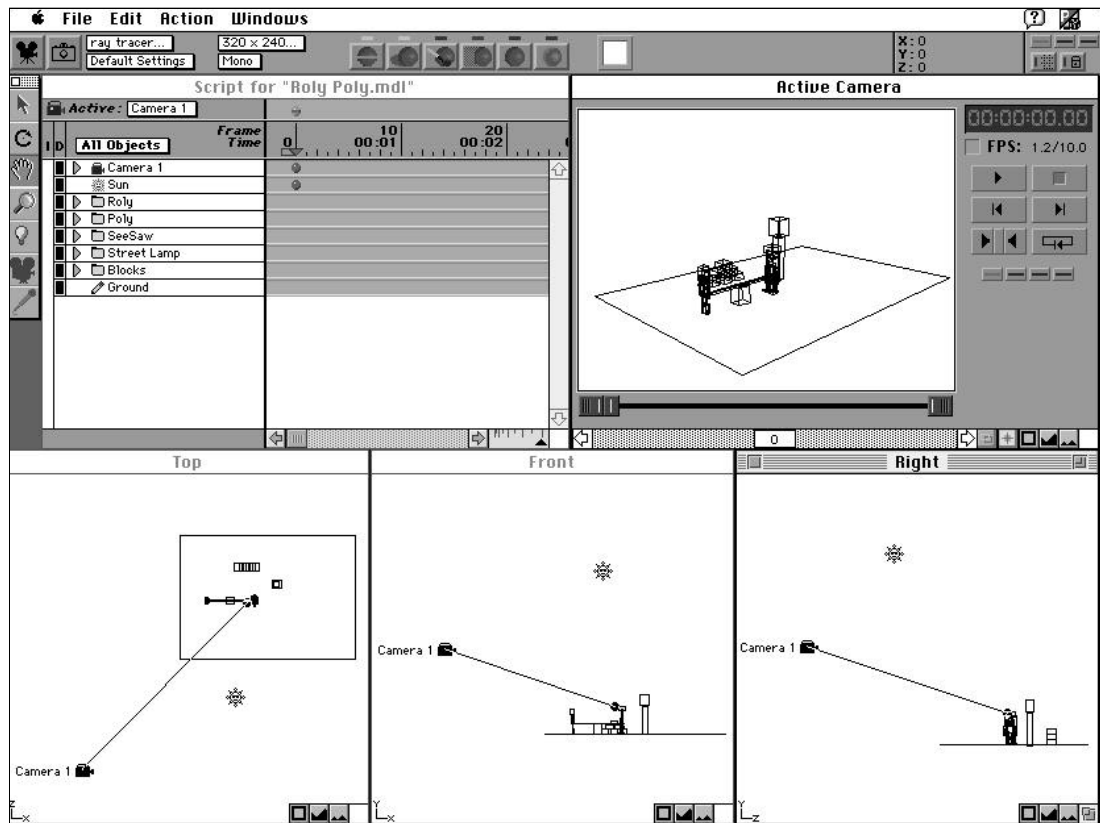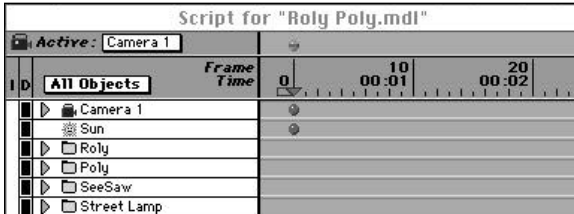## Animation Tutorial

This tutorial will show you how to use your virtual stage to produce and direct an animated multimedia presentation. Using the play ground scene from the previous tutorials and Presenter's Script window, you will animate the seesaw, make both of the characters legs move up and down in conjunction with the seesaw, and cut between different camera views. A strong wind will come along to cause a little disturbance that gives us an opportunity to show how the Effects Library can be used with the Script to demonstrate natural effects and to add sound effects. For what is a multimedia presentation without sound?

The Presenter Digital Stage Animation Environment

The Presenter Script Window

The Presenter Script window has two main parts, the Object List and the Event-based Timeline. The Object List include cameras, lights, microphones, folders, and modeled objects. The objects can be selected for positioning within the stage views, and for assignment of attributes.

Within the Script window timeline, Presenter uses colored balls and squares as event markers to indicate when an action is taking place, when a sound is attached to an object, and what camera is being used. These markers can be copied, pasted, and deleted using established Macintosh techniques.

Colored Balls - indicate user defined actions/events

Colored Squares - indicate an attribute (i.e. sound, human motion, etc.) has been added to the event or object

When adding a collision attribute to an object, you choose the color of ball (blue, yellow, or green) that will appear in the script window to represent that event. You can then tie any other attribute into that collision by attaching the other attribute to the chosen color. In this tutorial, you will attach sound to a collision attribute.

The multicolor ball at the top of the Script window is used to define which camera is in use. The box in the upper left of the Script window next to the camera icon indicates what camera is the active one.

The blue triangle which moves across the top of the Script window (under the time indicators) is the Script Time Marker. The positioning of this marker determines where an event begins.

Any event, or ball, can be deleted by clicking on that ball and pressing the delete key.

Events that have been calculated by the computer can all be deleted at once by selecting Delete ND Cells from the Action menu.

An attribute can be removed from an object by dragging the attribute from the Attributes section of that object's Object Information Dialog Box to the top of the screen.

A key concept in animating within Presenter is rotational points. All objects have rotational points which by default are in the center of the object. For each level of the hierarchy, the rotation point is in the center of the object at that level. For example, the rotation point of the globe of the street lamp is in the center of the globe. The rotation point of the lamp post (lathe mesh), is the center of the lamp post. The rotation point of the street lamp (the next level up on the hierarchy) is the center of the entire street lamp.

An animation can be viewed at any time by playing it in the Active Camera control screen. The controls in the Active Camera control screen are similar to those on a cassette tape deck. Drag the Time Scroll Bar in the Active Camera control screen to 00:00:00.00 and click on the triangle pointing to the right.
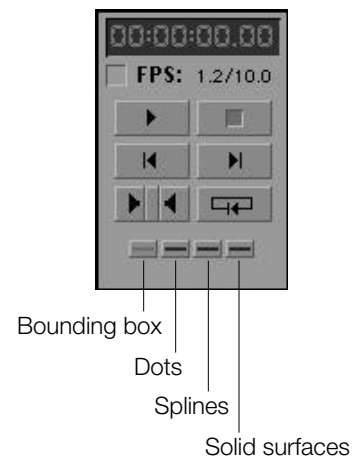
The four bars under the controls in the Active Camera control screen change the mode in which the model is being viewed in the Active Camera control screen. The first bar changes the model to block outlines. The second one changes it to dots. The third one changes it to colored wire frames. The fourth one changes it to solids with colors. As you advance from the first bar to the fourth, the screen redraw time takes longer.

Getting Started

If Presenter is not already open, open it now.

Click on File and drag to Open Model. Open the Roly Poly.mdl in the Tutorial Folder.

Click on File and drag to Save Model As. Enter new name for model: Roly Poly.Animation.

Bounding box
Dots
Splines
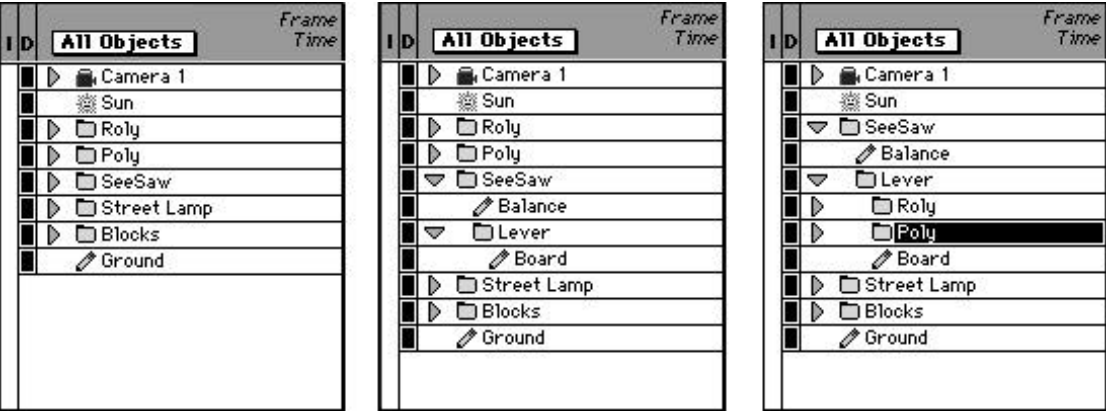Solid surfaces

Connect the Characters to the Seesaw

To ensure that the characters move with the seesaw as it moves up and down, the character folders need to be in the seesaw folder within the script window. The hierarchy of the folders in the Script window follows the same conventions as the hierarchy in ModelPro. Thus, a folder or object that is inside another folder is considered to be a child of that folder and a folder which contains other folders or objects is considered to be a parent. When an action is defined to include parental influences, whatever is done to a parent folder is done to the children of the folder. By moving Roly's and Poly's folder inside the Lever folder, Roly and Poly will move according to the motions of the Lever (the parent).

Open the SeeSaw folder in the Script window by clicking on the gray triangle to the left of the folder. When the gray triangle is pointing down, the folder is open and you can see the next level down in the hierarchy. When the triangle is point to the right, the folder is closed.

Open the Lever folder by clicking on the gray triangle to the left of the folder.

Click on the Poly folder and drag it inside the Lever folder, it doesn't matter where inside the folder.

Click on the Roly folder and drag it inside the Lever folder as well.

Re-positioning the Roly and Poly folders

Defining the Seesaw Key Frames for Up and Down Motion

           In animation, key frames are points in the animation that are crucial, or key, to defining the movement. In the case of a seesaw, the key frames would be with the seesaw horizontal to the ground, one end on the ground and the other in the air, and vice versa. Since the seesaw starts out being horizontal to the ground, you will set the first key frame at 2 seconds. The program will automatically determine the frames in-between the key frames (called in-betweening). Anytime you define an action to occur at a particular time, a red ball (an event marker) is placed in the Script window at that time and in that object's row.

Note: The "D" column in the All Objects section of the Script window allows you to turn objects on and off.

Scroll to 00:00:02 on the time line in the Script window by using the scroll bar at the bottom of the Script window.
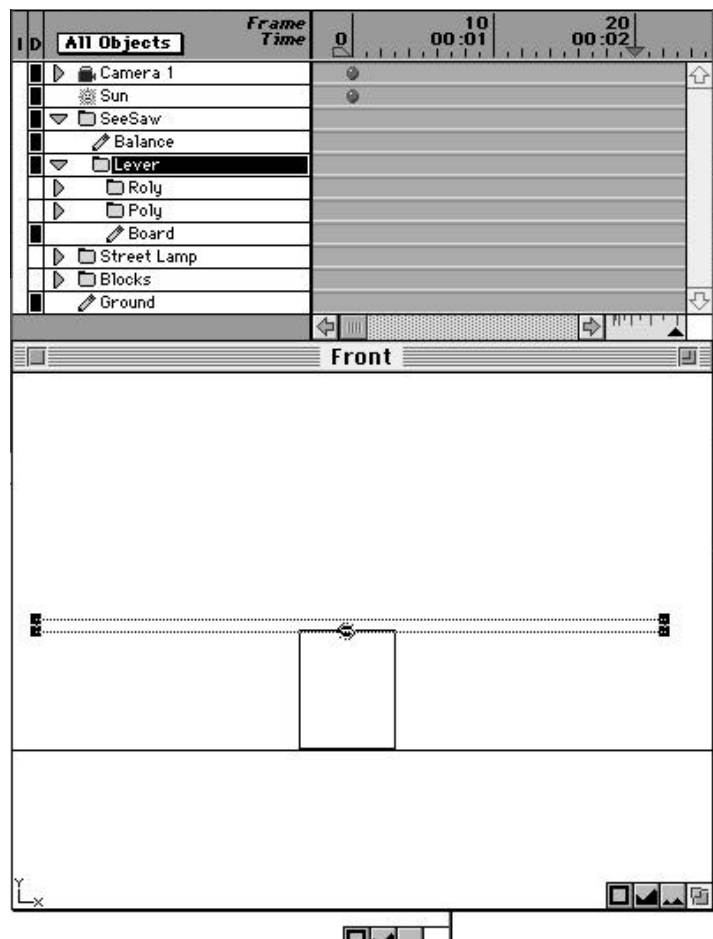
Click the cursor under the :02 to place the time indicator. The time indicator is a blue triangle pointing down. Any action you define will now occur at 2 seconds.

In the All Objects part of the Script window, click in the "D" column next to Roly, Poly, Street Lamp, and Blocks to clear the screen of objects not being worked on.
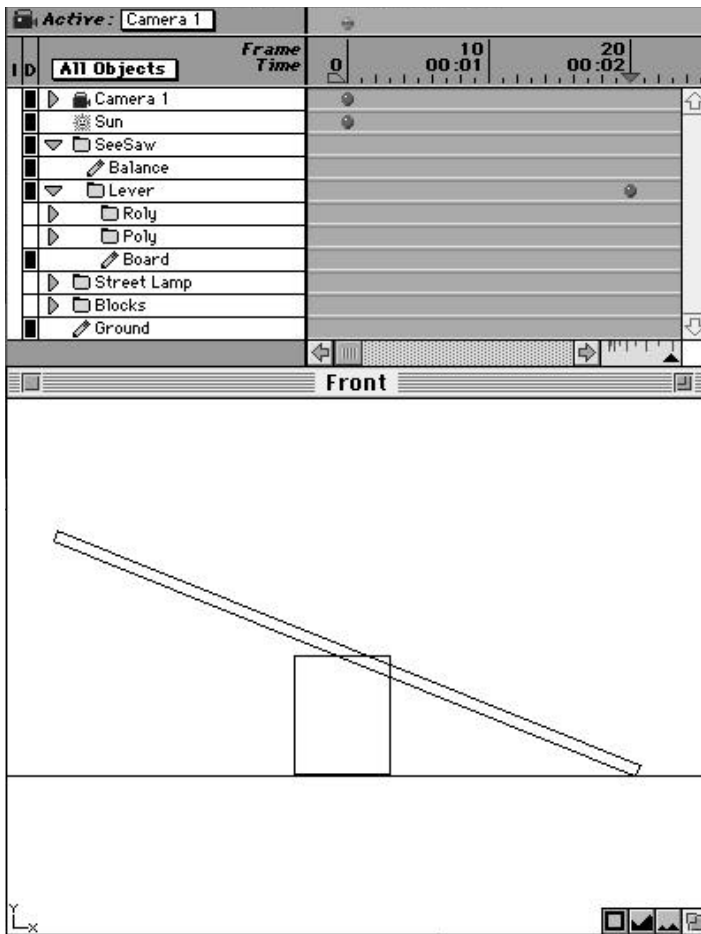
Click in the Front stage view to make it the active window. You will probably want to enlarge the picture either by using the zoom tool at the bottom of the screen, enlarging the window, or a combination of the two. Use the Hand tool to re-position the image so the seesaw is positioned in the center of the window.

In the Script window, click on the Lever folder to select it. In the Tools Palette, select the 2-D Rotation tool. Since the Lever is the selected object, you will see control handles at the four corners of the Lever.
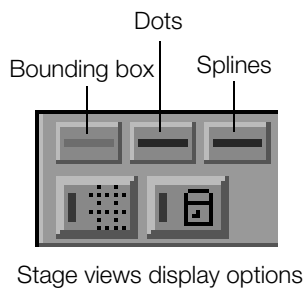
Selecting the Lever.

Click and drag one of the control handles near the right end. As you drag

Setting the right-down position
of the Lever.
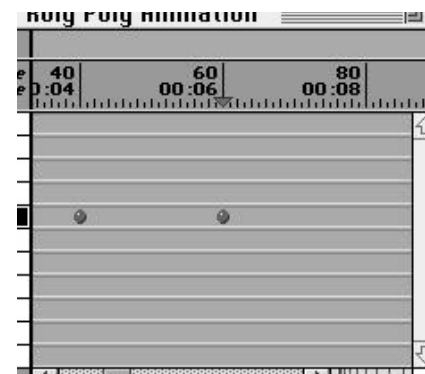

Dots
Bounding box   Splines

Stage views display options

to the right, the object moves down. Drag until the
right end is resting on the ground. Notice that the
left end is up in the air. All objects have a rotation
point which is at their center point. In the case of
the seesaw, the rotation point is where the seesaw
meets the base. So, when rotated in 2-dimensional
space, the left side goes up when the right side
goes down.

Set the seesaw to be horizontal with the ground at
six seconds by scrolling in the Script window until
you can see the time 00:00:04. Click under :04 to
set the time indicator. Using the 2-D Rotation tool,
rotate the seesaw to once again be horizontal with
the ground.

Set the left end of the seesaw to be on the
ground at 00:00:06 seconds. Change the window
display from bounding boxes to splines by clicking
on the Spline Display button at the top-right of the
screen.

Using the scroll bar at the bottom of the timeline,
scroll so that 00:00:04 is visible at the left. In the
Timeline Zoom box, click and drag the pointer box
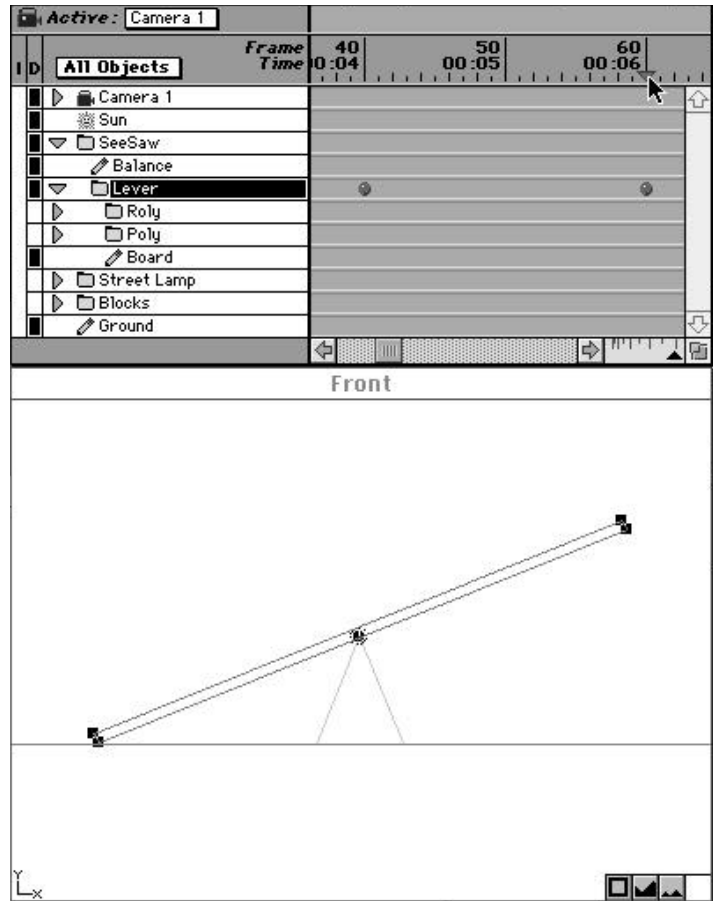till the :08 becomes visible.
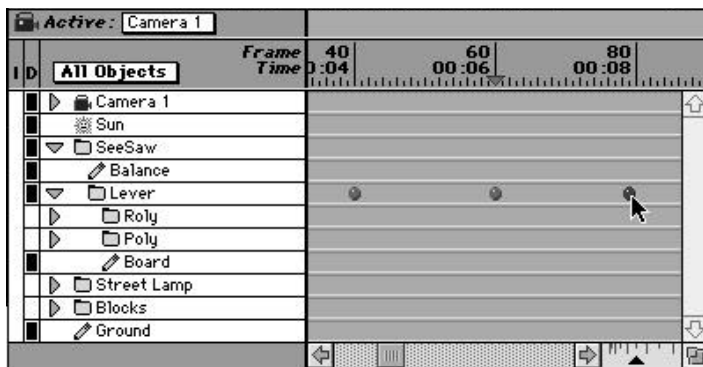

Using the Timeline scroll bar

While holding down the Option key, click on the red ball and drag to 00:00:08. This event is now set to occur at 8 seconds as well as at 4 seconds.

You can view your animation at any time by playing it in the Active Camera control screen. To see the animation from the beginning, drag the time scroll bar all the way to the left. The LED time indicator will show 00:00:00.00 and the time indicator in the Script window will reset to 00:00:00. Click on the triangle point to the right in Active Camera control screen. The animation will play in the Active Camera control screen. You can stop it by clicking on the red square. The controls in the Active Camera control screen work the same as those on a cassette player.

Following the above sequence, the seesaw would once again be horizontal at 8 seconds. Since you have already set the seesaw horizontally once before, you can do a "copy and paste" of the event. The more you can see of the Script window horizontally, the easier this will be. To compress the Script Timeline, click and drag the upward-pointing triangle to the left in the Timeline Zoom box. To expand the Script Timeline, click and drag the pointer to the right.

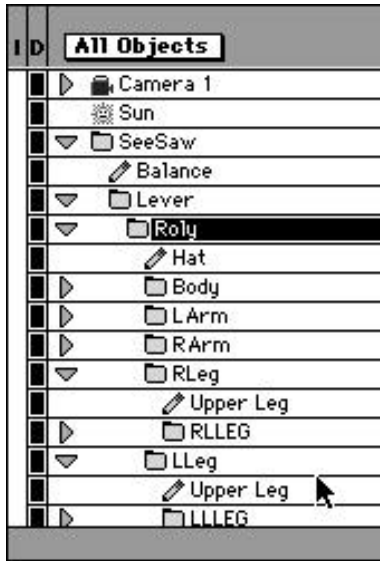Setting the left-down position of the Lever.

Duplicating and re-positioning an event

Note: The red ball at :04 in the Lever row is the event marker that is placed when you defined the seesaw as being horizontal at this point in time.

Active Camera Video controls

G:7

Note: Use the scroll bar at the right of the Script window. to reach an object in the script's Object List that is below the level of the window.

Animating Roly's Legs to Move with the Seesaw

        The seesaw now goes up and down, but the characters' legs are still stiff and move below the playground when the end it is sitting on is on the ground. You will now make Roly's (the green characters) legs go up as the right end goes down and straighten as the end goes up.

Since the right end is on the ground at 2 seconds, ensure that the time indicator is at 00:00:02 by clicking under the :02 in the Script window.

Click in the D column in the Object List next to Roly and Poly to make them visible.

Selecting the Left Upper Leg

Open Roly's folder in the Script window by clicking on the gray triangle to the left of the folder so that it is pointing down.

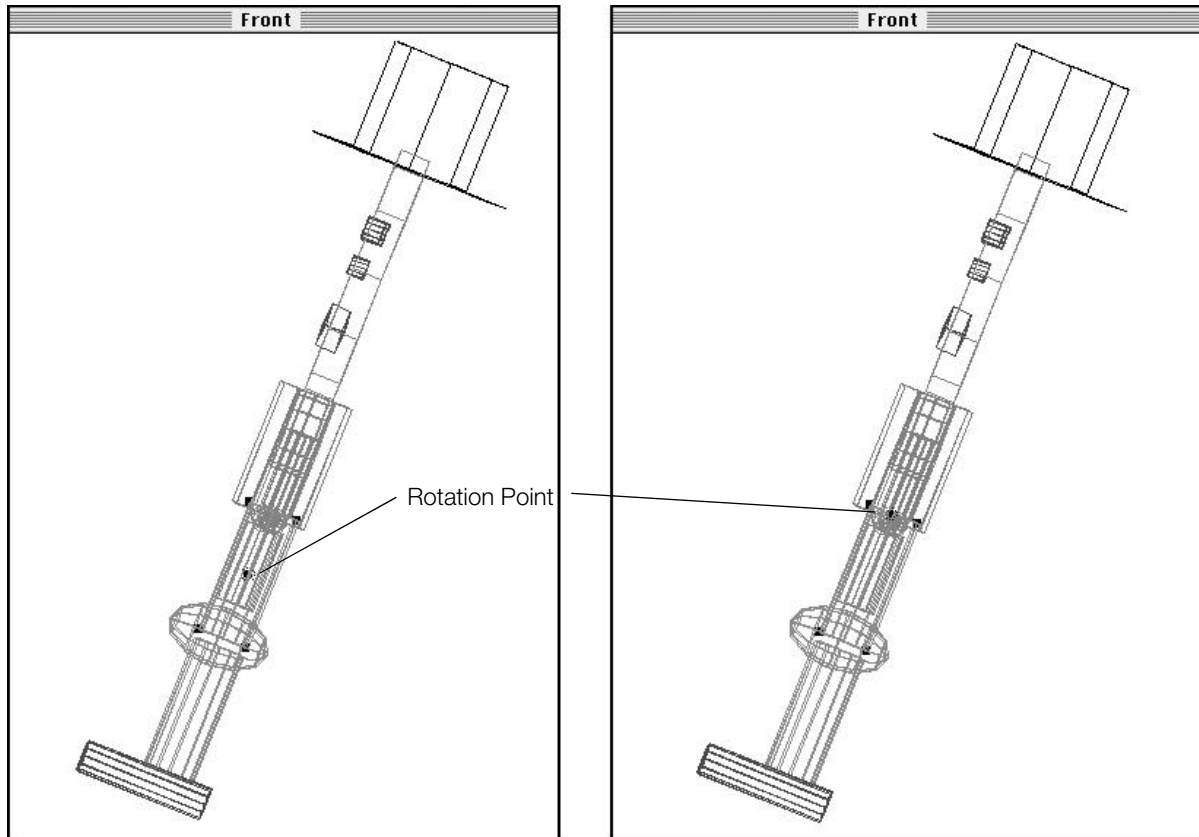Open the Left Leg and the Right Leg folders.

Click on the Upper Left Leg object in the Left Leg folder of the " Roly folder.

Click on the Front stage view so it is the active window. You may want to zoom in on the scene so that Roly is much larger and/or enlarge the whole window. Since you will be working on Roly, the larger it is, the easier it will be to see where you are trying to place things.

Tip: If you zoom the Front stage view to full screen and need the script to be displayed, hold the Command key down and type 4.

Bending the Legs

        To bend a leg, you will re-position the upper leg's rotation point and then rotate it.

The rotation point of the Upper Left Leg appears as a light gray dot in the middle of the upper left leg (Upper Leg). Click on it and drag it to the "hip" (where the left leg joins the body). As a placement aid, you can center it between the two control handles at this joint.
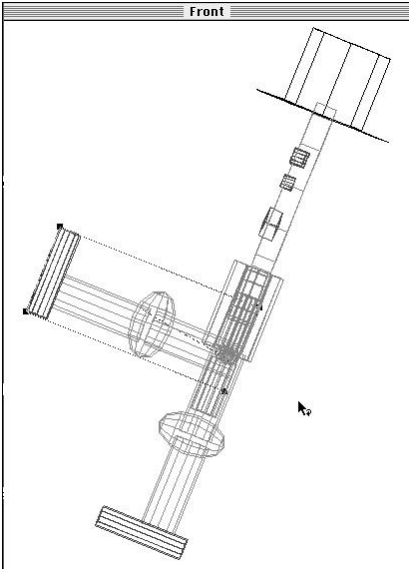
Re-positioning the Upper Left Leg's rotation point.
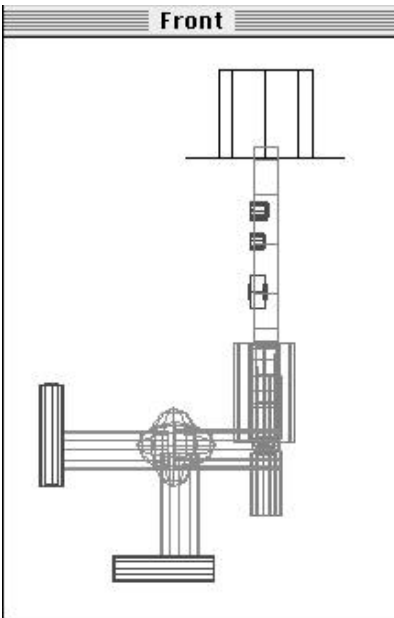
Click on the 2-D rotation tool in the Tools Palette.

Click on the Left Leg folder (LLEG) in the Script window.

Click on one of the control handles near Roly's left foot and drag directly to the right. The entire left leg will raise up. Drag it so the leg is close to perpendicular to the body.

Repeat the above steps for the right leg.

Re-positioning the Left Leg

Bending the Left Knee

Bending the Knees

To bend the knee, you will re-position the lower leg's rotation point and then rotate it at the point where the seesaw is back even with the ground.

Since the right end is even with the ground at 4 seconds, ensure that the time indicator is at 00:00:04 by clicking under the :04 in the Script window.

Click on the Arrow Tool in the Tools Palette. In the Script window, click on the LLLeg (lower left leg) folder.

In the Front stage view, click and drag the LLLeg's rotation point to the knee.

Click on the 2-D rotation tool in the Tools Palette.

In the Front stage view, click on one of the control handles near Roly's left foot and drag directly to the left. Drag it so the lower left leg is about perpendicular with the upper left leg. The lower left leg will move down at the knee joint.

Repeat the above steps for the right leg.

At six seconds, reposition Roly's legs so they are almost straight. Leaving them slightly bent will give it a more natural look. Since you have already set the rotation points, you do not need to reset them at 6 seconds.
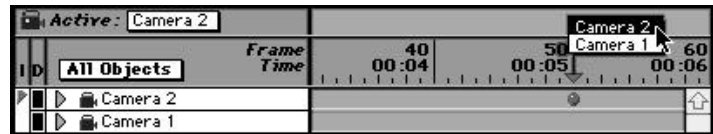
Close Roly's folder in the Script window by clicking on the gray triangle to the left of the folder so that it is pointing to the right.

Animating Poly's legs to Move with the Seesaw

Now that Roly's leg moves with the seesaw, you need to set Poly's legs to do the same thing. Using the above steps, bend Poly's legs at 6 seconds and bend the knees at 8 seconds. If you were to continue the animation, you would straighten out the legs at 10 seconds.

Changing Camera Views

By adding cameras to the scene, you can cut between the different camera views.

Adding a second camera

Set the time indicator to 00:00:05 seconds. Add a camera to any of the 3D stage views. Set the camera position to your liking. Notice the multi-colored ball that appears above the 5 second time marker. Double-click and hold on the ball. Notice that Camera 2 is high-lighted.

Note: The colored balls are used to change which camera is the Active Camera to record from.

Set the animation to 00:00:00 and play the animation in the Active Camera control screen. Notice that at 5 seconds the view cuts to Camera 2.

Note: You can view your animation at any time by playing it in the Active Camera control screen.

Add additional cameras and cut to them at different points in the timeline. Play the animation as you add and cut to each camera to see the effect.
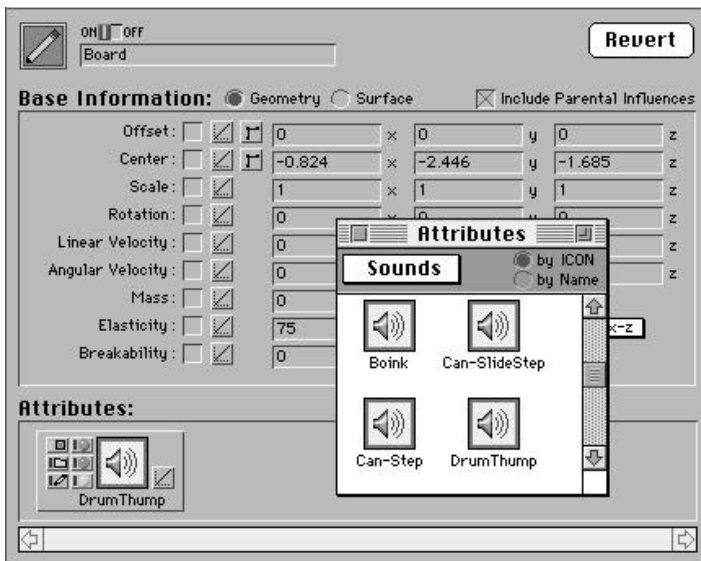
Tip: To continue the animation beyond 8 seconds, you can copy, using Shift-Select, the seesaw rotation and the Roly animation and paste as many times as you want.

Adding 3D Sound

Sound is a crucial part of any animation. It provides more depth and reality to the entire scene. You will now add sound so that when the teeter totter hits the ground, a thump is heard from the speaker on the same side as the seat that hits the ground. In order to hear sound when playing an animation, the speakers in the video controls section of the control room window need to be on. You can turn on either speaker by clicking on it or both speakers by clicking in the space between them. The speakers are the icons next to the loop icon.

Speaker "on/off" controls

Assigning sound to an object.

Selecting right stereo output.

Since the right seat is on the ground at 2 seconds, ensure that the time indicator is at 00:00:02 by clicking under the :02 in the Script Window.

Double click on the right seat in the Script Window. Click on Windows and drag to Attributes. Click on the Attributes pop-up box and drag to Sound.

Click on the sound that you want to use and drag it to the Attribute section of the Object Information Dialog box.

Double click on this sound icon. Click on the Play Into pop-up box and drag to Stereo Right. When the animation is played, the sound will come from the right speaker.

Set the time indicator at 00:00:06 seconds and repeat the above steps for the left seat.

Click on the Action menu and drag to Mix Sound Tracks.

Click on the space between the two speakers in the Active Camera control screen.

Save your work. Now, play your animation!

Let the Great Wind Blow

What is a playground without a wind to stir things up? To simulate the effects of a wind, you are going give an inertia to the ball to start it moving and then apply the effects of gravity and collision to make the ball fall and bounce down the stairs.

Starting the Ball Rolling

Since the Ball is currently sitting on top of the blocks, you need to give it a push to get it started. This initial "push" will be assigned in the Ball's Object Information dialog.

Click in the Front Window to make it the active window.
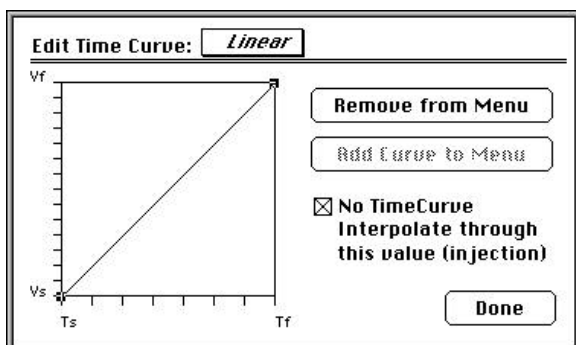
Position the Time Indicator at 00:00:01.

Double click on the Ball in the Script Window.

You determine the speed at which Ball falls by entering a linear velocity in the Ball's Object Information dialog. Enter 0.3 in the x-coordinate of Linear Velocity (using a positive number causes the object to move right).

Click on the Linear Velocity's Velocity Graph button, the one with the diagonal line. Click in the "No TimeCurve Interpolate" button to delay the effect of linear velocity. Notice that the linear Velocity button changes to indicate that the "No TimeCurve Interpolate" option is selected.
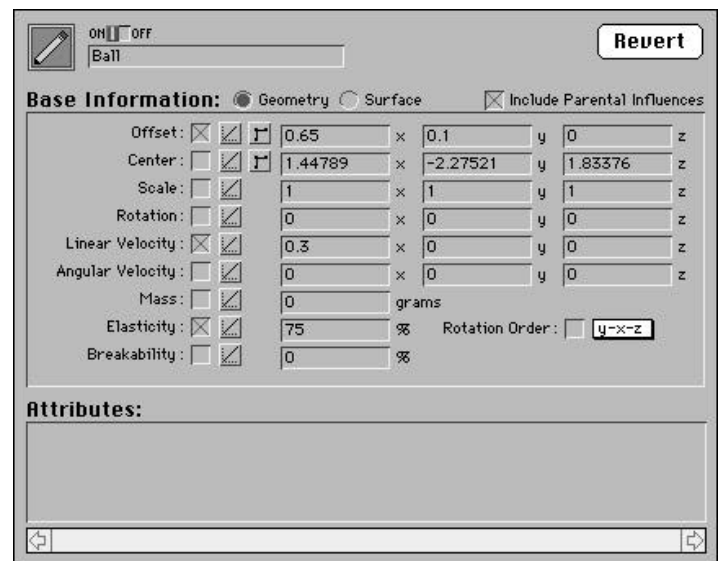
Click on the Offset's Velocity Graph button, the one with the diagonal line. Click in the "No TimeCurve Interpolate" button to delay the effect of positioning the ball until the linear velocity takes effect.

Enter 95 as the Elasticity so that the ball will rebound to nearly the full height of its previous drop.

Note: if you do not see the Ball in the Script Window, use the scroll bar at the right of the Script window to scroll down till you see the Ball.
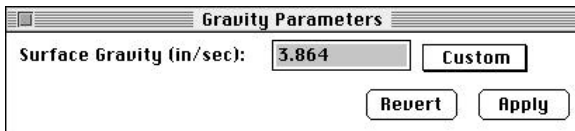
Assigning the inertia to simulate the push of the wind.

Edit Time Curve dialog box

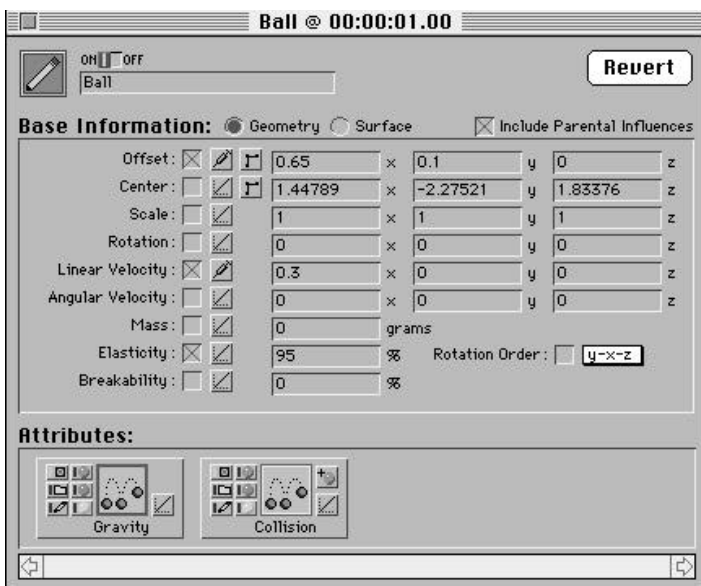**Entering the Effects of Gravity and Collision**

Presenter, through its Special Effects library, allows you to add effects that add reality to your animation. In this section, you are going to add Presenter's Gravity and Collision effects so that the ball can bounce down the stairs. Gravity exerts a pull on the ball and Collision determines the point and time of contact of each bounce .To assign Gravity and Collision, the icons for these animation effects will be placed in the Ball's Object Information dialog.

Gravity Animator edit dialog box

Click on Windows and drag to Attributes. Select Animators from the Attributes pop-up field. Drag the Gravity icon into the Attributes portion of the Object Information dialog.

Drag the Collision icon into the Attributes portion of the Object Information dialog. The Collision icon must follow the Gravity icon in order for them both to work correctly.
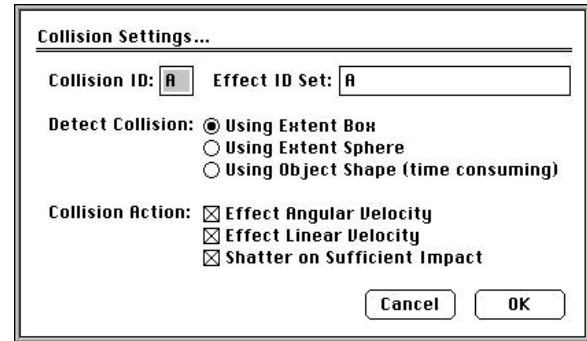

Assigning the gravity, and collision effects

The icons to the far left of the Gravity and Collision icons determine at what level in the group hierarchy the animation effects are applied. The top icon will cause the animation effect to be applied to the top most folder in the hierarchy (the current folder). The middle icon is a folder and causes the effect to be applied to the first-level items in the current folder. The bottom icon is a pencil and causes the effect to be applied to all the items, individually, in the current folder. Since Ball is an object at the bottom level of the hierarchy of a folder, it does not matter which icon you have on, they will all result in the Ball being the only item affected.
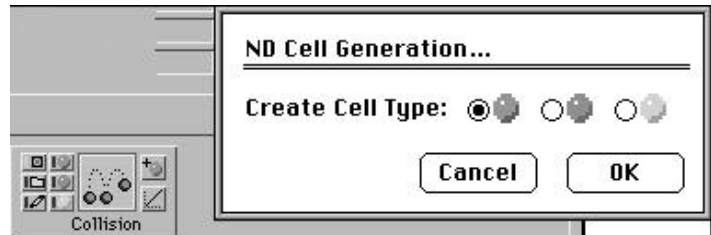
If you double-click on the Gravity icon in the Object Information dialog's Attributes area, you can select a gravity ranging from the moon, the planets, and the sun by clicking on the Custom pop-up and dragging down to the gravity of your choice. You can enter your own numerical gravity. If it's negative, the object will float up instead of falling down.

If you double-click on the Collision icon in the Object Information dialog's Attributes area, you can select the type pf collision detection and the type of collision action.

Collision Animator edit dialog box

When the program calculates the effects of collision, a colored ball will be placed at each point in time that the globe hits the playground. To select the color of ball that will be placed, click on the green ball to the far right of the collision icon. An ND Cell Generation dialog box appears. Click in the radio button next to the color of ball you want.

The advantage to the different colors is that different ND cells can have different colors. You can then add sound, gravity and other effects globally by selecting the color of ball to which the effect will be attached. You will use this capability to apply a sound effect to a series of collision events.

Assigning the color of the ND cells.

Click in the close button at the upper-left to close the Object Information dialog. Notice that a red square cell appears for the Ball at the one second position. The square shape denotes that attributes have been added to an object.

To see the effects of collision, you need to calculate the ND cells. ND cells are non-deterministic cells which the software calculates to mark the exact point of contact of an object with other objects in the stage environment. Click on Action and drag to Re-calculate ND cells. (Note: Re-calculate interactive is slow because it redraws the screen to show you the effect of the calculations).

Calculating ND cells

Play your animation in the Active Camera control screen using the video control buttons.

Recording Session

You are going to use a 3D microphone to record the ball bouncing. To save time and effort, Presenter allows you to assign the sound to all the bounce events at one time.

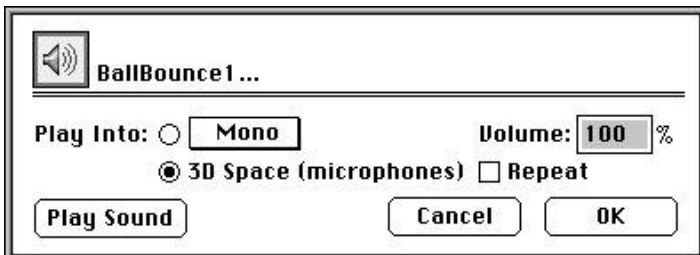Position the Time Indicator at 00:00:01.

Double click on the Ball in the Script Window or the square marker in the timeline channel for the Ball.

Click on Windows and drag to Attributes. Select Sounds from the Attributes pop-up field.

Drag the Ball Bounce icon into the Attributes portion of the Object Information dialog.

Adding sound

Selecting 3-D sound output

Double click on the Ball Bounce sound icon. Click on the 3D Space button. This defines that the sound can only be picked up by a 3D microphone.

Installing a Microphone

You are going to place a microphone in the vicinity of the blocks with enough range to pick up the sound of the ball bouncing.

In the tools palette, click on the Microphone, the bottom tool. To place the microphone click just to the right of the Blocks in the Top stage view. Click on the Arrow tool in the tools palette. Click in the Front stage view to select it. Click on the microphone and drag it so it is to the right and even with the Blocks. Click on one of the control handles that defines the sphere of sound pickup and drag till the sphere covers the Blocks. It will now pick up any sound generated within this sphere.

Double-click on the microphone in the stage views or in the Script. Click and hold on the None to display the output selection pop-up. Drag to Stereo Left. When the animation is played, the sound will come from the left speaker. Click on the close button.

Click on the Action menu and drag to Mix Sound Tracks.

Save your animation! Now, play your animation!

Congratulations on completing your directorial assignment. As with any production, you, as the director, have the perogative to change the script. Maybe the legs should move differently, the wind should blow from another direction, different sounds are produced, and there is traffic moving past the playground. Use your experience from previous tutorial to add more cameras and lighting effects to your animated production.

Select playback sound track

Summary

This completes your Animation tutorial. Presenter's Digital Production Stage was used to set up a multimedia animation sequence consisting of camera and object animation, the application of motion effects, camera edits, and 3D sound generation.