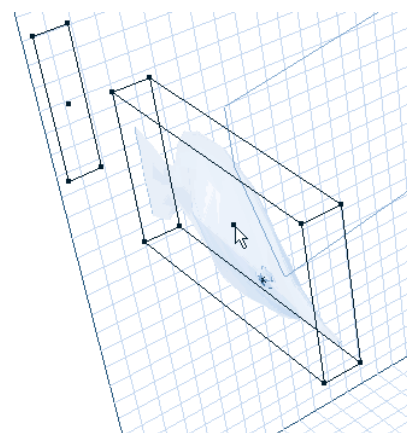
Before you begin rotating, you should adjust the object's Hot Point. When rotating, the Hot Point acts as the pivot point for the object, meaning that the object will rotate around the Hot Point.

By moving the Angel Fish's Hot Point you can rotate it around its nose.

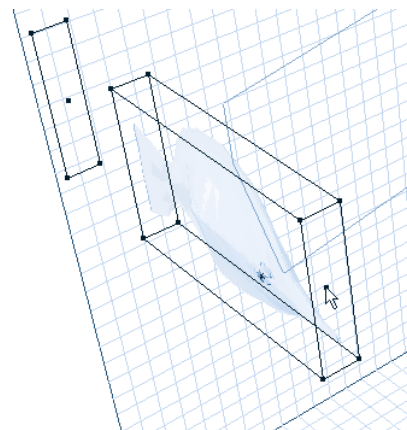


#### *To adjust the Hot Point:*

- 1 Using the **Selection** tool, click the **Angel Fish** object.
- 2 Hold down the **Shift** key and drag the black dot in the center of the object to the nose of the fish.



*With the Selection tool, click the Hot Point...*



*...and drag it to the nose of the fish.*

Now that the Hot Point is in the correct position, you can rotate the object.

### *To rotate an object using the Rotation tools:*

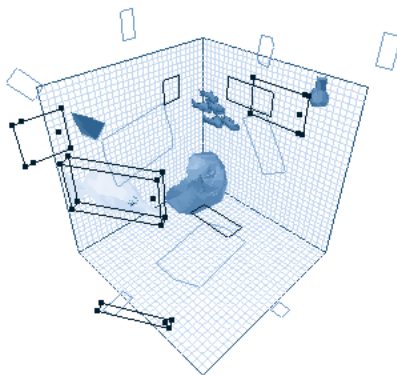
- 1 Press on the **Rotation** tool to pop-up and choose the **2D Rotation** tool.



Press to pop-up and choose the 2D Rotation tool.

- 2 Click the Angel Fish object's projection on the ground plane.
- 3 Hold down the **Shift** key and drag the projection to the left until it's rotated 30 degrees. Then release the mouse button.

Holding down the **Shift** key constraints the rotation to 30 degree increments.



Use the 2D Rotation tool to drag the fish's projection and rotate it.

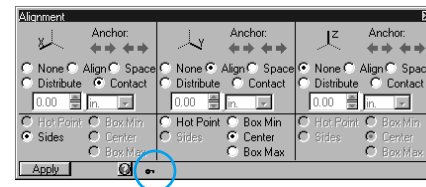
## Lesson 4: Aligning Objects

Another way of positioning objects is to align them to certain parts of your scene or to other object. In Ray Dream Studio, you can use the **Alignment** palette to align objects along each of the three axes (X, Y, and Z). The **Alignment** palette gives you several different methods of aligning. For more detailed information on the methods available, refer to ["Aligning Duplicating Objects"](#) on page 244.

In the scene you'll use the **Contact Sides align** option to align the Angel Fish to the Shell.

### *To align objects:*

- 1 Click outside the Working Box to make sure all the objects in the **Perspective** window are deselected.
- 2 Click the Shell object with the **Selection** tool.
- 3 Hold down the **Shift** key and click the Fish object.
- 4 Choose **Arrange menu > Align Objects**. The **Alignment** dialog appears.
- 5 In the **X** axis panel, select the **Contact** radio button. The **Sides** radio button is automatically enabled.
- 6 Click the extension button (key) at the bottom right of the palette to show the **Y** and **Z** axis panels.



Click the extension button (key) to expand the palette.

- 7 In the **Y** axis panel, click the **Align** radio button. The **Center** radio button is enabled by default.

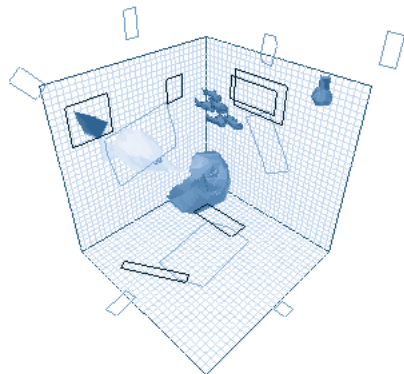


8 In the **Z** axis panel, enable **None**.

9 Click **Apply**.

The Fish moves closer to the Shell.

10 Click the **Close** box to close the **Alignment** dialog.



*Once you click Apply, the Fish and Shell are aligned.*

## Lesson 5: Duplicating and Grouping

Duplicating is a quick way of creating a complex object from a simple one. For example by duplicating a blade of grass you can create an entire field. Duplicating creates exact copies of an object.

Although duplicating can be a great way of creating large objects, arranging many duplicates in a scene can quickly become a complex task. You can make arranging

easier by combining a number of duplicates into a single group. A group can let you position and edit a number of objects all at the same time.

In the scene you're creating, you can add a bed of sea anemones by duplicating a simple object and grouping it.



### To duplicate objects:

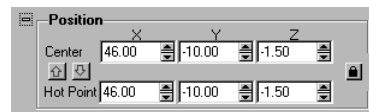
1 Click the SeaTerrain in the **Time Line** window and choose **View menu> Object Visible**.

2 Drag the object labeled **Anemone** out of the **Browser** palette and into the **Time Line** window.

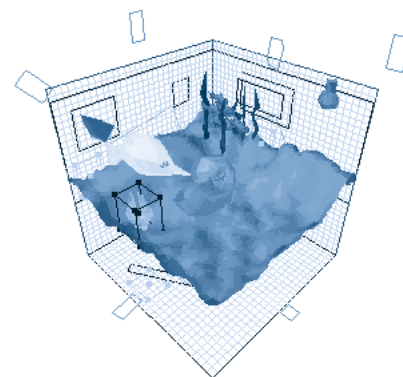
3 Choose **Windows menu> Properties**. The Properties palette appears.

4 Click the **Transform** tab.

5 In the **Position** controls, enter **X=46**, **Y=-10** and **Z=-1.5**.



*The Position controls in the Properties palette let you numerically position objects.*



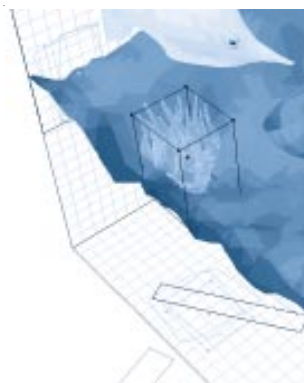
*When the new position values are applied to the anemone, it moves to the edge of the terrain.*

6 Click the Anemone object in the **Time Line** window.

7 Choose **Edit menu> Duplicate**.

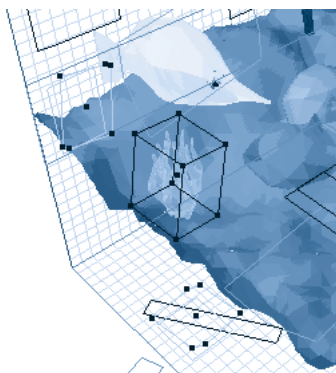
8 In the **Position** controls, enter **X= 42.75**, **Y= -13.25**, **Z= -1.5** and in the **Orientation** controls enter **Yaw= 6.5**, **Pitch= -8.85**, **Roll= 85**.

The duplicate object is now offset and slightly rotated.



*By entering values in the Properties palette you can offset and rotate the duplicate.*

- ③ Duplicate the object again and enter **X=46.85, Y= -15.75, Z= -1.5** and **Yaw= -6.5, Pitch= 8.85, Roll= 95** into the **Properties** palette.



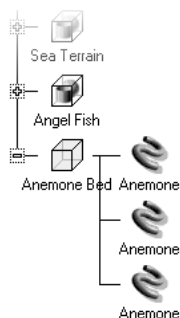
*Duplicate the object again and change its position to create a series of anemones in your scene.*

Now that you have a series of anemones, you can group them and create a bed of anemones.



#### *To group objects:*

- ① In the **Time Line** window, hold down the **Shift** key and select all the objects labeled **Anemones**.
- ② Choose **Hrrange menu**► **Group**. A new group object is created.
- ③ Click the group's title and type **Anemone Bed**.



*The Anemone bed appears as a new group in the Time Line window.*

You can use the **minus/arrow** icon to open or collapse the group. When the group is collapsed you can only edit the group, when it's open you can edit the individual objects.

#### *Moving On*

Your scene is now complete. If you're happy with the way your scene looks, choose **File menu**► **Save** and save it as **ARRNG\_TUT**.

You can now adjust the position of lights and cameras, then render your scene. If you want to learn how to setup your scene for rendering skip ahead to "[Lesson 2: Positioning Lights](#)" on page 70.

If you want to learn how the objects in the scene you just arranged were created, move on to the next section.

Arranging is an essential part of modeling so you may want to refer to "[Arranging Objects](#)" on page 232 for more detailed information.

## Modeling Objects



Modeling refers to the process of creating three dimensional objects in Ray Dream Studio. A 3D model can be anything from a basic cube to a complex sea monster.

The lessons in this section will lead you through the different types of 3D modeling you can do in Ray Dream Studio.

### *The Story so Far*

At the start of this section you should already know the basics of arranging objects in your scene. If you're not clear on how to align, rotate or numerically position objects, review [“Arranging Objects in the Scene” on page 39](#), or [Chapter 12](#), [“Arranging Objects.”](#)

### *What You'll Need*

In these next lessons you'll be creating objects from scratch so you don't need any other components. However, we have included completed versions of all the objects described in the lessons. If you have trouble, open the completed object and see how it was made. Completed objects are located in the **Tutorial: Modeling Objects** folder.

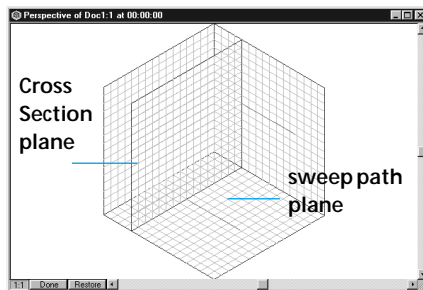
So as not to clutter the workspace, start each lesson with a blank scene.

## Lesson 1: Free Form Modeling

The **Free Form** modeler lets you create 3D objects by drawing cross section shapes and extruding them along a sweep path.

The cross sections determine the basic outline of the object, while the sweep path determines its depth.

The modeler has three drawing planes which you can use to create and extrude cross sections: the cross section plane and two sweep path planes. The active plane is shown in color while inactive planes are displayed in gray. Like the **Perspective** window, you can use the **Zoom** tools to magnify areas of your object.



*Use the Free Form modeler to create new 3D objects.*

Refer to [“Free Form Modeling” on page 109](#) for more on the **Free Form** modeler.

In this lesson you'll use the **Free Form** modeler to create some seaweed.



### *To create an oval cross section:*

- 1 Click the **Free Form** tool and drag it into the **Time Line** window.



*Drag the Free Form tool into the Time Line window to open the Free Form modeler.*

The **Free Form** modeling window automatically opens.

- 2 Enter a name for your object and click **OK**.
- 3 Choose **View menu** ▶ **Preset Position** ▶ **Drawing Plane**.

This changes the view of the modeling window to display only the active plane.

- 4 Choose **View menu** ▶ **No Preview**.

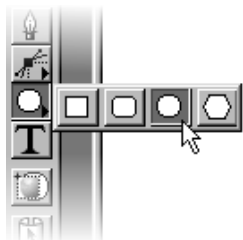
This turns off all shading, making it easier to see what you're drawing.

- 5 Choose **Geometry menu** ▶ **Extrusion Method** ▶ **Pipeline**.

This translation method lets you create a more tubular shape. For more on translation methods, refer to [“Translation vs. Pipeline” on page 131](#).

- 6 Click the **Zoom** tool and enlarge an area of the **Modeling** window.

- 7 Press on the **Square** tool to pop-up and choose the **Oval** tool



*The Oval tool creates oval cross sections.*

- 8 Click a point on the cross section plane and drag diagonally. Try to create more of a flat oval shape than a circle, this will be the cross section of the seaweed.



*Use the Oval tool to create oval shapes as a cross section for the seaweed.*

- 9 Press **Command-Shift-C/Ctrl+Shift+C** to center the cross section.



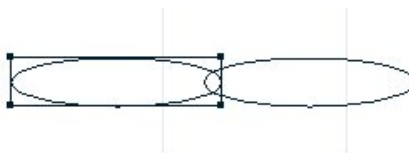
**To use multiple shapes in a cross sections:**

- 1 Choose the **Selection** tool and click the oval.
- 2 Choose **Edit menu** ▶ **Copy**.

- 3 Choose **Edit menu** ▶ **Paste**.

- 4 Deselect all shapes.

- 5 Hold down the **Shift** key and drag the oval to the right. The two ovals should be just touching as shown below.



*Move the pasted oval to the right so that the two ovals are touching slightly.*

- 6 Choose **Edit menu** ▶ **Select All** to select both shapes.
- 7 Choose **Arrange menu** ▶ **Combine as Compound**.
- 8 Press **Command-Shift-C/Ctrl+Shift+C** to center the compound cross section.

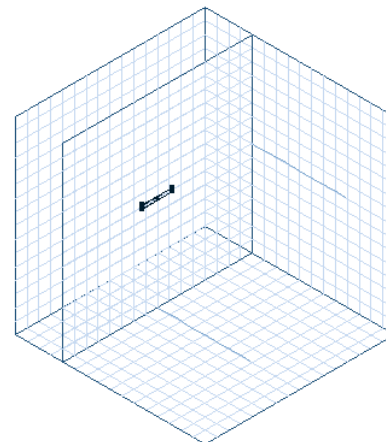
- 9 Choose **View menu** ▶ **Preset Position** ▶ **Reference**.

- 10 Click the **Zoom** tool.



*The Zoom tool lets you magnify your view of the scene.*

- 11 Hold down **Option/Alt** and click the center of the scene to zoom out.



*When you zoom out in Reference view you can see you new cross section in the Free Form modeling window.*

Now that you have the outline of the object you'll need to adjust the sweep path and extrusion envelope to give it a more organic look.

Before you can adjust the shape, you will need more points on the sweep path.

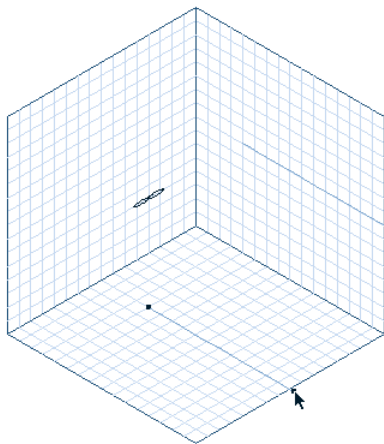


**To add points to the sweep path:**

- 1 Click the ground plane to make it active.
- 2 Choose **View menu** ▶ **No Preview**.

- 3 Hold down the **Shift** key and click the sweep path, then extend it to the edge of the **Modeling** window.

The sweep path is displayed in red.



*Extend the sweep path all the way to the edge of the Free Form modeling window.*

- 4 Choose **Geometry** menu► **Extrusion Envelope**► **Symmetrical** to add an extrusion envelope.
- 5 Double-click the **Convert Point** tool to choose the **Add Point** tool.

Every time you click the tool on the toolbar, a new tool appears. You can cycle through all the tools by clicking on it repeatedly.

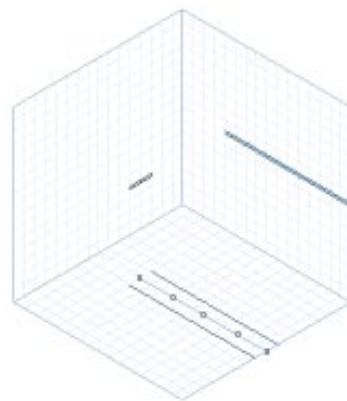


*The Add Point tool lets you add control points to path.*

- 6 Click the sweep path. A new point is added.

Each time you click the path a new point is added. You'll need the new points to create additional cross sections. Every point on the sweep path represents a point where you can place a cross section.

- 7 Add two more points to the sweep path.



*When you're done adding points, your sweep path should look like this.*

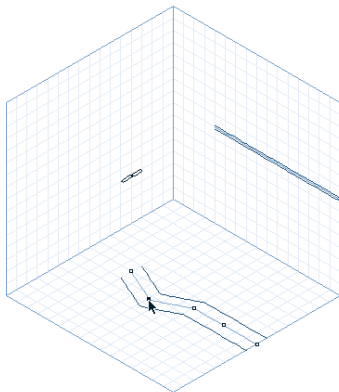
Now that you've added points, you can move them to reshape the sweep path.



**To move points:**

- 1 Choose the **Selection** tool.
- 2 Click the second point and drag it to the left.

Make sure you're selecting a point on the sweep path (the red line) not on the envelope (the blue lines).

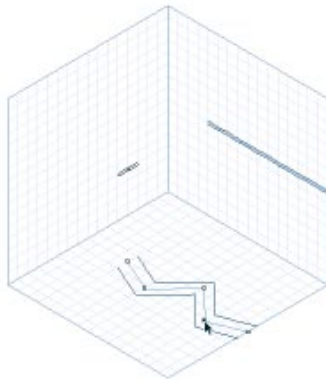


*Add a second point on your sweep path and drag to the left.*

Make sure all the points are deselected before going on.

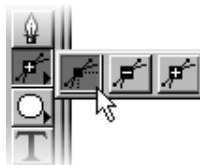
- 3 Click the next point and drag it to the right.

- 4 Click the next point and drag it to the left.



*After adjusting the points along your sweep path, it should look like this.*

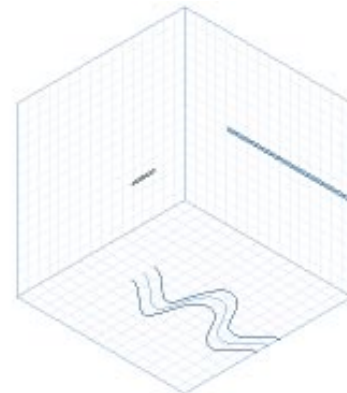
- 5 Press on the **Add Point** tool to pop-up and choose the **Convert Point** tool.



*Choose the Convert Point tool.*

- 6 Click each point on the sweep path and drag up.

Your sweep path should now look like a wave.



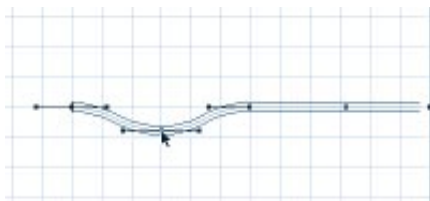
*After you use the convert points to smooth the sweep path it should look like a wave.*

- 7 Choose **View** menu ► **Preset Position** ► **Right**.

- 8 Click the **Zoom** tool and zoom in on the sweep path.



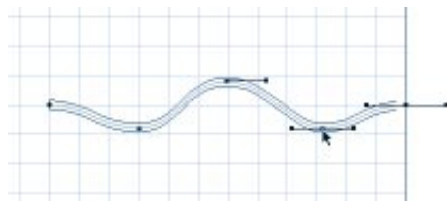
- 9 Click the second point on the sweep path with the **Selection** tool and move it down.



*Use the Selection tool to move the second point on sweep path down.*

You'll need to deselect all the points before selecting the next point.

- 10 Click the next point and move it up.  
11 Click the next point and move it down.



*When you're done adjusting the points, your sweep path should look like a wave.*

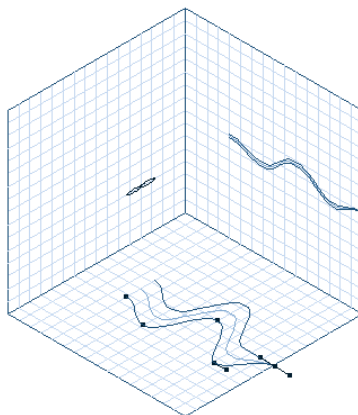
Your seaweed now waves both side to side and up and down. Next you'll adjust the extrusion envelope to add the final touches to your seaweed.



*To adjust the extrusion envelope:*

- 1 Click the final point on one of the envelope lines and drag it towards the center.

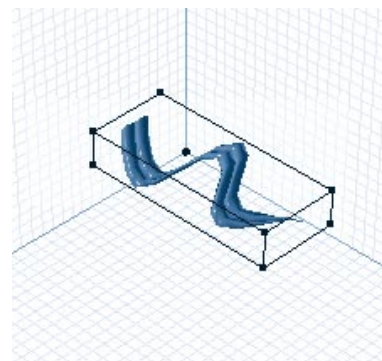
Envelope definition lines are shown in blue.



*Drag the final point to the center to "pinch off" the extrusion envelope creating the tip of the seaweed.*

- 2 Choose **View menu > Preset Position > Reference**.

- 3 Click **Done**.



*Your completed seaweed should look like this.*

Your seaweed stalk is now complete. You may want to save it in a convenient location. Once the object is in the **Perspective** window, you can position and duplicate it to create a seaweed bed. For more information, refer to "[Lesson 5: Duplicating and Grouping](#)" on page 45.



*You can arrange and duplicate the seaweed in the scene.*

## Lesson 2: Complex Free Form Modeling

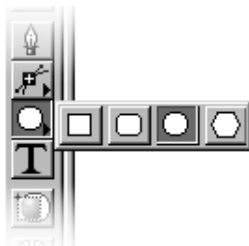
Now that you know how to create simple objects using the **Free Form** modeler, you can use the skills you learned to create much more complex objects. Many objects have more detail than can be extruded using only a simple cross section and sweep path. In the next chapter you'll learn how to use multiple cross sections and shape numbering to create a sea anemone.



**To create multiple cross sections:**

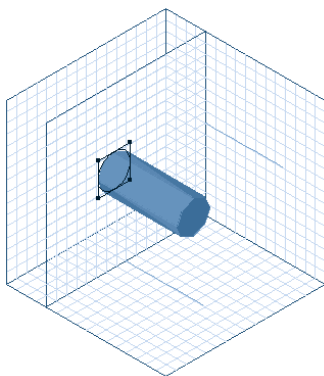
- 1 Open the **Free Form** modeler.

- 2 Press to pop-up and select the **Draw Oval** tool.



*Select the Draw Oval tool to draw oval cross sections.*

- 3 Hold down the **Shift** key and draw a circle about five grid squares in diameter.

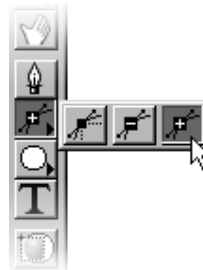


*Use the Draw Oval tool to create the first cross section.*

- 4 Press **Command-Shift-C**/**Ctrl+Shift+C** to center the cross section.

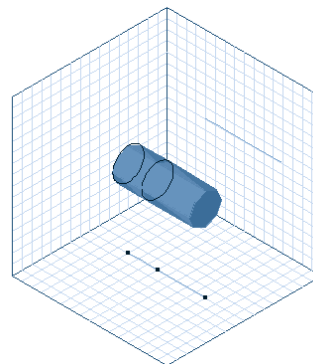
- 5 Choose **View** menu► **Preset Position**► **Reference**.

- 6 Choose the **Add Point** tool.



*Use the Add Point tool to add new control points to a path.*

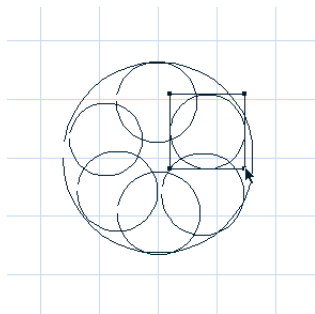
- 7 Click the sweep path on the ground plane and add a point about two grid squares from the first point.



*Use the Add Point tool to add a point on the sweep path two grid squares from first.*

- 8 Choose **Sections** menu► **Create**.
- 9 Choose the **Selection** tool.
- 10 Click the new cross section and choose **View** menu► **Preset Position**► **Drawing Plane**.
- 11 Choose **View** menu► **No Preview**.
- 12 Choose **Sections** menu► **Next**. If **Next** is not available you are already on the correct section.
- 13 Choose the **Oval** tool.
- 14 Hold down the **Shift** key and draw six smaller circles inside the larger circle.

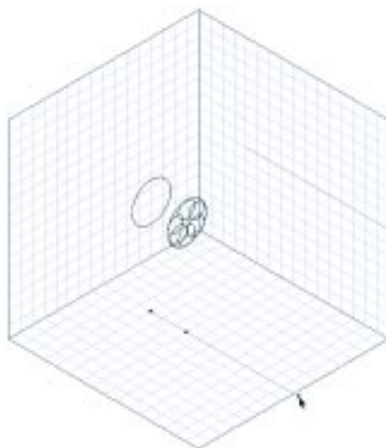
You may need to move the circles to get them inside the larger circle.



*Add six smaller circles inside the larger circle with the **Oval** tool.*

- 15 Choose **View** menu► **Preset Position**► **Reference**.

- 16 Choose the **Selection** tool.
- 17 On the ground plane, click the last point on the sweep path.
- 18 Hold down the **Shift** key and drag it to the end of the Working Box.



*Extend the sweep path to the end of the **Free Form** modeling box.*

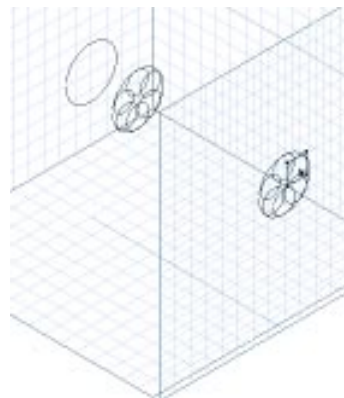
- 19 Choose **Sections** menu► **Create**. A new cross section is added to the end of the path.

To ensure that shapes with multiple cross sections are extruded properly, you can assign numbers to shapes. Ray Dream Studio uses corresponding numbers to determine how to extrude cross sections.



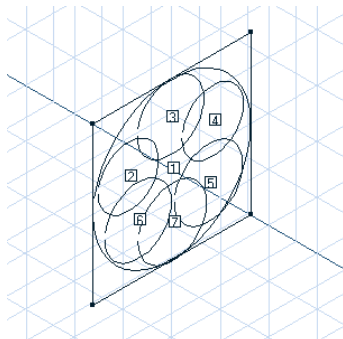
*To adjust shape numbers:*

- 1 Click the last cross section on the sweep path.



*When you select the last cross section on the path, the cross section becomes the active **Drawing** plane.*

- 2 Choose **Sections** menu► **Show Shape Numbers**.



*You can use the cross sections shape numbers to control how multiple sections are extruded.*

- 3 Choose **Sections** menu► **Previous**.

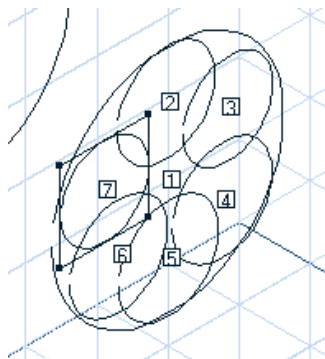
- 4 Choose **Sections** menu► **Previous** again. You should be on the first cross section.

If **Previous** is not available you're already on the first cross section.

- 5 Choose **Sections** menu► **Next**.

- 6 Click a cross section number. The **Shape Number** dialog appears. This dialog lets you change the shape's number.

- 7 Change the number of the cross sections to match those shown below.

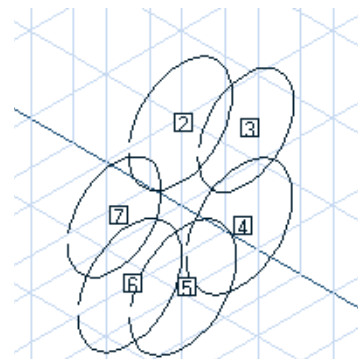


*When you're done adjusting the shape numbers on your cross section, they should match these shown.*

- 8 Choose **Sections** menu► **Next**.

- 9 Select shape #1 and delete it. All the numbers change.

- 10 Change the shape numbers to match the diagram shown below.



*After you delete a shape, the number all change so you need to adjust the remaining numbers to match those shown.*

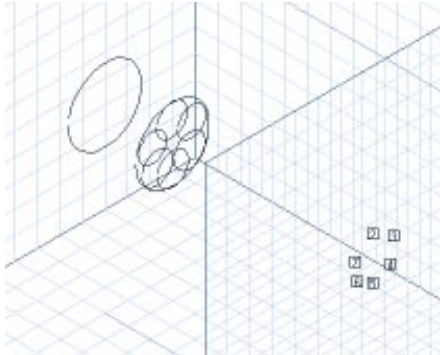
- 11 Click shape #2 with the **Selection** tool.

- 12 Choose **Windows** menu► **Properties**.

- 13 In the **Position** controls, enter **Width=0.25, Height=0.25**. Be sure the **Keep Proportions** box is enabled.

- 14 Click **Apply**.

- 15 Repeat steps 11 to 14 for each of the remaining shapes.



*When you're done resizing the cross sections, your cross sections should look like these.*

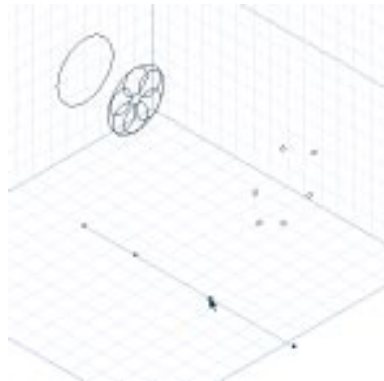
Now that the numbers are correct, you can add more sections.



**To add more sections:**

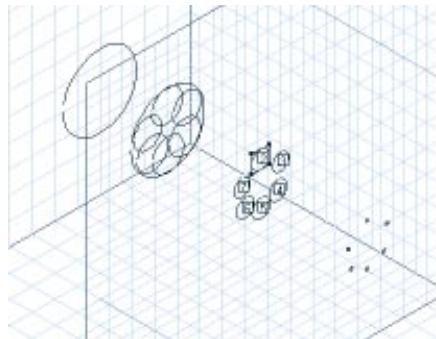
- 1 Click the ground plane to make it active.
- 2 Choose the **Add Point** tool.

- 3 Add a point between the second and last cross sections.



*The new point determines where the cross section will be placed.*

- 4 Choose **Sections menu** ▶ **Create**.
- 5 Click the new cross section.

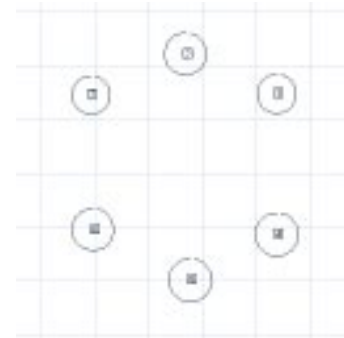


*The new cross section has the same number of shapes as the previous section.*

- 6 Choose **View menu** ▶ **Preset Position** ▶ **Drawing Plane**.

- 7 Choose **Sections menu** ▶ **Show** ▶ **Current**.

- 8 Drag the circles away from the center as shown below.



*When you're done repositioning shapes, your cross section should look something like this.*

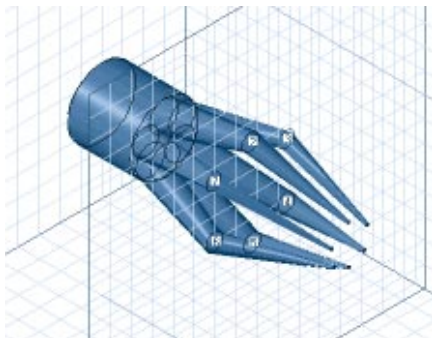
- 9 Choose **View menu** ▶ **Preset Position** ▶ **Reference**.

- 10 Click the **Shaded Preview Quality** button.



*Use the Shaded Preview Quality button to see a preview of your object with shading.*

- 11 Choose **Sections** menu► **Show**► **All**.



*Your object should look like this in Shaded Preview.*

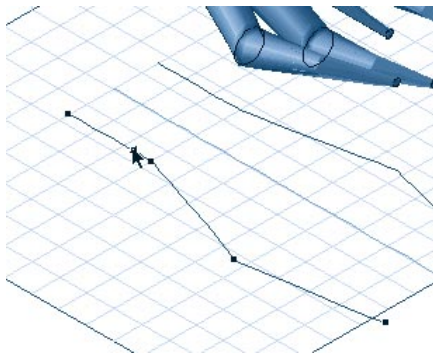
Now that you have all the necessary cross sections, you can add an extrusion envelope to reshape the anemone.



**To adjust the object's envelope:**

- 1 Choose **Geometry** menu► **Extrusion Envelope**► **Symmetrical**.
- 2 Choose the **Add Point** tool.

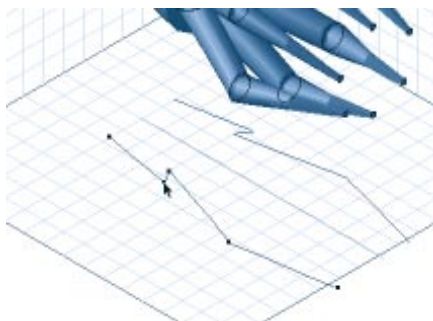
- 3 Add a point on the envelope as shown.



*Use the Add Point tool to create a new point on the object's envelope.*

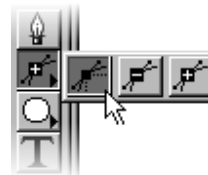
- 4 Choose the **Selection** tool.

- 5 Drag the new point down and to the left as shown.



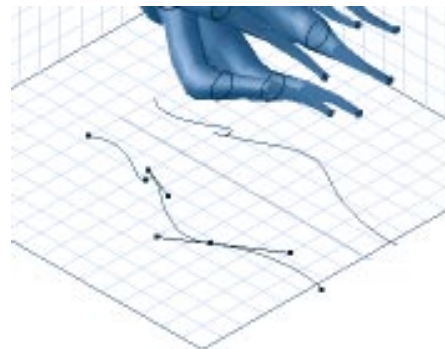
*Use the Selection tool to adjust the position of the new point.*

- 6 Choose the **Convert Point** tool.



*Use the Convert Point tool to convert lines to curves.*

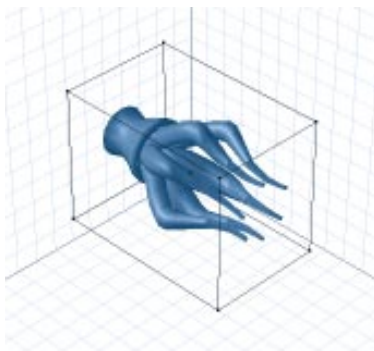
- 7 Smooth the points as shown.



*After you adjust the points on the envelope, your object should look like this.*



8 Click **Done**.



*This is how your completed anemone appears in the Perspective window.*

Your sea anemone is complete. You may want to save it in a convenient location. In the **Perspective** window you can duplicate the anemone to create a sea anemone bed.

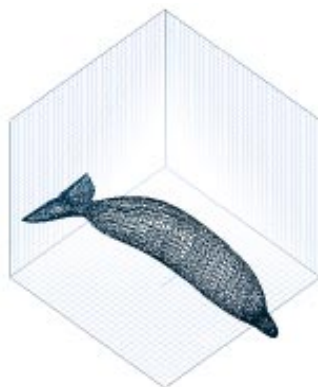


*Duplicate the anemone to form a bed.*

### Lesson 3: Mesh Form Modeling

The **Mesh Form** modeler lets you create 3D objects by adjusting the position of vertices, or points, mapped onto a shape or outline.

The **Mesh Form** modeler is a very organic way of modeling. You can think of the objects you create in the modeler as being made out of a malleable medium, like clay, that can be reshaped by pulling or pushing it's surface.



*The Mesh Form modeler lets you create objects using vertices and polymeshes.*

Like the **Free Form** modeler, the **Mesh Form** modeler has three drawing planes representing the X, Y, and Z axes. However, since you're not working with a sweep path there are no projections to work with. All your modeling is done directly in 3D.

The axis indicator will help you tell which plane you're working in.



*The Mesh Form modeler axis indicator helps determine the plane you're working in.*

Each plane has a different color. The X axis is in green, the Y axis in blue and the Z axis is red.

Refer to "[Mesh Form Modeling](#)" on [page 137](#) for more on the **Mesh Form** modeler.

In this next lesson you'll create a fish using a 3D primitive and the **Sphere of Attraction** tool.



*To open the Mesh Form modeler:*

1 Drag the **Mesh Form** tool into the **Perspective** window.



*Drag the Mesh Form tool into the Perspective window to open the Mesh Form modeler.*

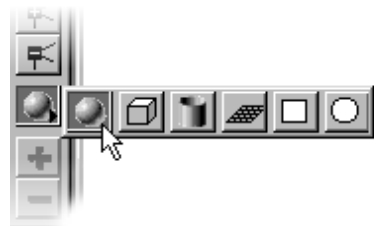
The **Mesh Form** modeler opens.

2 Enter a name for your new object and click **OK**.



### To create a 3D primitive

- 1 Choose the **Create Sphere** tool.



Drag with the **Create Sphere** tool to make a 3D sphere.

- 2 Drag the tool in the Mesh Form modeling window. Using the grid squares, make your object approximately 4 x 4.

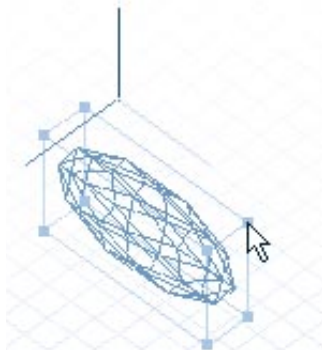


Your 3D sphere should be about four grid boxes wide and four grid boxes long.

- 3 Choose the **Selection** tool.

- 4 Click the top right point of the sphere's bounding box and drag to flatten and stretch the sphere as shown.

The flattened sphere should be about two grid squares wide.



Drag the sphere's bounding box to stretch and flattened it.

Now that you have the basic shape, you can move its points (also called vertices) to reshape the sphere's outline



### To edit an object's mesh:

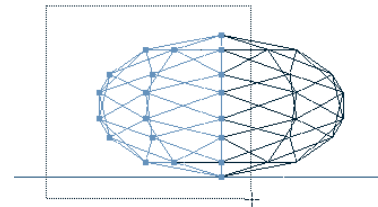
- 1 Choose **View menu**► **Preset Position**► **Left**.

- 2 Choose the **Marquee** tool.



Use the **Marquee** tool to select a group of vertices.

- 3 Drag to select the back half of the sphere.



Use the **Marquee** tool to selected the vertices on the back half of the object.

- 4 Choose **Selection menu**► **Subdivide**.

This will double the number of points in the selected area. The more points you have, the more control you have over the shape of the object.

- 5 Click the **Sphere of Attraction** tool.



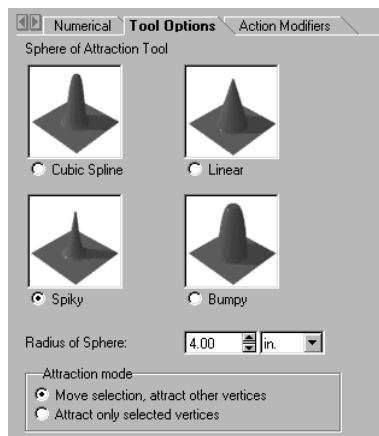
Use the **Sphere of Attraction** tool to move a group of vertices.

- 6 Choose **Windows menu**► **Properties**. The **Properties** palette appears.

- 7 Click the **Tool Options** tab.

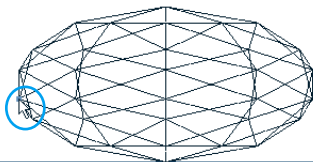
- 8 Select the **Spiky** radio button.

- 9 Set the **Radius of Sphere** to **4.00**.



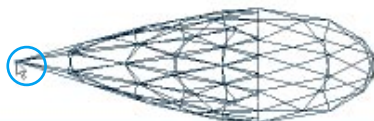
Use the *Sphere of Attraction* options to set the radius and shape of the tool.

- 10 Click outside the sphere to deselect it.
- 11 Select the left-most point on the sphere and drag it left.



The left-most point on the sphere is approximately in the position shown. You may need to zoom in on the object.

Stop dragging when your shape looks like the one shown below.



Your object should look like the one shown after you drag the vertex.

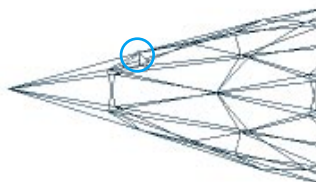


*To create the fish's tail:*

- 1 Click the **Zoom** tool.
- 2 Zoom in on the extended section.
- 3 Click the second point from the left on the top edge of the tail.

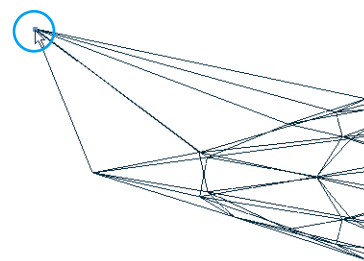
You may need to click a few times to find the right point. Refer to the diagram below for more precise positioning.

**Tip:** If you accidentally click on a segment (a line with two points), click outside the object to deselect it.



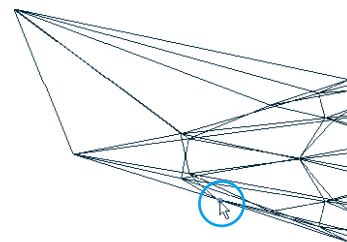
Click the vertex shown above and drag it to the left.

- 4 Drag the point up and towards the left as shown.



After you're finished moving the vertex your object should look like this.

- 5 Click the second point from the left on the bottom edge of the tail.



Click the point shown and drag it down and to the left.

- 6 Drag the point down and to the left.

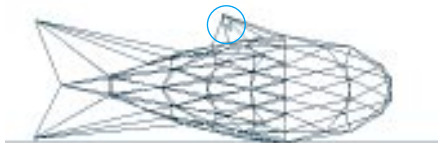


*The tail should look like this when you're finished adjusting the vertex.*

- 7 Choose the **Sphere of Attraction** tool.

- 8 In the **Properties palette: Tool Options** tab, enable the **Spiky** radio button and set the **Radius of Sphere** to **0.5**.

- 9 Click a point on the top edge of the object and drag it up and to the left.



*Your dorsal fin should look like this when you're finished adjusting it with the Sphere of Attraction tool.*

The basic shape of your fish is now complete. To finish it off you'll need to adjust the smoothness of the fish shape.



*To smooth object edges:*

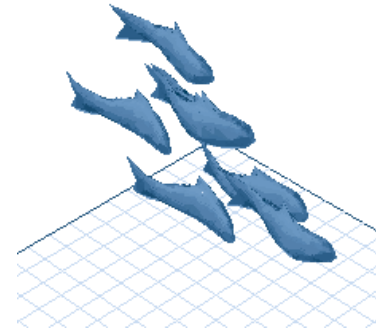
- 1 Choose the **Marquee** tool and select the entire object.
- 2 Choose **Poly Mesh menu > Smooth Edges**.
- 3 Click **Done**.



*Your completed fish should look like this.*

The fish is now complete. You may want to save it in a convenient location. The fish object you just completed was used to create the School of Fish object in the first section.

To create the school you'll need to duplicate and group the fish. For more information, refer to "[Lesson 5: Duplicating and Grouping](#)" on page 45.



*When your fish is complete you can duplicate and group it to create a school of fish.*

## Lesson 4: Deformers

Deformers are a special set of tools that let you reshape objects or groups of objects. Using deformers you can easily create effects that would require a large amount of repositioning and editing. For example, you can explode an object by just applying a deformer instead of breaking the object apart manually and repositioning all the pieces. For more on Deformers, refer to "[Deformers](#)" on page 171.

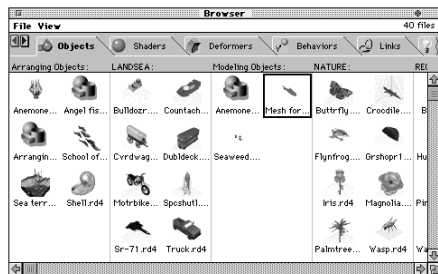
In this lesson you'll apply the **Wave** deformer to a fish object. The **Wave** deformer will give the fish object a fluid look.

Although this tutorial instructs you to use the fish from the **Browser** palette, feel free to use the fish object you created in the **Mesh Form** modeler.



### To apply a deformer:

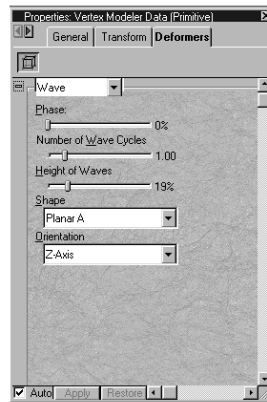
- 1 If you haven't done so already, add the **Modeling Objects** folder in the **Tutorial** folder to the **Browser** palette: **Objects** tab.
- 2 Drag the **Mesh Form Fish** object from the **Browser** palette to the **Perspective** window.



When you add the **Modeling Objects** folder to the **Browser**, you should see the **Mesh Form Fish**.

- 3 Choose **Windows** menu ► **Properties**.
- 4 Click the **Deformers** tab.

- 5 Choose **Wave** from the **Deformers** pop-up.



Use the **Wave Deformer** controls to set the phase and shape of the wave.

- 6 If it is not already enabled, enable the **Auto** button at the bottom of the dialog.

When this button is enabled, any settings you change are automatically applied to the object.

- 7 Set **Phase** to 0.
- 8 Orientation to **X Axis**.
- 9 Set **Number of Wave cycles**=1.5.
- 10 Set **Height of waves** =08%.

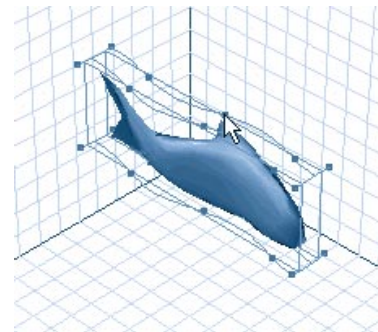
- 11 Click the **Direct Manipulation** button.



Click the **Direct Manipulation** button to display the Deformer's control handles.

Direct manipulation lets you adjust the deformer's settings interactively in the **Perspective** window.

- 12 Click the center point and drag it to the left. The center points adjust the phase.



The **Direct Manipulation** controls let you adjust the **Wave** deformer's attributes in the **Perspective** window.

- 13 Close the dialog.

The fish should now look like its swimming through water. Deformers can also be applied to groups of objects. For example if you create a school of fish from the single fish object you can apply the **Wave**

deformer to the entire school. All the fish will then appear to be swimming in the same direction.

### ***Moving On***

After completing the lessons in this section you should be familiar with the different types of objects you can create with Ray Dream Studio. The objects you created are just the beginning. You can create some incredibly complex objects just by combining the skills outlined in these lessons. For example, the same techniques used in Lesson 1, can be used to create leaves or plants. The techniques in Lesson 2 can be used to create an octopus or any number of tentacled creatures.

A good way to expand your modeling skill is to jump into some of the objects in the **Browser** palette. You can examine their sweep paths and cross sections to see how you might go about creating your own objects.

The next section of the tutorial will lead you through the process of creating and applying shaders to objects.

## **Shading Objects**



Shaders are used to apply surface properties to objects. The Shader determines whether the object is shiny or dull, rough or smooth, transparent or opaque. By combining several different surface properties you can make even the simplest objects come alive.

A Shader can be saved as a file in the **Browser** palette which allows you to apply the same surface properties to several different objects.

The lessons in this section will teach you how to create, save and apply shaders.

### ***The Story so Far***

In the previous sections, you learned how to create and arrange objects. The type of shader you create will largely depend on the shape of your object, so you should be familiar with modeling concepts and procedures. For more details of modeling, refer to “[Free Form Modeling](#)” on page 109 and “[Mesh Form Modeling](#)” on page 137.

### ***What You’ll Need***

In the next lessons you’ll be creating shaders. To see the effects of the Shaders you’ll need to apply them to some objects.



***To add lesson files to the Browser palette:***

- 1** Click the **Objects** tab and choose **Browser palette: File menu► Add Directory/Folder**.
- 2** Locate and open the **Tutorial** folder on the Ray Dream Studio 5 CD-ROM. Open the **Tutorial** folder, then open the **Shading Objects** folder.
- 3** Click **Select Current Directory**.
- 4** Click the **Shaders** tab and choose **Browser palette: File menu► Add Directory/Folder**.
- 5** Locate the **Tutorial** folder on the Ray Dream Studio 5 CD-ROM. Open the **Tutorial** folder, then open the **Shading Objects: Tutorial Shaders** folder.
- 6** Click **Select Current Directory**.

For more instructions on opening folders in the **Browser** palette, refer to “[Arranging Objects in the Scene](#)” on page 39.

## **Lesson 1: Creating Shaders**

Shaders are a collection of surface properties that are saved in a special file called a shader file. You can create new shader files and edit existing ones using the **Current Shader Editor** palette.



In this lesson you'll use the **Current Shader Editor** to create a new shader and save it in the **Browser** palette.

Since you'll be applying shaders to your objects in this lesson you should adjust your preview mode to better see the affects of the shaders.



### To change the preview mode:

Click the **Shaded Preview Mode** button.



Use the **Shaded Preview Mode** button to see the effects of shaders on an object.

In this preview mode, you will be able to see any texture maps you apply to objects.



### To create new shader:

1 Drag the **Shell** object from the **Browser** palette to the **Perspective** window.

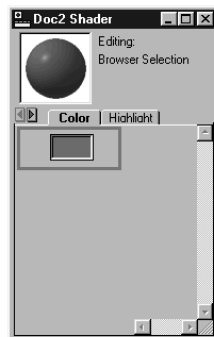
2 Choose the **Eyedropper** tool.



Use the **Eyedropper** tool to pick up the selected object's shader and display it in the **Current Shader Editor** palette.

3 Click the **Shell**.

The **Current Shader Editor** palette appears. When you create a new object, Ray Dream Studio places a default shader on it. The default shader has all the shader's channels set to 50. Each shader has eight channels which store a different surface property.



The **Current Shader Editor** lets you edit the shader's eight property channels.

4 Click the **Color** tab.

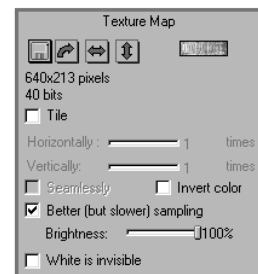
5 Choose **Shader Editor: Insert menu** ▶ **Texture Map**.

6 Locate the file **Tutorial: Shading Objects: SHELL\_TEXTURE** on the Ray Dream Studio 5 CD-ROM.



You can import this image to use as **Texture map** on your object.

The **Texture map** controls appear.



The **Texture Map** controls let you specify the tile size and orientation of the texture map.

7 Click the **Highlight** tab.

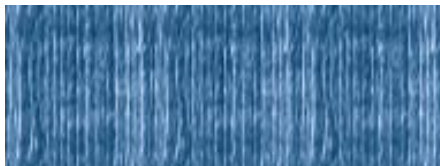
8 Set the value to **50**.

9 Click the **Shininess** tab and set the value to **50**.

10 Click the **Bump** tab.

11 Choose **Shader Editor: Insert menu**► **Texture Map**.

12 Locate the file **Tutorial: Shading Objects: SHELL\_BUMP** on the Ray Dream Studio 5 CD-ROM



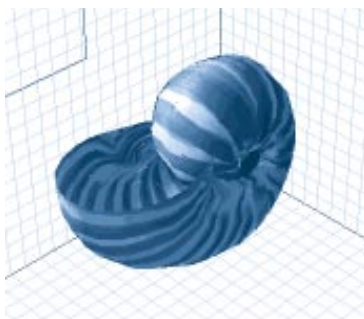
*You can also import a different image in the Bump channel to use as a Bump map.*

13 Set Brightness to **30%**.

Bump channel effects can only be seen in the final rendered image.

14 Click **Apply**.

Your shader is now complete. If you want to apply the shader to other objects, you need to save it in the **Browser** palette.

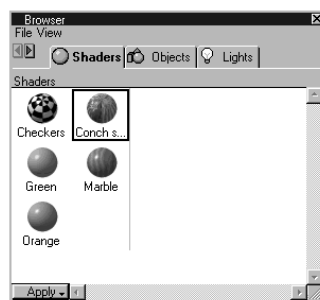


*When you click Apply, Ray Dream Studio applies all the attributes in all the Shader channels to the Shell.*

*To save a shader in the Browser palette:*

1 Click the **Browser** palette: **Shader** tab.

2 In the **Current Shader Editor**, click the shader preview image and drag it to the **Browser** palette.



*You can drag your Shader to any shader family in the Browser palette.*

3 Enter a name for the shader.

## Lesson 2: Applying Shaders

Ray Dream Studio lets you apply shaders in a number of different ways. You can apply the shader uniformly, or use the **3D Paint** tools to apply shaders to specific areas of an object.

In this lesson you'll use Paint shapes to apply stripes to a fish and then use the 3D Paintbrush to fade them.

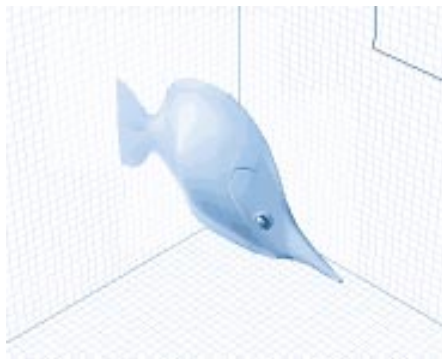


*To apply a shader uniformly:*

1 Drag the object labeled **Angel Fish** from the **Browser** palette to the **Time Line** window.

2 Click the **Shaders** tab.

- 3 Locate the drag the **Angel Fish Skin** shader from the **Browser** palette onto the **Angel Fish** object.



*The fish's skin was created by applying the base shader Angel Fish Skin.*

The Fish Skin shader is designed to be used as a base shader, meaning that the properties set for this shader will be carried over to any other shader you apply on top of it.

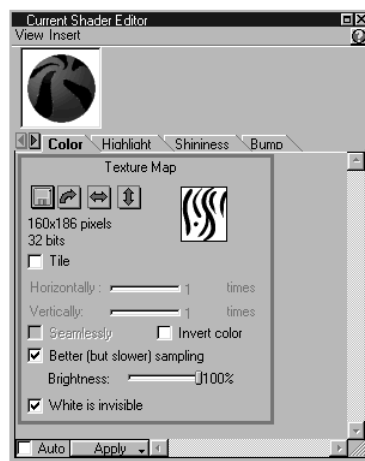
Once the fish's base color is set you can add the stripes.



*To a place a paint shape on an object:*

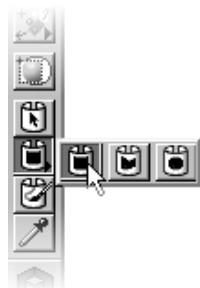
- 1 Click the **Angel Fish Stripes** shader in the **Browser** palette.

The Angel Fish Stripes shader was created using a single image map of stripes. All the other channels in the shader are empty.



*You can see how the Fish stripes shader was created by opening it in the Current Shader Editor.*

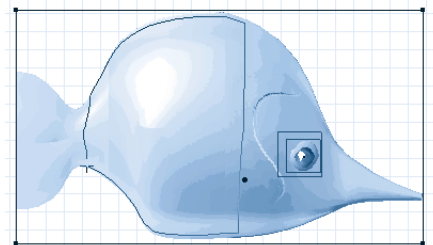
- 2 Choose the **Rectangular Paint Shape** tool.



*Use the Rectangular Paint Shape tool to create a rectangular paint shapes on objects.*

The **Paint Shape** tools let you place image maps directly onto the surface of an object.

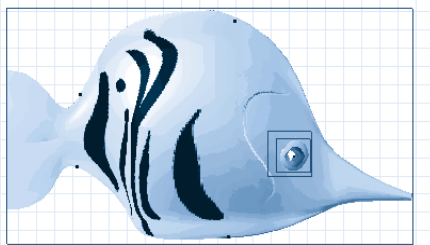
- 3 Choose **View menu > Preset Position > Left**.
- 4 Drag a large square over the body of the fish.



*Drag the Paint Shape tool on the object's surface to size the paint shape.*

The stripes appear when you release the mouse button.

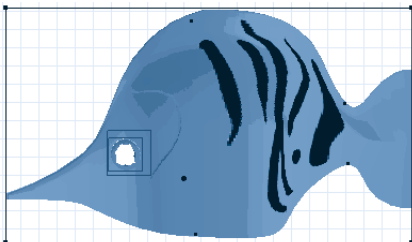
If the stripes are not in the right place, Choose the **Paint Shape Selection** tool and drag it to a different location.



*When you release the mouse button the stripes appear.*

5 Choose **View menu ▶ Preset Position ▶ Right**.

6 Draw a large square on this side as well.



*Since the fish's stripes are in a shader, you apply them again to the other side of the fish.*

Now that you have the stripes on the fish. You can make them appear to fade as they reach the fish's edges.

### *To apply a shader using the 3D Paintbrush:*

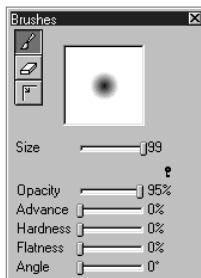
1 In the **Browser** palette, click the **Fish Skin** shader.

2 Choose the **3D Paintbrush** tool.



*Use the 3D Paintbrush tool to paint brush strokes onto your object.*

The **Brushes** palette appears.



*Use the Brushes palette controls to set the size and Opacity of your 3D Paintbrush.*

3 Set the **Size** value to **99**.

4 If the palette is not extended, click the **Extend** icon to extend the palette.



*Use the extend icon to view more 3D Paintbrush controls.*

5 Set the following:

**Opacity** to **95%**

**Advance** to **0%**

**Hardness** to **0%**

**Angle** to **0** degrees.

6 Choose **View menu ▶ Preset Position ▶ Right**.

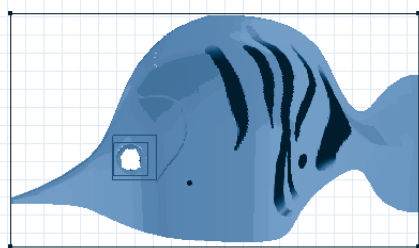
7 Drag the brush over the top and bottom edges of the fish.



*The brush you created will fade fish's stripes when you paint over them.*

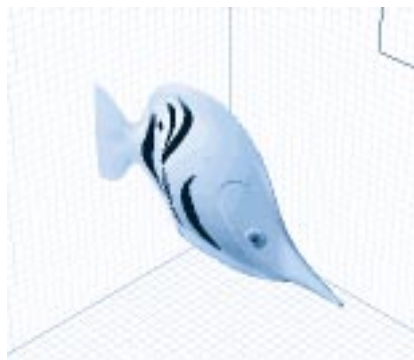
8 Choose **View menu ▶ Preset Position ▶ Left**.

- 9 Paint over the edges of the fish on this side as well. You don't have to worry about matching to the two sides as the fade will look more natural the more uneven your strokes.



*Use the 3D Paintbrush to fade the other side of the fish as well.*

- 10 Choose **View** menu ▶ **Reference**.



*When you're done painting on the fish, switch to Reference view to see the results of your changes.*

The fish is now complete. If you want to see the rendered shader use the **Render Preview** tool or skip ahead to [“Rendering” on page 92](#).

### **Moving On**

The lessons in this section covered most of the basics of working with Shaders, but that doesn't mean that's all there is to learn. Shaders can give you an almost infinite variety of textures and colors. There are many more complex ways of creating shaders. Refer to [“Creating Shaders” on page 197](#) for details on all the features you can use to create complex shaders.

As with modeling objects, a good way to learn more about shaders is to take a look at how other shaders are made. Try opening some of the pre-made Shaders in the **Current Shader Editor**.

The next section of the tutorial will lead you through the process of adding lights to your scene.

## **Setting up Lights**



The final appearance of your scene depends greatly on how you light it. In fact, many of the effects you applied to objects using shaders can only be seen if they are lit properly. For example, you can't see the shininess of an object's surface unless you shine a light onto it.

In Ray Dream Studio, you can apply the same lighting techniques used in real photography. By adjusting the position and attributes of lights you can produce a large number of different scenes using the same set of objects.

The lessons in this section will take you through adding lights using the **Browser** palette and position them using the **Direct Manipulation** controls.

### **The Story So Far**

This tutorial has lead you through the steps necessary to create, arrange and shade objects. If you're unclear on any of these concepts refer to earlier sections of this tutorial or see the relevant chapters.

### **What You'll need**

To see the affects of the lights you'll need a scene. You can use the scene you arranged in the first section of the tutorial, or use the file **LIGHT\_TUTOR\_1**.

### *To begin setting up lights:*

- 1 Open the scene file **Tutorial: Setting Up Lights: LIGHT\_TUTOR\_1** on the Ray Dream Studio 5 CD-ROM.
- 2 Click the **Lights** tab.
- 3 Choose **Browser palette: File menu ▶ Add Directory/Folder**.
- 4 Locate **Tutorial: Setting Up Lights** folder and click **Select Current Directory**.

Like shaders, some of the lighting effects cannot be seen until you render your scene. Ray Dream Studio offers you two tools for see light effects without having to render your scene: **Shaded Preview Mode**, and the **Render Area** tool.

### *To switch to Shaded Preview mode:*

Click the **Shaded Preview** button.



*Use the Shaded Preview button to see the effects of lights on your objects.*

**Shaded Preview** slows the redraw time dramatically so its a good idea to work in Preview mode while you're setting up lights and then switch to Shaded Preview only when you're finished.

The **Render Area** tool lets you check your lighting by rendering a small area of your scene.

### *To render an area of a scene:*

- 1 Choose the **Render Area** tool.



*Use the Render Area tool to render areas of your scene.*

- 2 Drag the tool over the area you want to render.

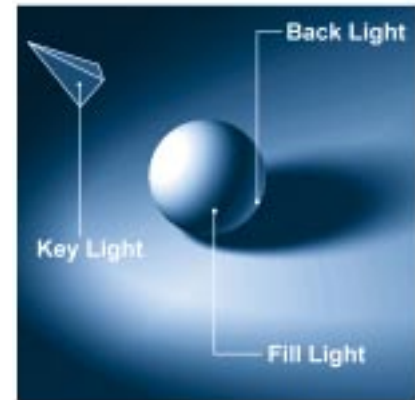
## Lesson 1: Adding Lights

There are two different types of lights you can add to your scene: ambient and specific. Ambient light acts like daylight. It has no origin and doesn't cast shadows. Specific lights like, spot lights or bulb lights, have an origin which can be positioned in your scene.

When deciding how many lights to add, you should consider the contents of your scene and your systems memory limitations. The more lights you add, the longer the rendering time.

In most cases you can adequately light your scene using only three specific lights. One light in front of the object to illuminate the scene (Key Light), one behind the

scene to highlight object outlines (Back Light) and one to create shadows (Fill Light).



*This basic lighting setup can be used to effectively light most scenes.*

In Ray Dream Studio this basic setup can be created using a Spot light as a Key Light, Distance light as a Back Light and Ambient light as a Fill Light.

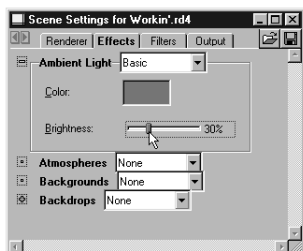
Ambient light settings depend on the environment you want to create. For an underwater scene, the ambient light should be set fairly low to create murky atmosphere.

### *To set ambient light:*

- 1 Choose **Windows menu ▶ Scene Settings**. The **Scene Settings** dialog appears.



- 2 Click the **Effects** tab.



Use the **Effects** tab of **Render Effects** palette to set the color and brightness of your ambient light.

- 3 Display the **Ambient Light** controls.
- 4 Click the color chip and choose a dark blue color from the palette.
- 5 Set **Brightness** to 30%.
- 6 Close the palette.

Now that you've set the ambient light you can add specific lights to the scene. You can begin by adding a bulb light.



**To add a light:**

- 1 Drag the **Create Light** tool into the **Time Line** window.

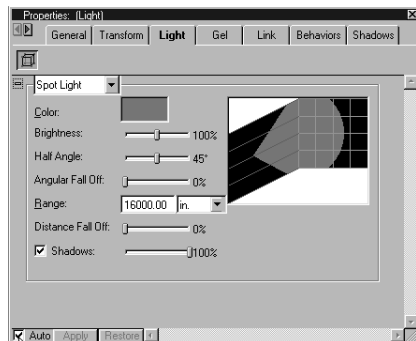


Drag the **Create Light** tool into the **Perspective** window to create a new light.

- 2 Choose **Windows** menu > **Properties**.  
The **Properties** palette appears.

- 3 Click **Auto**.

- 4 Choose **Bulb Light** from the pop-up.



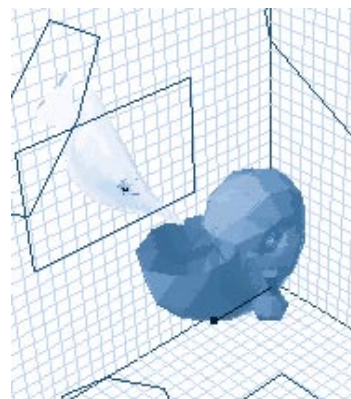
Use the **Light** tab of **Properties** dialog to choose a light type and color.

- 5 Disable the **Shadows** checkbox to save on rendering time.
- 6 Click the **Direct Manipulations** button.



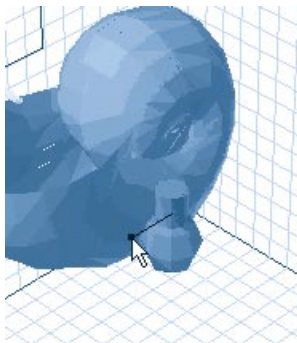
Use the **Direct Manipulations** button to display the light's control handles.

Two points appear on the bulb light (called control handles) in the **Perspective** window. You can adjust the light's properties by dragging its control handles.



Use the light's **Direct Manipulation** controls to set its properties in the **Perspective** window.

- 7 Click the control handle that extends from the light and drag it away from the light. This adjusts the **Brightness** value in the **Properties** palette.



*As you drag the Bulb brightness control, the Brightness value in the Properties palette changes.*

You can use the **Direct Manipulation** controls to adjust the properties any type of light. Spot lights have many more control points than bulb lights. For more details on interactive controls, refer to “[Controlling a Spot Light Directly](#)” on page 277.

You can also add lights by dragging them out of the **Browser** palette.

- 
- To add lights from the Browser palette:**
  - 1 Choose **Browser** palette: **Lights** tab.




*Click the Light tab on the Browser palette to view any saved lights.*

- 2 Drag the light labeled **Light Tutor** to **Time Line** window.

Your new lights appear at preset positions. You now have all the lights you'll need to create a good lighting effect, but you still need to properly position the lights.

## Lesson 2: Positioning Lights

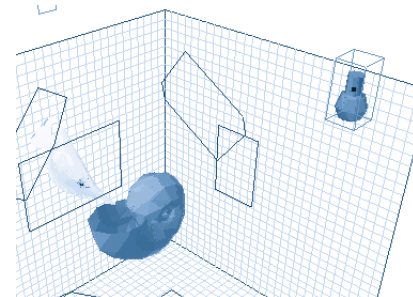
There are several ways of positioning lights. Like other objects you can position lights numerically or manually. As well, you can also assign special behaviors to lights which will automatically position them.

- 
- To position lights using Transform controls:**

- 1 Click the **Bulb** light in the **Time Line** window.
- 2 Choose **Windows** menu► **Properties**. The Properties palette appears.
- 3 Click the **Transform** tab.

- 4 Set **Position** values to **X=0**, **Y=65**, and **Z=80**.
- 5 Click **Apply**.

The light moves to the upper left corner of the Working Box.



*You can enter values in the Properties palette's Transform tab to numerically reposition the bulb light.*

The remaining light can be positioned easily by applying the **Point At** behavior. The Point At behavior forces the light to always point at the object no matter what position it is in. Wherever you move the object, the lights will follow.

- 
- To add the Point At behavior to a light:**

- 1 In the **Time Line** window, click the light labeled Key light.
- 2 Choose **Windows** menu► **Properties** if the **Properties** palette is not already visible.

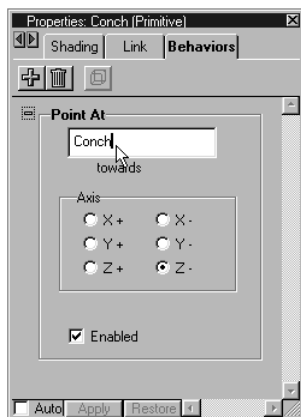
3 Click the **Behaviors** tab.

4 Click the **Add Component** button.



Click the **Add Component** button to see a list of available components.

5 Choose **Point At** from the list and click **OK**.



Use the **Behaviors** tab to add or delete behaviors for an object.

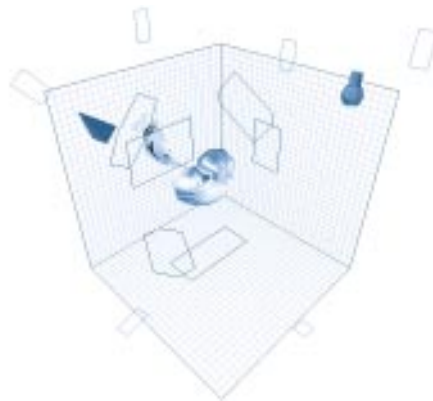
6 Type the name **Conch Shell** in the **Point At** box.

This forces the light to point at the Conch at all times.

7 Make sure the **Enabled** checkbox is checked.

8 Click **Apply**.

9 To see the results of the pointed light, enable the **Shaded Preview** button.



*In **Shaded Preview** you can see the results of your light settings.*

Now that your lights are all in the correct position you can refine individual light properties to create special effects.

### Lesson 3: Lighting Effects

Just like in a real studio, a light doesn't have to be just a simple spot light. You can adjust the light's properties to create subtle effects, or you can add gels to lights to create a special lighting effect.

Gels are images that act as transparency masks when you place them in front of a light.

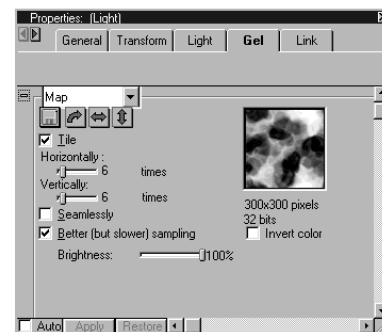


*To add a gel:*

1 Click the light labeled **Key** light in the **Time Line** window.

2 Choose **Windows** menu ► **Properties**. The **Properties** palette appears.

3 Click the **Gel** tab.



Use the **Gel** tab in the **Properties** palette to load image maps as gels.

4 Choose **Map** from the pop-up.

5 Click the disk icon and choose **Open**.

6 Locate the file: **Tutorial: Setting Up Lights: WATER** on the Ray Dream Studio 5 CD-ROM and click **Open**.

7 Click **Apply**.

Your lighting setup is now complete. If you want to see the lighting effect, drag the **Render Preview** tool over the entire scene.



*When you render your image you can see the effects the gel has on your objects.*

### Moving On

The lighting setup can be quickly adapted to any scene by just changing the **Point At** object.

Many other lighting setups are available through the Scene Wizard. The Scene Wizard will lead you through the process of creating a lighting setup by answering a few questions. For more on the Scene Wizard, refer [“Using the Scene Wizard” on page 27](#).

The next section of the tutorial will show you how to set up cameras.

## Setting up Cameras

Just like in a real photo studio, the appearance of your scene can vary depending on where you view it from. That is why you strategically place cameras at specific positions. Since all your objects in Ray Dream Studio exist in a 3D space, you can position cameras to view your scene from any angle.

When you're rendering an image or animation, the view you see through a camera is used to produce the final image.

The lessons in this section will teach you how to add cameras using the **Browser** palette and position them using the **Direct Manipulation** controls.

### The Story so Far

You've learned how to create, arrange, shade and light objects in your scene. Since lighting can be essential to deciding where you place cameras, you should be familiar with lighting concepts and procedures.

For more information, refer to [“Lesson 1: Adding Lights” on page 68](#), or [“Setting Lights” on page 271](#).

### What You'll Need

To get a feel for how different camera perspectives can be used in a scene, you'll need a sample scene.



### To begin setting up cameras:

- 1 Open the file **Tutorial: Setting Up Cameras: CAMERA TUTOR** on the Ray Dream Studio 5 CD-ROM.

You can also use the scene you arranged in the first section of the tutorial.

- 2 Choose **Browser palette: Cameras** tab.
- 3 Choose **Browser palette: File menu** ▶ **Add Directory/folder**.
- 4 Locate the **Tutorial: Setting Up Cameras** folder and click **Select Current Directory**.

## Lesson 1: Adding Cameras

By default, your scene already has one camera. The preset positions available from the **View** menu are based on the default camera. You can add other cameras to view your scene from different perspectives. You can also add cameras to save commonly used camera angles.

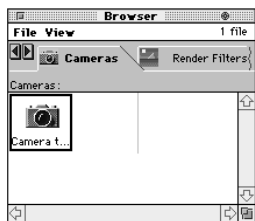
The simplest way of adding a camera is to drag one out of the **Browser** palette.



### To add cameras from the Browser palette:

- 1 If the **Browser** palette is not visible, choose **Windows menu** ▶ **Browser**.

- 2 Choose the **Cameras** tab.



*The Camera tab in the Browser palette contains sets of camera settings.*

- 3 Drag the **Camera Set** camera from the **Browser** palette into the **Time Line** window.

The new camera appears at its preset position.

You can also create new cameras and customize their attributes.



*To add cameras using the Create Camera tool:*

- 1 Choose the **Create Camera** tool and drag it into the **Time Line** window.

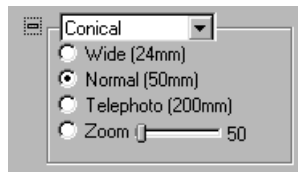


*Drag the Create Camera tool into the Time Line window to add a new camera to your scene.*

A new camera appears at the origin. By default, the camera is named Camera 2.

- 2 Choose **Windows** menu ► **Properties**. The **Properties** palette appears.

- 3 Click the **Camera** tab.



*Use the Camera tab in the Properties palette to set camera type and zoom level.*

- 4 Choose **Conical** from the pop-up.

- 5 Enable the **Normal** radio button.

- 6 Enable the **Auto** box.

- 7 Click the **Direct Manipulation** button.

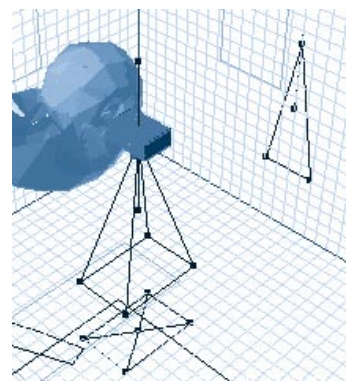


*Use the Direct Manipulation button to display the camera's control handles.*

The camera's control handles appear in the **Perspective** window. You can set the camera's attributes by dragging these control handles.

The control handle that extends in front of the camera controls the viewpoint, the control that extends behind it controls

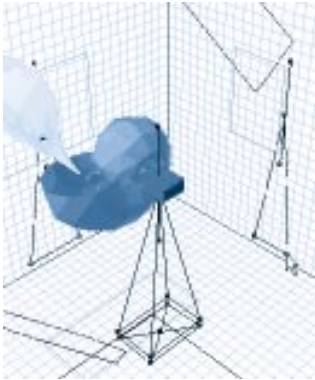
the position of the camera in the scene. The triangle that extends out in front of the camera controls the zoom level.



*Use the camera's direct manipulation controls to adjust its attributes in the Perspective window.*

- 8 Drag the zoom controls (the triangle extending in front of the camera) towards the camera.

If you find it difficult to move the zoom control, try adjusting the zoom control on one of the camera's projections.

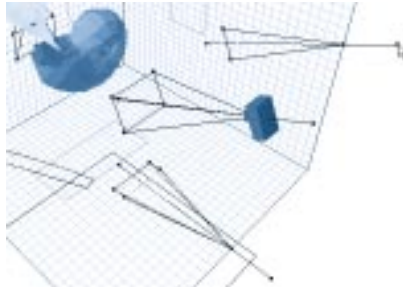


*Drag the camera's zoom controls to adjust the zoom level.*

When you release the mouse button, the zoom value in the **Properties** palette should read about 45.

- 9 Drag the control handle that extends from behind the camera to front of the workspace.

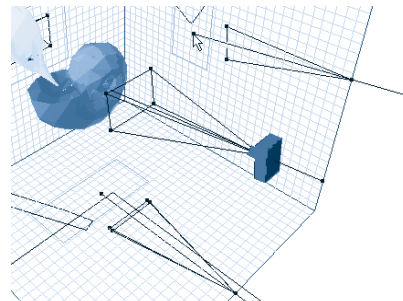
When you release the mouse button, the camera changes position.



*Drag the camera position control handle to move the camera to a new position.*

- 10 On the right plane, click the control handle that extends out in front of the camera and drag it over the center of the scene.

The camera is now pointing at the center of the scene.



*Drag the viewpoint control out to the object you want the camera to point at.*

Your new camera setup is complete.

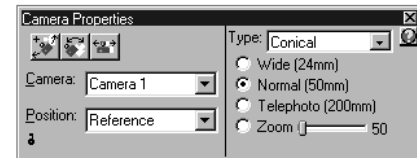
## Lesson 2: Viewing your Scene from Different Cameras

Now that you have more than one camera you can choose which camera you want to use to view your scene.



*To switch between cameras:*

- 1 Choose **Windows** menu ► **Camera Properties**. The **Camera Properties** palette appears.

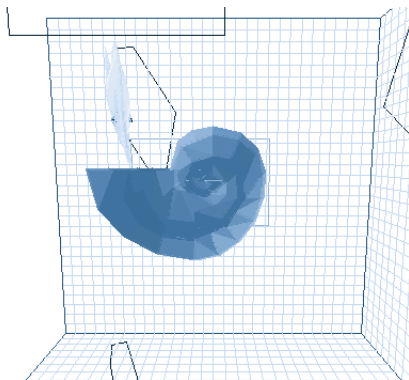


*Use the Camera Properties palette to switch between cameras.*

- 2 Choose **Camera 2** from the **Camera** pop-up.



The view of the scene changes.



*When you change the camera in the Camera Properties palette the view of your scene changes.*

- 3 Choose **Reference** from the **Position** pop-up. The view changes to the **Reference** view for Camera 2.
- 4 Choose **Camera 1** from the **Camera** pop-up. The view changes to the **Reference** view from the default camera.

You can use the **Camera Properties** palette to switch between different cameras and to save your most commonly used positions. For more on cameras, refer to [“Setting up Cameras” on page 72](#).

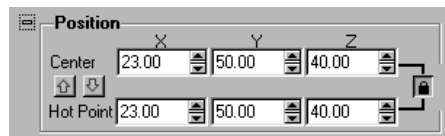
Now that you’ve added some cameras you need to position them to get the best views of your scene.

### Lesson 3: Positioning Cameras

There are several ways of positioning cameras in Ray Dream Studio besides using the **Direct Manipulation** controls. You can send the camera to a specific position using the transform commands, or using the **Camera Dolly**, **Camera Pan**, or **Camera Track** tools.

*To numerically position a camera:*

- 1 Select **Camera Set** in the **Time Line** window.
- 2 Choose **Properties** palette: **Transform** tab. If the **Properties** palette is not visible, choose **Windows** menu► **Properties**.
- 3 In the **Position Controls** enter **X=23**, **Y=50** and **Z=40**.



*Use the Position controls in the Properties palette to numerically position cameras.*

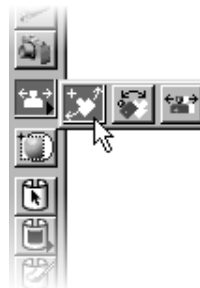
- 4 Click **Apply**.

The camera moves to a new position.

You can also use the camera tools to position your cameras.

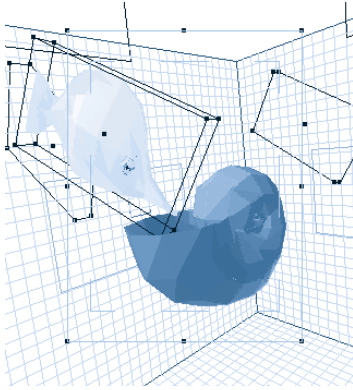
*To position a camera manually:*

- 1 Choose **Windows** menu► **Camera Properties**. The **Camera Properties** palette appears.
- 2 Choose **Cameras** menu► **Camera Tutor**.
- 3 Choose **Position** menu► **Reference**.
- 4 Click the Shell object in the **Perspective** window.
- 5 Choose the **Dolly** tool from the toolbar.



*Use the Dolly tool to interactively adjust the position of the camera.*

The production frame appears and the pointer changes to a camera. The production frame defines the area of your scene that appears in the final artwork when you render the scene.



*The production frame defines the area of your scene that is used to produce a rendered image or animation.*

- 6 Drag the pointer down and to the left. The view of the scene rotates around the selected object.

You can also use the other **Camera** tools to adjust the position. The production frame for each camera can also be adjusted separately.



#### **To adjust the Production Frame:**

- 1 Select the **Camera Tutor** camera in the **Perspective** window.

- 2 Choose **View menu > Production Frame**. A green frame appears around your scene.

- 3 **Shift-drag** one of the points on the production frame towards the center. The frame shrinks proportionately.

If you drag a point without holding down the **Shift** key, a dialog appears warning you that you're about to change the frame's aspect ratio.



#### **To move the production frame:**

Click the production frame and drag it to a new location.

Your camera setup is now complete. Using the cameras you set up in this lesson you can produce a number of different 3D illustrations using the same scene. If you want to see how your scene will look rendered from a particular angle, drag the **Render Preview** tool over the scene.



*Use the **Render Preview** tool to see how your scene will look when it's rendered.*

#### **Moving On**

The cameras you created in this section can be used in a wide variety of scenes. If you like the custom camera you created, save it in the **Browser** palette. Refer to

[“Using the Browser Palette” on page 28](#) for instructions on saving to the **Browser** palette.

Ray Dream Studio comes with a number of preset cameras which can be accessed through the Scene Wizard. The Scene Wizard will set up cameras and lighting based on your answers to a few questions. For more information, refer to [“Using the Scene Wizard” on page 27](#).

The next section of the tutorial will lead you through the process of animating the objects in your scene.

## **Animating Objects**



Ray Dream Studio uses a process known as *key frame* animation to animate objects. In this process, each point in time where an action begins, ends or changes is known as a key frame. All the frames in between the key frames, or action, are filled in Ray Dream Studio.

For example, if you wanted to animate a bouncing ball, you would set up a key frame showing the ball in its starting position, a frame showing it bouncing off the ground and a frame showing its final position. When the animation is rendered, Ray Dream Studio creates all the frames in between, showing the ball moving towards the floor and then away from the floor.

The lessons in this section will show you how to create key frames and apply **Tweeners** and **Behaviors** to them to create simple animations.

### The Story So Far

In this tutorial you've learned how to create, arrange, and light objects and how to add cameras. In the next section you'll learn how to animate objects. Before you can animate an object you should know how to create one. For more information on modeling, refer to "Free Form Modeling" on page 109 and "Mesh Form Modeling" on page 137. Key frame animation relies heavily on changes in position and angle so it's essential that you also understand how to position objects. For more information, refer to "Arranging Objects in the Scene" on page 39 or "Arranging Objects" on page 223.

### What You'll Need

In order to animate objects, you'll need a few sample objects. Since animation takes up a large amount of memory, it is recommended that you use only a few objects in your scene. The file **ANIMATE TUTOR** in the **Tutorial** folder on the CD-ROM has been designed especially for this animation section.

### To begin animating objects:

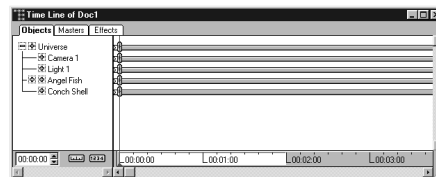
- 1 Open the file **Tutorial:Animating Objects: ANIMATE TUTOR** on the Ray Dream Studio CD-ROM.

- 2 Choose **Browser palette: Objects** tab.
- 3 Choose **Browser palette: File menu**► **Add Directory/Folder**.
- 4 Locate the folder **Tutorial: Animating Objects** and choose **Select Current Directory**.

The first step in any animation is to set the its time limit.

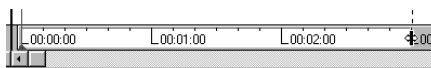
### To set animation time limit:

- 1 Make sure the **Time Line** window is visible. If it's not, choose **Windows menu**► **Time Line of Animate Tutor**.



The **Time Line** window displays all the key event markers in the animation and its current length.

- 2 Click the **Time Axis** at **00:02:00** and drag it to **00:03:00**.



Drag the end of the **Time Axis** to **00:03:00** to extend the length of your animation.

Your animation will now last for three seconds.

When you're animating, you'll probably need to quickly move between frames. Ray Dream Studio's **Time Controller** tools let you jump from the beginning of an animation, to the end, or anywhere in between.

### To display the Time Controller:

- 1 Choose **View menu**► **Toolbars**. The **Toolbars** dialog appears.
- 2 Enable **Time Controller**. A toolbar is visible when a checkmark appears next its name.



The **Time Controller** toolbar contains all the tools you'll need to preview your animation in the **Perspective** window.

## Lesson 1: Creating Key Frames

In key frame animation you need to create a key frame anywhere you want action to start, stop or change. In this lesson you'll be creating a simple animation with only one action so you'll only need to create two key frames one to tell Ray Dream Studio where you want the action to begin and another to define where you want the action to stop.



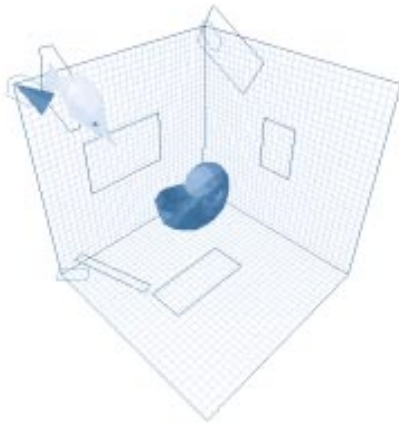
### To create a key frame:

- 1 Make sure you're at the first frame of your animation. If you're not, click the **First Frame** button.



Click the **First Frame** button to jump to the first frame in your animation.

By default, Ray Dream Studio creates key frames for all the objects in the scene at the start of the time line. So, you already have the starting key frame of your animation. All you have to do now is create a key frame for the end of the animation.



By default Ray Dream Studio creates the first key frame in your animation when you open a scene.

- 2 Click the **Last Frame** button on the **Time Controller**.



Click the **Last Frame** button to jump to the last frame in your animation.

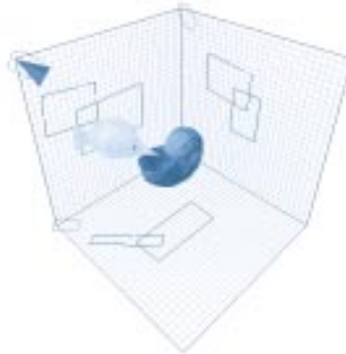
The **Current Time** indicator jumps to the end of the animation.

- 3 Click the Angel Fish object in the **Time Line** window.

- 4 Click **Command-T/Ctrl+T** to display the **Object Properties** palette.

- 5 Click the **Transform** tab.

- 6 Enter the **Position** values **X=34**, **Y=-16**, **Z=20** and **Yaw= 45**, **Pitch= -5** and **Roll= -5** click **Apply**.



When you adjust the position of objects, Ray Dream Studio creates a new key frame.

- 7 Click the **First Frame** button.

- 8 Click the **Perspective** window to make it the active window.

- 9 Click the **Interactivity** button. This button should be active whenever you preview animations in the **Perspective** window.



When the **Interactivity** button is active you can see your objects moving between key frames.

- 10 Click the **Play** button to preview your animation.



Click the **Play** button to run your animation.

The fish appear to move towards the shell.

## Lesson 2: Applying Tweeners

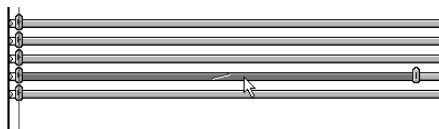
In the animation you created in Lesson 1 you probably noticed how quickly the fish approached the shell. In reality, the fish would probably slow down as it gets closer to the shell. This type of behavior can be controlled using **Tweeners**. A tweener lets you control how Ray Dream Studio fills in the transitions between key frames.

If you apply a Bézier tweener to the Angel fish, the fish will slow down as it approaches the shell.



### To apply a Tweener:

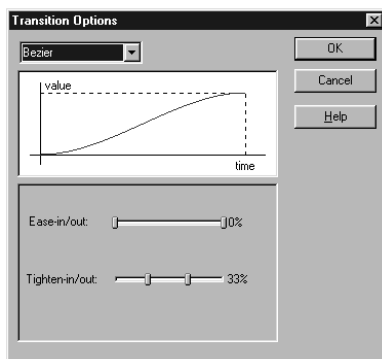
- 1 In the **Time Line** window, double-click the time track between the first and last key frames for the **Angel Fish** object.



The tweener icon appears in the space between frames when you apply a tweener to your animation.

The **Transition Options** dialog appears

- 2 Choose **Bézier** from the pop-up.



Use the **Transitions Options** dialog to select a **Tweener** type and set its attributes.

The Bézier tweener lets you control the acceleration of an object and its trajectory. For more on tweeners, refer to “[Using Tweeners](#)” on page 309.

- 3 Set the **Ease-in /out** values to 40% and 40%.

These values control the speed of the object.

- 4 Set the **Tighten-in /out** values to 50% and 50%.

These values control the trajectory of the object.

- 5 Click the **First Frame** button then click **Play** to preview the new animation.

The fish now appears to slow down as it approaches the Conch shell. If you're happy with this animation, save it to a convenient location.

## Lesson 3: Applying Behaviors

Using a combination of key frames and tweeners you can create some very realistic looking animations. However, by applying **Behaviors** to objects you can create realistic animations that would be very complicated to create using only key frames.

A behavior gives an object a specific set of instructions that determine or modify their actions during an animation.

In this lesson you'll apply a special set of behaviors called *physically-based* behaviors.

Physically-based behaviors let you set up a simulation of real world physical action like gravity or velocity.

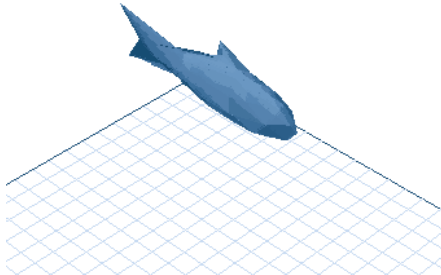
To set up a simulation you must first define which objects are to be included in the simulation and then apply some kind of force to move those objects.

For example, to simulate a collision, you would create two physical objects, then apply directional force to one of them. When rendered, one object would appear to crash into another and then rebound off it.

In this lesson you'll apply the **Flow Force** behavior to a school of fish and then watch as they swim away in every direction

### To apply physically-based behaviors:

- 1 Drag the Mesh Form Fish object out of the **Browser** palette and into the **Perspective** window.

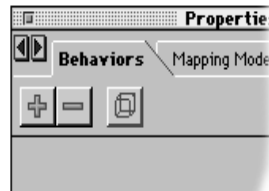


*This is what the Mesh Form Fish looks like in the Perspective window*

- 2 Choose **Windows menu ▶ Properties**. The Properties palette appears.
- 3 Enable the **Auto** checkbox.

When **Auto** is enabled, any change you make to the behavior's values are automatically applied to the object.

- 4 Click the **Behaviors** tab. If the tab is not visible, click the arrow buttons to scroll the tabs.



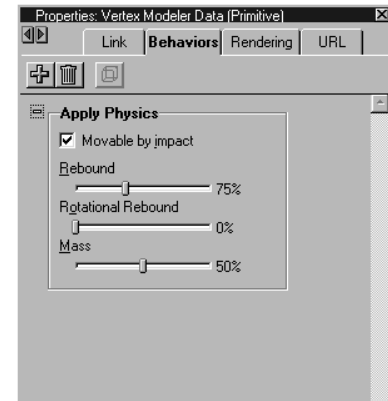
*Use the scroll buttons to view Properties tabs that are not visible.*

- 5 Click the **Add** button. The **Add** dialog appears.



*Use the Add button to display a list of available behaviors.*

- 6 Select **Apply Physical Effects** and click **OK**.



*When you select a behavior from the Properties palette's Behaviors tab, controls for that behavior are displayed.*

**Apply Physical Effects** is the base behavior for all physical simulation. you must apply this behavior to any object you want to be included in the simulation.

Once the behavior is applied, the other objects in the simulation will interact with it as if it were a real object.

- 7 Enable the **Movable by impact** checkbox.
- 8 Click the **Add** button again.



- 9 Choose **Flow Force** from the list and click **OK**. The **Flow Force** controls are added to the **Behaviors** tab.

Flow Force simulates the force of water currents on an object.

- 10 Set the **Turn Density** to 70%.
- 11 Enable the **Rotate with flow** checkbox.

The behavior setup is now complete. If you ran the simulation at this point the little fish would appear to swim through the scene towards the camera. However, you can create a much more interesting effect by creating an entire school of fish.

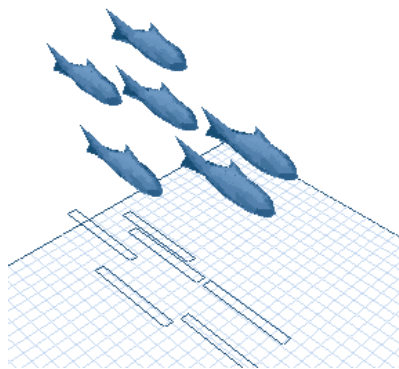


#### *To duplicate objects:*

- 1 Select the School Fish in the **Perspective** window and press **Command-D/Ctrl+D**.
- 2 Drag School Fish up and to the left.
- 3 Press **Command-D/Ctrl+D** again. A new fish appears.

You may need to move the fish around to get the right positions for the school.

- 4 Continue duplicating and repositioning the fish until you have enough to look like a school.



*As you duplicate fish, each duplicate will have the same behaviors applied to it.*

In order to see the full affect of the behaviors in your scene, you'll need to activate **Interactivity** and extend the time limit of the animation.



#### *To preview behaviors:*

- 1 Click the **Interactivity** button.



*When the Interactivity button is active you can see your objects move during the animation.*

- 2 In the **Time Line** window, drag the end of the animation in the **Time Axis** from 00:03:00 to 00:10:00.

- 3 Click the **First Frame** button and then click **Play**. Make sure the **Interactivity** button is enabled.

The school of fish appears to break apart and swim away in all directions.

If your not happy with the speed of the action, you can use the techniques you learned in the previous lesson to apply **Tweeners** to the fish.

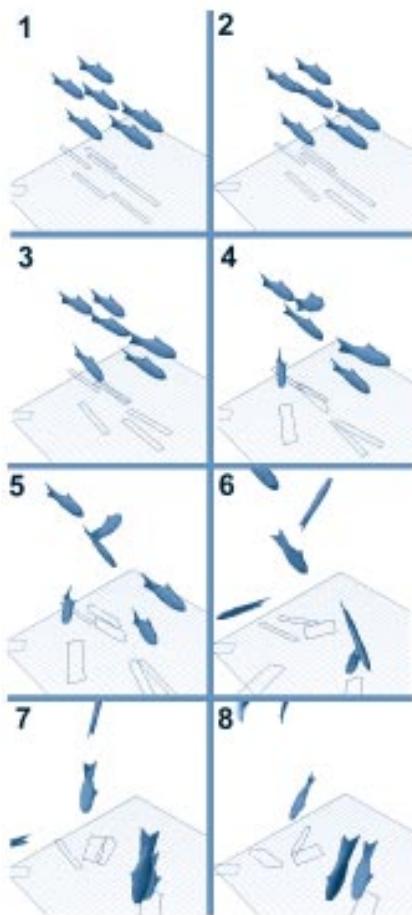
If you get an animation you're satisfied with, save it to a convenient location.

#### *Moving On*

The animations you created in this section are just the beginning. Try experimenting with different objects to create key frames or apply different tweener settings.

The Physically-based behaviors you added in this section are one example of the kinds of simulations you can create. These new behaviors open up a whole new world of possibilities in animation. Experimenting with different simulations can produce some astounding results. For a full descriptions of the Behaviors available in Ray Dream Studio, refer to "**Behaviors**" on [page 314](#).

The next section of the tutorial will lead you through the process of animating objects by altering their shape.



*When you play the animation, Ray Dream Studio plays the physically-based simulation.*

## Animating Shapes



In Ray Dream Studio there are several ways of animating objects. The previous section showed you how to animate objects by changing their position. You can also animate objects by altering their shape using either the **Free Form** or **Mesh Form** modelers or by applying a Deformer.

In this section you'll alter the shape of several objects across several key frames to produce moving objects.

### *The Story So Far*

In this tutorial you've learned how to create, arrange, light and animate objects in a scene. Since you'll be using the object modelers and deformers to alter object shapes in this section it is essential that you understand the concepts involved in modeling objects. It would be a good idea to review the "Modeling Objects" on [page 47](#) before beginning this section.

### *What You'll Need*

This section of the tutorial deals with altering object shapes so you'll need some shapes to start with. If you've been following the tutorial, you can use the objects you created in the Modeling Objects section, or you can use the **Animating Shapes** folder in the **Browser** palette. This folder contains the models used as examples in this section.



### *To begin animating shapes:*

- 1 Make sure the **Browser** palette is visible. If it's not, choose **Windows** menu ▶ **Browser**.
- 2 Click the **Objects** tab.
- 3 Choose **Browser** palette: **File** menu ▶ **Add Directory/Folder**.
- 4 Locate the folder **Tutorial: Animating Shapes** and click **Select Current Directory**.

## Lesson 1: Animating the Extrusion Path

You can animate the shape of a Free Form object by altering the shape of its sweep path in different key frames.



### *To animate an object using the sweep path:*

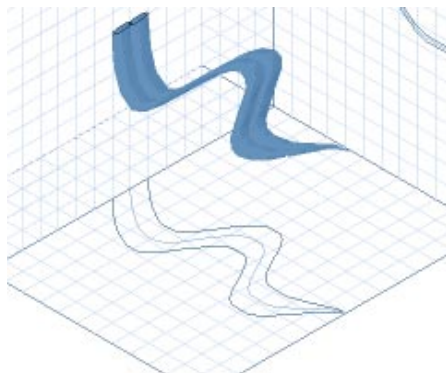
- 1 Drag the Seaweed object from the **Browser** palette into the **Perspective** window.
- 2 Click the **Last Frame** button.



*Click the **Last Frame** button to jump to the last frame in your animation.*

- 3 Double-click the seaweed in the **Perspective** window to open the **Free Form** modeler.

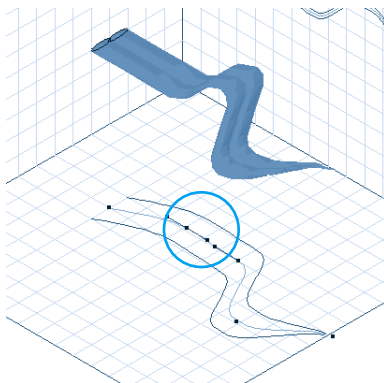
- 4 Select the **Zoom** tool and zoom in on the sweep path on the ground plane.



*The sweep path looks like this at the beginning of your animation.*

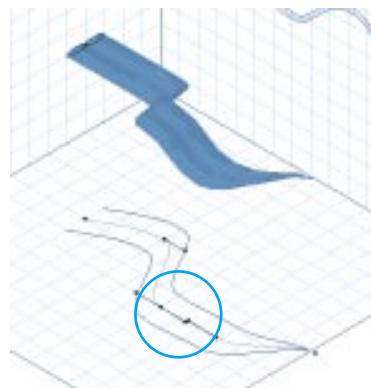
- 5 Choose the **Selection** tool.
- 6 Click the second point on the sweep path and drag it to the right as shown.

Make sure that you're not selecting a point on the extrusion envelope (blue lines).



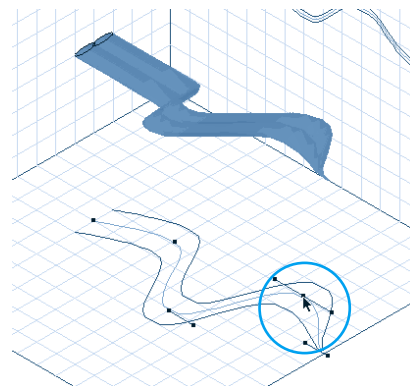
*This is what your sweep path should look like after you reposition the second point.*

- 7 Click the third point and drag it to the opposite side of the sweep path.



*Your sweep path should look like this after you reposition the third point.*

- 8 Click the fourth point and repeat step 7.

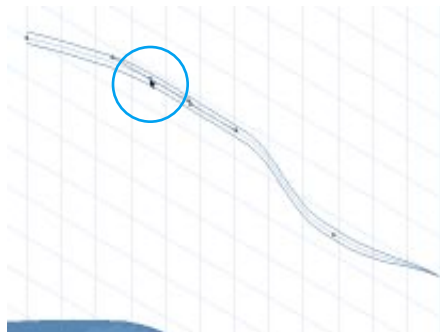


*When you're done repositioning the fourth point, your sweep path should look like the one shown.*

- 9 Choose **View menu ▶ Preset Position ▶ Left**.

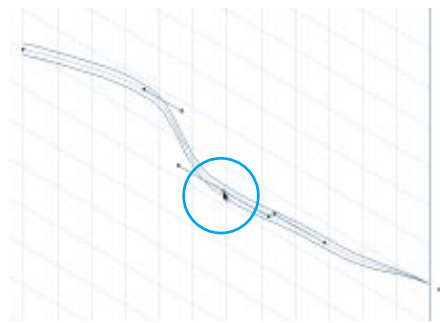
10 Zoom in on the horizontal sweep path.

11 Click on the second point on the sweep path and drag it up.



*This is what your sweep path should look like after you reposition the second point.*

12 Click the third point and drag it down.



*Your sweep path should look like this after you reposition the third point.*

13 Click the fourth point and drag it up.



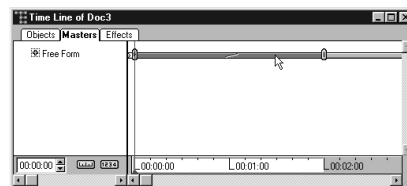
*When you're done repositioning the fourth point, your sweep path should look like this.*

When you play this animation the seaweed will appear to sway, but the motion will be somewhat stiff. To smooth out the motion, you can apply the **Oscillate** tweener.



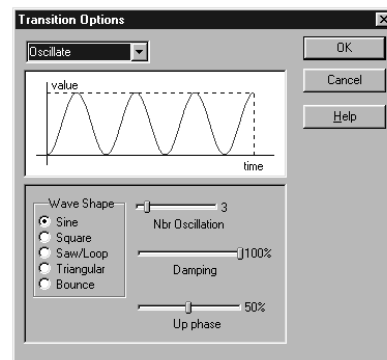
*To apply the Oscillate tweener:*

1 Double-click between the first and last frame of the **Seaweed** object in the **TimeLine** window. The **Transition Options** dialog appears.



Double-click the space between frames to display the **Transition Options** dialog.

2 Choose **Oscillate** from the **Tweener** pop-up.



*The controls available in the Transition Options dialog change depending on the tweener you select.*

- 3 Set the **Nbr Oscillation** slider to **2** and click **OK**.

- 4 Click the **First Frame** button on the **Time Controller**.

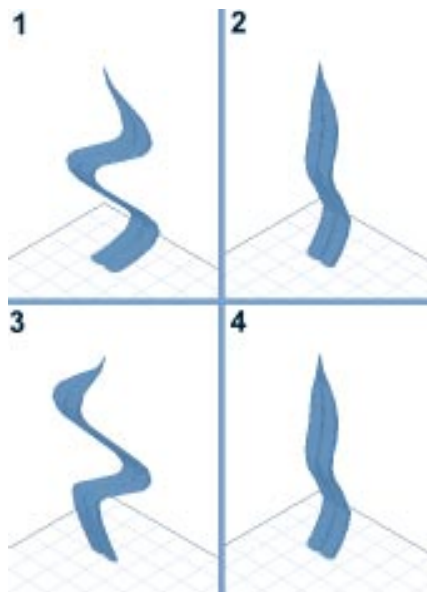


*Click the First Frame button to jump to the first frame in your animation.*

If the **Time Controller** is not displayed, choose **View menu > Toolbars** and then enable **Time Controller**.

- 5 Click **Play**.

The seaweed appears to sway in the current.



*When you run your animation, the seaweed will appear to sway.*

If you're satisfied with this animation, save it to a folder on your hard drive.

## Lesson 2: Animating the Mesh Form Modeler

You can animate an object's shape in the **Mesh Form** modeler the same way you would in the **Free Form** modeler, by altering the object's shape over several key frames.



*To animate an object by repositioning its vertices:*

- 1 Make sure the **Objects** tab is selected on the **Browser** palette, and drag the **Mesh Form Fish** from the **Browser** palette to the **Perspective** window.
- 2 Click the **First Frame** button. If the button is not available, you're already on the first frame.



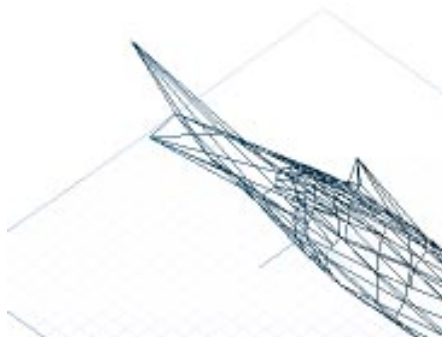
*Click the First Frame button to jump to the first frame of your animation.*

- 3 Double-click the fish to open the **Mesh Form** modeler.
- 4 Choose the **Zoom** tool.



*Use the Zoom tool to enlarge an area of your scene.*

- 5 Zoom in on the fish's tail.



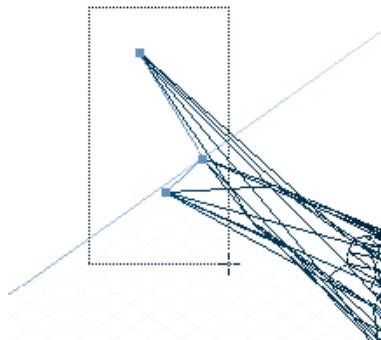
Use the Zoom tool to zoom in on the back end of the Mesh Form Fish's tail

- 6 Choose the **Marquee** tool.



Use the Marquee tool to select a group of vertices.

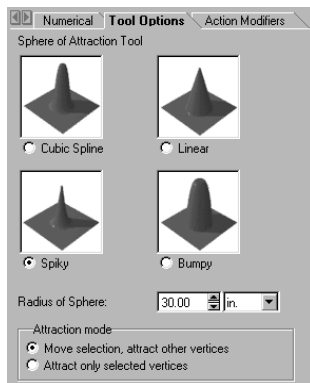
- 7 Select the rear of the tail.



Use the Marquee tool to select the points shown.

- 8 Choose the **Sphere of Attraction** tool.

- 9 Choose **Windows** menu► **Properties** and then click the **Tool Options** tab in the **Properties** palette.

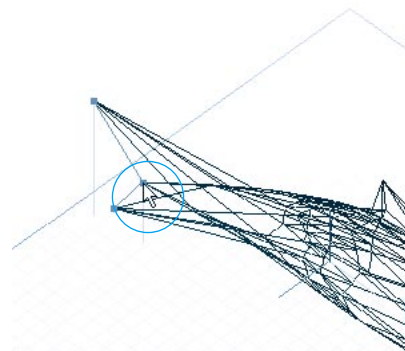


Use the Sphere of Attraction tool options to set the tool's size and shape attributes.

- 10 Enable **Spiky**.

- 11 Set the **Radius of Sphere** to **30**.

- 12 Click the center point of the three selected points and drag it to the left.

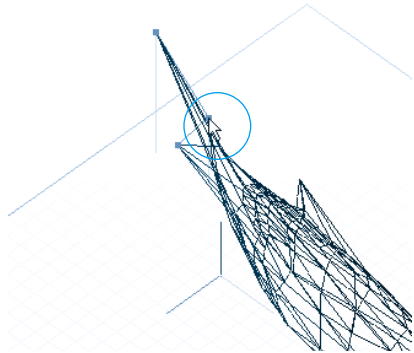


Select the center point in the tail and drag it to the left.

- 13 Click the **Last Frame** button.



- 14 Drag the center point to the right.



Select the same center point again and drag it to the right

When you play this animation the tail of your fish will appear to swing from left to right. However, the movement will appear somewhat rigid. To smooth out the motion you can apply an **Oscillate** tweener.

- 15 In the **Time Line** window, double-click the time line between the first and last frames of the **Mesh Form Fish** and apply the **Oscillate** tweener.

For more detailed instructions on applying the **Oscillate** tweener, refer to “To apply the **Oscillate** tweener:” on page 84.

- 16 Click **Done**.

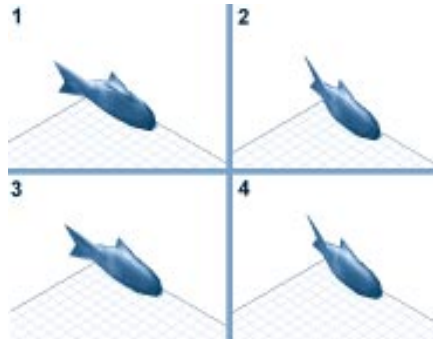
- 17 Click the **First Frame** button on the **Time Controller** and then click **Play**.



Click the **First Frame** button to jump to the first frame of your animation.

If the **Time Controller** is not displayed, choose **View menu > Toolbars** and then enable **Time Controller**.

Your fish now appears to swim. To create a school of fish, duplicate the **Mesh Form Fish** object.



When you run the animation, the fish's tail appears to move from left to right.

If you're happy with the animation as it is, save it to your hard drive.

### Lesson 3: Animating Deformers

**Deformers** you applied to objects to alter their shape can also be animated. By adjusting the parameters of the **Deformer** in different key frames, you can have the objects appear to change over time. In this lesson you'll learn another way of making your fish swim—by animating the **Wave** deformer.



#### To animate a deformer:

- 1 Make sure you're on the first key frame of your animation. If you're not sure, click the **First Frame** button on the **Time Controller**.

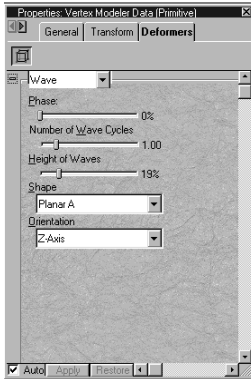


Click the **First Frame** button to jump to the first frame of your animation.

If the button is grayed out, you're already on the first frame.

- 2 Drag the **Mesh Form Fish** object from the **Browser** palette into the **Perspective** window.
- 3 Choose **Windows menu > Properties**. The **Properties** palette appears.
- 4 Click the **Deformer** tab.

The **Wave** deformer controls appear. If you want to learn how the **Wave** deformer was applied to the object refer to “[Lesson 4: Deformers](#)” on page 60.



Use the **Wave** deformer controls to control the phase and shape of the wave applied to your object.

- 5 Enable the **Auto** checkbox.
- 6 Make sure the **Phase** slider is set to **0%**
- 7 Click the **Last Frame** button. The current time indicator jumps to the last key frame.



Click the **Last Frame** button to jump to the last frame of your animation.

- 8 Set the **Phase** slider to **100%**

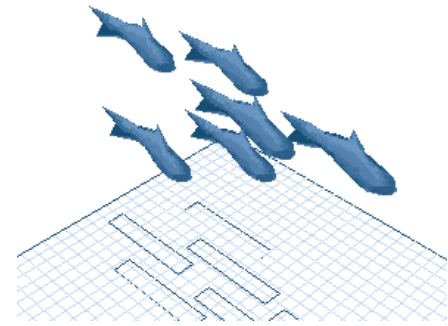
- 9 Click the **First Frame** button and then click **Play** to preview your animation. Make sure the **Interactivity** button is enabled.

The little fish appear to swim. You can now duplicate the fish to create a school of swimming fish.



*To duplicate the deformed fish:*

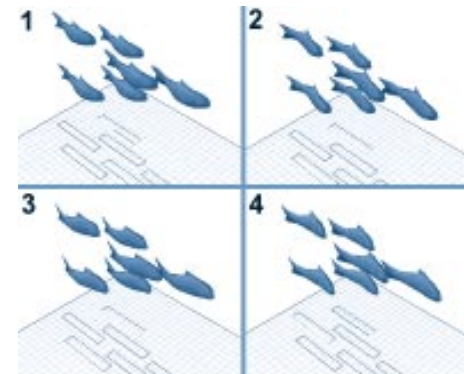
- 1 Click the **First Frame** button.
- 2 Click the **Mesh Form Fish** in the **Perspective** window.
- 3 Press **Command-D/Ctrl+D** to duplicate the fish.
- 4 Drag the **Mesh Form Fish** up and to the left.
- 5 Click the duplicate fish and press **Command-D/Ctrl+D** again.
- 6 Continue moving and duplicating fish until you have a good sized school.



When you duplicate the fish, each duplicate will have the Deformer applied to it.

- 7 Click the **First Frame** button and then click **Play** to preview your animation.

The school of fish appears to swim.



When you run the animation the fish appear to all be swimming in the same direction.

## Moving On

The techniques you just learned can be combined with tweeners to fine tune the animation.

You may want to try these animation techniques with some of the more complex objects in the **Browser** palette. You'll quickly find out how easy it is to create some very complex effects by just adjusting a few parameters.

The techniques you learned in this tutorial are just a few of the ways you can use the modelers in animations. For more information, refer to [“Free Form Modeler” on page 328](#) and [“Mesh Form Modeler” on page 329](#).

The next section of the tutorial will show you how to add special effects to your animations.

## Animating Effects



After you've created the main action of your animation you may feel that something is still missing. Perhaps your environment needs a little added realism, or do you want your object to change color? Using key frame animation, you can animate almost any object parameter to create subtle effects to enhance your animations.

In this section you'll learn how to add Rotoscoping to your animations and how to animate Shader settings.

### The Story So Far

You've learned how to create, shade, light and animate objects. In this lesson you'll be animating Shaders and adding Rotoscoping to lights, so you should be familiar with shading and lighting concepts. You may want to review [“Shading Objects” on page 62](#) and [“Setting up Lights” on page 67](#), or refer to [“Applying Shaders” on page 181](#) and [“Setting Lights & Cameras” on page 269](#) for a detailed explanation of these concepts.

### What You'll Need

To create the effects shown in this section, you'll need some lights and a shader. The file **ANI\_EFF** has all the models and lights you'll need to complete the lessons in this section.



### To begin animating effects:

- 1 Locate the **Tutorial: Animating Effects** folder and open the file **ROSCOPING TUTORIAL**.
- 2 Choose **Browser** palette: **Shaders** tab.
- 3 Choose **Browser** palette: **File** menu► **Add Directory/Folder**.
- 4 Locate the folder **Tutorial: Animating Effects** and click **Select Current Directory**.

## Lesson 1: Rotoscoping

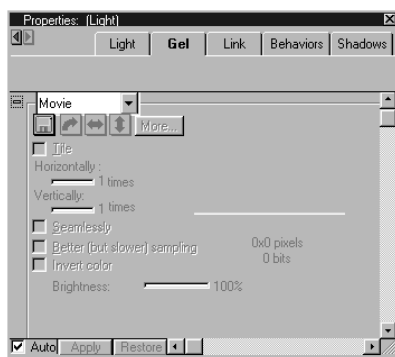
Rotoscoping lets you add a movie to your animation. You can use movies as animated textures on your objects or apply them to lights as gels.



### To apply rotoscoping to a light:

- 1 Click the **Key Light** in the **Time Line** window to select it.
- 2 Click the **First Frame** button to move to the first key frame in your animation.
- 3 If necessary choose **Windows** menu► **Properties** to display the light's properties.
- 4 Click the **Gel** tab.

- 5 Enable the **Auto** button.
- 6 Choose **Movie** from the **Gels** pop-up.

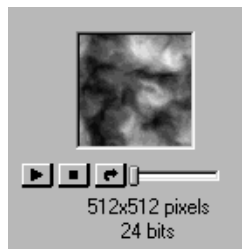


Use the **Movie** controls in **Properties** palette to load a movie as a gel.

- 7 Click the disk icon.
- 8 Use the dialog to locate the file **Tutorial:Animation:Effects:H20.MOV** or **H20.AVI** and click **Open**.

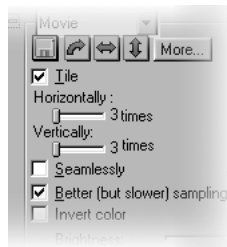
When you add the movie, Ray Dream Studio automatically creates a key frame at the end point of the movie's. Since the movie is only 1.46 seconds long, a new key frame appears at 1.46 in the time line.

- 9 In the **Time Line** window drag the key frame indicator from **00:01:46** to **00:02:00**.



You can use the **Movie** controls to play the movie you loaded.

- 10 In the **Properties** palette, enable **Tile**.
- 11 Move the **Horizontal** slider to **3 times**.



Use the **Tile** Controls to tile the movie 3 times.

To view the roto-scoping effect you need to preview the rendered animation.



### To preview a rendered animation:

Choose **Render** menu► **Best Animation Preview**.

Your scene now has a realistic underwater look to it.



When you render your animation in **Best Animation Preview** you'll be able to see the effects of the movie as a gel.

## Lesson 2: Animating Shaders

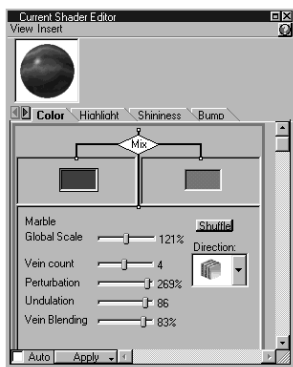
By adjusting shader parameters, you can animate a change in color, or texture on the surface of objects.



### To animate a shader:

- 1 Click the **First Frame** button to move to the beginning of your animation.

- 2 Drag the **Shaded Fish** from the **Browser** palette to the **Perspective** window.
- 3 Choose the **Eyedropper** tool.
- 4 Click the Shaded Fish in the **Perspective** window. The **Current Shader Editor** appears.



*When you click the fish with the Eyedropper tool, its shader appears in the Current Shader Editor.*

- 5 Click the **Last Frame** button to move to the end of your animation.
- 6 In the **Current Shader Editor**, double-click the left color chip.

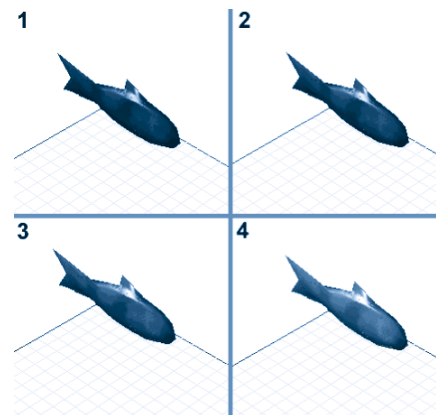
- 7 Click the **Color palette** button.



*Click the Color palette button to display your system's color picker.*

- 8 Select a green color, then click **OK**.
- 9 Double-click the right color chip, then click the **Color palette** button.
- 10 Choose a light gray color, then click **OK**.
- 11 Click **Apply**.
- 12 Choose **Render menu > Best Animation Preview**, to create a preview of your animation.

The school of fish will appear to change from silvery red to silvery green.



*When you play the preview of your animation you can see the shader change color over time.*

### **Moving On**

The animation effects you learned in this section are only two of the many types of effects you can add to your animation. By changing the properties of objects across different key frames you can create a wide variety of effects. For example, you could adjust an object's size across key frames and the object would appear to grow. For more details on creating animation effects, refer to [Chapter 15, "Animating."](#)

The next section of the tutorial will show you the fundamentals of rendering your scenes and animations.

## Rendering



Rendering is the process of creating a two-dimensional image or movie from a three-dimensional scene. The settings you choose for your rendering can have a large impact on the final appearance of your image. Ray Dream Studio offers you several different types of renders that you can use to achieve different effects. For detailed information on the different types of renderers available, refer to “Renderers” on page 342.

The lessons in this section will teach you how to set up a rendering session for an image and for an animation.

### *The Story so Far*

The previous sections have shown you how to create and arrange objects, how to set up lights and camera, how to animate objects and now finally you will learn how to turn your scene into an image or an animation. Before you begin this section you should understand how to set up a scene using the arranging features as well as understanding how to set up cameras and the production frame. You may want to review “Setting up Cameras” on page 72 or “Setting Lights & Cameras” on page 269.

### *What You’ll Need*

The materials you need for this section depend on how you’ve been using this tutorial. If you have been following the

tutorial from the beginning, you’ll need the scene you arranged in “Arranging Objects in the Scene” on page 39, the lighting setup from “Setting up Lights” on page 67, and the camera setup from “Setting up Cameras” on page 72.

If you’ve skipped ahead to this section you can complete the lessons using the preset files provided.



### *To open preset files for the rendering lessons:*

- 1 Locate the folder **Tutorial: Rendering** and open the file **RENDERING TUTORIAL**.
- 2 Choose **Browser palette: Cameras** tab and add the folder **Tutorial: Setting Up Cameras**.
- 3 Choose **Browser palette: Lights** tab and add the folder **Tutorial: Setting Up Lights**.
- 4 Drag the objects **Camera Tutor** and **Light Tutor** from the **Browser** to the **Perspective** window.

## Lesson 1: Rendering an Image

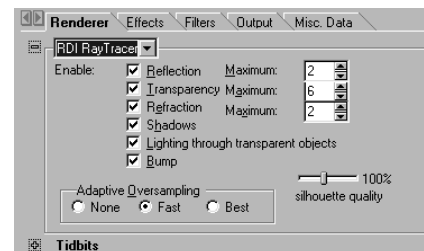
The first thing you need to do to set up a rendering is to choose a renderer. A renderer converts your scene into a bitmap or movie.

In this lesson you’ll be using the RDI Ray Tracer since it’s one of the renderers that handle reflections and refractions.



### *To choose a renderer:*

- 1 Choose **Render menu** ▶ **Current Scene Settings**. The **Scene Settings** palette appears.



Use the **Render Settings** dialog to choose a renderer and set its attributes.

- 2 Click the **Renderer** tab.
- 3 Choose **RDI Ray Tracer** from the pop-up.
- 4 Make sure that all the rendering options are enabled.

If you want to speed up the rendering, disable the options you won’t be using in your scene. For example, since there are no transparent objects in your scene, you can disable the **Light through transparency** option.



After you've selected a renderer, you need to set the atmosphere for your scene.



### To set the atmosphere:

1 Choose **Scene Settings** palette: **Effects** tab.

2 Choose **Distance Fog** from the **Atmosphere** pop-up.

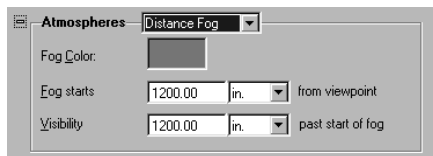
**Distance Fog** makes objects appear to fade the further they move away from the camera.

3 Click the **plus/arrow** icon next to the **Atmosphere** title to display its controls.



Use the **Plus** icon to display more controls.

The **Distance Fog** controls appear.



The **Distance Fog** controls let you set the color and range of the fog.

4 Double-click the **Fog Color** chip.

5 Choose a light blue color and then click **OK**.

6 Enter **Fog starts= 120**

7 Enter **Visibility = 300**

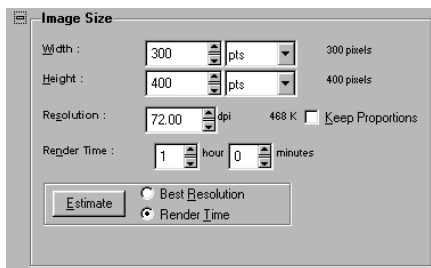
The **Distance Fog** will add realistic depth to your image. If you want to add a more detailed realism, you can add a background to the scene. Now that your scene has an environment, you can set the output file options.



### To set Output options:

1 Choose **Scene Settings** palette: **Output File** tab.

2 Click the **plus/arrow** icon next to **Image Size**. The **Image size** options appear.

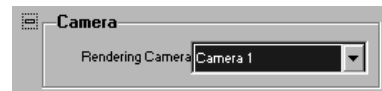


Use the **Image Size** options to set the height, width and resolution of your rendered image.

3 Set **Width=300** and **Height=400**.

4 Set the **Resolution** to 72 dpi.

5 Click the **plus/arrow** icon next to **Camera**. The **Camera** options appear.



Use the **Camera** options to select a camera to use for your rendering.

6 Choose **Render Camera** from the **Rendering Camera** pop-up.

7 Click the **File Format** plus/arrow icon. The **Format** options appear.



Use the **File Format** options to set the output format for your rendered image.

8 Choose **BMP (RD)** from the pop-up.

9 Click the **Save** button to save your rendering setup.

Your rendering setup is now complete. Now you can use these saved settings to render your scene.



### To start a rendering:

Choose **Render** menu► **Use Current Settings**.

Ray Dream Studio starts rendering your image. Depending on the complexity of your image, rendering can be a time consuming process, so it's a good idea to only render when you're happy with your scene.

The rendering options you just set can be used in any number of rendering sessions. So you can adjust the cameras and lights in your scene and then render multiple views of your scene using the same settings.

## Lesson 2: Rendering an Animation

The only difference between rendering a movie and an image is the file output type. Instead of selecting an image format as the output format, you select an animation format.



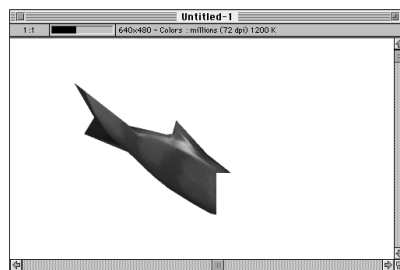
### To render a movie:

- 1 Choose **Render menu**► **Current Scene Settings**.
- 2 Click the **Renderer** tab and choose a renderer from the pop-up.  
  
If you're creating a preview of your animation, choose **Draft Z-Buffer**, otherwise choose **RDI Raytracer**.
- 3 Click the **Effects** tab.
- 4 Choose **Distance Fog** from the **Atmosphere** pop-up.

- 5 Expand the **Atmosphere** controls by clicking the plus/arrow icon.
- 6 Click the **Fog Color** chip and choose a blue color.
- 7 Enter **Fog starts=300, Visibility=200**.
- 8 Click the **Output** tab.
- 9 Choose **QuickTime/AVI** from the pop-up.
- 10 Set the frame rate to 6fps (frames per second).

Leave the time limits as they are. By default the time limits in the **Scene Settings** palette are the same as those shown in the **Time Line** window.

- 11 Click **Save** to save your settings.
- 12 Choose **Render menu**► **Use Current Settings**. The rendering preview window appears.



*Ray Dream Studio displays a preview window as it renders your animation.*

When the rendering is complete you can save the file for use in other applications.

## Moving On

The rendering settings you choose can have a large affect on the final artwork you produce. You should make sure that you're using the best settings for your scene. If you find that the rendering is taking too long you or you run out of memory you may want to reduce the complexity of your image. One area you should watch out for is reflection and refraction. These effects take a long time to render and require a great deal of memory. If you're having memory problems you may want to use this effect sparingly.

For complete descriptions of how to choose the right renderer for your image, refer to [Chapter 17, "Rendering."](#)

## Wrapping Up

Now that you've completed the tutorial you may be asking yourself where do I go from here? Well the best way to learn Ray Dream Studio is to experiment. The techniques outlined in this tutorial are only the beginning. You can apply the skills you've learned to any project you have in mind.

If you want to learn more about modeling, open some of the models in the **Browser** palette and see how they were made. Even in the most complex models you'll be able to see the basic techniques described in this tutorial. Another great modeling

resource is the **Modeling Wizard**. The **Modeling Wizard** is a picture-based assistant that guides you through the process of creating many types of objects, teaching you valuable modeling principles along the way. For instructions on accessing the Modeling Wizard, refer to [“Free Form Modeling” on page 109](#).

If you want to learn more about arranging scenes, try using the **Scene Wizard**. This wizard leads you through the process of setting up lights and backgrounds. Refer to [“Using the Scene Wizard” on page 27](#).

Some of the files you created in this tutorial can be the basis for your own 3D illustration cookbook. The shader you created can be the start of your own Shader library. The Shell shader can be applied to other underwater creatures such as snails and hermit crabs. Trying saving the shader in a personal shader folder and then add more shaders as you create other objects.

The lighting setup you created can be used to light almost any scene effectively. It’s a great starting point for even the most complex lighting setups. The cameras you set up can also be used in other scenes.

You’re now ready to explore Ray Dream Studio in more detail. The remaining chapters in this User Guide will explain in detail all the features and functions of Ray Dream Studio 5. Remember, you can use this tutorial as a reference source. If you

want to brush up on a certain aspect of Ray Dream Studio, jump into the tutorial lesson that deals with the topics you want to review.

