

Creating a Scene by Adding and Positioning Objects



What Will I Learn?

Objectives

- Identify scene components
- Define a gallery using Java programming terminology
- Define and provide examples of classes and instances
- Communicate the value of saving multiple versions of a scene
- Describe three-dimensional positioning axes
- Describe the difference between precise positioning and drag-and-drop positioning
- Use a one-shot procedural method to precisely position an object in a scene

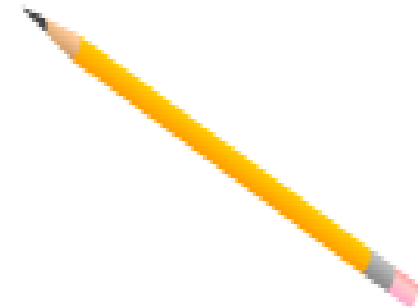


Why Learn It?

Purpose

Animations come to life when interesting objects are added to the scene. A very long time ago, professional animators would draw scenery with a paper and pencil. Setting up a single scene on paper could take hours—sometimes days.

Alice 3 provides tools to quickly set up a scene, so you can spend more time animating your objects.





Initial Scene

To create an animation you first create an initial scene.

The initial scene is the first scene in your animation where you set up your animation's objects and background template.

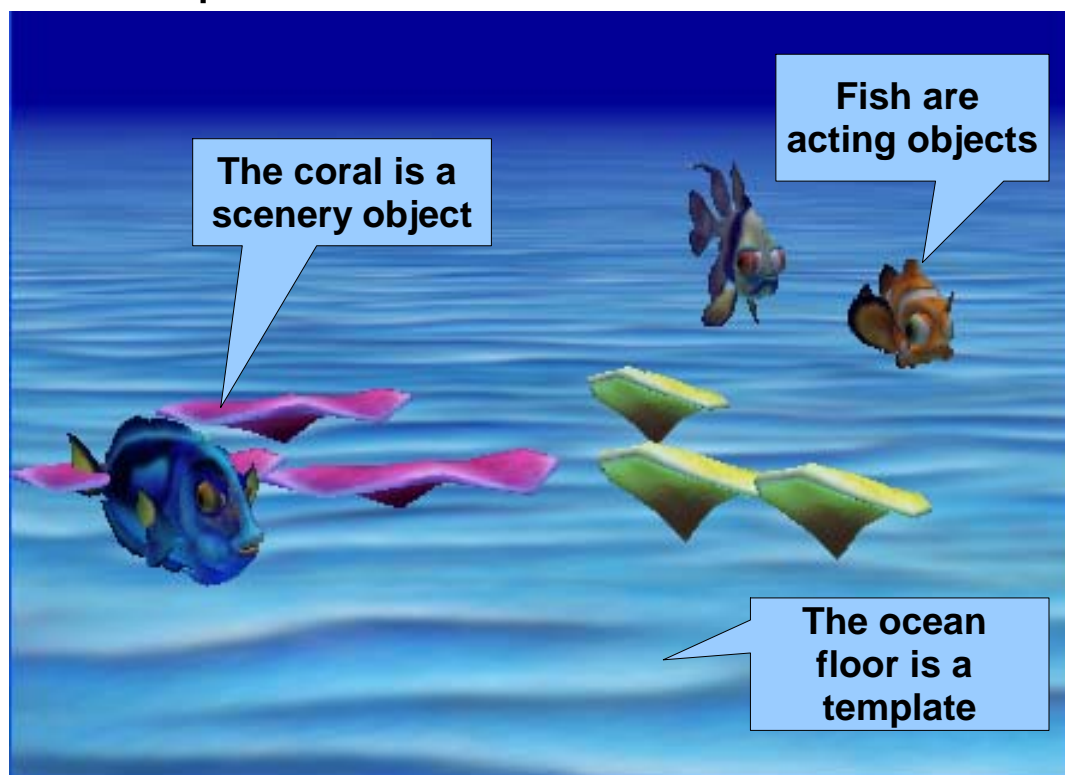
An initial scene has three components:

- Template that provides the sky, ground, and light
- Non-moving scenery object(s) that provide the setting
- Moving object(s) that provide the action

Initial Scene (cont.)

Example

Here are the components of an ocean floor scene.





Develop a Scene

Steps to develop an initial scene:

1. Create a new project and select a template.
2. Locate classes in the gallery.
3. Add instances of one or more classes to a scene.
4. Save the project.
5. Position the instances within the scene.



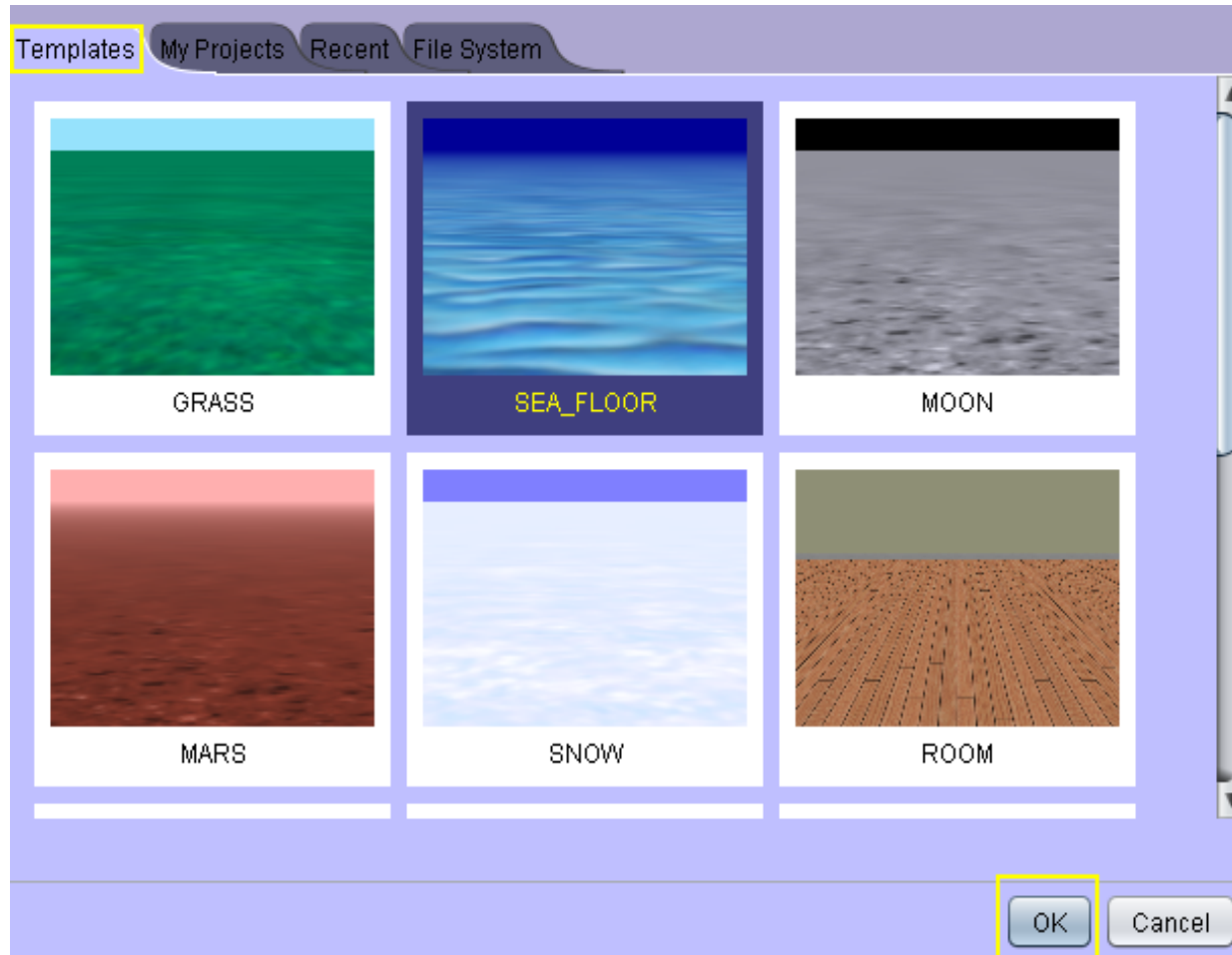
Step 1: Create a New Project

To set up an initial scene follow these steps:

1. Start Alice 3.
2. In the dialog box, select the Templates tab.
3. Select a template, then click OK.
4. In the File menu, select *Save As...*
5. Name the project.
6. Save the project.

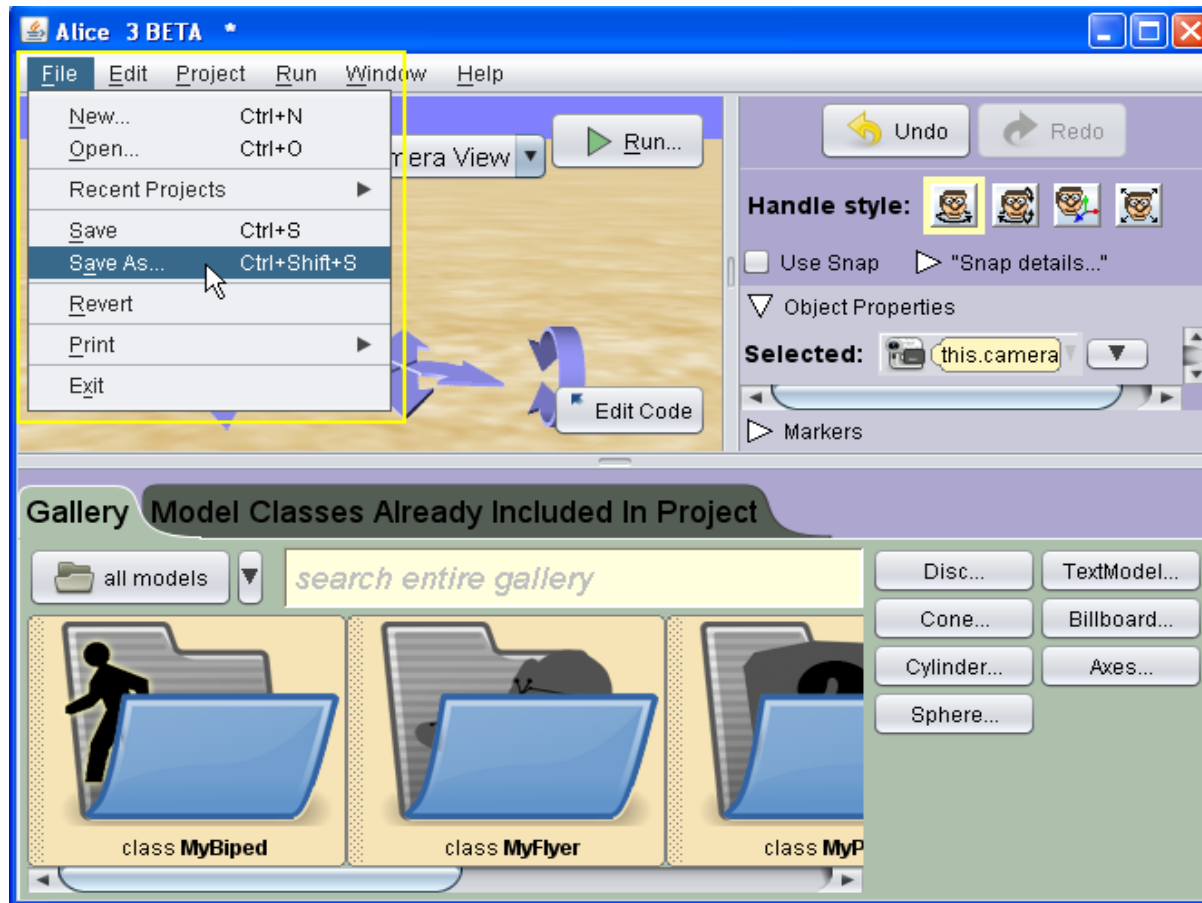
Step 1: Create a New Project (cont.)

Use this dialog box to select a Template.



🍏 Step 1: Create a New Project (cont.)

Use this menu option to save your project.





Step 2: Locate Classes

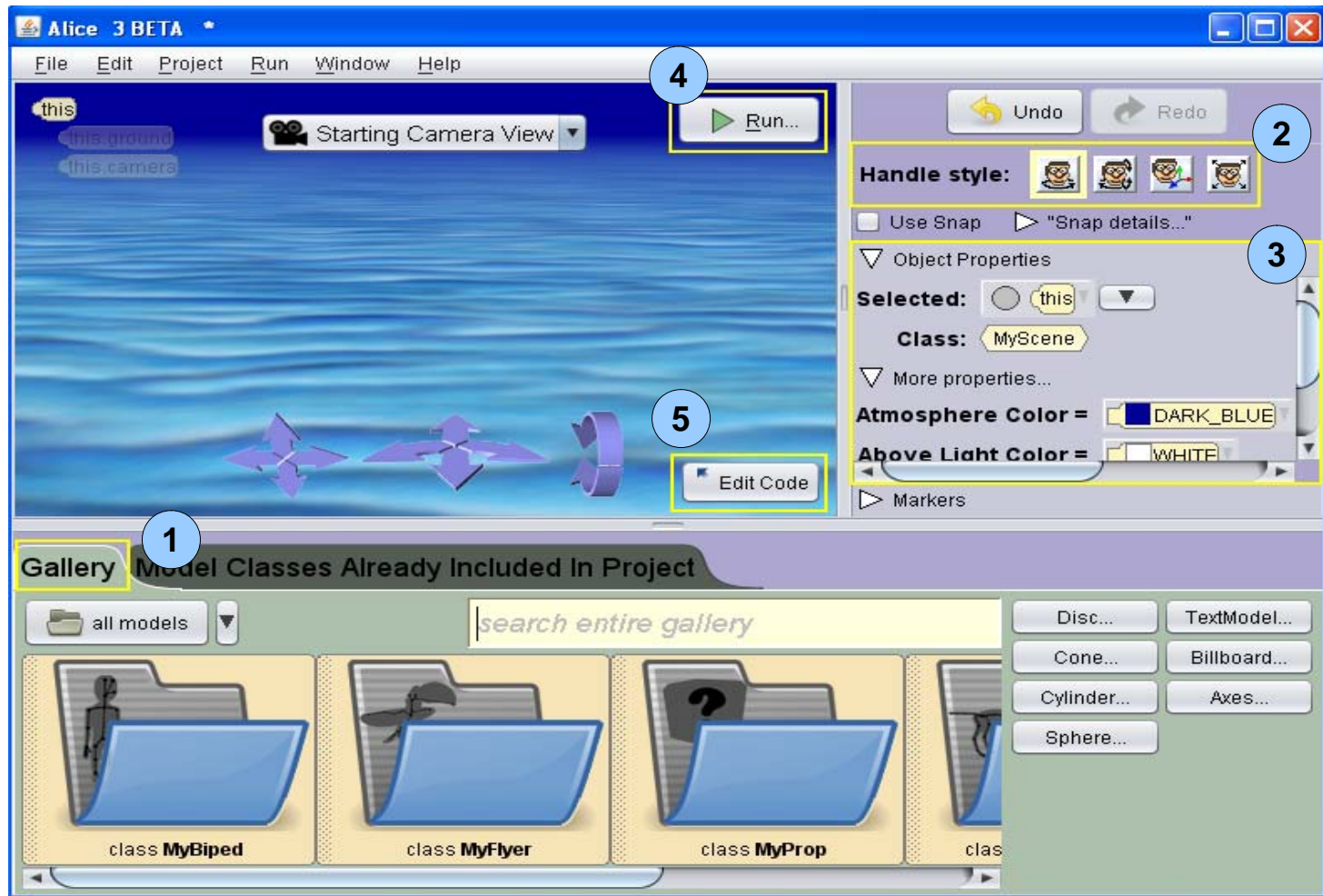
After a template is selected, the code editor is displayed (the default view). Use the Setup Scene button to switch to the scene editor as it contains the tools needed to edit your scene.

In the scene editor, you can:

1. Select objects to add to the scene from the gallery
2. Position objects in the scene using the Handles palette
3. Edit an object's properties using the Properties panel
4. Run (“play”) the animation
5. Access the Code editor

🍏 Step 2: Locate Classes (cont.)

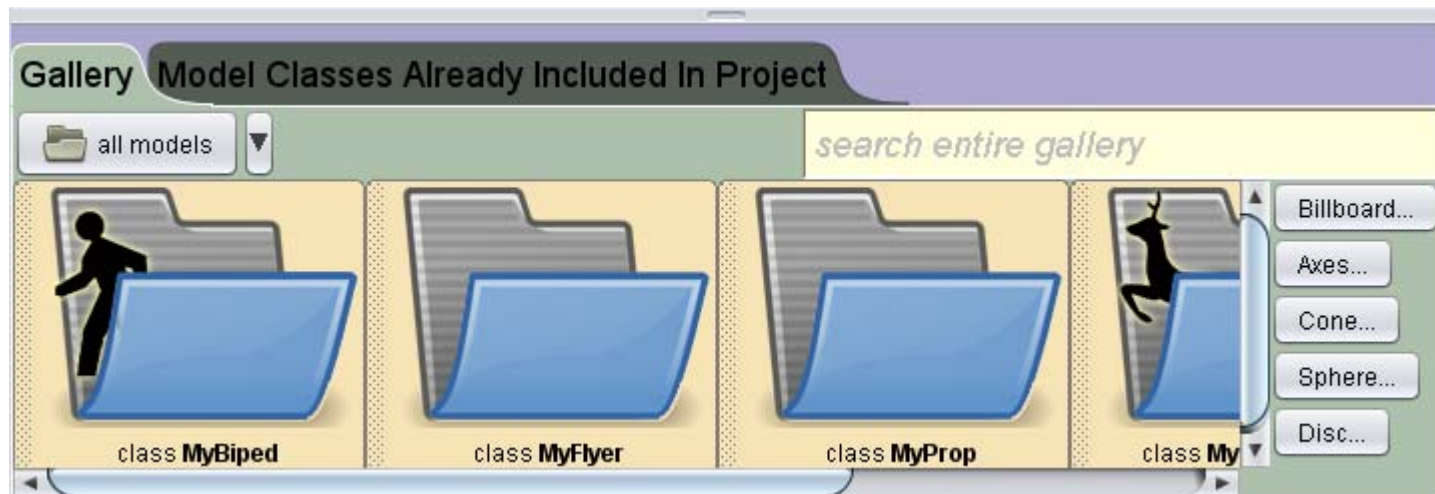
This is an example display of the Scene Editor.



Step 2: Locate Classes (cont.)

A gallery of classes is available with many objects you can add to your scene. You can browse folders or search by keyword.

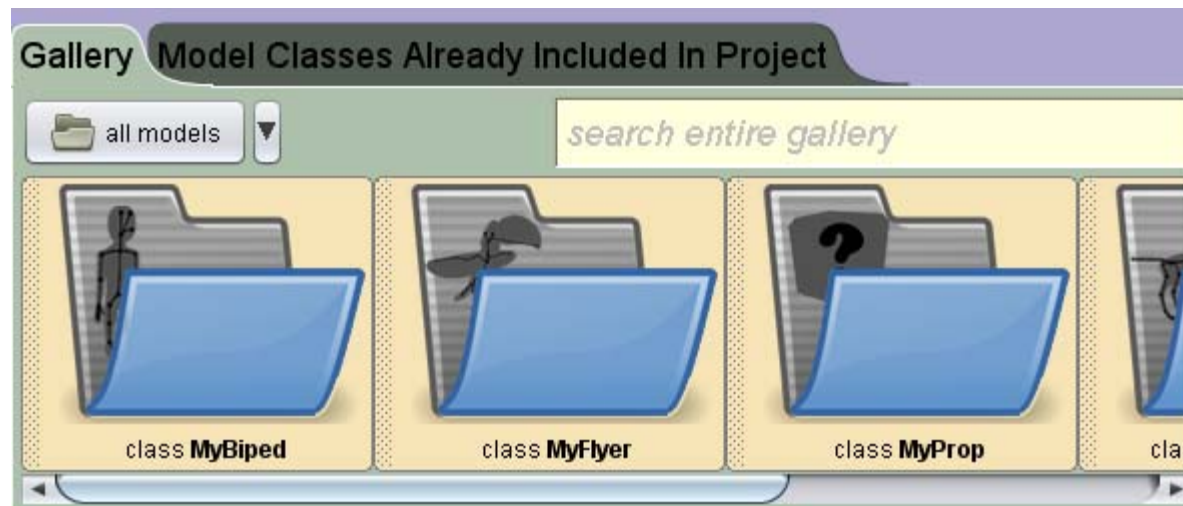
The gallery is a collection of 3D models that can be inserted into the scene.



Step 2: Locate Classes (cont.)

Within a class folder in the gallery, select the specific class you want to add to the scene.

A class contains the specifications that define the appearance and movement of a 3D object, such as a frog, cat, or tree. Instructions are provided to Alice3 for how to create and display an object from that class in your scene. Classes are grouped into folders, such as Animals, People, City, etc. All objects within a class have common properties, such as appearance and movement.



Step 2: Locate Classes (cont.)

Example

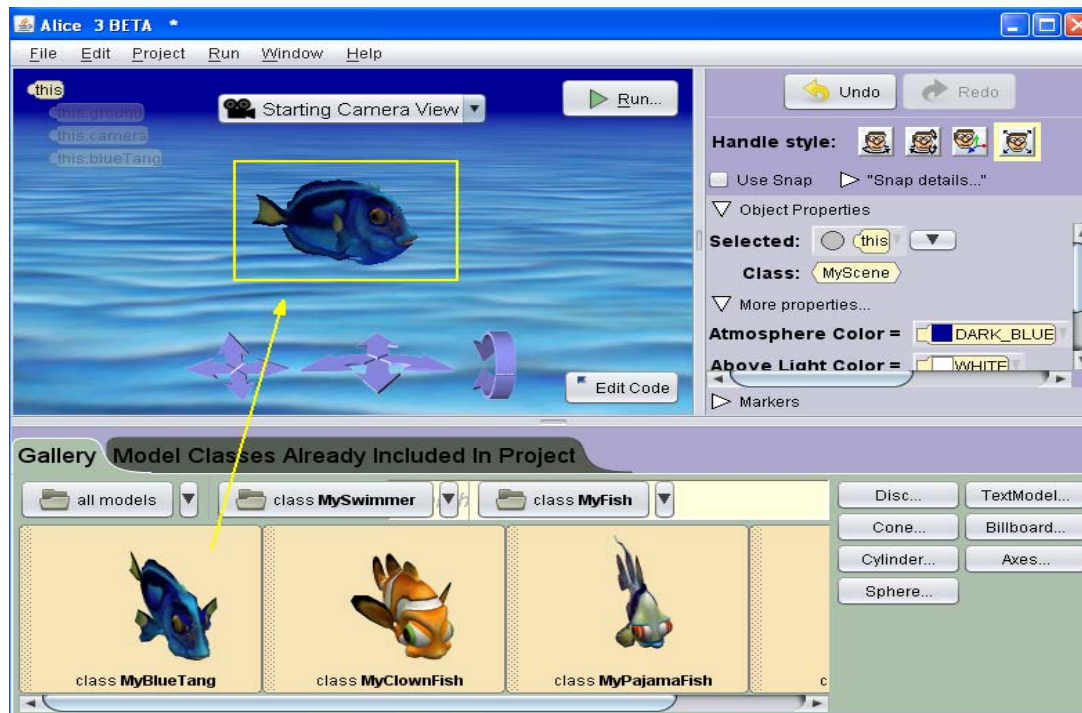
A class could be a type of bird, such as a chicken. Every time a chicken is added to a scene, it has the same basic properties of the chicken class: two legs, two wings, feathers, and the ability to fly.



Step 3: Add Instances

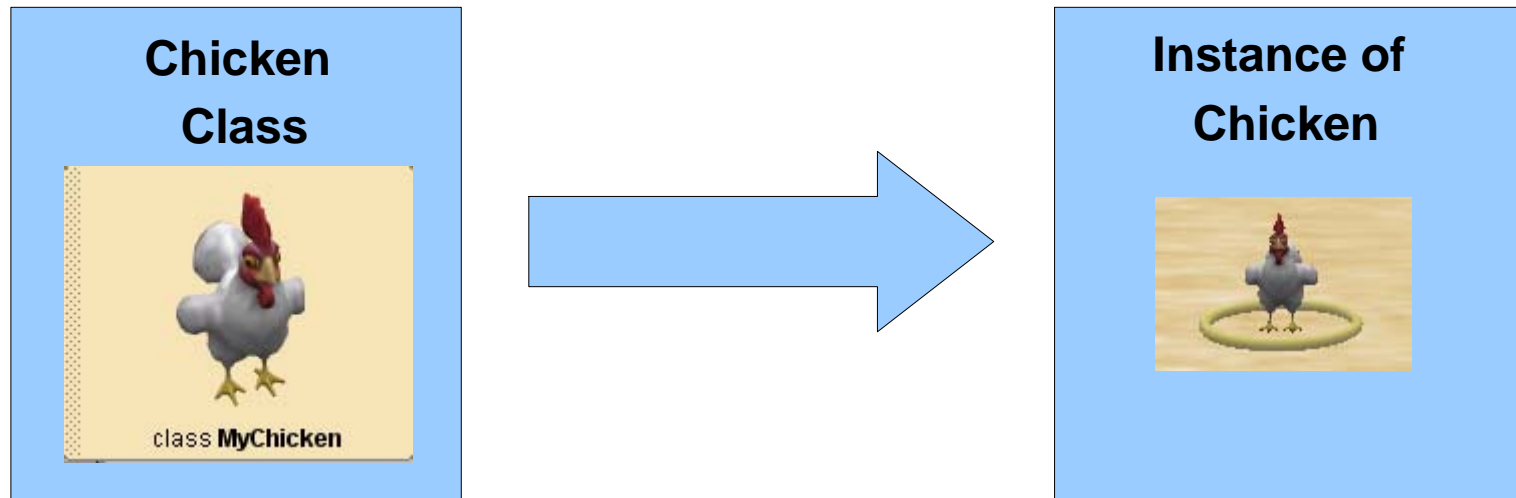
Once you select a class, you can either drag an instance of the class into your scene with your mouse or simply click and let Alice add the instance to the center of your scene.

An instance is an object from a class once it is added to the scene.



Step 3: Add Instances (cont.)

Select the chicken class from the gallery. Use the mouse to drag the object to the scene. The object becomes an instance of the Chicken class. Now, you can modify its properties and program the chicken instance to perform tasks.





Step 3: Add Instances (cont.)

With an instance, you can:

- Use all of the properties in its class
- Change its properties
- Program it to perform new tasks
- Save it to use in other projects



Step 3: Add Instances (cont.)

When you add an instance to the scene you can accept the default name provided by Alice or specify a new instance name. Providing unique instance names will help you to assign actions to the correct objects in the scene.

Alice preferences can be set to automatically name instances of the same class with an incremental number.



Step 4: Save the Project

Save projects frequently at various points throughout your animation development. Alice 3 will remind you to save your project.

To save a project:

1. Select File
2. Select *Save As...*
3. Select the location to save the project (e.g., computer, file server, memory stick)
4. Enter project name
5. Click Save



Step 4: Save the Project (cont.)

If you want to use the same scene to create several different animations, save multiple versions of the project at different points of development, giving the versions different names.

By using a saved version of a scene to create a new animation, you save time already spent creating and positioning objects in the scene, and can go straight to programming the instructions for how objects should move and interact.



Step 5: Position Objects

Once instances are added to a scene, you need to position them how you want them to appear when the animation starts.

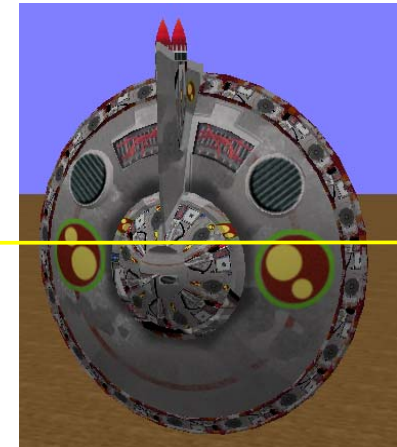
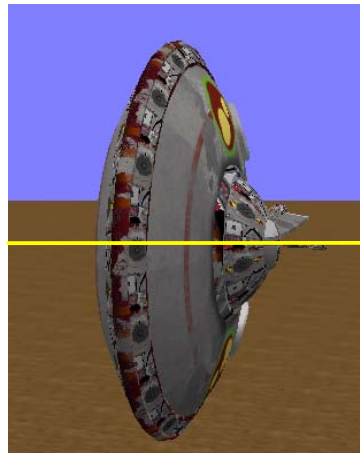
This includes:

- Direction the object should face
- The object's orientation relative to other objects in the scene
- The object's position
- The position of the object's sub-parts (arms, legs, head)

Step 5: Position Objects (cont.)

All objects:

- Have 3D coordinates on an x, y, and z axis
- Have a center point, where its own axes intersect (usually at the center of their mass)
- Have sub-parts that can move
- Move relative to their center point
- Can be positioned by moving the axes

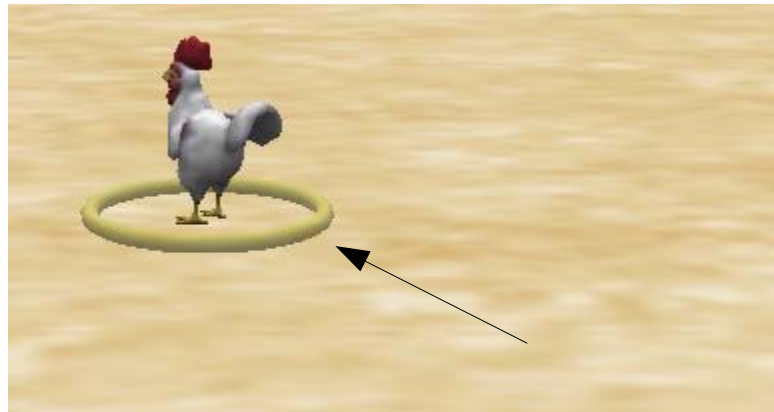


Step 5: Position Objects (cont.)

Objects move relative to their own orientation, or sense of direction.

Example

An object facing backward, programmed to move forward 2 meters, moves 2 meters towards the back of the scene.



Step 5: Position Objects (cont.)

Ways to position an object:

1. Imprecise:

1. “Drag and drop” with cursor

2. Precise:

1. Enter values for the x, y, and z coordinates

or

2. Use a procedural method

Step 5: Position Objects (cont.)

To position using a “drag and drop” method:

1. Select the object, or sub-part of object, with the cursor
2. Select a handle style
3. Position object with cursor (rings that surround the object may be used to manipulate the object)

Handle Type	Description
Default	Simple rotation and movement
Rotation	Rotate about the x, y, and z axes
Movement	Move along the x, y, and z axes
Resize	Change size of the object and stretch it along the x, y, and z axes



Step 5: Position Objects (cont.)

Handle Styles Used to Position Objects



The screenshot displays a software interface with a purple header bar containing "Undo" and "Redo" buttons. Below the header is a "Handle style:" section with four icons of a chicken head, each with a different handle style. A yellow box highlights this section. Below the handle styles is a "Use Snap" checkbox and a "Snap details..." button. The "Object Properties" section is expanded, showing "Selected:" with a radio button and a dropdown menu set to "this.Chicken", and "Class:" with a dropdown menu set to "MyChicken". The "Show Joints:" checkbox is unchecked. The "More properties..." section is expanded, showing "Paint = WHITE", "Opacity = 1.0", and "Vehicle = this". The "Position = (x: 0.04, y: 0.00, z: -1.97)" is displayed. Below the position is a "Width: 0.28" field and a "Size = Height: 0.47" field, with a "Reset" button. The "Markers" section is collapsed.

🍏 Step 5: Position Objects (cont.)

You can use the four handle styles to position an object's sub-parts as well.

Select the instance, then its sub-part. Use the rings around the subpart to position it.

The screenshot displays a software interface with a purple header bar. On the left, there are four character icons under the heading "Handle style:". Below this is a "Use Snap" checkbox and a "Snap details..." button. The main area is titled "Object Properties" and contains several sections:

- Selected:** A dropdown menu showing "this.dolphin".
- Class:** A dropdown menu showing "this".
- Show Joints:** A section with checkboxes for "this.ground" and "this.camera".
- More properties:** A section with a "Paint =" button and a "Vehicle =" dropdown showing "this".
- Position =** (x: -0.30, y: 0.52, z: -4.56)
- Size =** Width: 0.57, Height: 0.73. A "Reset" button is next to it.
- Markers:** A section with a play button icon.

On the right side, there is a "Swimmer Joints:" section with a list of joints, each with a red handle icon and a button labeled "this.dolphin" followed by the joint name:

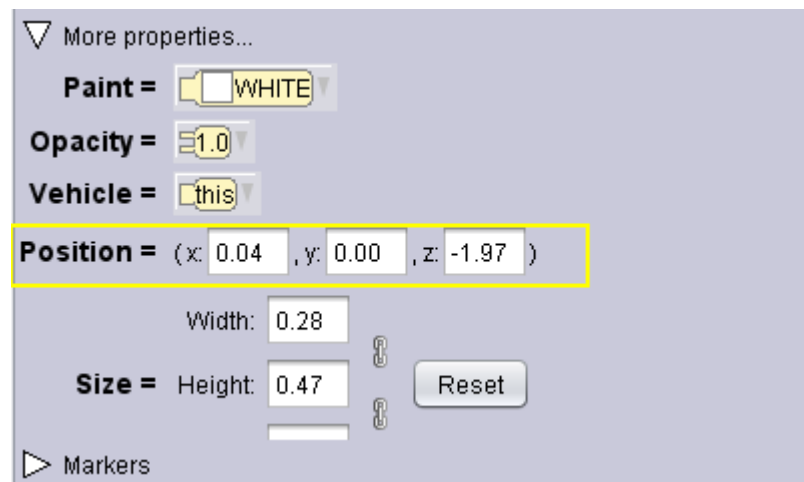
- getNeck
- getHead
- getMouth
- getLeftEye
- getRightEye
- getLeftPectoralFin
- getRightPectoralFin
- getSpineBase
- getSpineMiddle
- getTail

At the bottom of the interface, there is a yellow search bar with the text "search entire gallery".

Step 5: Position Objects (cont.)

To position by entering coordinate values:

1. In the Properties panel, locate the Position property.
2. Enter values in the x, y, and z axes.
3. The object will automatically re-position to the coordinates.





Step 5: Position Objects (cont.)

To position using a one-shot procedure:

1. Right click on the object in the scene editor.
2. Select Procedures.
3. Select the procedure.
4. Enter the argument values.
5. The object will automatically move based on the procedure and arguments selected.

A procedure is a set of instructions, or programmed code, for how the object should perform a task.

Note that one-shot procedures are used to make a scene adjustment. The procedure does not execute when the Run button is executed.



Terminology

Key terms used in this lesson included:

Axes

Class

Gallery

Initial scene

Orientation

Procedure

Scene editor

Template



Summary

In this lesson, you learned how to:

- Identify scene components
- Define a gallery using Java programming terminology
- Define and provide examples of classes and instances
- Communicate the value of saving multiple versions of a scene
- Describe three-dimensional positioning axes
- Describe the difference between precise positioning and drag-and-drop positioning
- Use a one-shot procedural method to precisely position an object in a scene



Practice

The exercises for this lesson cover the following topics:

- Identifying scene components
- Understanding 3D and precision positioning
- Working with galleries, classes, and instances
- Working with and saving multiple scenes