Online Help

version

Adobe Atmosphere® 1.0

Adobe® Atmosphere™ Builder

Contents

Atmosphere Builder Basics

About Atmosphere Builder

The Atmosphere Builder application provides tools for building virtual three-dimensional worlds and publishing them on the Web. Users can explore published worlds on the Web using the Atmosphere Browser. The experience of exploring a world is much like a video game, except that Atmosphere Builder worlds can be linked together and explored over the Internet at realistic speeds, with high resolution, realistic lighting effects, and in full color. Users that are exploring the same world can see representations of each other called *avatars*, and converse with one another by typing messages in a chat window.

Creating and opening worlds

When you start Atmosphere Builder for the first time, you will see a variety of palettes and a menu bar. The menus at the top of your screen provide access to commands, and the palettes contain tools and options for building a 3D world. When you create a new world or open an existing world, a document window appears on your screen. You can have only one document window open at a time.

To create a new world:

Choose File > New.

To open a world:

1 Choose File > Open.

2 Select the name of the file you want to open, and click Open.

Note: *You can only open Atmosphere files using the Open command. For information on importing Viewpoint files, see* *"Importing objects" on page 14.*

Working with views

The document window displays a *view* of the objects in a world. You can choose one of three wireframe views to see a blueprint representation of your world called a *wireframe*; or you can choose Browser view to see your world with its surface textures, colors, and lighting. Browser view shows you how your world will appear when viewed on the Web in the Atmosphere Browser.

About views

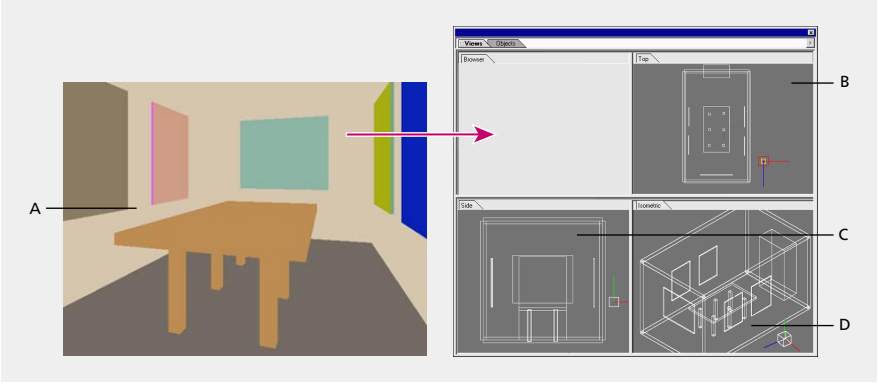
Building a world is easier when you understand how to use the different views. If you've ever worked in a 3D modeling application or sketched out plans for a building project, you're already familiar with the concept of using views. Atmosphere Builder provides four ways to view a world. The three wireframe views show you the structure of the world and how the objects are connected to each other; the fourth view shows a preview of the world as it will appear in the Atmosphere Browser with surface textures, colors, and lighting applied to objects.

Top view Shows the top of the wireframe from a position directly above it. When you first create or open a world, this is the initial view in the document window.

Side view Shows the side of the wireframe. You'll frequently switch between the Top view and Side view when placing and aligning objects in Atmosphere Builder.

Isometric view Shows the wireframe from an oblique angle that is above and to the side of it. Isometric view is useful for getting an overview of where objects are in the world.

Browser view Shows a rendered, three-dimensional view of your world that you can move through and explore. You use Browser view to apply surface textures and colors to the objects you created in wireframe view, and to adjust the lighting in the world. Keep in mind that what you see in Browser view is what users will see on the Web.



***A**. Browser view **B.** Top view **C.** Side view **D.** Isometric view*

Selecting a view

You can use the Views palette or the Views menu to select a view.

To display the Views palette:

Choose Window > Views.

To select a view:

Do one of the following:

- Click a view in the Views palette.
- Choose a view from the View menu.

Navigating in wireframe views

Navigating is essential to building a world. You can scroll, rotate, magnify, and reduce a view to better see the portion of the wireframe you want to work on.

Scrolling wireframe views

If the area of the wireframe you want to work on is not visible in the document window, you can scroll to bring that area into view.

To scroll a view:

Select the pan tool ( ), and drag in the document window.

Rotating wireframe views

You can rotate a wireframe view in the document window to see the objects from a different perspective. Keep in mind that rotating the view does not change the orientation of individual objects, only the angle at which you see the wireframe as whole. For information on rotating individual objects, see "Rotating objects" on page 40.

To rotate a view:

1 Select the rotate objects tool ( ).

2 Drag to the left in the document window to rotate the view clockwise; drag to the right to rotate the view counter-clockwise.

Magnifying and reducing wireframe views

You can magnify your view to see the wireframe in greater detail, or you can reduce your view to see a larger portion of the wireframe. Keep in mind that zooming in and out does not change the actual size of the objects, only the magnification at which you see them. For information on changing the scale of objects, see "Scaling and distorting objects" on page 41.

To zoom in and out by dragging:

1 Select the zoom tool ( ).

2 Drag to the right in the document window to zoom in, or to the left to zoom out. Your view zooms in and out on a continuous range of percentages based on how much you drag.

To zoom in by clicking:

Select the zoom in tool ( ), and click a point in the wireframe around which you want to magnify.

To zoom out by clicking:

Select the zoom out tool ( ), and click a point in the wireframe around which you want to reduce magnification.

Centering wireframes in the document window

After navigating in the wireframe views, you can quickly display all of the objects in the wireframe and center the view in the document window.

To center a wireframe in the document window:

Choose View > Fit All.

Navigating in Browser view

Browser view presents a shaded, perspective view of a world. You can navigate around this world using your mouse and keyboard commands. You can move forward and backward through doorways, climb up and down stairs, and look side to side. You can also set options that determine the quality of your movement.

To navigate in Browser view:

1 Select the move tool ( ).

2 Do one or more of the following:

• Drag in a world to change your point of view: drag to the left to turn left, drag to the right to turn right, drag up to move forward, and drag down to move backward.

• Press an arrow key to change your point of view: press the left arrow key to turn left, the right arrow key to turn right, the up arrow key to move forward, and the down arrow key to move backward.

• Shift-drag up or down, or hold down Shift+up arrow key or Shift+down arrow key, to move vertically in the world. Shift-drag right or left, or hold down Shift+right arrow key or Shift+left arrow key, to move horizontally (side to side) in the world.

• Ctrl-drag to rotate around your current position (as if you are turning your head and looking). When you Ctrl-drag to the side, your subsequent movement is determined by the direction in which you are looking. For example, if you Ctrl-drag to the right, release the Ctrl key, and then drag forward, you will move along a forward trajectory to the right.

To set move tool options:

1 Select the move tool ( ).

2 Display the Tool Inspector palette. (See "Using the Object Inspector palette" on page 16.)

3 Select or deselect the following options:

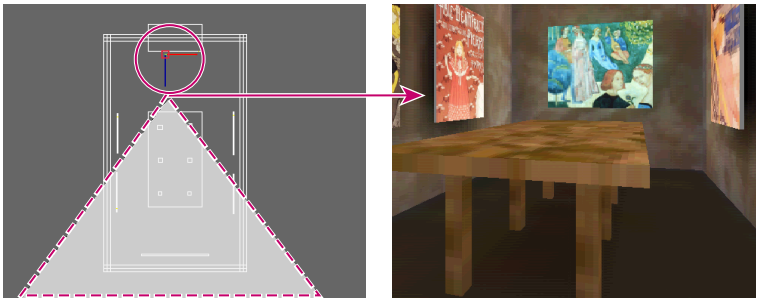
• Collide to specify whether or not you can move through objects. If you select Collide, objects in the world, like walls, floors, and so on, will block your passage. If you deselect Collide, you will be able to move through objects in the world without resistance.

• Gravity to specify the effects of gravity on your movement. If you select Gravity, you are drawn to the floor or ground plane of the world. If you deselect Gravity, you can change your vertical position and hover above or below the ground plane of the world.

Note: *When you deselect Collide, Gravity is implicitly disabled (although the Gravity checkbox does not change). When you reselect Collide, Gravity is reenabled.*

Using the Actor object

The Actor is a special object that appears in each wireframe view and reflects your current location and orientation in the Browser view.



Moving the Actor object in a wireframe view changes your position in Browser view.

To change your position and orientation in Browser view using the Actor object:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select the Actor object (or). (See "Selecting objects" on page 30.)

3 Drag the Actor object to the desired position in the wireframe.

4 If necessary, rotate the Actor object until it is pointing in the direction you want to face in Browser view. (See "Rotating objects" on page 40.)

5 Switch to Browser view.

Using palettes

Atmosphere Builder features a variety of palettes that you use to perform different tasks, including selecting tools and views, adding objects to a world, and setting the properties of those objects. When you first start Atmosphere Builder, several palettes are displayed by default. You can choose to show and hide palettes as you work.

A *group* is a window that lets you organize palettes. You can move all palettes into a single group or move each palette into its own group window. You can also close and resize groups to make better use of your work area.

To show a palette and any palettes in its group:

Choose the palette's name in the Window menu.

To hide a palette and any palettes in its group:

Click the close box in the upper right corner of the group window.

To bring a palette to the front of its group:

Click the palette's tab, or choose the palette's name in the Window menu. A check mark next to the palette's name in the Window menu indicates that the palette is visible and at the front of its group.

To move a palette between groups:

Drag the palette's tab to another group.

To move a palette so that it appears in its own window:

Drag the palette's tab to the desktop.

To move a group of palettes:

Drag the group's title bar.

To resize a group window:

Drag the lower right corner of the window.

To collapse a group of palettes to a tab at the right edge of the screen:

Ctrl-click the title bar of the group window. To expand the group window, click the tab at the right edge of the screen.

Saving and publishing worlds

When you save a world, Atmosphere Builder creates a single file; when you publish a world, Atmosphere Builder collects all files required to open a world into one folder.

Important: *Be sure to use the Publish command, rather than the Save or Save As command, when you are ready to post your world on a Web server.*

Saving a world

When you save a world, its geometry, lighting, and colors are preserved in the world file. However, all textures and Viewpoint objects are maintained as separate files and loaded by reference. This means that you must keep texture and Viewpoint files in the same relative location to the world file. If Atmosphere Builder can't locate a texture file, a solid color will be substituted for the missing texture.

To save a world:

Choose File > Save.

To save a world with a different name:

1. Choose File > Save As.
2. Locate and open the folder where you want to save the world.
3. Enter a name, and click Save.

Publishing a world

Publishing accomplishes several tasks to ensure that your world will function correctly when you post it on the Web. First, the Publish command copies all of the files required to open a world, including its referenced texture files and Viewpoint objects, into one folder. The URL of each texture file is updated to its new location. If you don't want the texture to be copied and its URL to be updated, you can select the Absolute Path option in the Object Inspector palette. (See "Viewing and updating the location of textures" on page 50.)

Second, the Publish command generates a snapshot for every entry point in your world. This snapshot is what users see when they create a bookmark for your world. If your world does not include an entry point when you publish it, Atmosphere generates a default entry point based on your location in the world. (See "Creating an entry point" on page 67.)

To publish a world:

1. Choose File > Publish.
2. Locate and open the folder where you want to store all of the files for the world.
3. Enter a name, and click OK.

To place the world on a Web site, use any standard FTP software application to upload the contents of the folder to a Web server.

Closing and quitting

When you're done working in Atmosphere Builder, you can close the current world file and exit the application.

To close a world file:

Choose File > Close

To quit Atmosphere Builder:

Choose File > Exit.

If you did not save the file before choosing the Exit command, the Save dialog box appears. Enter a name for the file (if necessary), and click Save.

Building Worlds

About building worlds

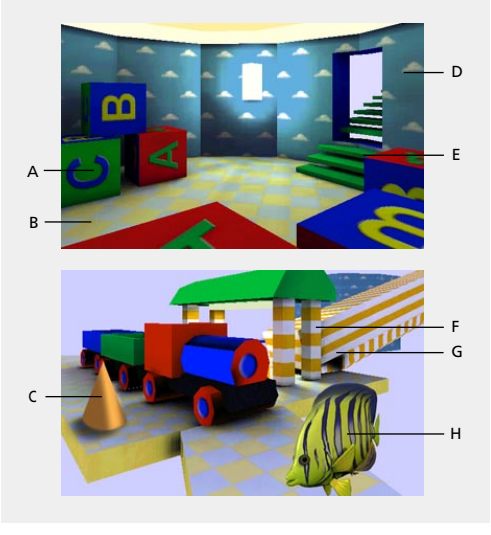
There are two main aspects to building the structure of a world. The first is creating objects; the second is laying out objects in relation to each other.

Creating objects

Objects are the building blocks of a three-dimensional world—you use objects to define space and give form to your vision. Atmosphere Builder provides tools for creating basic geometric forms called *primitives*. Primitives—such as boxes, floors, polygons, walls, slabs, stairs, columns, and cones—let you quickly lay out the framework of a world.

When you build with structure in Atmosphere Builder, you are working with the principles of constructive solid geometry. Because primitives are solid objects, they are easy to combine and form a solid structure. (You don't have to worry about wrapping polygons around a structure as you do in some 3D applications.) You can use primitives to create more complex objects by adding them together or subtracting them one from the another. Take, for example, a box object and wall object that intersect each other. By selecting the Connect Objects option in the Tool Inspector palette, Atmosphere Builder combines the objects to create a solid that represents a wall with a protruding box. However, you can choose to subtract the volume of the box from that of the wall, in which case you create a solid that represents a wall with a hole in it. You can also choose to intersect the volumes of the box and the wall, in which case you create a solid that has the depth of the wall and the height and width of the box.

Although you can create an infinite variety of objects using constructive solid geometry, there are some objects that you cannot create in Atmosphere Builder. Organic shapes, such as the human form, and spheres may only be approximated using the available primitives. This is where 3D objects saved in the Viewpoint file format come into play. Importing Viewpoint objects provides a way to add additional detail to a world. For example, you can create a model of a fish in another 3D modeling application and import it into Atmosphere Builder as a Viewpoint object.



***A.** Box object **B.** Floor object **C.** Cone object **D.** Wall object **E.** Stairs object **F.** Column object **G.** Slab object **H.** Viewpoint object*

Laying out objects

When building a world, the space between objects is as important as the objects themselves. For example, if you build a room using two floor objects and four wall objects, the amount of the space inside the room is defined by the relationship between objects. You can create a tall, narrow space by creating a narrow floor and tall walls, or you can create an expansive space by creating a wide floor and short walls.

As you add objects to a world, the relationship between objects becomes more complex. For example, if you want to increase the length of a room, all of the room's components (the floor, walls, and ceiling) must change. *Connectors* let you link objects to each other and maintain their spatial relationships. Think of connectors as the bolts of your world. When objects are linked, you can move one connector to adjust an entire structure.

Atmosphere manages the connections between objects in a world using *constraints*. Constraints determine how an object can be moved. For example, when you move a wall object that is connected to a floor object, Atmosphere Builder constrains the movement so that the wall remains vertical, the floor remains horizontal, and the wall and floor remain connected. This system of constraints adds stability to your world.

Adding objects to a world

You can add objects to a world using the object tools that appear in the Variable Tools palette.

Creating new objects

The Variable Tools palette contains specialized tools for creating boxes, walls, floors, cones, columns, and stairs, as well as portals and entry points that let users travel between worlds.

To create a new object:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select a tool in the Variable Tools palette.

3 If desired, set object properties in the Object Inspector palette. (See "Using the Object Inspector palette" on page 16.)

4 Do one of the following:

- Click in the document window to place the object.
- Hold the mouse button in the down position and drag in the document window to position the object. Note that dragging does not allow you to resize the object; it simply allows you to reposition the object.

After creating an object, you can change its properties in the Object Inspector palette.

Importing objects

Importing lets you bring additional 3D content into the Variable Tools palette. You can import two types of content: Atmosphere content and content saved in Viewpoint file format.

• Atmosphere content comprises any world (or portion of a world) that you create and save in Atmosphere Builder. Creating Atmosphere content makes it easy to reuse objects between worlds. For example, you can create furniture, landscaping, and other libraries of objects that you want to use repeatedly.

• You can create 3D content in a third-party application and import it into Atmosphere as a Viewpoint object. Some 3D applications let you directly export scenes to Viewpoint (MTX) format. If this is not the case with your 3D application, you can save the scene in MTS, OBJ, or ASE file and using the Viewpoint Scene Builder application to output an MTX file. An MTX file is an XML file that contains parameters describing the scene's 3D objects and the 3D scene itself. For more information about Viewpoint format, see the Viewpoint Web site at www.viewpoint.com.

To import Atmosphere content:

1 Choose File > Import Objects.

2 Select the name of the file you want to open, and click Open. The content appears as a tool in the Variable Tools palette.

To import Viewpoint content:

1 Choose File > Import Viewpoint Objects.

2 Select the name of the file you want to open, and click Open. The content appears as a tool in the Variable Tools palette.

For more information on using object tools, see "Creating new objects" on page 13.

Specifying where to add objects

When you work in Top view or Side view, objects are represented in two dimensions. For example, if you place a box in Top view, you can see the object's width and depth but not its height. Similarly, if you place the same box in Side view, you can see the object's width and height but not its depth. How, then, can you determine the exact location of an object in the world? The Axis Reference object fulfills this role.

You use the Axis Reference object to specify the exact location for the object before you place it. For example, before placing a box in Top view, you can move the Axis Reference object in Side view to where you want to bottom of the box to be. Using the Axis Reference object is especially useful when you want to add multiple objects and align them at the same time, such as four columns in a line in front of a floor.

To select the Axis Reference object:

Do one of the following:

- Select the select tool ( ), and click the Axis Reference object ( or ) in the document window.
- Select the object in the Objects palette.

Note: *If you can't find the Axis Reference object in the document window, an EntryPoint object may be obscuring it. Use the select tool to move the EntryPoint object* ( or ) *to a different position.*

To specify where to add an object:

1. Determine the view in which you want to add the new object.
2. Do one of the following:

- If you want to place the object in Top view, select the Axis Reference object in Side view or Isometric view.
- If you want to place the object in Side view, select the Axis Reference object in Top view or Isometric view.
- If you want to place the object in Isometric view, select the Axis Reference object in any view.

3 Select the select tool and drag the yellow square on the Axis Reference object to the desired location. The location that is specified by the Axis Reference object depends on two factors: the type of object you add and the view in which you position the Axis Reference object.

Object:	Specifies the following location in Side view:	Specifies the following location in Top view or Isometric View:
wall	bottom edge of wall	midpoint of wall thickness
floor	midpoint of floor thickness	center of floor
slab	midpoint of slab thickness	edge of slab
stair, column, or cone	bottom edge of stair, column, or cone	center of stair, column, or cone
box, entry point, or portal	center of box, entry point, or portal	center of box, entry point, or portal

4 Select the view in which you want to add the new object, and use an object in the Variable Tools palette to create the object. (See "Creating new objects" on page 13.)

Using the Object Inspector palette

The Object Inspector palette is context sensitive and changes as different objects are selected. Some settings in the Object Inspector palette are common to several objects (such as the Visible in Wireframe Views, Hide in Browser View, Locked, and Subtractive options), and some are specific to one object (such as the Entry Point Title option for the entry point tool).

To set options in the Object Inspector palette:

1 If the Object Inspector palette is hidden, choose Window > Object Inspector to display it.

2 Select a tool in the Variable Tools palette.

3 Select options in the Object Inspector palette. For more information on specific options, see the related topic. For example, for information on the Faces and Radius options for the column tool, see "Creating cones and columns" on page 21.

Creating floors

A floor object is any flat, horizontal surface in an Atmosphere world. In the real world, we define a floor as something we walk on; in Atmosphere, you can also use a floor object as a ceiling or as any other flat horizontal surface such as a patio or deck. The floor tool lets you create a floor object that is initially square; however, you can adjust the length of each side by dragging the floor's connectors. Floor objects always remain horizontal in a world, no matter how you adjust their connectors. For example, if you're working in Side view and move one of the floor's connectors up, the whole floor (and any floor sections connected to it) moves up to keep the floor horizontal.

To add a floor object:

1 Select the floor tool () in the Variable Tools palette.

2 If desired, set one or more options in the Object Inspector palette:

• Object Name to enter a name for the object that will appear in the Object Inspector palette and the Objects palette.

• JavaScript URL to attach a script to the object. (See "Attaching a script to a world" on page 61.)

• Visible in Wireframe Views to show the object after you create it. (See "Showing and hiding objects" on page 38.)

• Hide in Browser View to create a hidden object, such as a hidden luminous object. (See "Creating hidden luminous objects" on page 54.)

• Locked to lock the object. (See "Locking objects" on page 37.)

• Subtractive to use the object to cut through another object. (See "Creating openings in objects" on page 26.)

• Thickness to specify the thickness of the horizontal surface in feet.

3 Click in the document window. If you're working in Top view or Isometric view, click where you want to locate the center of the floor. If you're working in Side view, click where you want to locate the midpoint of the floor thickness. Hold down the mouse button and drag to reposition the object.

Creating walls

A wall object is any flat, vertical surface in an Atmosphere Builder world. You can connect wall objects with floor objects to build rooms. You can also use a wall object by itself as any other flat vertical surface, such as a door, a picture frame, or a fence. Wall objects always remain vertical in a world, no matter how you adjust their connectors. For example, if you're working in Top view and move one of the wall's top connectors, the corresponding bottom connector moves up to keep the wall vertical.

You can quickly add and connect walls to a floor using the Extrude Walls from Floor command. Atmosphere Builder adds and connects a wall object to each side of the selected floor. This command works only with a floor.

To add a wall:

1 Select the wall tool () in the Variable Tools palette.

2 If desired, set one or more options in the Object Inspector palette:

• Object Name to enter a name for the object that will appear in the Object Inspector palette and the Objects palette.

• JavaScript URL to attach a script to the object. (See "Attaching a script to a world" on page 61.)

• Visible in Wireframe Views to show the object after you create it. (See "Showing and hiding objects" on page 38.)

• Hide in Browser View to create a hidden object, such as a hidden luminous object. (See "Creating hidden luminous objects" on page 54.)

• Locked to lock the object. (See "Locking objects" on page 37.)

• Subtractive to use the object to cut through another object. (See "Creating openings in objects" on page 26.)

• Thickness to specify the thickness of the vertical surface in feet.

3 Click in the document window. If you're working in Top view, click where you want to locate the midpoint of the wall thickness. If you're working in Side view or Isometric view, click where you want to locate the center of the bottom edge of the wall. Hold down the mouse button and drag to reposition the object.

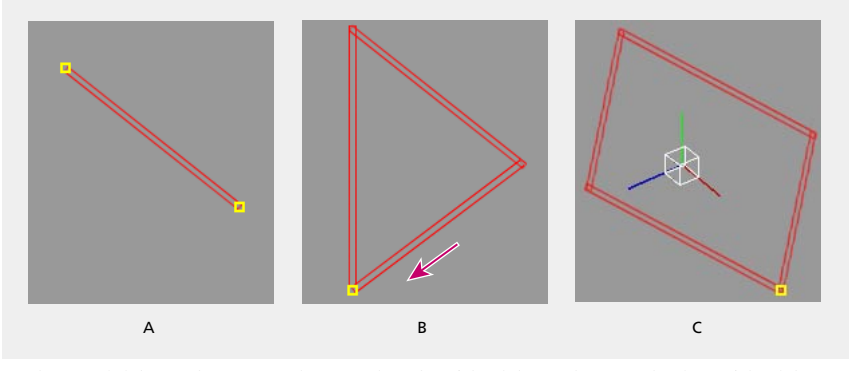
To add and connect walls using the Extrude Walls from Floor command:

1 Select a floor object.

2 Choose Edit > Extrude Walls from Floor. A wall object is automatically connected to each edge of the floor.

Creating slabs and trislabs

A slab is a four-sided object that can be slanted at any angle from 0 to 90 degrees, relative to the ground in your world. For example, you can use a slab as a ramp leading up to a floor. The slab tool lets you create an object that is initially flat, horizontal, and has four equal sides. After you add a slab, you can change the sides of the slab to be unequal lengths, or change the slope of the slab.



***A**. The initial slab in Side view. **B.** Changing the sides of the slab. **C.** Changing the slope of the slab.*

To add a slab:

1 Select the slab tool ( ) or the trislab tool ( ) in the Variable Tools palette.

2 If desired, set one or more options in the Object Inspector palette:

• Object Name to enter a name for the object that will appear in the Object Inspector palette and the Objects palette.

• JavaScript URL to attach a script to the object. (See “Attaching a script to a world” on page 61.)

• Visible in Wireframe Views to show the object after you create it. (See "Showing and hiding objects" on page 38.)

• Hide in Browser View to create a hidden object, such as a hidden luminous object. (See "Creating hidden luminous objects" on page 54.)

• Locked to lock the object. (See "Locking objects" on page 37.)

• Subtractive to use the object to cut through another object. (See "Creating openings in objects" on page 26.)

• Thickness to specify the thickness of the slab in feet.

3 Click in the document window. If you're working in Top view or Isometric view, click where you want to locate the center of the slab edge. If you're working in Side view, click where you want to locate the midpoint of the slab thickness (or height). Hold down the mouse button and drag to reposition the object.

To change the slope of a slab:

1 Select Side view. Although you can change the slope in Isometric view, the slope of the slab is easier to see if you work in Side view.

2 Select the select tool ( ).

3 Do one of the following:

• Select the connectors on the side of the slab that you want to adjust. Drag the connectors up or down to the desired elevation. For information on selecting multiple connectors, see "Using the select tools" on page 30.

• If the slab is connected to another object, such as a wall, drag that object up or down.

Note: *Depending on the position of its connectors, a slab can become non-planar. (A non-planar slab is one in which no single plane can be positioned through all of its connectors.) In this case, Atmosphere automatically breaks the slab into two triangular slabs. If the slab becomes planar again, the break is automatically removed and a single planar slab is restored.*

Creating boxes

A box is an object that has six faces: a bottom, four sides, and a top. You can use box objects to represent solid objects such as cabinets, refrigerators, or other appliances. The box tool lets you create an object that is a cube with six equal sides. After you add a box, you can change its sides to be unequal lengths by dragging the box's connectors.

To add a box:

1 Select the box tool ( ) in the Variable Tools palette.

2 If desired, set one or more options in the Object Inspector palette:

• Object Name to enter a name for the object that will appear in the Object Inspector palette and the Objects palette.

• JavaScript URL to attach a script to the object. (See "Attaching a script to a world" on page 61.)

• Visible in Wireframe Views to show the object after you create it. (See "Showing and hiding objects" on page 38.)

• Hide in Browser View to create a hidden object, such as a hidden luminous object. (See "Creating hidden luminous objects" on page 54.)

• Locked to lock the object. (See "Locking objects" on page 37.)

• Subtractive to use the object to cut through another object. (See "Creating openings in objects" on page 26.)

3 Click in the document window to locate the center of the box. Hold down the mouse button and drag to reposition the object.

Creating cones and columns

A column is an object that is the same diameter at all points between its top and bottom edge. A cone is an object that can have a larger diameter at its bottom than at its top. For example, you can use a column to hold up the roof of a building, and you can use a cone to represent the nose cone on an airplane. You can slant a cone or column at any angle from 0 to 90 degrees, relative to the point of view of visitors to your world.

Before you create a cone or column, you can specify how many sides (called *faces*) you want it to have. If you increase the number of faces, the column or cone becomes increasingly circular and the surface becomes smoother. If you decrease the number of faces, the column or cone becomes increasingly angular and the surface becomes rougher.

To add a cone or column object:

1 Select the cone tool ( ) or the column tool ( ) in the Variable Tools palette.

2 If desired, set one or more options in the Object Inspector palette:

• Object Name to enter a name for the object that will appear in the Object Inspector palette and the Objects palette.

• JavaScript URL to attach a script to the object. (See "Attaching a script to a world" on page 61.)

• Visible in Wireframe Views to show the object after you create it. (See "Showing and hiding objects" on page 38.)

• Hide in Browser View to create a hidden object, such as a hidden luminous object. (See "Creating hidden luminous objects" on page 54.)

• Locked to lock the object. (See "Locking objects" on page 37.)

• Subtractive to use the object to cut through another object. (See "Creating openings in objects" on page 26.)

• Faces to specify the number of sides of a cone or column. To make the column or cone more circular and its surface smoother, specify a larger number of faces. To make the column or cone more angular and its surface rougher, specify a smaller number of faces.

• Radius (column tool only) to specify the width of the column.

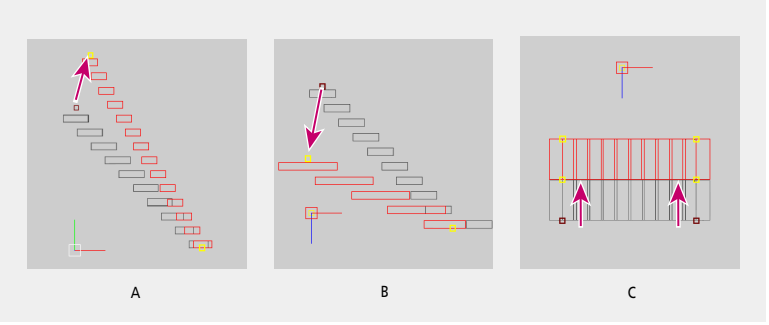
• Top Radius and Bottom Radius (cone tool only) to specify the width at the top and bottom of a cone.

3 Click in the document window. If you're working in Top view, click where you want to locate the center of the cone or column. If you're working in Side view or Isometric view, click where you want to locate the bottom of the cone or column. Press the mouse button and drag to reposition the object.

Creating stairs

Stairs are an object that contain one or more steps. The shape and size of a stairs object is determined by the location of its two top and two bottom connectors. Atmosphere Builder uses the distance, slope, and width between the top and bottom connectors to automatically determine the number, size, and shape of the steps.

After you add a stairs object, you can drag one or more of its connectors to reshape it. For example, you can create a spiral staircase by dragging one of the top or bottom connectors to form a twist in the stairs object. When you change the vertical or horizontal dimensions of a stairs object, Atmosphere Builder automatically adjusts the number and size of the steps. For example, if you reduce the vertical height, Atmosphere Builder automatically reduces the number of steps and increases the size of each step.



A. *Adjusting the vertical height of a stairs object in Side view.* ***B.*** *Adjusting the horizontal span of a stairs object in Side view.* ***C.*** *Adjusting the width of the steps in Top view.*

To add stairs:

1 Select the stairs tool ( ) in the Variable Tools palette.

2 If desired, set one or more options in the Object Inspector palette:

• Object Name to enter a name for the object that will appear in the Object Inspector palette and the Objects palette.

• JavaScript URL to attach a script to the object. (See “Attaching a script to a world” on page 61.)

• Visible in Wireframe Views to show the object after you create it. (See “Showing and hiding objects” on page 38.)

• Hide in Browser View to create a hidden object, such as a hidden luminous object. (See "Creating hidden luminous objects" on page 54.)

• Locked to lock the object. (See "Locking objects" on page 37.)

• Subtractive to use the object to cut through another object. (See "Creating openings in objects" on page 26.)

3 Click in the document window. If you're working in Top view, click where you want to locate the center of the stairs object. If you're working in Side view, click where you want to locate the third step from the bottom of the stairs object. If you're working in Isometric view, click where you want to locate the third step from the bottom of the stairs object. Hold down the mouse button and drag to reposition the object.

To change the vertical height or horizontal span of stairs:

1 Select Top view.

2 In the Tool Inspector palette, choose Connectors for the Select option.

3 Select the select tool (), and click away from the stairs object if it's currently selected.

4 Press Shift and select the two connectors at the end of the stairs object you want to change.

5 Select Side view. Although you can change the size in any view, the vertical height and horizontal span are easier to see if you work in Side view with the connectors already selected from Top view.

6 Do one of the following:

• To change the vertical height, Shift-drag the selected connectors up or down.

• To change the horizontal span, Shift-drag the selected connectors to the right or left.

To change the width of stairs:

1 Select Top view.

2 In the Tool Inspector palette, choose Connectors for the Select option.

3 Select the select tool ().

4 Do one of the following:

• To make each step the same width, Shift-drag the two connectors at the side of the stairs object.

• To make the top and bottom steps a different width, drag each of the connectors at the top or bottom step. Atmosphere Builder automatically adjusts the width of each step between the top and bottom step.

To change the shape of a stairs object:

1 Select Top view or Isometric view. Although you can change the shape of a stairs object in any view, a twisted shape is easier to see if you work in Top view or Isometric view.

2 Select the select tool ( ).

3 Select one connector at the end of the stairs object you want to twist.

4 Drag the selected connector in the direction you want to move it.

Combining objects

With the constructive solid geometry features in Atmosphere Builder, you can combine two or more objects to create a new object. There are three modes for combining objects:

Union Creates a composite object. This is the default mode for combining objects.

Intersection Creates an object from the junction of two or more objects.

Subtraction Creates openings in objects.

Creating an object from a union

By selecting the Connect Objects option in the Tool Inspector palette, overlapping objects can be combined to create a composite object. For example, you can combine a column, cone, and floor object to create an airplane. The resulting object has a smooth surface, as if a skin has been stretched over it.

Creating an object from an intersection

You can create a new object based on the intersecting area of two or more objects in a group. You start by creating a composite object and grouping it together. Then, you select the Junction option for the group. For example, you can create an elliptical-shaped object by intersecting two columns.

To create an object from an intersection:

1 Create and place individual objects to form an intersection.

2 Select all of the objects, and choose Object > Group.

3 Select the group.

4 In the Object Inspector palette, select the Junction option.

5 Select the Browser view to see the resulting object.

Creating openings in objects

You can create openings in objects, such as doors or windows, using subtractive objects. You first define the volume of the opening by creating an object or a group of objects. Then in the Tool Inspector, select the Subtractive option for the object or group. When an object or group has the Subtractive option selected, its volume is subtracted or cut out of the object or group it intersects.

To avoid cutting out other objects, group the subtractive object with the objects that you want it to cut out. If you don't group a subtractive object, it affects all other objects in the world. For example, if you want to place a flower vase in a window opening, group the subtractive box object with a wall object. Then, when you position the flower vase object within the window opening defined by subtractive box, the vase is not affected because it isn't in the same group as the subtractive box.

To create an opening in objects:

1 Create an object to use as an opening. You can also create a group of objects to use as an opening.

2 Select the object or group of objects.

3 In the Object Inspector palette, select the Subtractive option.

4 Select the subtractive object, along with the objects from which you want to subtract it, and choose Object > Group.

5 Select Browser view to see the resulting object.

Note: *You can't set the Subtractive option on entry point objects and portal objects.*

Exporting and publishing objects

You can export any object or group of objects and use them in other worlds. By exporting the objects you frequently use, you can create object libraries that save you time when building new worlds. For example, you can create a library of objects that you use for building a room.

The Export Objects command doesn't change the location of any related texture files that have been applied to the exported object. If you want to save the exported object to another folder or location, use the Publish Objects command to move it and its related textures together. Otherwise, you might lose track of the textures used by the exported object.

Note: *You can only export objects in the native Atmosphere format, which means that you can only import them into other Atmosphere worlds.*

To export an object:

1. Select the object or group of objects you want to export.
2. Choose File > Export Objects.
3. Enter a name, and click Save.

To publish an object:

1. Select the object or group of objects you want to publish.
2. Choose File > Publish Objects.
3. Locate and open the folder where you want to publish the object and textures.
4. Enter a name, and click Save.

Working with Objects

About working with objects

Once you get the hang of working with objects, building a world is easy. Even in a complex world, you can use different techniques to simplify the workflow. For example, you can use the Objects palette to view all the objects in a world (see "Using the Objects palette" on page 29). You can connect objects to each other to make resizing a structure easier (see "Aligning and connecting objects" on page 34). You can lock objects, hide objects, create hierarchies, and apply transformations.

Some people prefer to build a world methodically, others dynamically. Atmosphere Builder facilitates many work styles, so experiment and find the techniques that work best for you.

Using the Objects palette

Working in a world becomes more complex as you add objects to it. Objects may overlap each other, making them difficult to select. In addition, identifying objects becomes a challenge. For example, if you have ten box objects in a world, how do you tell which one is a table and which one is a chair? This is where the Objects palette comes into play.

The Objects palette lists all of the objects in a world and provides an easy way to select and name objects. For example, you might create a group called "Dining Room" that contains all of the objects you want to add to a dining room, such as a table, chairs, paintings, and so on. The relationship between objects and groups is called a *hierarchy*. A hierarchy adds structure to the objects in a world and makes arranging and manipulating objects much easier. For more information on creating groups, see "Grouping objects" on page 36.

To display the Objects palette:

Choose Window > Objects.

To expand or collapse a group in the Objects palette:

Click the plus icon (⊞) to the left of the group name.

Using the Tool Inspector palette

The Tool Inspector is a context-sensitive palette that displays options for the currently selected tool in the Tools palette. Some tools do not have options, in which case the Tool Inspector palette is empty.

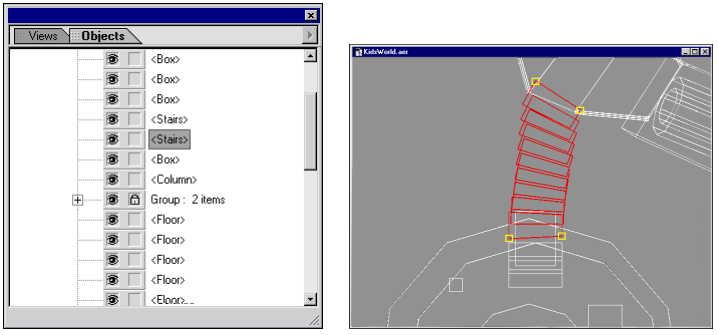
To display the Tool Inspector palette:

Choose Window > Tool Inspector.

Selecting objects

Before you can work with an object, you must select it. Selecting allows you to make changes to an object without affecting the other objects in the world. When an object is selected, you can move it, rotate, it, edit its properties, and so on.

There are two methods for selecting objects and groups of objects. You can use the select tools to select objects directly in the document window by clicking or dragging. Or you can use the Objects palette to select an object or group based on its name and position in the world hierarchy.



Object selected in Objects palette, and corresponding object in Top view.

Using the select tools

You can select objects, groups, and connectors with the following tools:

- The select tool lets you select entire objects or groups.
- The group select tool lets you select an individual object within a group, a single group within multiple groups, or a set of groups within the framework.

To select a single object or connector:

1 Select the select tool ( ) or the group select tool ( ).

2 In the Tool Inspector palette, specify the selection type:

• Objects to allow the selection of objects or groups only. This option prevents the selection of connectors.

• Connectors to allow the selection of connectors only. This option prevents the selection of objects and groups.

3 Do one of the following:

• Click the object or connector you want to select.

• Drag a marquee border around the object or connector you want to select.

Note: *When you click to select an object, either the object or its connectors are selected, but not both at the same time. When you drag a marquee to select an object, both the object and its connectors are selected at the same time.*

To select grouped objects:

1 Select the select tool ( ).

2 In the Tool Inspector palette, make sure that the Objects mode is chosen from the Select menu.

3 Click or drag a marquee border around the grouped object you want to select.

To select multiple objects, groups, or connectors:

Do one of the following:

• Shift-click additional objects, groups, or connectors.

• Drag a marquee border around the objects, groups, or connectors you want to select. If there are undesired objects overlapping the objects you want to select, hold down Ctrl and drag a marquee around the desired objects. The Ctrl key prevents you from selecting objects that are located where you first click to begin dragging the marquee.

To select objects based on their hierarchy:

1 Use the group select tool ( ) to select any object.

2 Ctrl-click to select all remaining objects in the current group. Each additional Ctrl-click selects all objects in the next group in the hierarchy.

Selecting objects in the Objects palette

The Objects palette lists all the objects in an Atmosphere world. Using the Objects palette to select objects is very convenient when you have overlapping objects, because underlying objects can be difficult to access with select tools. For more information on using the Objects palette, see "Using the Objects palette" on page 29.

To select an object or group in the Objects palette:

Click the name of the object or group in the Objects palette. If necessary, click the plus icon ( ) to the left of the group name to view its contents.

Deselecting objects

You can deselect one object or connector at a time, or all selected objects and connectors at once.

To deselect objects or connectors:

Do one of the following:

- To deselect part of a selection, Shift-click the object or connector you want to deselect.
- To deselect everything in the world, click or drag away from any object.

Viewing selected objects

When working with objects, it can be very useful to view a specific area of the wireframe. You can maximize your view of the selected objects in a world using the Fit Selected command.

To maximize your view of selected objects:

Choose View > Fit Selected.

Moving objects

The composition of a world depends on the position of objects relative to other objects. You can reposition objects by dragging them to a different location in the document window.

To move an object or group:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select the object or group you want to move. (See "Selecting objects" on page 30.)

3 With the select tool ( ) or the group select tool ( ), drag the object to the desired location. Be sure not to drag the object by one of its connectors, because you will resize the object rather than moving it.

Use the Snap to Grid option to align an object with a grid when you drag it. (See "Working with the grid" on page 35.)

Deleting objects

You can delete an object to remove it permanently from the world.

To delete an object or group:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select the object or group you want to delete. (See "Selecting objects" on page 30.)

3 Choose Edit > Clear.

Duplicating objects

Duplicating an object adds an exact copy of the object, or group of objects, to the world a short distance below the original object.

To duplicate an object or group:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select the object or group you want to duplicate. (See "Selecting objects" on page 30.)

3 Choose Edit > Duplicate.

Aligning and connecting objects

After adding objects to a world, you can connect the objects. Connected objects are bound together as if nailed or bolted. When you drag an object that is connected to another object, the objects move together as a unit or change their shape as necessary. If you drag one of their common connectors where the objects are joined, the shapes of both objects will change. (See "About building worlds" on page 11.)

Connecting and disconnecting objects

You can connect two objects by moving a connector on one object to a connector on the other object, or by moving one object close to the other object until their connectors are aligned.

To connect two objects:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select the select tool ( ) or the group select tool ( ). In the Tool Inspector palette, make sure that the Connect Objects option is selected. This option controls Atmosphere Builder's ability to connect objects to each other.

The Closeness setting determines the snapping properties of the connectors.

3 Do one of the following:

• Drag a connector on one object to a connector on the object that you want to connect to. Drag the remaining connectors as necessary to fully connect the two objects.

• Drag one object to another object until their connectors are aligned when viewed from all angles.

As you drag the object, each connector displays a faint yellow halo. The yellow halo indicates the area where a connector will snap to another connector. The size of the yellow halo can be adjusted in the Tool Inspector palette by entering a radius value in the Closeness text box. See"Adjusting the minimum distance required to connect objects" on page 35.

If you align two connectors but can't get them to snap together, the connectors may not be at the same depth in your world. Switch to a different view to make sure that the connectors line up in all three dimensions.

To disconnect objects:

1 Select the object you want to disconnect in a wireframe view.

2 Select either the select tool ( ) or the group select tool ( ).

3 In the Tool Inspector palette, deselect Connect Objects. When this option is deselected, you can disconnect objects that were previously connected.

4 Drag one of the objects away from the other object.

Working with the grid

You can use an invisible background grid to help you position and align objects in a world.

To snap objects to the grid:

1 Select the select tool ( ) or the group select tool ( ).

2 In the Tool Inspector palette, select Snap to Grid.

To adjust the grid size:

1 Select the select tool or group select tool.

2 In the Tool Inspector palette, specify a value for Spacing. The lower the Spacing value, the smaller the grid.

Adjusting the minimum distance required to connect objects

The Closeness option in the Tool Inspector palette lets you specify how close you must move a connector to another connector before it connects the two objects.

To adjust the minimum distance required to connect objects:

1 Select the select tool ( ) or the group select tool ( ).

2 Make sure the Connect Objects option is selected in the Tool Inspector.

Selecting the Connect Objects option causes a faint yellow halo to appear at the connectors when you move an object. This yellow halo indicates the area of the minimum distance required to connect objects.

3 In the Tool Inspector palette, enter a value for Closeness. This value specifies the radius of connectivity (the minimum distance required for one connector to snap to another). The lower the closeness value, the smaller the yellow halos are around the connectors of the object you're moving. You must move a connector closer to another connector in order to connect the objects.

Grouping objects

Grouping lets you control a set of objects as a single unit. When you manipulate a group, all of the objects are equally affected. For example, if you resize a group, all of the objects change in size. In addition, grouping lets you maintain the spatial relationships between objects. For example, if you rotate a group, all of the objects are rotated around the same axis.

To group objects:

1 Select the objects you want to group. Be sure you select the object and not the object's connectors. (See "Selecting objects" on page 30.)

2 Choose Object > Group.

If you're not sure if an object is part of a group, view the hierarchy in the Objects palette. (See "Using the Objects palette" on page 29.)

To ungroup objects:

Select the objects you want to ungroup, and choose Object > Ungroup.

To create a new group:

Choose Object > New Group. The new group appears in the Objects palette.

To add objects to an existing group:

1 Select the group to which you want to add objects.

2 Choose Object > Activate Group.

3 Create new objects as desired. The objects are added to the active group.

Locking objects

You can prevent accidental changes to objects or groups by locking them. You might want to lock finished objects in a complex wireframe that are near or above other unfinished objects. After you lock an object or group, you can't select it with the select tools or make any direct changes to it in the wireframe views. You can, however, select Browser view and change the texture of a locked object or group.

Although you can't select an entire locked object with the select tools, you can select the connectors for locked object and resize it. Or if you change other objects connected to a locked object or group, the locked object or group can change its size, shape, and location.

To lock an object or group:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select the object or group you want to lock. (See "Selecting objects" on page 30.)

3 Do one of the following:

• In the Object Inspector palette, select Locked.

• In the Objects palette, click the button to the left of the object name or group name.

When a group or object is locked, a lock icon ( ) appears. Locking a group locks all of the subgroups and objects within it.

To unlock an object or group:

Select the object or group you want to unlock, and do one of the following:

• In the Object Inspector palette, deselect Lock.

• In the Objects palette, click the lock icon ( ) to the left of the object name or group name.

To lock all unselected groups or objects:

Choose Object > Lock Others.

To unlock all groups and objects:

Choose Object > Unlock All Objects.

Showing and hiding objects

You can hide an object or group to make it easier to work in a crowded area.

To hide an object or group:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select the object or group you want to hide. (See "Selecting objects" on page 30.)

3 Do one of the following:

• In the Object Inspector palette, deselect Visible in Wireframe Views.

• In the Objects palette, click the eye icon ( ) to the left of the object name or group name.

To hide all unselected groups and objects:

Choose Object > Hide Others.

To show all hidden objects:

Choose Object > Show All Objects.

To show a hidden object or group:

In the Objects palette, click the visibility column button to the left of the object name or group name. When a group or object is showing, an eye icon ( ) appears in the visibility column.

Resizing objects

You can change the shape and size of an object by dragging its connectors. In addition, you can set the thickness of some objects—such as floors, polygonal floors, slabs, and walls—in the Object Inspector palette.

To resize an object:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select the select tool ( ) or the group select tool ( ).

3 Drag a connector on the object to change the size or shape of the object. If you select more than one connector on an object, the orientation and length of the lines between the selected connectors become fixed. Shift-drag the selected connectors to move them together as a unit.

To change the thickness of an object:

1 Select the floor, polygonal floor, slab, or wall object you want to change.

2 In the Object Inspector palette, enter a value in the Thickness text box, or use the Thickness slider to adjust the current value.

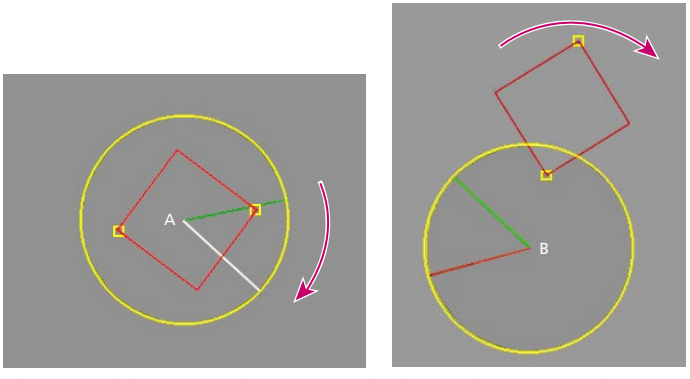
Transforming objects

If an object is the wrong size or in the wrong position, it won't look right in your world. To get the right look, you may need to scale, rotate, or distort objects. These kinds of operations are called *transformations*.

About transformations

The transformation tools let you change the orientation, scale, or shape of objects. As you transform objects, keep the following in mind:

• The transform object tool and the rotate object tool perform their transformations in relation to a fixed point on or around the object. This fixed point is called the *point of origin*. The point of origin is wherever you click in the wireframe after selecting the transform object tool or the rotate object tool.



Object rotated from a point of origin inside the object, and object rotated from a point of origin outside the object

• You can undo all of the transformations that you applied to an object or group with the transform object tool or rotate object tool. (You can only undo the transformations you did with these two tools.)

Rotating objects

Rotating an object turns it around a fixed point that you specify with the rotate object tool.

To rotate an object or group:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select the object or group you want to rotate. (See "Selecting objects" on page 30.)

3 Select the rotate object tool ( ).

4 Click once to set the point of origin around which you want to rotate the object. For finer control, click inside or close to the object. A yellow circle appears around the point of origin.

5 Drag the pointer towards the outside of the circle until a red line and a green line appear.

6 Drag in the direction you want to rotate the object. As you drag, the green line moves around the circle to indicate the amount of rotation. The red line remains fixed and indicates the original orientation of the object. You can cancel the rotation by dragging the pointer back inside the yellow circle.

7 When the object is rotated to the desired position, release the mouse button. Or, you can undo the rotation by dragging the pointer within the circle before releasing the mouse button.

Scaling and distorting objects

Scaling an object enlarges or reduces it horizontally (along the x axis), vertically (along the y axis), or both horizontally and vertically relative to the point of origin. The point of origin is wherever you click in the wireframe after selecting the transform object tool. You can also distort the object by changing its shape and size in any direction.

To scale or distort an object or group:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select the object or group you want to scale or distort. (See "Selecting objects" on page 30.)

3 Select the scale objects tool ( ).

4 Do one of the following:

• To scale or distort the object without moving it, click in the center of the object. A yellow circle appears where you clicked.

• To scale or distort the object and move it away from a specific location at the same time, click that location.

5 Drag the pointer toward the outside of the circle until a green line appears.

6 Do one of the following:

• To enlarge the object both vertically and horizontally, drag away from the center of the circle. To reduce the object both vertically and horizontally, drag toward the center of the circle.

• To enlarge the object along one axis only, Shift-drag away from the center of the circle along that axis. To reduce the object along one axis only, Shift-drag toward the center of the circle along that axis.

• To enlarge and distort the object both vertically and horizontally, Ctrl-drag in any direction away from the center of the circle. To reduce and distort the object both vertically and horizontally, Ctrl-drag in any direction toward the center of the circle.

7 When the object is scaled or distorted as desired, release the mouse button.

Undoing transformations

Atmosphere Builder saves the original size, shape, orientation, and location of the objects before the transformations. When you clear transformations, Atmosphere Builder restores the object or group to its original dimensions and position.

To undo transformations to an object or group:

1 Select an object or group.

2 Choose Edit > Clear Transform.

Adding Textures and Colors

About surface textures and colors

In an Atmosphere world, you can add textures and colors to the objects you create to make them look as real (or unreal) as you want. Applying a texture adds a 2D image to the surface of a 3D object, giving the appearance that the object is composed of the material in the texture image. Applying an RGB value creates a solid-colored object.

Before and after applying a surface textures in Browser view.

Creating surface textures

A surface texture can be any image that is saved in a GIF, JPEG, or PNG file. It can be a scanned photograph or a bitmap image created inside a graphics application such as Adobe Photoshop. When you apply a texture to a surface, Atmosphere Builder tiles the texture using the scale and rotation values that you specify. Tiling is the process of repeating a texture to fill up a surface area. Tiling in Atmosphere Builder uses the same concept of tiling in the real world, where tiles are placed edge-to-edge until they fill the desired area.

How you plan to use a surface texture will determine the characteristics of the source image:

• If you're creating a texture that will be tiled, keep the image size and file size small, and try to create a seamless texture. A seamless texture is an image whose top edge precisely matches its bottom edge, and whose left edge matches its right edge. When the texture is tiled on a surface, no seam is visible between tiles. There are different techniques for creating seamless textures. For example, you can use the cloning brush in Photoshop to create a seamless texture. Refer to your image editing application's documentation for more information.

• If you're creating a texture that will not be tiled, image size and resolution are more important. Make sure the source file has enough resolution to display the texture image on the surfaces at the desired size—the more pixels, the bigger the image. For example, if you're creating an image that you plan to use as a painting, you may want to create several versions of the image at different resolutions to see which works best in your world.

Importing textures

Before you can apply a texture to an object, you must either import it from a GIF, JPEG, or PNG file, or copy a texture that has already been applied to an object. Imported and copied textures appear in the Variable Tools palette when you are in Browser view. Imported textures remain in the Variable Tools palette until you exit Atmosphere Builder.

Atmosphere Builder provides two modes for applying textures. The mode of a texture is determined be the import command you choose—Import Textures or Import Anchored Textures:

• When you import a texture using the Import Textures command, you can adjust the scale and rotation of an applied texture without changing other applications of the texture. For example, if you apply the same texture to three cubes in a world, you can reduce the scale of the texture on the first cube without affecting the scale of the texture on the other cubes.

• When you import a texture using the Import Anchored Textures command, you can adjust the scale and rotation of all applied textures by changing one application of the texture. In addition, anchored textures produce a continuous pattern on the surfaces to which they are applied. Choose Import Anchored Textures if a texture has a strong pattern and you want to create a seamless texture over multiple surfaces. For more information, see "Working with anchored texture objects" on page 50.

To import a texture:

1 Select Browser view.

2 Do one of the following:

• Choose File > Import Textures.

• Choose File > Import Anchored Textures.

3 Select one or more textures you want to import. A texture must be a GIF, JPEG, or PNG file.

4 Click Open.

To copy a texture from a surface:

1 Select Browser view, and use the move tool ( ) to navigate to the surface you want to work with.

2 Select the get texture tool ( ), and click the surface.

You can create multiple variations of a texture in the Variable Tools palette by importing or copying a texture multiple times, and then setting different properties for each texture. (See "Editing textures" on page 46.)

Applying textures

You can apply a texture to an entire object or a single face of an object. Textures are cumulative—they overlay, rather than replace, the previous surface.

To apply a texture:

1 Select Browser view, and use the move tool ( ) to navigate to the object you want to work with.

2 Select a texture in the Variable Tools palette.

3 In the Object Inspector palette, choose an option from the Apply To menu:

- Face to apply the texture to just one side or face of an object.
- Object to apply the texture to the entire object.

4 If desired, set additional texture options in the Object Inspector palette. (See "Editing textures" on page 46.)

5 Click the object or face that you want to apply the texture to in the document window.

Applying colors

You can apply an RGB color to the surface of an entire object or a single face of an object.

To apply a solid color:

1 Select Browser view, and use the move tool ( ) to navigate to the object you want to work with.

2 Select the paint bucket ( ) in the Variable Tools palette.

3 In the Object Inspector palette, choose an option from the Apply To menu:

- Face to apply the color to just one side or face of an object.
- Object to apply the color to the entire object.

4 In the Object Inspector palette, specify values for Red, Green, and Blue by dragging the color sliders or by entering numbers.

5 Click the object or face that you want to apply the color to in the document window.

To edit the color of an object or face:

1 Select Browser view, and use the move tool ( ) to navigate to the object you want to edit.

2 Select the edit texture tool ( ).

3 Click the object or face whose color you want to edit.

4 In the Object Inspector palette, specify values for Red, Green, and Blue by dragging the color sliders or by entering values in the text boxes.

Editing textures

The Object Inspector palette provides options for adjusting the scale and rotation at which Atmosphere applies a texture to an object. These options are important because they let you change a texture's characteristics without editing the texture file. You can set the characteristics of the texture in the Variable Tools palette or change the texture's characteristics for the selected object or face only.

Scaling modes

When editing textures in the Object Inspector, you have a choice of two modes for the Scaling Type—Pixel mode and Tile mode.

In Pixel mode, the physical size of an image is determined by the number of pixels—the more pixels, the bigger the image. In the Objects Inspector, the Scale values are the size of a single pixel, expressed in length units. The Offset values are specified in numbers of pixels.

In Tile mode, the physical size is independent of the number of pixels in the image. In the Objects Inspector, the Scale values are the size of the image, in length units. The Offset values are also measured in length units.

If you find that you're using different variations of a texture, you can add multiple versions of the texture to the Variable Tools palette, and then adjust the settings for each texture.

Scaling textures

A texture's scale is an important factor in creating realistic objects. For example, if you apply a brick texture to a wall, the size of the bricks should be proportional to the size of the wall. Or if you use a forest texture to create a natural environment, the trees should be proportional to the other objects in the world.

To specify texture scale in the Variable Tools palette:

1 Select Browser view.

2 Select the texture you want to scale in the Variable Tools palette.

3 In the Object Inspector palette, make sure the Scaling Type is set to the mode you wish to edit in. See "Scaling modes" on page 47.

4 Specify your scaling options by selecting:

• Scale with Object to have the texture scale proportionately when an object is scaled.

• Constrain Proportions to uniformly scale the U (horizontal) and V (vertical) texture coordinates together.

5 Specify a scale value by dragging the Scale U and Scale V sliders, or entering values in the Scale U and Scale V text boxes.

Note: *Changing the scale of a texture in the Variable Tools palette does not affect the scale of existing textures in a world.*

To scale a surface texture on an object or face:

1 Select Browser view, and use the move tool ( ) to navigate to the object you want to edit.

2 Select the edit texture tool ( ).

3 Click the object or face whose surface texture you want to edit.

4 In the Object Inspector palette, make sure the Scaling Type is set to the mode you wish to edit in. See "Scaling modes" on page 47.

5 Specify your scaling options by selecting:

- Scale with Object to have the texture scale proportionately when an object is scaled.
- Constrain Proportions to uniformly scale the U (horizontal) and V (vertical) texture coordinates together.

6 Specify a scale value by dragging the Scale U and Scale V sliders, or entering values in the Scale U and Scale V text boxes.

Rotating textures

Along with scale, a texture's orientation is an important factor in creating realistic objects. For example, when applying a brick texture to a wall, you probably want the bricks to run horizontally, rather than diagonally, along the wall. Or when applying a forest texture, the trees should be pointing up rather than down. Of course, you can also apply surface textures in different directions to create unexpected effects.

To specify texture rotation in the Variable Tools palette:

1 Select Browser view.

2 Select the texture you want to rotate in the Variable Tools palette.

3 In the Object Inspector palette, make sure the Scaling Type is set to the mode you wish to edit in. See "Scaling modes" on page 47.

4 Specify a value for Rotation by dragging the slider or by entering the value in the text box. The value you specify is the decimal representation of the degrees of rotation, where 90.00 is 90 degrees of rotation, and 180.00 is 180 degrees of rotation.

To rotate a surface texture on an object or face:

1 Select Browser view, and use the move tool ( ) to navigate to the object you want to edit.

2 Select the edit texture tool ( ).

3 Click the object or face whose surface texture you want to edit.

4 In the Object Inspector palette, make sure the Scaling Type is set to the mode you wish to edit in.

5 Specify a value for Rotation by dragging the slider or by entering the value in the text box. The value you specify is the decimal representation of the degrees of rotation, where 90.00 is 90 degrees of rotation, and 180.00 is 180 degrees of rotation.

Adjusting offset

A texture can be moved so its pattern wraps around an object or surface to produce the appearance you wish. For example, you may want to move the texture on a slab surface so a specific portion of the texture pattern is on the main horizontal surface, while the less aesthetic portion of the pattern wraps onto the side edge.

To specify texture offset in the Variable Tools palette:

1 Select Browser view.

2 Select the texture you want to scale in the Variable Tools palette.

3 In the Object Inspector palette, make sure the Scaling Type is set to the mode you wish to edit in. See “Scaling modes” on page 47.

4 Specify an offset value by dragging the Offset U (horizontal) and Offset V (vertical) sliders, or entering values in the Offset U and Offset V text boxes.

To offset a surface texture on an object or face:

1 Select Browser view, and use the move tool ( ) to navigate to the object you want to edit.

2 Select the edit texture tool ( ).

3 Click the object or face whose surface texture you want to edit.

4 In the Object Inspector palette, make sure the Scaling Type is set to the mode you wish to edit in. See "Scaling modes" on page 47.

5 Specify an offset value by dragging the Offset U (horizontal) and Offset V (vertical) sliders, or entering values in the Offset U and Offset V text boxes.

Working with anchored texture objects

An anchored texture is projected onto the surfaces to which it is applied from a stationary position, or *anchor*. The first time you apply an anchored texture in a world, Atmosphere Builder creates an anchored texture object. You can change the position and orientation of this object to change the appearance of the texture in the world.

To change the position and orientation of an anchored texture object:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select the anchored texture object (). (See "Selecting objects" on page 30.)

3 Drag the anchored texture object to the desired position in the wireframe. Rotate the anchored texture object until it is pointing in the desired direction. (See "Moving objects" on page 33 and "Rotating objects" on page 40.)

4 Switch to Browser view to see how the texture is applied to surfaces in the world.

Viewing and updating the location of textures

Atmosphere Builder tracks each texture you import into a world as an independent file. This keeps the world file very small and improves performance in the Atmosphere Browser. However, it also means that texture files must stay in the same location relative to the world file. If you move the world file without moving its texture files, Atmosphere Builder can't display the objects in the world with surface textures. Instead, Atmosphere Builder approximates the hue of the missing surface texture with a solid color.

The URL text box in the Object Inspector palette indicates where Atmosphere looks for the texture file. If a surface texture for an object is missing, you can use the Browse feature to locate the texture file and update the path to it. You can also replace one texture with another texture by changing the specified path.

When you publish a world, Atmosphere Builder makes a copy of each texture file, places the texture files in the same folder as the world file, and updates the URL of each texture file to its new location. If you don't want the URL for a texture to be updated, you can select the Absolute Path option in the Object Inspector palette. This option is particularly useful if you want to include dynamic textures in a world. Because textures are fetched at runtime, if you update or replace a texture file on the Web server, users will see the new texture the next time the world is loaded. For more information on publishing worlds, see "Saving and publishing worlds" on page 8.

To view or update the location of an object's surface texture file:

1 Select Browser view, and use the move tool (✣) to navigate to the object you want to work with.

2 Select the edit texture tool ().

3 Click the object or face whose surface texture you want to view or update.

4 In the Object Inspector palette, update the referenced file by entering a new path in the URL text box or by clicking Browse and selecting a new file.

5 If you don't want Atmosphere Builder to update the path to the texture file when you publish your world, select Absolute Path. An absolute path must be the URL of a texture file on a Web server.

Rendering surface textures and colors

Rendering is the process of translating 3D data into pixels on your computer screen. The texture options in the Tool Inspector palette let you control how surface textures and colors are rendered in Atmosphere Builder. The Use Textures option determines whether surface textures and colors are displayed in Browser view. (Hiding textures and colors can help you see how lighting contributes to the world.) The Smooth Textures option determines whether texture quality is enhanced during rendering. Enabling the Smooth Textures option enhances the appearance of textures and reduces blockiness; however, it also increases rendering time.

Note: *These options do not affect how a world appears when viewed in the Atmosphere Browser—they apply only to the current Atmosphere Builder session. Selecting these options can also slow down rendering in Atmosphere Builder.*

To hide textures and colors in a world:

1 Select Browser view, and select the move tool ( ).

2 Deselect Use Textures in the Tool Inspector palette. Only the luminous surfaces in the world are displayed with textures.

To enhance texture quality:

1 Select Browser view, and select the move tool ( ).

2 Select Smooth Textures in the Tool Inspector palette.

Deleting surface textures

If you want to change an object's surface texture, you can simply apply a new texture over the existing one. Atmosphere Builder keeps track of all the textures for an object, but only displays the top-most texture. If you delete the top-most texture, you expose the one beneath it.

To delete a surface texture:

1 Select Browser view, and use the move tool ( ) to navigate to the object you want to work with.

2 Select the delete texture tool ( ).

3 Click the object or face whose surface texture you want to delete.

4 Continue clicking to delete underlying surface textures. When you delete all the surface textures, each face of the object is assigned a random color.

Adding Lighting

About lighting

When light rays strike an object in the real world, the object's surface reflects them. This reflected light is what enables us to see objects. The light an object reflects goes on to illuminate other objects. This effect is known as *radiosity*.

Atmosphere Builder's lighting environment is based on the real-world principle of radiosity. All surfaces in an Atmosphere world are either luminous (giving off light) or lit (receiving light). How much light a surface receives is based on all of the distributed light in the environment. With each lighting pass, the light reflected by surfaces is added to the lighting environment. As a result, lighting gets more subtle every time you apply it to a world.

Without realistic lighting your world will look flat and dull; with lighting your world gains depth and dimension.

Creating luminous surfaces

The first step in lighting a world is to create luminous surfaces. A luminous surface casts light onto the non-luminous surfaces around it.

About luminous surfaces

There are three types of luminous surfaces in Atmosphere Builder:

• The sky is the default luminous surface in a world. If you're building an enclosed structure, the sky becomes a visible light source when you create openings, such as doors and windows. The default color of the sky is light blue; however, you can change the color of the sky to any RGB value. (See "Applying colors" on page 46.)

• A visible luminous surface is a texture or RGB value that emits light and is visible in the world. For example, you can create a lamp that emits light.

• A hidden luminous object is an object that emits light but is not visible in the world. Hidden luminous objects give you more control over lighting in a world.

Creating visible luminous surfaces

A visible luminous surface can be a solid color or have a surface texture. Luminous surfaces (both colored and textured) remain visible when the lighting in a world is cleared. (See "Resetting lighting" on page 59.)

To create a visible luminous surface:

1 In Browser view, select the edit texture tool ( ).

2 Click the surface you want to make luminous.

3 In the Object Inspector palette, select Luminous.

Creating hidden luminous objects

A hidden luminous object is an object that emits light but is not visible in the world. When placing hidden luminous object, think of yourself as a lighting designer. In the real world, lighting designers use recessed lighting to provide light without drawing attention to the light fixture itself. Hidden luminous objects give you similar control over the lighting in a Atmosphere world.

For purposes of designing a world, you can choose to show hidden luminous objects in Browser view. This allows you to see exactly where the light sources are. However, hidden luminous objects are always invisible when viewing a world on the Web in the Atmosphere Browser. In addition, users never collide with hidden objects when navigating in a world.

To create a hidden luminous object:

1 In a wireframe view, create the object you want to make luminous. (See "Creating new objects" on page 13.)

2 Switch to Browser view, and apply the desired texture or color to the object you created in Step 1. (See "Applying textures" on page 45 and "Applying colors" on page 46)

3 Select the edit texture tool (), click the surface of the object to which you just applied the texture or color, and select Luminous in the Object Inspector palette.

4 Switch back to a wireframe view, and select the object you created in Step 1. Select Hide in Browser view in the Object Inspector palette.

To show or hide hidden luminous surfaces in Browser view:

1 In Browser view, select the move tool.

2 In the Tool Inspector palette, do one of the following:

- To show hidden objects, select Show Hidden Objects.
- To hide hidden objects, deselect Show Hidden Objects.

Editing luminous surfaces

You can change the quality of light that a luminous surface emits by editing its color and by amplifying its brightness.

Changing the color of luminous surfaces

The color of a luminous surface determines the color of the light that it emits. The sky, which is the largest luminous surface in a world, is blue by default; however, you can change the color of the sky to any RGB color. Likewise, you can apply a color or texture to hidden luminous surfaces using the edit texture tool.

To change the color of the sky:

1 In Browser view, use the move tool () to navigate until you can see the sky. If you're building an enclosed structure, this means that you must navigate to the outside of the structure.

2 Select the paint bucket ( ) in the Variable Tools palette.

3 In the Object Inspector palette, specify values for Red, Green, and Blue by dragging the color sliders or by entering numbers.

4 Click the sky to apply the color.

To apply a color or texture to a hidden luminous surface:

1 In Browser view, select the move tool ( ), and select Show Hidden Objects in the Tool Inspector palette.

2 Navigate until you can see the hidden luminous surface, and apply a color or texture to it. (See "Applying colors" on page 46 and "Applying textures" on page 45.)

Lighting a world

When you light a world for the first time, Atmosphere Builder calculates all of the distributed light in the world. How much light each non-luminous surface receives is based on its spacial relationship to luminous surfaces in the world. Non-luminous surfaces that are close to a luminous surface receive more light than those that are far away from a luminous surface. Lighting is assigned to surfaces using a *light map*. A light map is an RGB image of the lighting value for each unit of surface area in a world. This light map is imposed over the world's surface textures to create the appearance of light and shadows.

With each subsequent lighting pass, Atmosphere Builder recalculates the distributed light in the world. Surfaces that were previously unlit now reflect light—this reflected light, in turn, goes on to illuminate other surfaces in the world. To understand how Atmosphere Builder uses the principle of reflected light, imagine a room with one red wall, one green wall, and a white light in the center of the ceiling. During the first lighting pass, the red wall and the green wall are illuminated by the white light. During the second lighting pass, the light that is reflected by both walls is added to the distributed light in the world. The red wall receives green light and vice versa. Because of this, the lighting in the world becomes more subtle with each lighting pass.

Using the Lighting Control palette

The Lighting Control palette contains options for lighting a world. It also displays the number of faces that remain to be processed during a lighting pass and the percentage of pixels left to light in the currently-processing face.

To display the Lighting Control palette:

Choose Window > Lighting Control.

Applying lighting

Each time you apply lighting, Atmosphere Builder recalculates how much light non-luminous surfaces receive. You can apply lighting to a face of an object, an object, or every surface in the world. In addition, you can stop the lighting process at any time. These controls allows you to fine-tune the lighting in a world with precision. For example, you can queue up five lighting passes, and stop the lighting process when you are satisfied with the results.

To apply lighting to every surface in a world:

1 Select Browser view.

2 In the Lighting Control palette, click Add Lighting to Scene.

3 If desired, click Add Lighting to Scene multiple times to execute multiple lighting passes.

Atmosphere Builder creates a queue that lists each surface in a world, and adds additional lighting passes to the end of the queue. The Faces field in the Lighting Control palette displays the number of faces that remain to be processed at any time. The Pixels field in the Lighting Control palette displays the percentage of completed pixels in the currently-processing face.

To apply lighting to an object:

1 Select Browser view, and use the move tool ( ) to navigate until you can see the object you want to apply lighting to.

2 Select the light object tool ( ).

3 Click the object.

To apply lighting to a face:

1 Select Browser view, and use the move tool ( ) to navigate until you can see the face you want to apply lighting to.

2 Select the light face tool ( ).

3 Click the face.

If you use the light object tool or the light face tool while a lighting pass is in process, the object or face is processed first. This makes it possible apply lighting to key surfaces of a world at any point during a lighting pass.

To stop a lighting pass:

1 Select Browser view.

2 Click Stop Lighting in the Lighting Control palette.

Improving lighting quality in Browser view

A *light map* is an RGB image that is imposed over the world's surface textures to create the appearance of light and shadows. The Smooth Lighting Maps option in the Tool Inspector palette lets you control how light maps are rendered in Atmosphere Builder. Enabling the Smooth Lighting Maps option enhances the appearance and accuracy of light maps; however, it also increases rendering time.

Note: *This option does not affect how a world appears when viewed in the Atmosphere Browser—it applies only to the current Atmosphere Builder session. Selecting this option can also slow down rendering in Atmosphere Builder.*

To enhance lighting quality:

1 Select Browser view, and select the move tool (✣).

2 Select Smooth Lighting Maps in the Tool Inspector palette.

Turning lighting on and off

You can view a world with and without lighting. With lighting, the surfaces in a world display highlights and shadows; without lighting, the surfaces in a world appear exactly as they do in the texture file—flat and unlit. Turning lighting off can help you work with surfaces in dimly lit areas of a world.

Note: *You must apply lighting at least once before turning the lighting on and off has any effect.*

To turn lighting on and off:

1 Select Browser view, and select the move tool (✣).

2 In the Tool Inspector palette, do one of the following:

- To turn lighting on, select Use Lighting.
- To turn lighting off, deselect Use Lighting.

Resetting lighting

When you reset lighting, only the luminous surfaces in the world are visible. Keep in mind that resetting lighting is different than turning lighting off. Resetting lighting causes all the non-luminous surfaces in the world to become black; turning lighting off simply displays all surface textures without highlights and shadows. You can also think of resetting lighting in terms of applying black light to a world.

To clear lighting in a world:

1 Select Browser view.

2 Click Reset Lighting in the Lighting Control palette.

Removing light maps

You can return a world to its unlit state by removing its light maps.

To remove light maps:

1 Select Browser view.

2 Click Remove All Light Maps in the Lighting Control palette.

Creating effects with JavaScript

About working with JavaScript

If you know how to write JavaScript, you can add effects to your world using the Atmosphere JavaScript API (Application Program Interface). These effects can be simple or complex—ranging from adding a sound effect to creating an interactive animation. The possibilities are limited only by your ability to implement your ideas in JavaScript.

Keep in mind that this documentation doesn't explain how to write JavaScript code—you can find a wealth JavaScript resources on the Web and in print. This documentation does provide information about how to incorporate scripts into a world and gives you some ideas for what you can do with the Atmosphere JavaScript API. For more information, see the Atmosphere JavaScript API documentation. This documentation is installed with Atmosphere Builder and is accessible from the Atmosphere folder in the Windows Start menu.

Attaching a script to a world

You can attach a script to an object, a group of objects, or a whole world. If you attach a script to an object or group, you can use the keyword *this* to refer to the current object. Alternately, you can attach a script to the world and refer to objects by name. The world script is always run before any of the other scripts; therefore, you can use the world script to do initializations and provide methods that are required by other scripts.

To attach a script to an object or group:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select the object or group to which you want to attach the script.

3 In the Object Inspector palette, enter the location of the JavaScript source file in the JavaScript URL text box.

To attach a script to a world:

In the World Settings palette, enter the location of the JavaScript source file in the JavaScript URL text box.

Using the Atmosphere JavaScript API

The Atmosphere JavaScript API comprises a set of modules that cover a broad range of functionality—from adding buttons to the Atmosphere Browser to applying transformations to an object. The following topics describe some of the things you can do with the Atmosphere JavaScript API.

Note: *The Atmosphere JavaScript API is under continual development. For the most up-to-date information, see Atmosphere JavaScript API documentation. This documentation is installed with Atmosphere Builder and is accessible from the Atmosphere folder in the Windows Start menu.*

Adding sound

The Sound module provides methods and properties for implementing sound effects in a world. You can add both ambient and positional sounds to a world. An ambient sound is one that emanates from the entire world; while a positional sound is tied to a static or dynamic position in the world. For example, you can write a script that plays a creaking sound when a user navigates into a given position in the world.

Atmosphere supports WAV format and MP3 format for sound effects. For example, the following code adds a sound and defines its parameters:

```
sound = Sound("soundName.wave");
sound.volume = .5 // volume
sound.repeats=0 // loop sound
sound.active=true // turn sound on
```

For more information on the Sound module, see the Atmosphere JavaScript API documentation.

Adding fog

The FogModel module provides methods and properties for implementing fog effects in a world. Fog is an atmospheric effect that obscures objects in relation to the position of the user. For example, you can write a script that creates a greenish-gray fog that falls within 10 feet of the user's position.

Note: *In many cases, adding fog to a world slows down the rendering. However, in the case of highly complex worlds, it can speed up rendering if the far point of the fog (beyond which things are completely obscured) is close enough to cull out substantial portions of the world.*

For example, the following code defines the parameters for rendering with fog:

```
// Set the fog color to bluish white
fog.color =[0.5, 0.6, 0.8];
// Specify quadratic drop-off with distance
// This is softer than linear fog (1)
fog.dropOff =2;
// Set the distance away that fog starts
fog.near = 1.0
// Set the distance away that the fog becomes completely opaque
fog.far = 400.0
// Now make the fog appear
fog.active = true;
```

For more information on the FogModel module, see the Atmosphere JavaScript API documentation.

Adding buttons and sliders to the Atmosphere Browser

The Button and Slider modules provide methods and properties for adding controls to the Atmosphere Browser. These controls appear in the Controls panel of the Browser. Creating buttons and sliders allows you to add user-controlled interactivity to a world.

For example, the following code adds a toggle switch to control whether the scene uses fog and adds a slider to control the drop-off parameter of the fog:

```
if (hasModule("Button")) {
// Make a toggle to activate the fog
fogToggle = Toggle("Fog").add();
fogToggle.onClick = function(state) {
fog.active = state;
}
fogToggle.state = true;
// Now make a slider to control the drop-off parameter
fogDropOff = Slider("Fog DropOff").add();
fogDropOff.integersOnly = true;
fogDropOff.range = [0,2];
fogDropOff.onChange = function(val) { fog.dropOff = val; }
fogDropOff.value = fog.dropOff;
}
```

For more information on the Button module and the Slider module, see the Atmosphere JavaScript API documentation.

Getting feedback about user position and orientation

The Actor module provides methods and properties for getting feedback about user position and orientation. For example, you can write a script that executes an animation when a user navigates to a given position in the world.

For example, the following code tests the player to see if it is within 10 world units of a target vector. If so, it prints a message:

```
if (player.position.subtract(target.position).length < 10) {
chat.print("You are within ten feet of the target!");
}
```

For more information on the Actor module, see the Atmosphere JavaScript API documentation.

Printing in the chat window

The PrintDevice module provides methods and properties for printing text in the chat area of the Atmosphere Browser. For example, you can write a script that prints "Hello" when a user enters the world.

For more information on the PrintDevice module, see the Atmosphere JavaScript API documentation.

Working with objects

The WorldObject module provides methods and properties for getting information about objects in a world. The primary use of this module is to determine the location of objects in a world. For example, if you want the computer to play a sound when the user enters a room, you need to determine the location of the doorway. You can use the WorldObject module to find the location of the doorway and then compare it to the user's position.

To receive notification when a user control-shift-clicks or mouses over a particular object, use the onClick, onMouseOver, or onMouseOut callback in the WorldObject module..

For example, the following code fills the vector position with the position of the world object:

```
position = spiderWorldObject.position;
```

For more information on the WorldObject module, see the Atmosphere JavaScript API documentation.

Working with subworlds

A *subworld* is a world that is loaded into the parent world. For example, an avatar is considered a subworld. A subworld has the same functionality of a parent world, with the exception of users being able to navigate inside of it. In addition, subworlds can be moved around (or move themselves around) dynamically, whereas the parent world is static. Subworlds have their own scripting engine, which is in a separate name space from the scripting engine of the parent world.

The SubWorld module provides methods and properties for working with subworlds. For example, the following code adds a subworld that is set to be invisible but made active for collisions:

```
ghost = SubWorld("ghost.3da").add();
ghost.visible = false;
ghost.collide = 2; // Other objects collide with the ghost
```

For more information on the SubWorld module, see the Atmosphere JavaScript API documentation.

Working with Viewpoint content

Viewpoint content is a 3D scene saved in MTX format. An MTX file contains parameters describing the scene's 3D objects and the 3D scene itself. You can use MTX format to import objects (including animations) that you created in a third-party application into Atmosphere.

The ViewpointScene module provides methods and properties for interacting with Viewpoint content in a world. You can use this module to play a named animation (called a *time element*), to enumerate animations and *instances* (geometric components with associated transforms), and to get and set Viewpoint properties. For example, the following code attaches a script to the MetaObj in Atmosphere Builder, scales down the model by a factor of two, and starts the time element that controls walking:

```
// Scale down the model (i.e. geometric instance) called "BodyModel" by a factor of 2
this.scene.getInstance("BodyModel" ).scale = [0.5, 0.5, 0.5];
// Activate the animation called "Walking"
timeElem = this.scene.getTimeElem("Walking");
timeElem.start();
```

For more information on the ViewpointScene module, see the Atmosphere JavaScript API documentation. For more information about MTX format and the Viewpoint API, see the Viewpoint Web site at www.viewpoint.com.

Transforming objects

The Vector, Rotation, and Transform modules provide methods and properties for transforming subworlds and imported Viewpoint objects. You can use the Vector module to move (translate) objects, the Rotation module to rotate objects, and the Transform module to translate and rotate objects at the same time. For example, you can write a script that rotates a subworld around its y axis while moving the subworld to a different position in the world. Vector, Rotation, and Transform objects are values which you can query as well as apply, so they are useful for finding the current position or orientation of a subworld or Viewpoint object.

There is an important distinction between setting a position and orientation directly and using the moveTo() and rotateTo() functions. When setting the position variables the change happens at that time, and discontinuously. This is good for setting up the initial position of an object in a scene when it is loaded.

It is important to provide smooth motions between frames for the collisions to be computed correctly. This is achieved in the system using moveTo() and rotateTo() which smoothly transform the object between frames allowing for correct collisions with other objects in the scene. A moveTo() function schedules an update of the position but does not do the change at that time. For this reason the updated position can only be read-back during the next time step.

For example, the following code changes the position and orientation of a subworld named “table”:

```
// Set the position the first time
// Same as table.setPosition(30.0, 2.0, 0.0);
table.position = Vector (30.0, 2.0, 0.0);
table.orientation =Rotation('Y', firstAngle); // Rotate about the y axis
// From now on any position changes for table will collide with
// other objects and other objects will collide with it
table.collide = 3;
// Now schedule the smooth transition during the next time step
table.moveTo(Vector(31.0, 2.0, 0.0));
table.rotateTo(Rotation('Y', secondAngle));
```

For more information on the Transform, Vector, and Rotation modules, see the Atmosphere JavaScript API documentation.

Connecting Worlds, Users, and the Web

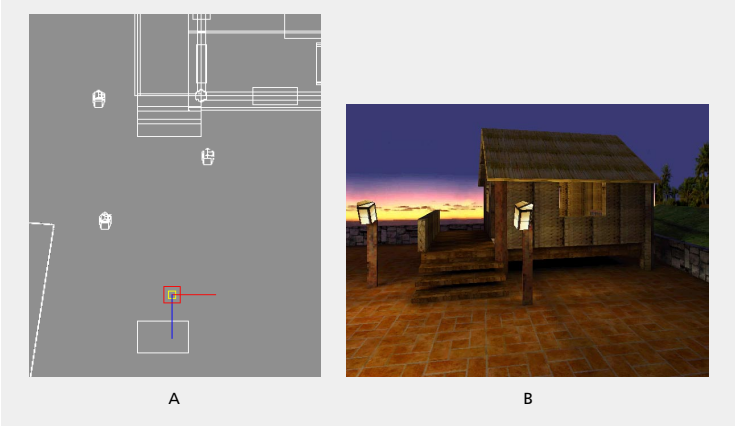
Creating gateways

Gateways let users move from one 3D world to another. A gateway consists of an entry point object and a portal object. An entry point specifies the point where users enter a world; a portal specifies where users exit a world.

Creating an entry point

When you publish a world, Atmosphere Builder establishes a default entry point based on your position and orientation in Browser view. For example, if you're standing in the middle of a room in Browser view, users will enter your world at the middle of that room. If you're facing to the right, users will enter your world facing to the right; if you're facing the left, users will enter your world facing to the left.

You can create additional entry points in a world using the entry point tool. An entry point object consists of a square, which determines the location of the entry point in a world, and a red line, which determines the initial point of view when users enter a world. Creating multiple entry points provides the potential for users to enter your world through different gateways.



***A.** Actor object **B.** Point of view from an entry point*

To create an entry point:

1 In Browser view, navigate to the position and orientation in which you want users to enter your world.

2 Select a wireframe view: Top, Side, or Isometric.

3 Select the entry point tool () in the Variable Tools palette.

4 In the Object Inspector palette, do the following:

• Enter text in the Entry Point Title text box to assign a name to the entry point. A portal references the entry point name in order to create a gateway between worlds.

• Click the Move to Viewer Location button. This establishes the location and orientation of the entry point object based on your current location and orientation in Browser view.

5 Click in the document window to create the entry point object. After you create an entry point, you can move it around like any other object. (See "Moving objects" on page 33.)

To edit entry point options:

1 In a wireframe view, select the entry point object. (See "Selecting objects" on page 30.)

2 Edit the options as desired in the Object Inspector palette.

To change the position and orientation of an entry point, first change your position and orientation in Browser view, and then click Move to Viewer Location in the Object Inspector palette.

Creating a portal

When you create a portal, you create a gateway for users to travel to another world. In order for the gateway to function, you must specify the URL of the world you want your portal to connect to. You can also specify the name of the entry point where you want users to enter the destination world. If you don't specify an entry point name, the portal connects to the default entry point in the destination world.

Creating portals is easy if you know the world URL and name of the entry point you want to connect to. But what if you don't know this information? Atmosphere Builder provides an easy way to deal with this situation. First, explore different worlds on the Web using Atmosphere Browser. When you find a world you want to create a portal to, create a bookmark. Then, import the bookmarks into Atmosphere Builder. A tool for creating a portal to each bookmarked entry point appears in the Variable Tools palette.

To create a portal using the portal tool:

1 Select a wireframe view: Top, Side, or Isometric.

2 Select the portal tool () in the Variable Tools palette.

3 In the Object Inspector palette, specify the entry point you want to link to in the Target World URL text box using the following format:

`http://server/world/world.3da#entry_point_name`

Important: *Use a pound character (#) to separate the URL and the entry point name. The entry point name must correspond to the Entry Point Title option for the entry point in order for the gateway to function. If no entry point name is specified, the portal connects to a default entry point in the destination world.*

4 Click in the document window to place the portal.

To create a portal by importing bookmarks:

1 Use Atmosphere Browser to explore different worlds on the Web. When you enter a world to which you want to add a portal, create a bookmark. A bookmark records the URL of the world and the name of the entry point you entered through.

2 In Atmosphere Builder, choose File > Import Bookmarks. A tool for creating a portal to each bookmarked entry point appears in the Variable Tools palette.

3 Select a portal tool in the Variable Tools palette, and click in the document window to place the portal.

To edit portal options:

1 In a wireframe view, select the portal object. (See "Selecting objects" on page 30.)

2 Edit the options as desired in the Object Inspector palette.

Creating links to Web sites

You can add hypertext links to a world using JavaScript.

To add a hypertext link to a world:

1 Create a text file that contains JavaScript code for creating a hypertext link. For example, the following script launches the Adobe Web site when a user clicks the object that it is attached to:

```
this.onClick=function(){
 launchURL("http://www.adobe.com");
}
```

2 In Atmosphere Builder, do one of the following:

• Select a wireframe view, and select an object to attach the script to. In the Object Inspector palette, enter the path to the JavaScript file you created in Step 1 in the Javascript URL text box.

• In the World Settings palette, enter the path to the JavaScript file you created in Step 1 in the Javascript URL text box. For more information on the World Settings palette, see "Administering worlds" on page 70.

Administering worlds

The World Settings palette contains options for administering a world. You can specify a name for your world, specify the occupancy limit, and set up chatting.

To display the World Settings palette:

Choose Window > World Settings.

Specifying a world's name and topic

Specifying a world's name and topic makes it easier for users to find and identify your world on the Web.

To specify a world's name and topic:

In the World Settings palette, specify values for the following options:

• World Name to specify a name for your world as you want it to appear in the title bar of a Web browser.

• Reference URL to allow all people to access to your world concurrently even if your world is mirrored on different servers.

Specifying the user count

The user count determines the occupancy limit for a world. When a world reaches the specified limit, a new instance of the world is created. To determine a reasonable user count, consider how much space your world encompasses. For example, if you created a large, expansive world, it's acceptable to allow 100 users to explore it at one time. However, if you created a small, intimate world, you probably want to limit the user count to a low number.

Important: *In the Beta version of Atmosphere Builder, User Count is hard-coded to 20 and cannot be changed.*

To specify the occupancy limit for a world:

In the World Settings palette, enter the maximum number of users in the User Count text box. A setting of 0 indicates no limit on the number of users.

Setting up chatting and community

As a Web site designer, you can use Adobe's community server to facilitate chatting. The community server also enables the display of avatars in a world. (See "About avatars" on page 73.)

To specify the community server for a world:

1 In the World Settings palette, enter the URL of the community server in the Server text box. The community server URL includes the following elements:

Protocol The protocol for the Adobe community server is YACP. As with the HTTP protocol, the YACP string is followed by :// (yacp://).

Server address The address for the Adobe community server is yacp://atmosphere.adobe.com. Use a forward slash (/) to separate the server address and the channel name.

2 If necessary, enter the primary location of your world in the Reference URL text box. The Reference URL is only entered for worlds that are mirrored on multiple servers and enables users to be in the same community space regardless of the server they used to access the world.

Embedding the Atmosphere Browser plug-in in a Web page

Atmosphere Browser is a plug-in viewer that enables users to view and navigate Atmosphere worlds in a Web browser. You can embed one or multiple plug-ins in a Web page by adding a few lines of code to an HTML file.

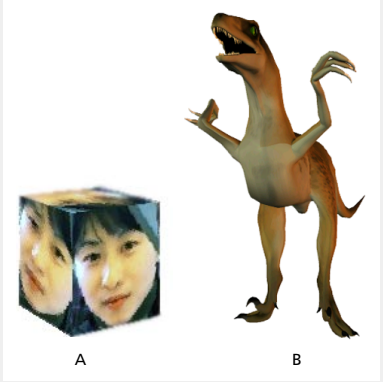
For complete information on how to embed the Atmosphere Browser plug-in in a Web page, see the README file in your Atmosphere installation folder.

Building Avatars

About avatars

When users enter a world that is connected to the Adobe community server, they are visible to each other in the form of *avatars*. Users can choose a standard avatar provided by Adobe or create their own avatar. You can also provide avatars to users by making them available on a Web server. To use an avatar, users specify the URL of the avatar in their Atmosphere Browser preferences.

An avatar can take any form you want it to. It can be a realistic human form or a simple shape—the only limit is your imagination. For example, you can create a simple avatar by creating a box object in Atmosphere Builder and applying a surface texture to it. Or you can create a complex avatar in a 3D modeling application.



An avatar represents a user in an Atmosphere world. ***A****. Avatar created in Atmosphere Builder.*
B. *Avatar created in a third-party application and exported in Viewpoint format.*

Creating avatars

You can model avatars in Atmosphere Builder or another 3D application; however, you must save avatars in Atmosphere format in order to use them in Atmosphere Browser.

To create an avatar:

1 Do one of the following:

• Create the avatar in Atmosphere Builder using basic primitives. Apply surface textures, colors, and lighting as desired.

• Create the avatar in a third-party 3D application, and save it in Viewpoint (MTX) format. Then import the Viewpoint object into Atmosphere Builder, and place it in a world. (See "Importing objects" on page 14.)

Note: *Some 3D applications let you directly export scenes to MTX format. If this is not the case with your 3D application, you can still create Viewpoint content by saving the avatar in MTS, OBJ, or ASE file and using the Viewpoint Scene Builder application to output an MTX file. For more information about creating Viewpoint content, see the Viewpoint Web site at www.viewpoint.com.*

2 Create an entry point object at the eye location for the avatar. (See "Creating an entry point" on page 67.)

The eye location determines the direction in which the avatar faces, as well as the vertical level at which users of the avatar view a world. If you don't establish an eye location using an entry point object, Atmosphere Builder establishes the eye location at the center of the avatar's volume and facing your current position in Browser view.

3 In Browser view, navigate until you are looking at the front of the avatar. If you switch back to a wireframe view, the Actor object should be pointing at the front of the avatar. The orientation of the Actor object indicator determines the direction that the avatar faces in a world. (See "Using the Actor object" on page 6.)

4 Choose File > Publish Objects. Enter a filename that includes the Atmosphere format extension, and click Save. Then place the avatar file on any Web server.

Making avatars available to users

You can make avatars available to users by placing them on any Web server. Keep in mind that you need to let users know the URL of the avatar file. One way to do this is to prepare a pre-entry Web page for your world that provides the information. Or you can add a link to such a Web page from inside the world. (See "Creating links to Web sites" on page 70.)

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