

Animatron Tutorial

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Animatron

This tutorial introduces computer animation using Animatron. Animatron is a product of Animatron.com. A free, cloud-based version (as well as paying versions) is available at:

<http://www.animatron.com>

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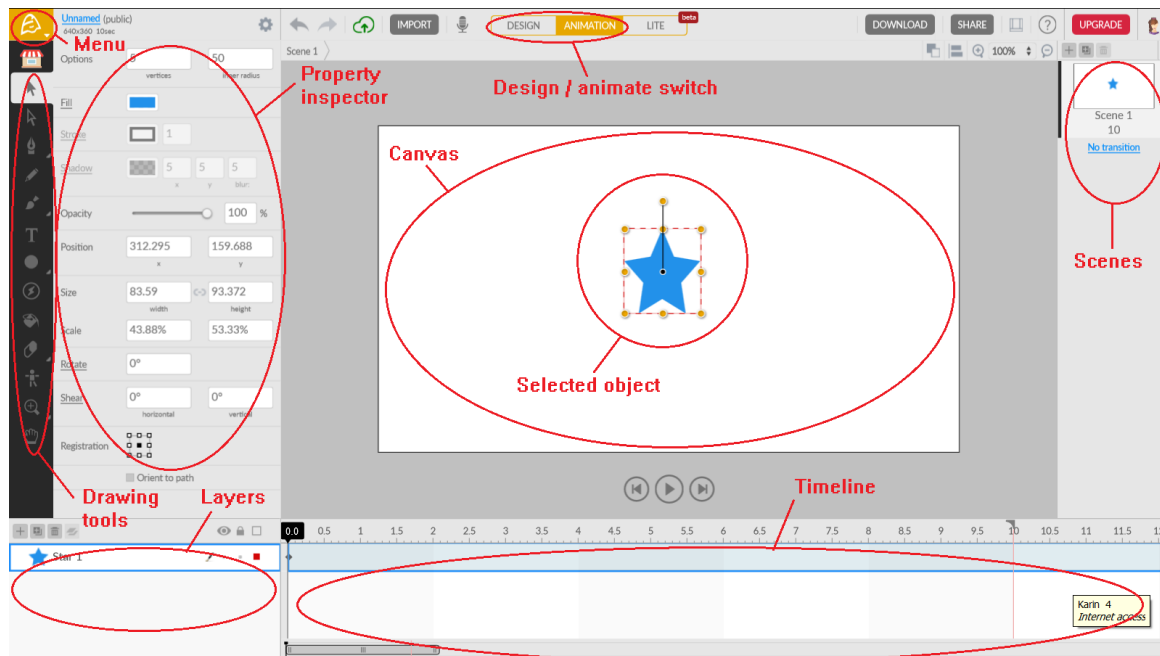
Lesson 1: Getting Started

1.1 Creating an Animatron account

1. Go to <http://www.animatron.com>.
2. Click on Sign Up.
3. Enter your email address. Click Create Account.
4. Go to your email account and get your mail. This should include a confirmation email from Animatron. Click the Activate Your Account button.
5. Go back to Animatron and log in.
6. Click Create.

1.2 Animatron screen

The Animatron editor looks like this:



The main parts are circled in red:

- **Canvas.** Where you draw objects. Objects can also be drawn in the gray area around the canvas, but will not be visible when the animation plays.
- **Drawing tools.** The tools you use to draw objects.
- **Selected object.** The object you are currently working on.
- **Property inspector.** Properties of the currently selected object, such as fill color and shadow.
- **Design/Animation switch.** Tells Animatron whether you are drawing objects on the canvas or animating them.
- **Timeline.** Shows the current time in your animation and describes how objects move and change over time.
- **Layers.** A list of the objects in your animation.
- **Scenes.** A list of the scenes in your animation.
- **Menu.** A list of useful commands, such as creating a new project or undoing an action.

Lesson 2: Drawing

2.1 Drawing objects

In this exercise, you will learn to draw simple objects.

1. Click on Create.
2. Make sure the Design/Animation switch is set to Design:
3. Draw something with each of the tools in the drawing menu.



NOTE: Tools with a triangle in the lower right corner have submenus. For example, the Oval tool has a submenu with Rectangle, Star, Polygon, and Line tools. To display a submenu, click and hold the triangle until the submenu appears.



NOTE: Before you use a tool, you can set its properties, such as text font, fill color, or number of points in a star.

Symbol	Name	Description	Notes
	Market	Predefined objects.	Use the project library tab to move your own objects between scenes.
	Pen	Draws curved lines.	To draw straight lines, click each new point on the line. To draw curved lines, hold the mouse button down at each new point and move the mouse around. To end a line, press ESC or choose a different drawing tool.
	Pencil	Draws free-form lines.	To draw a line, hold the mouse button and move the mouse. To end a line, release the button.
	Brush	Draws free-form lines.	Like Pencil, but with different line styles.
	Text	Writes text.	
	Shape	Draws shapes.	Use the submenu to draw ovals, rectangles, stars, or polygons.
	Line	Draws straight lines.	On the same submenu as oval, rectangle, star, and polygon. Single-click to add a point. Double-click to end the line.
	Bucket	Fills enclosed areas.	Each filled area is a new, separate object.
	Eraser	Erases objects.	
	Bone	Defines a skeleton.	Defines the skeleton of an animated object. For more information, see http://kb.animatron.com/kb/tools/how-to-use-the-bone-tool-in-animatron .

2.2 Object properties

In this exercise, you will learn to set object properties.

1. Draw an oval.



2. Change the properties until your oval looks like the following. You will need the Fill, Stroke, and Shadow properties.



3. Draw a second oval and drag it over the first. Change the opacity until you get the following.



4. Write the word Animatron and change its font, fill, stroke, and shadow to create the following:

Animatron
Animatron

2.3 Moving, stretching, and rotating objects

In this exercise, you will learn to move, stretch, and rotate objects.

1. Choose the Text tool, double-click on the screen, and write “Animatron is cool” on two lines. After you finish typing, press ESC. Your text will be selected:



2. Make three copies of your text and drag them apart. Change your copies as follows:
 - Use the grab points to make one copy short and wide.
 - Use the rotation handle — the line sticking up from the center — to turn one copy upside down.
 - Make a mirror image of the fourth copy: Right-click on the copy and select Transform/Flip Vertically. Use the horizontal shear property to slant it and change the fill color to lighten it.

The result should look something like this:



2.4 Reshaping objects

In this exercise, you will learn to reshape objects.

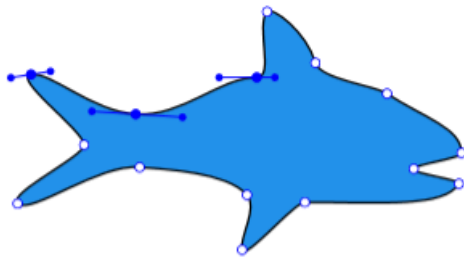
1. Create a new project using Project/New Project on the Animatron menu (the Animatron symbol in the upper left corner).
2. Draw an oval and click the Direct Select tool (the hollow arrow). You will see four white dots on the edges.



3. Click on the top dot. Blue handles will appear on the top and side dots. These handles control the direction and curvature of the lines connecting the dots.



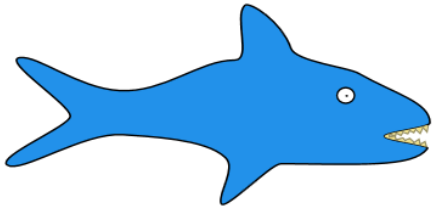
4. Try the following:
 - Drag the top dot.
 - Grab the end of a handle and rotate it around a dot.
 - Grab the end of a handle and drag it.
 - Press ALT and click on a dot.
 - Press CTRL and drag a handle.
5. Double-click somewhere on the edge of your object; this adds another dot. Double-click the same dot to delete it.
6. Add and move dots and use the handles to reshape your oval into a shark:



2.5 Grouping objects

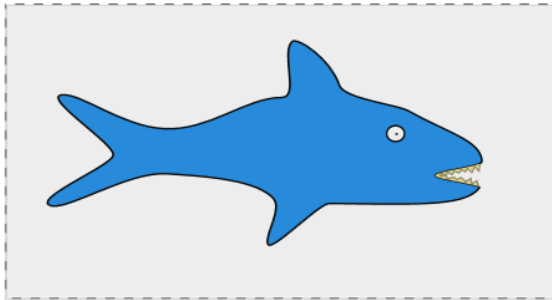
In this exercise, you will learn to group objects.

1. Add teeth and an eye to your shark.

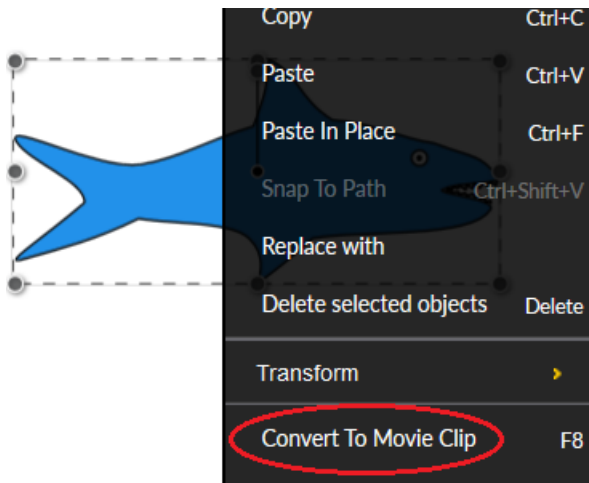


If you need to zoom in or out, position the cursor where you want to zoom and press Z to zoom in and X to zoom out.

2. Select the shark and drag it somewhere else on the canvas. Notice that the eye and teeth stayed behind.
3. To fix this, press CTRL+Z to undo your move, then use the select tool to draw a box around the entire shark. This selects everything in the box: the shark, its eye, and its teeth:



4. Right-click on the shark and select Convert to Movie Clip from the pop-up menu. You can also select Convert to Movie Clip from the Edit menu.



NOTE: The term *movie clip* is confusing, as a movie clip is usually thought of as a short part of a movie. Almost all computer drawing programs (including earlier versions of Animatron) use the term *group* instead. For clarity, this tutorial uses the term *group*.

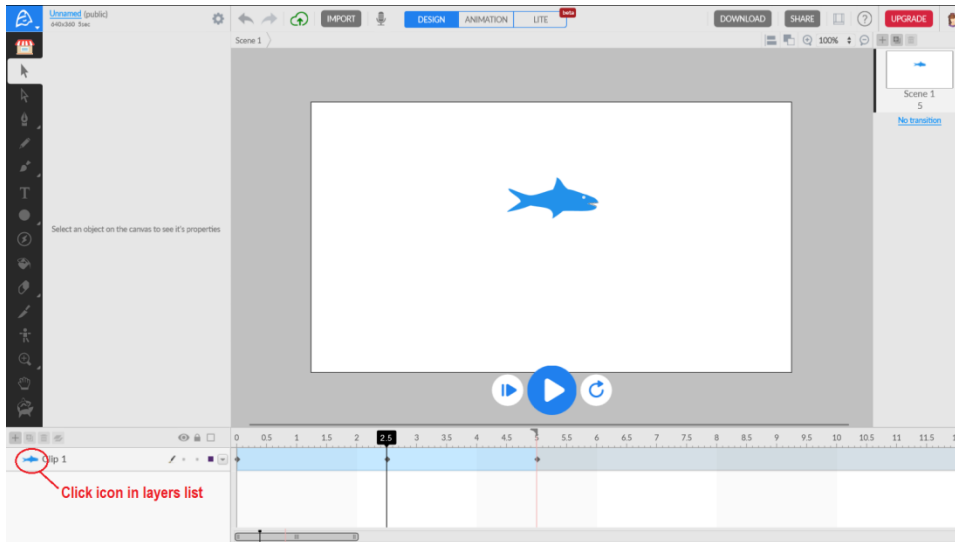
5. Drag the shark again and notice that the teeth and eye move with the body. When you place multiple objects in a group, Animatron treats them as a single object. If you want to ungroup them later, right-click the group and select “Break apart from movie clip” from the pop-up menu.

2.6 Extra: Editing objects in groups

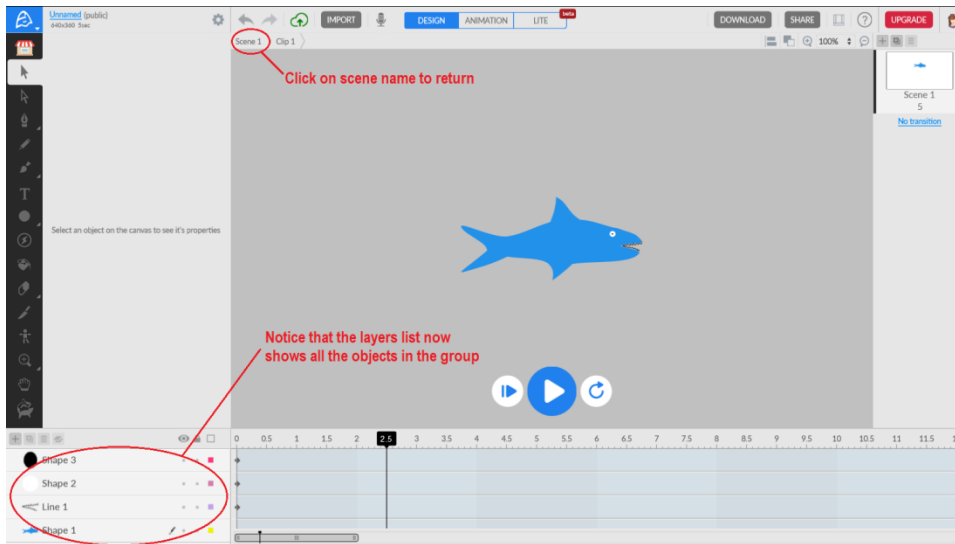
This section is read-only. You do not need to do anything.

After you have collected objects into a group, you can no longer select and edit them individually. So how do you change objects in a group, such as adding more teeth or changing the shape of a fin?

To edit the objects in a group, click on the group's icon in the layers list:



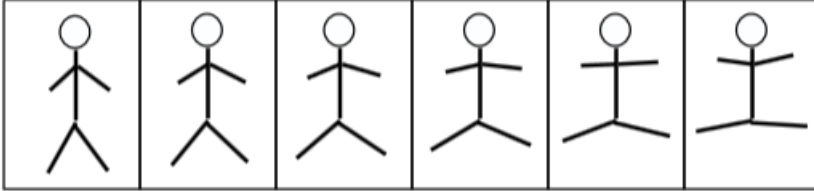
This displays only the objects in the group and allows you to edit them. When you are done editing, click on the scene name:



Lesson 3: Simple Animation

Before computer animation, animators hand-painted each frame of a story on one or more pieces of clear plastic. They then stacked all of the pieces of plastic for a single frame — background, foreground, characters — under a piece of glass and photographed it. When the photos of all of the frames were played as a movie, the characters appeared to move.

Computer animation is not that different, except that computers make it easier to reuse work and can do some of the work themselves. For example, suppose you want to animate a stick figure doing jumping jacks. In traditional animation, you must draw the following frames:



In computer animation, you only need to draw the first and last frames and tell the computer how to rotate the arms and the legs.

The frames that you actually draw are called **keyframes**, because they are “key” (important) frames. The instructions about how to move parts of your drawing between the keyframes are called **tweens**, because they tell the computer what to do *between* the key frames. Animateur supports eight types of tweens:

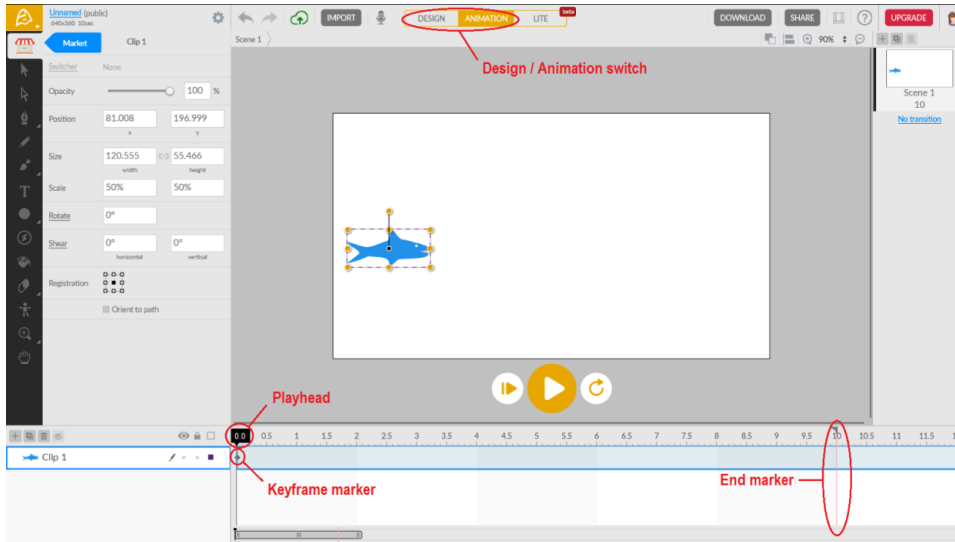
- **Translate:** Moves an object from one place to another.
- **Rotate:** Rotates an object around its pivot point, which is called its **registration point**.
- **Scale:** Changes the size of an object.
- **Alpha (Opacity):** Changes an object’s opacity — that is, how transparent it is.
- **Fill:** Changes an object’s fill color.
- **Stroke:** Changes an object’s outline color and thickness.
- **Shadow:** Changes color, opacity, offset, and blurriness of an object’s shadow.
- **Shear:** Changes an object’s horizontal and vertical shear.

3.1 Shark 1: Translating (moving) objects

In this exercise, you will learn to move objects with the Translate (movement) tween.

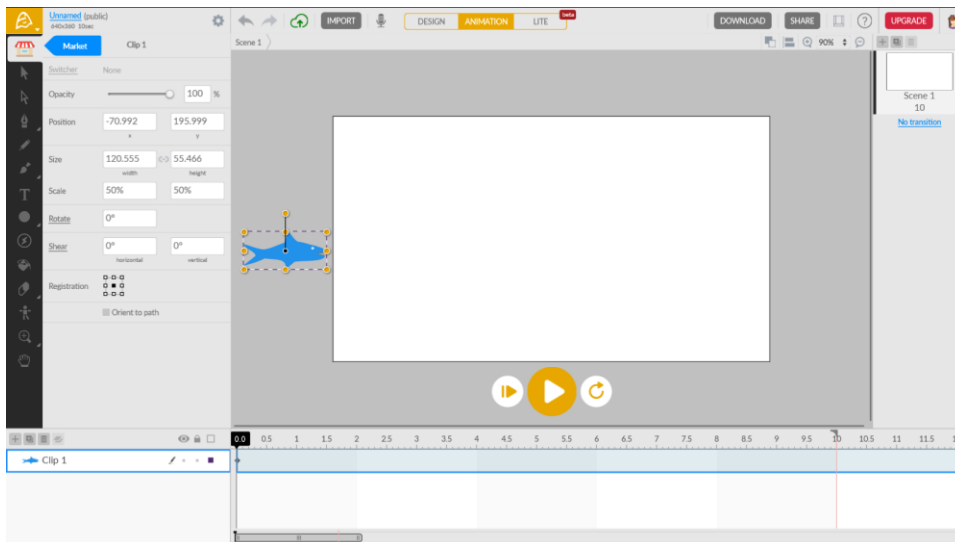
1. Click on the Project Settings icon (the gear at the top right of the property inspector) and set the project name to Shark.
2. Set the Design/Animation switch to Animation and select the shark.

Look at the timeline (below the editor) and find the playhead, keyframe marker, and end marker.



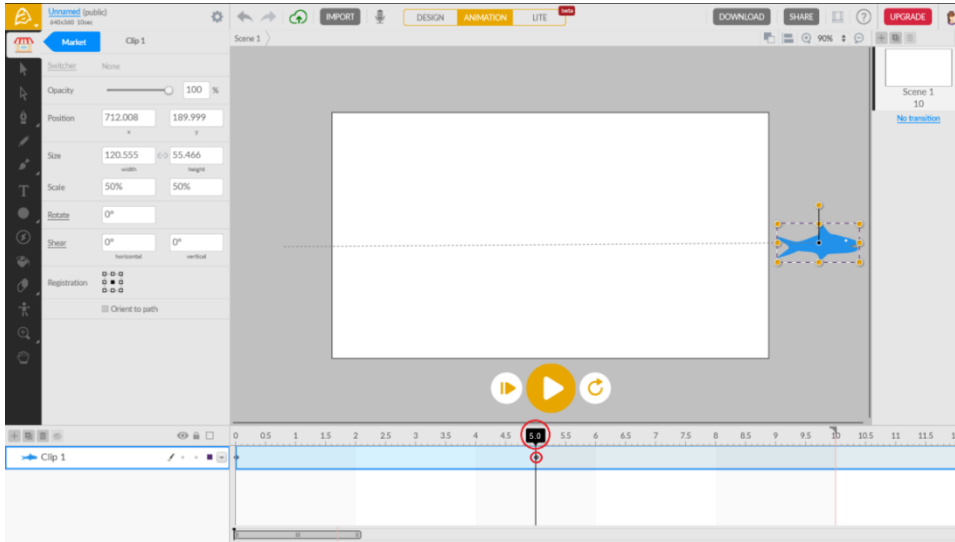
3. The playhead is at 0.0 seconds, which means that the current picture shows how the animation will look when it starts. The keyframe marker (a grey diamond) below the playhead means that the shark's current position is a key frame. That is, Animatron will use this position when deciding how to move the shark.

The shark will swim from left to right. So that it starts in the correct position, move it off the left side of the canvas.



4. Move the playhead to 5.0 seconds and move the shark off the canvas to the right. This tells Animatron where the shark will be at 5.0 seconds.

Notice that Animatron inserted a keyframe marker at 5.0 seconds and drew a dotted blue line across the screen. The keyframe marker says that the shark's new position will be used when moving the shark. The blue line is the path the shark will follow.



5. To watch the animation, click “Play this scene” (the left-hand play button). The playhead will move to 0.0 seconds and the shark will move back to the left, because that is its position at 0.0 seconds. The shark will then move across the canvas from left to right as the playhead moves from 0.0 to 10.0 seconds.

You can drag the playhead back and forth to see where the shark will be at any point in time.

It is important to understand what is happening, because this is how you animate objects in Animatron:

- **Think of Animatron as a film editor that displays one frame of an animated film at a time. The playhead tells you which frame you are currently looking at. For example, if you set the playhead to 3.2 seconds, Animatron displays the “frame” that will be shown 3.2 seconds into the animation.**
- **The keyframe markers tell you which “frames” are keyframes. Keyframes tell Animatron where an object should be at certain points in time. Animatron calculates the location of the object in the frames between the keyframes.**

3.2 Shark 2: Inserting keyframes

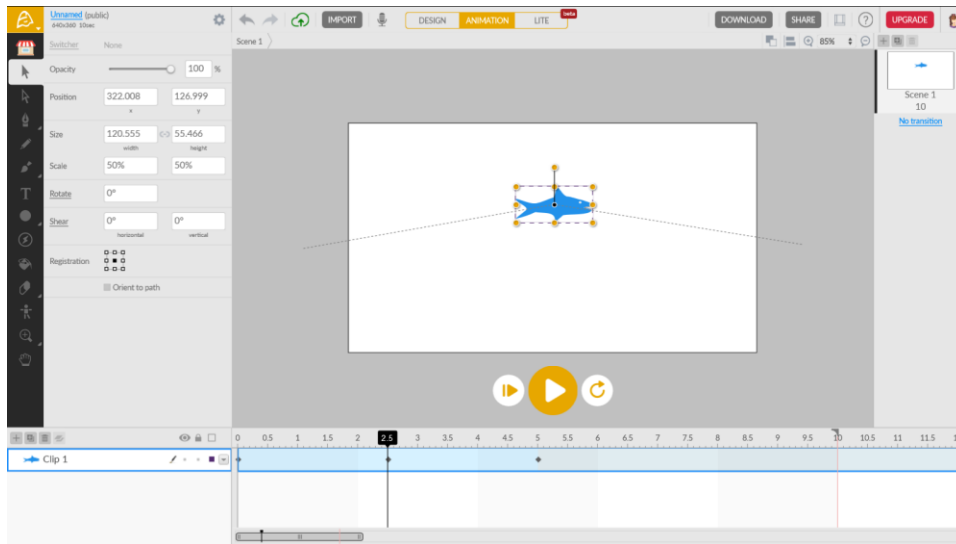
In this exercise, you will learn to insert more keyframes.

1. Now its time to make the shark jump.

Move the playhead to 2.5 seconds and move the shark to the middle of the canvas. Two things happen:

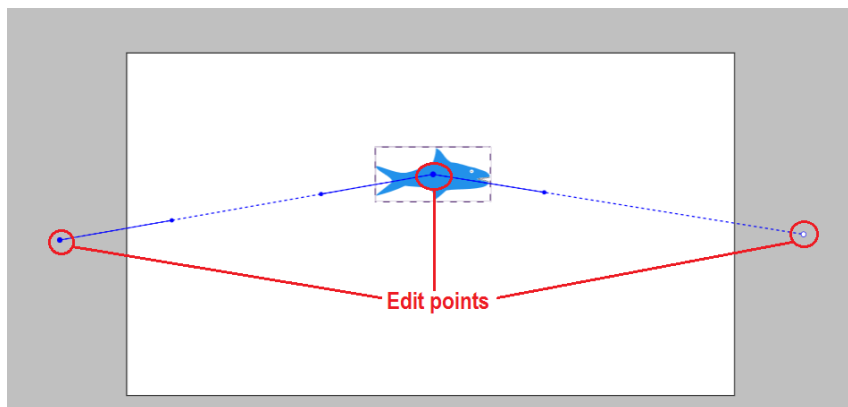
- The dotted blue line diagonals up and then down, showing the new path.
- Animatron inserts a new keyframe at 2.5 seconds.

Play the animation and watch the shark follow the new path.

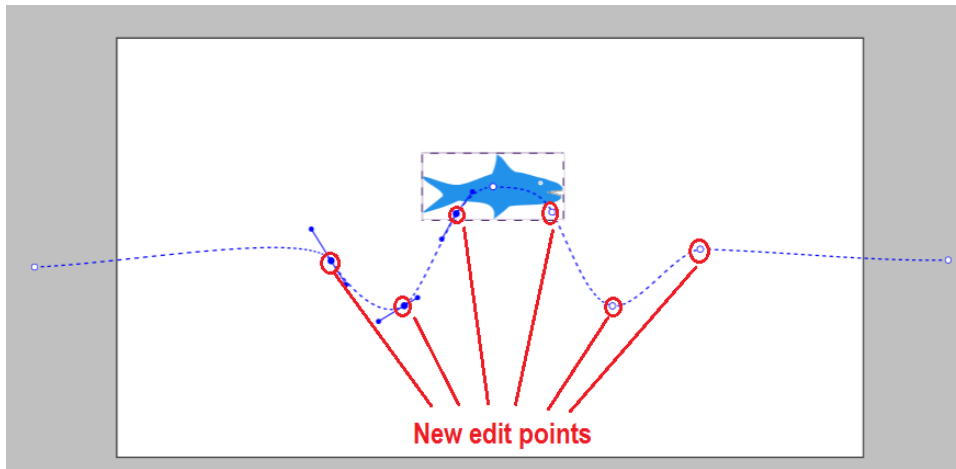


2. To make the jump more realistic, edit the path directly.

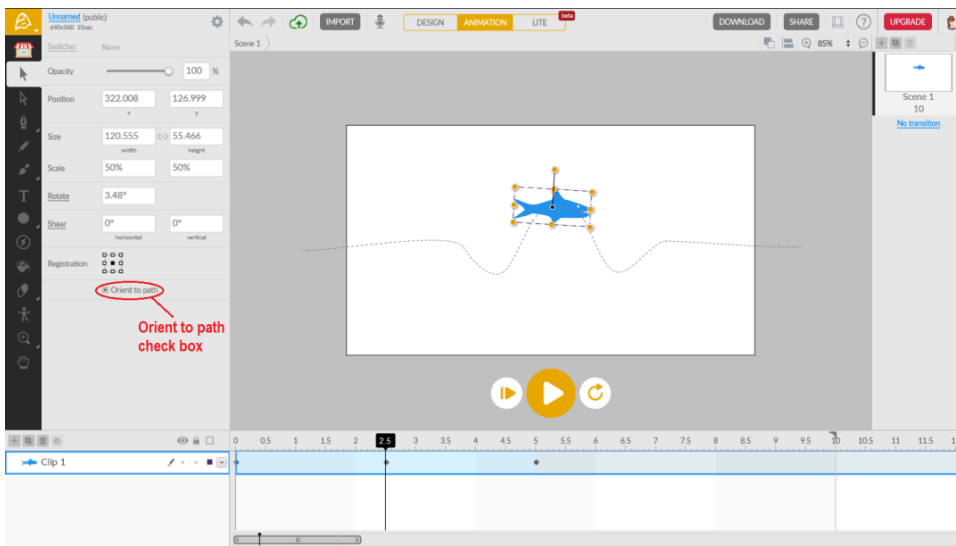
Click on the path to the left of the shark. This selects the path and highlights the edit points. These allow you to edit the path in the same way you edited an oval to create your shark.



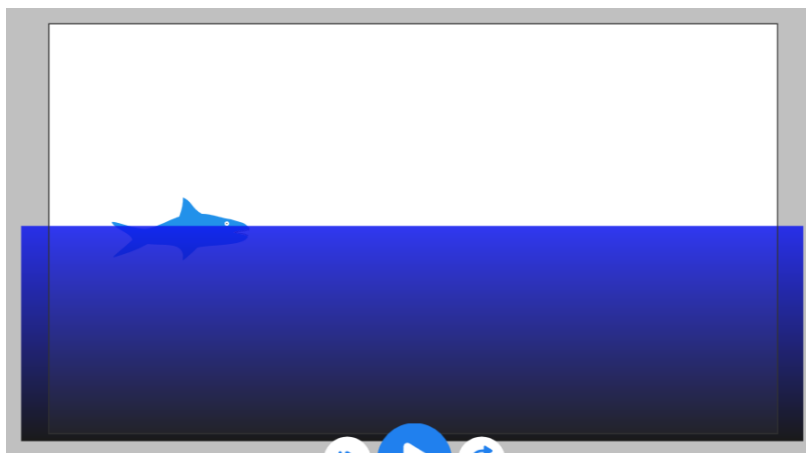
3. Double-click on the path to add new edit points, then move the edit points to reshape the path. Notice that editing the path does not insert new keyframes — it only changes the shape of the path.



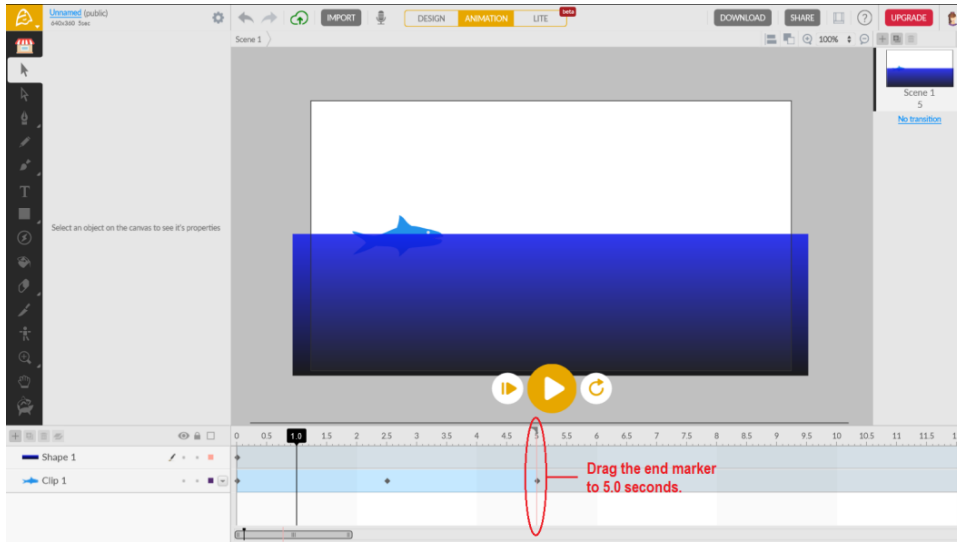
4. Play your animation. You may notice that the shark stays horizontal while leaping. To fix this, check the Orient to path box. When you replay your animation, the shark will rotate in the direction of its path.



5. Now add water. Set the Design/Animation switch to Design and add a blue rectangle across the bottom of the canvas. Use the Fill, Gradient, and Opacity properties to create blue, semi-transparent water that gets darker as it gets deeper.



6. The final problem is that the shark doesn't move after five seconds. To fix this, drag the end marker to 5.0 seconds.

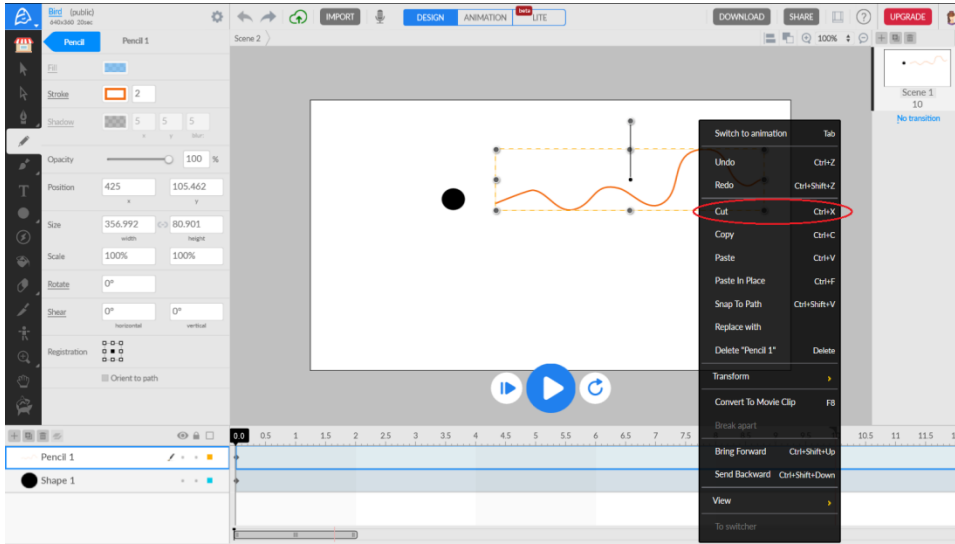


3.3 Extra: Following a path

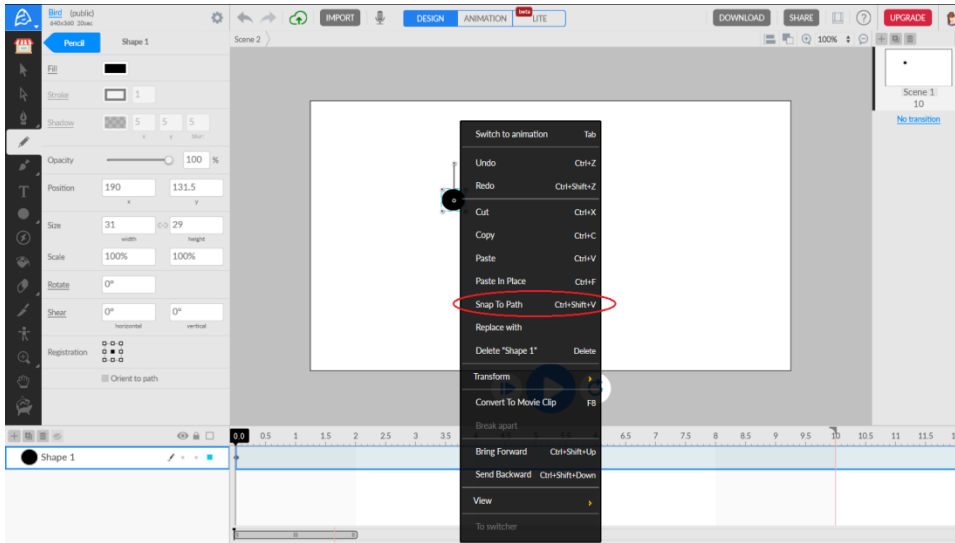
This section is read-only. You do not need to do anything.

In the previous exercise, you learned how to create and modify the path that an object follows. Another option is to draw the path and then assign that path to an object:

1. Create an object.
2. Using a tool such as Pencil or Line, draw the path you want your object to follow.
3. Select the path you just drew and cut it (CTRL-X, right-click / Cut, or Edit/Cut).



4. Select your object, right-click, and select Snap To Path.

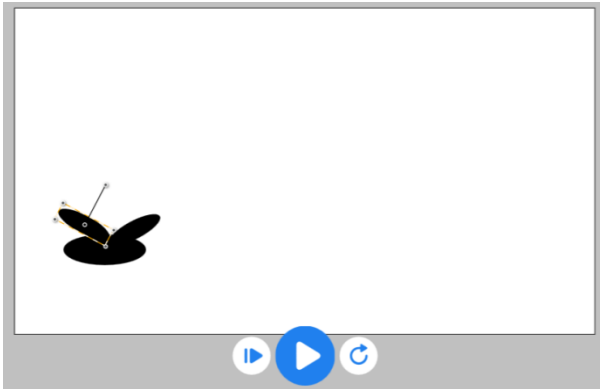


Animatron creates keyframes at 0.0 seconds and the end marker. When you click play, your object follows the path you drew.

3.4 Bird 1: Rotating objects

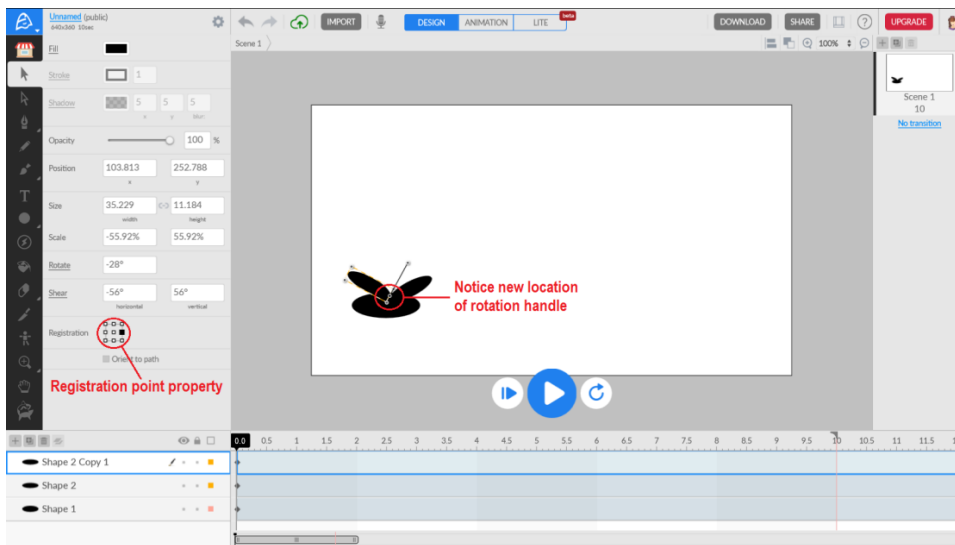
In this exercise, you will learn to rotate objects with the Rotate tween.

1. Create a new project named Bird and set the Design/Animation switch to Design.
2. Create a simple bird from three black ovals. Use the rotation handles to position each wing at the correct angle.



3. To make the wings flap correctly, you need to change the **registration point**, or point that they rotate around.

Select the left wing and click on the right center registration point on the property sheet. For the right wing, choose the left center registration point.



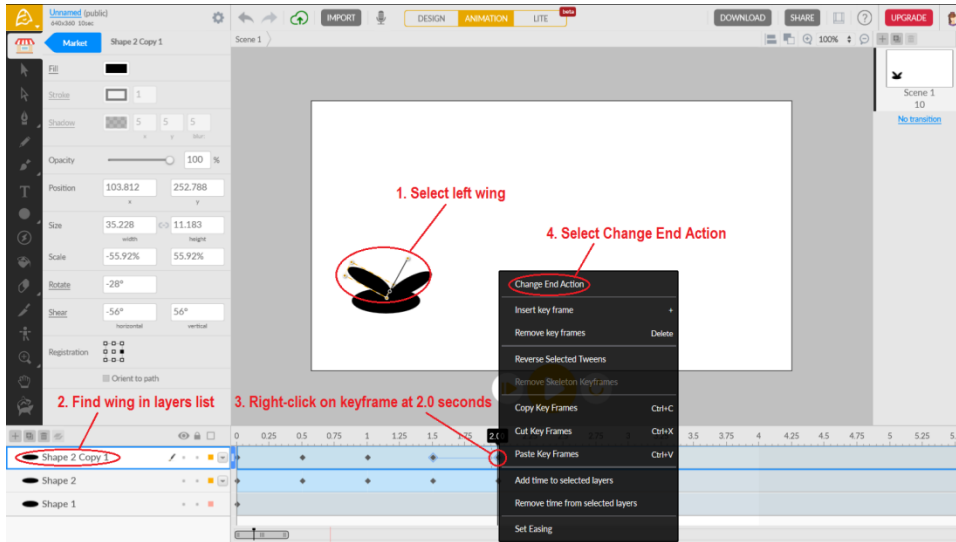
4. Now make the wings flap.

Set the Design/Animation switch to Animation and set the playhead to 0.5 seconds. Select the left wing and rotate it down by about 15°. This adds a Rotate tween between 0.0 and 0.5 seconds. Now use the rotation handle or the Rotate property to rotate the wing at 1.0, 1.5, and 2.0 seconds. The wing should rotate as follows:

<u>Time</u>	<u>Rotation</u>
0.0 seconds	Original position
0.5 seconds	Down 15°
1.0 seconds	Original position
1.5 seconds	Up 15°
2.0 seconds	Original position

Repeat this process for the right wing and play your animation to watch the wings flap.

- To make your wings keep flapping, select the left wing, right-click on the keyframe marker at 2.0 seconds, and select Change End Action, then select Loop 0 times. This means to repeat the preceding actions forever.

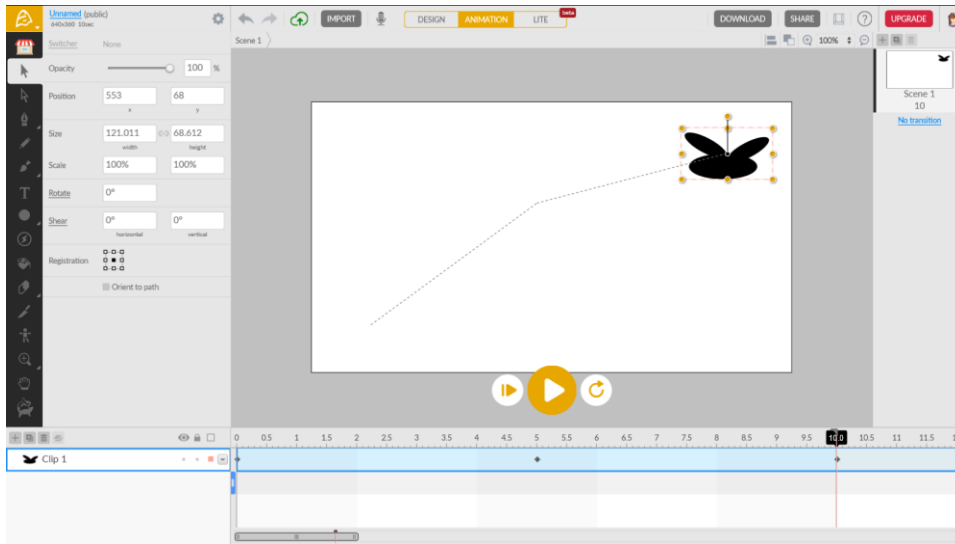


Repeat this for the right wing, then play your animation and watch the wings flap continuously.

3.5 Bird 2: Scaling (resizing) objects

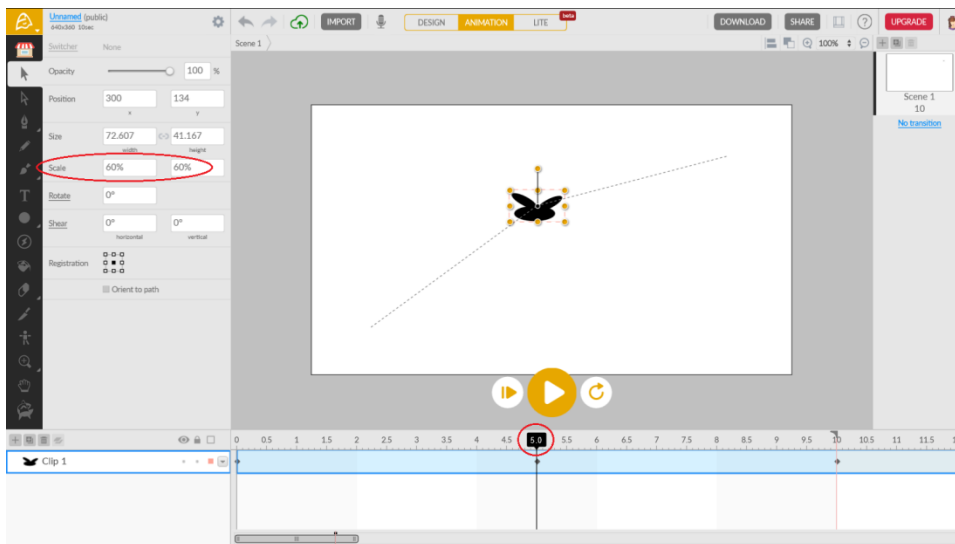
In this exercise, you will learn to scale (resize) objects with the Scale tween.

1. Group your bird's body and wings together. If you don't remember how to do this, see section 2.5.
2. Animate the bird so it follows a bent path from lower left to upper right, with keyframes at 0.0, 5.0, and 10.0 seconds. If you don't remember how to do this, see section 3.2. Play the animation and watch the bird fly across the canvas while flapping its wings.



It is important to understand what is happening. The wings were animated as separate objects, then grouped together with the body and the entire group was made to move. Thus, the wings are flapping “inside” the group, while the entire group is moving across the canvas. This shows the importance of groups — imagine having to move the body and each wing separately across the canvas while trying to make the wings flap.

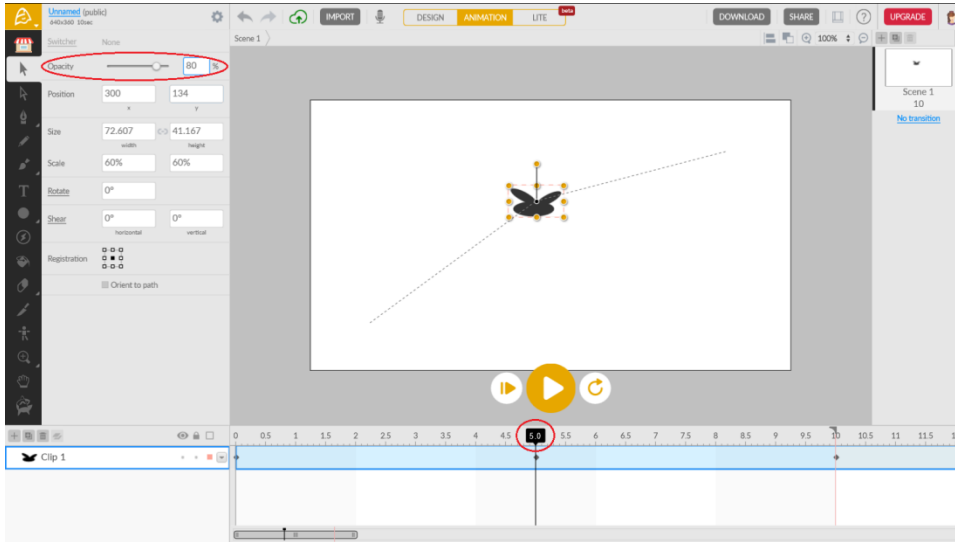
3. To make the bird look like it is flying away from us, you will shrink it as it flies. Set the playhead to 5.0 and set the width and height in the property sheet to 60%. This inserts a Scale tween between 0.0 and 5.0 seconds that will shrink the bird from 100% of its original size to 60%. Next, set the playhead to 10.0 and set the width and height to 10%. This inserts another Scale tween, this time between 5.0 and 10.0 seconds, that will shrink the bird from 60% of its original size to 10%. Now play the animation and watch as the bird flies into the distance.



3.6 Bird 3: Making objects fade

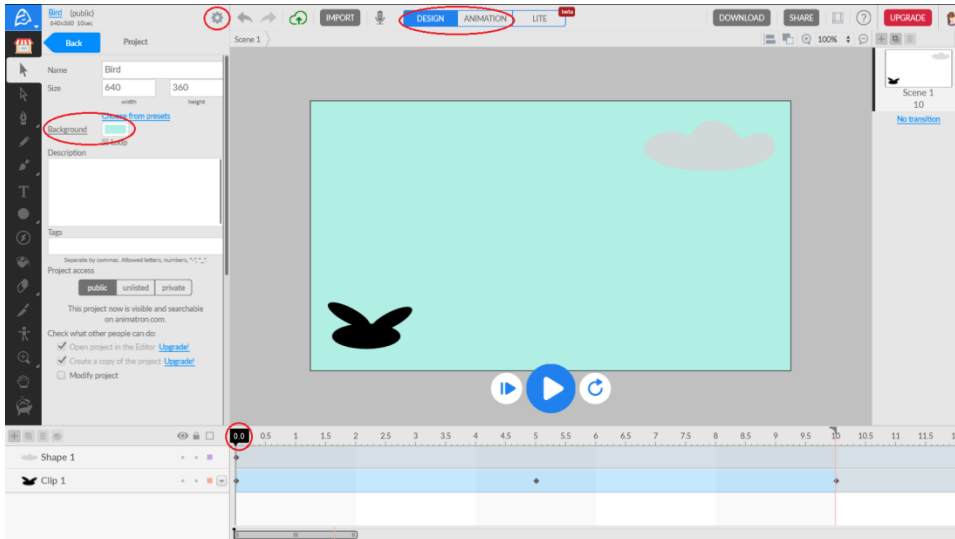
In this exercise, you will learn to make objects fade with the Alpha (opacity) tween.

1. For even more realism, you will make the bird fade into the distance. Move the playhead to 5.0 and set the Opacity to 80%. This creates an Alpha (opacity) tween, changing the opacity from 100% opaque (solid) at 0.0 seconds to 80% opaque at 5.0 seconds. Next, move the playhead to 10.0 and set the Opacity to 0%. This inserts another Alpha (opacity) tween, changing the opacity from 80% opaque at 5.0 seconds to 0% opaque (invisible) at 10.0 seconds. Click play and watch the bird fade as it flies into the distance.



2. To finish the bird project, add sky and clouds. Set the Design/Animation switch to Animation and the playhead to 0.0. In the upper right corner, add a light grey cloud with 80% opacity. Next, click on the project menu (the gear at the top of the property inspector) and set the background color to light blue.

Play your animation and watch your bird fly off into the clouds.

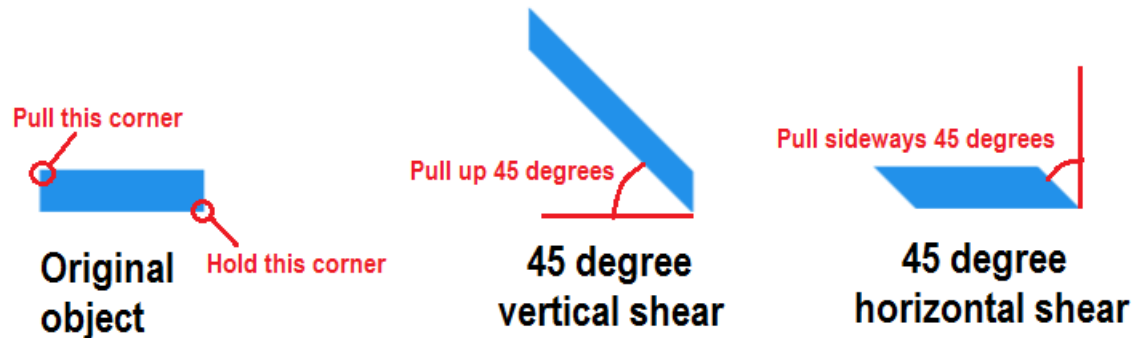


3.7 Extra: Fill, stroke, shadow, and shear tweens

This section is read-only. You do not need to do anything.

In addition to the four types of tweens seen so far (translation, rotation, scaling, and opacity), Animatron supports four more types of tweens:

- **Fill:** The fill tween, also known as the color tween, changes the fill color of an object.
- **Stroke:** The stroke tween changes the color and width of an object's outline.
- **Shadow:** The shadow tween changes the color, opacity, horizontal and vertical offset, and blurriness of an object's shadow.
- **Shear:** The shear tween changes an object's shear, which can be thought of as holding one corner of an object and pulling horizontally or vertically on the opposite corner. This deforms the object in the direction of the pull.



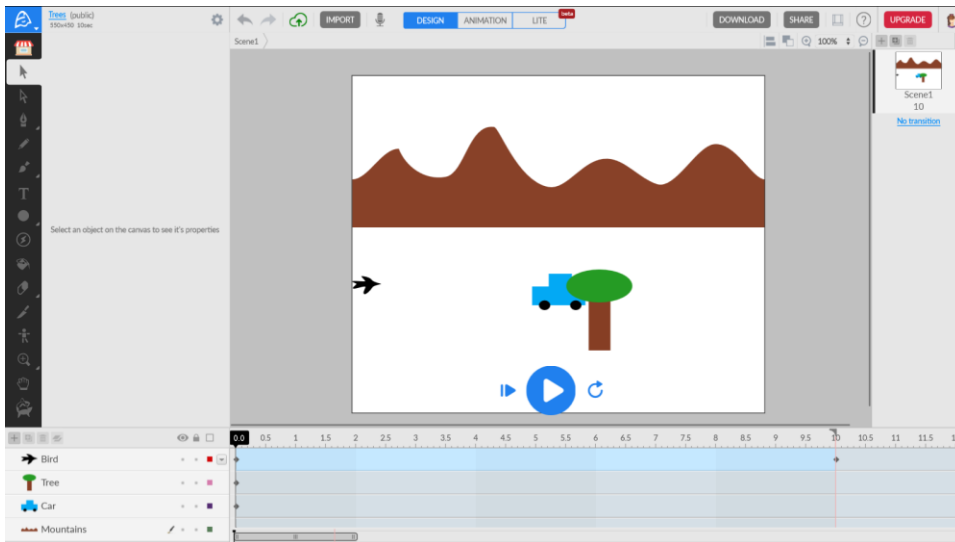
Lesson 4: Advanced Animation

In the previous lesson, you saw how to use the four different types of tweens: translation (movement), rotation, scaling, and alpha (opacity). In this lesson, you will learn advanced techniques: simulating depth, panning, multiple scenes, and easing.

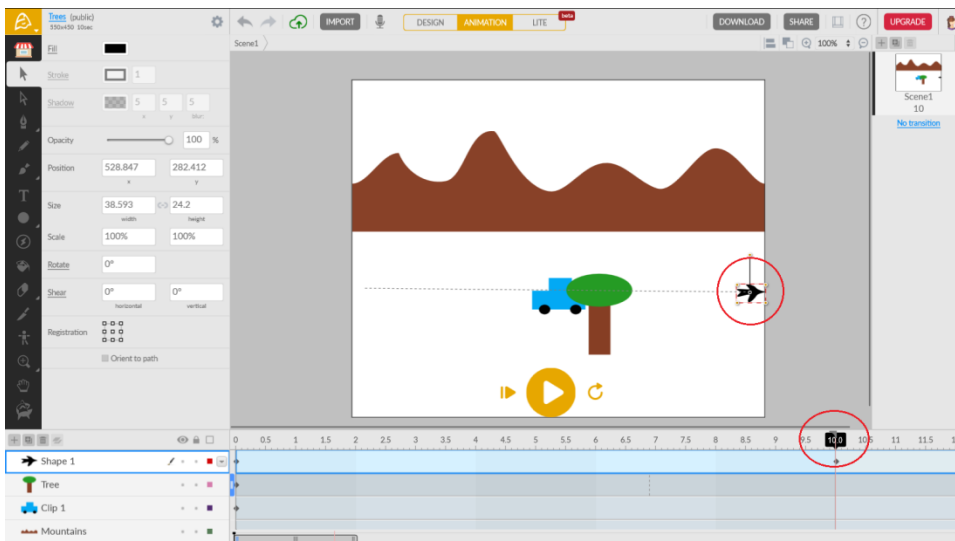
4.1 Trees 1: Using layers to simulate depth

In this exercise, you will learn to use layers to simulate depth.

1. Create a new project and name it Trees. Set the Animate/Design switch to Design.
2. In the following order, draw (1) a mountain range, (2) a car made by grouping two rectangles and two circles, (3) a tree made by grouping a rectangle and a circle, and (4) a bird. After you have drawn the objects, right-click on their names in the lower left corner and rename them Bird, Tree, Car, and Mountains.

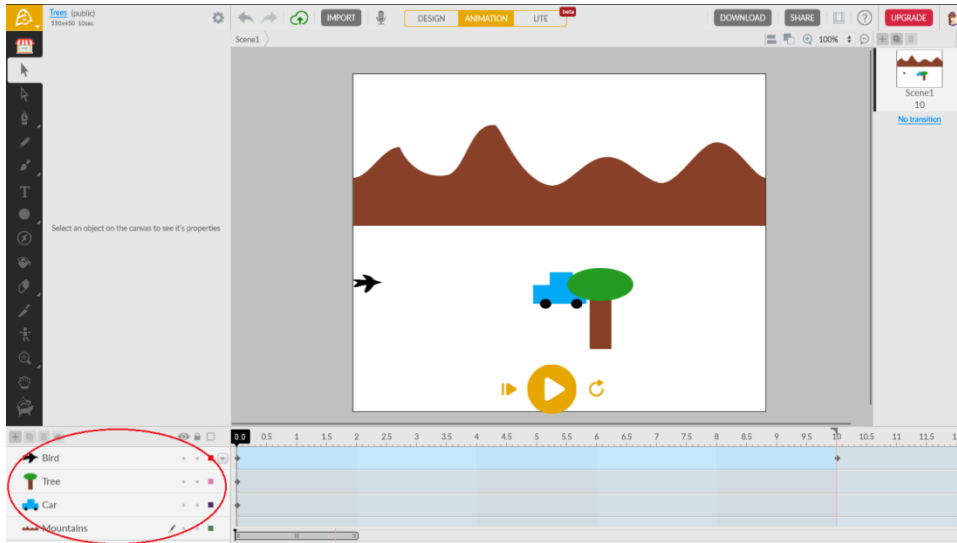


3. Switch to animation mode, set the playhead to 10.0 seconds, and move the bird to the position shown.



Play your animation and watch the bird fly in front of the tree.

- Now look again at the list of objects in the lower left corner.



Each object in the list is a *layer*. The term layer comes from traditional animation, where objects are painted on plastic sheets that are stacked on top of each other. Each plastic sheet (and its object) is an individual layer in the stack. The important thing about layers is that an object in a higher layer can block the view of objects in lower layers.

The layers list shows how objects are layered in Animatron. Objects higher in the list block objects lower in the list. For example, the bird is higher in the list than the tree, so it blocks the tree and appears to fly in front of it.

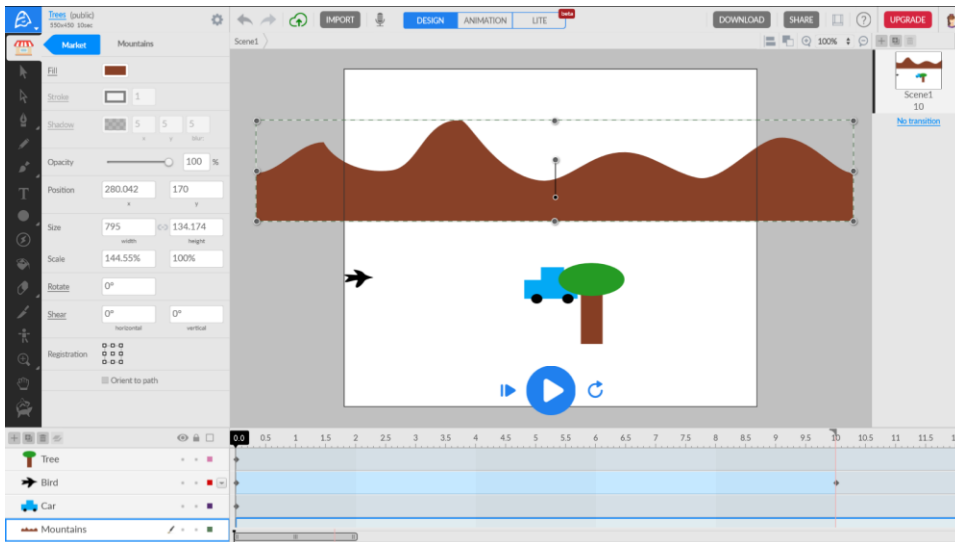
- You can change the order of the layers by moving them up and down in the list.

Move the bird below the tree in the layers list — the new order is Tree, Bird, Car, Mountains — and replay the animation. Notice that the bird now flies behind the tree and in front of the car. You can also change the order of layers by right-clicking on an object and selecting Bring Forward or Send Backward.

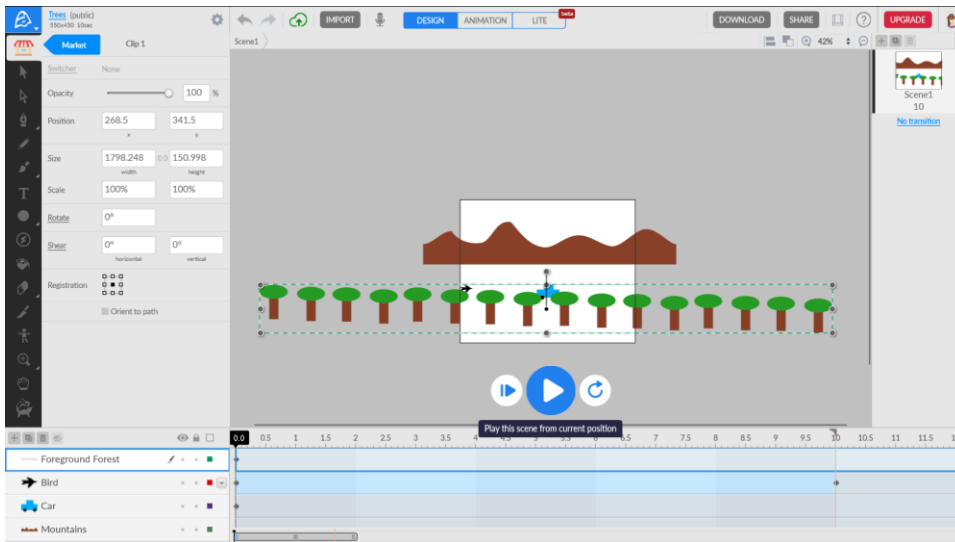
4.2 Trees 2: Panning

In this exercise, you will learn to pan. **Panning** is the act of moving a camera across a scene, such as to follow a car driving along a road. In animation, panning is simulated by keeping an object in one place and moving the scenery past it. (Platform video games, such as the *Mario* series, use this technique as well.)

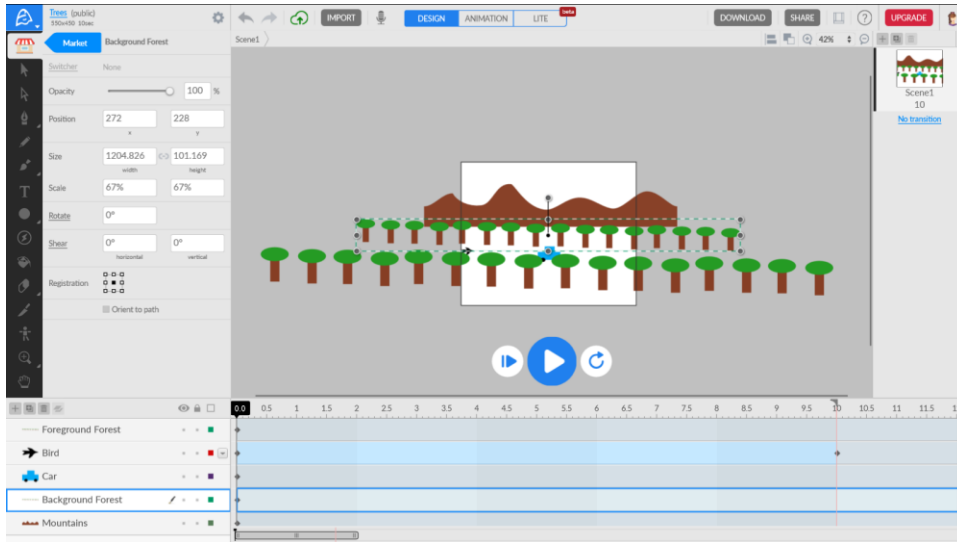
1. Switch to design mode and stretch the mountain range so it extends past both edges of the canvas.



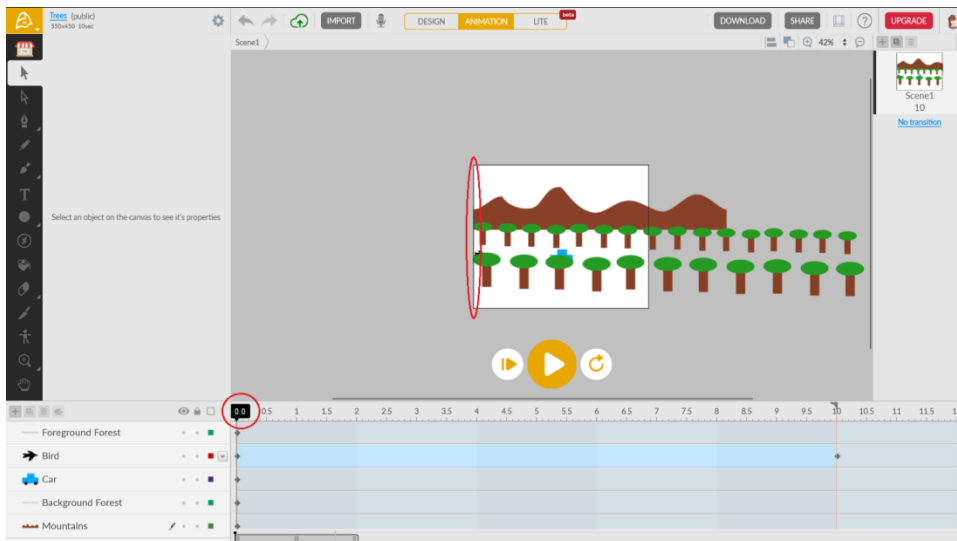
2. Copy and paste the tree to make a forest that extends about one canvas width beyond each side of the canvas. (Use the X key to zoom out so you can see the entire forest.) Group all of the trees together and name the group Foreground Forest.



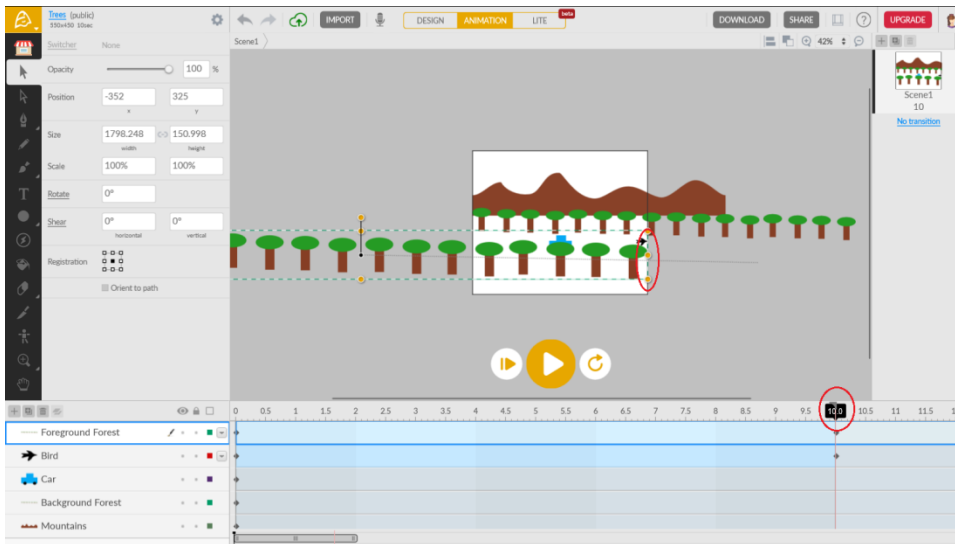
- Copy the forest, name the copy Background Forest, and shrink it to 2/3 the size of Foreground Forest. Move it down in the list of layers so it is below the car and above the mountains.



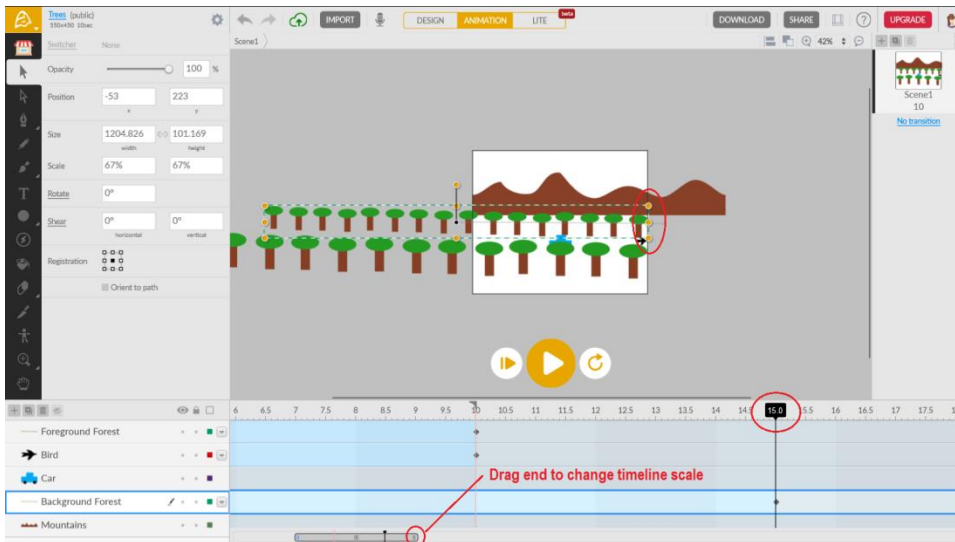
- Set the Animate/Design switch to Animate, set the playhead to 0.0, and move the left edges of Mountain, Background Forest, and Foreground Forest to the left edge of the canvas.



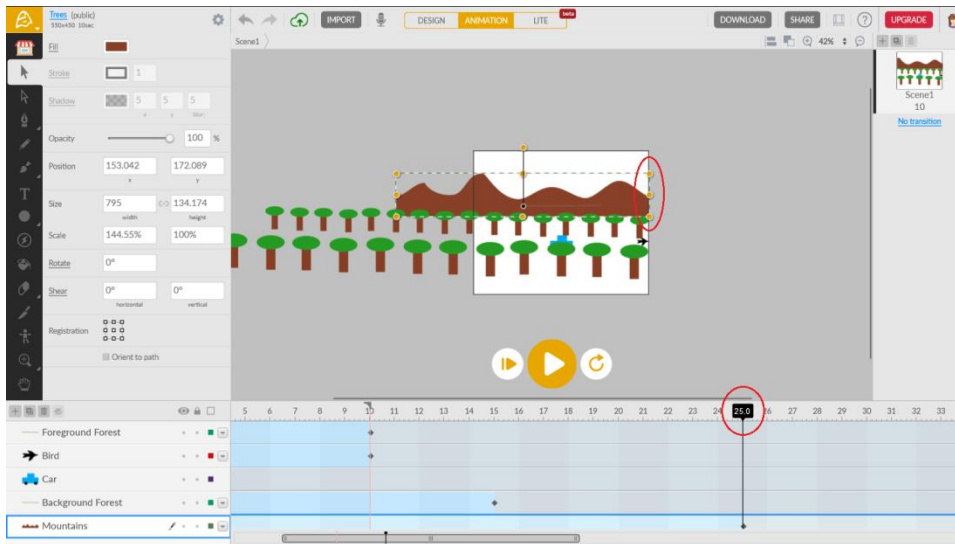
5. Set the playhead to 10.0 and move the right side of Foreground Trees to the right edge of the canvas.



6. Set the playhead to 15.0 and move the right side of Background Trees to the right edge of the canvas. If 15.0 seconds is off the screen, drag the end of the timeline slider to change the scale of the timeline.



7. Set the playhead to 25.0 and move the right side of Mountains to the right edge of the canvas.



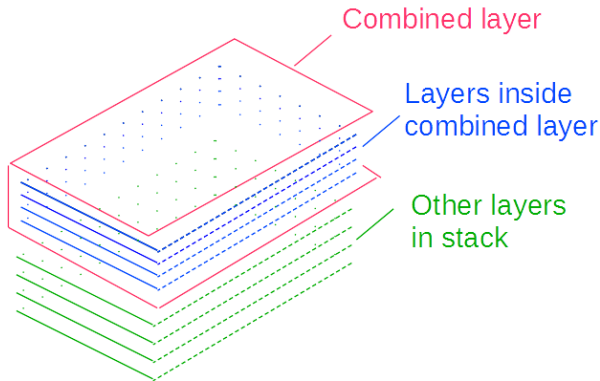
8. Zoom back in (with the Z key) so the canvas fills most of the editing area, then play the animation.

There are two things to notice. First, the car appears to be moving because the scenery in front of and behind it are moving. Second, objects in the foreground move faster than objects in the background. This is because, as we move through a landscape (such as when driving in a car), objects far away from us appear to move more slowly than objects close to us.

4.3 Extra: Combined layers

This section is read-only. You do not need to do anything.

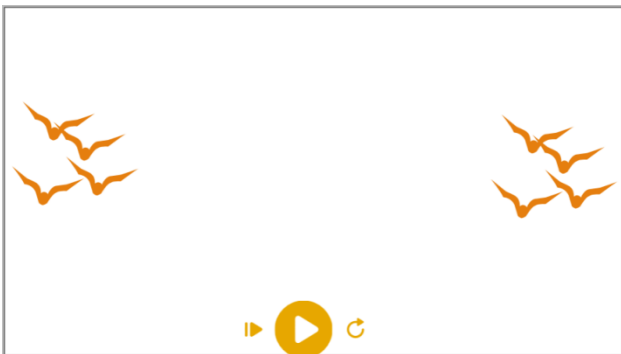
Objects can be placed inside *combined layers*. In traditional animation terms, a combined layer is like a clear plastic folder you put other layers inside:



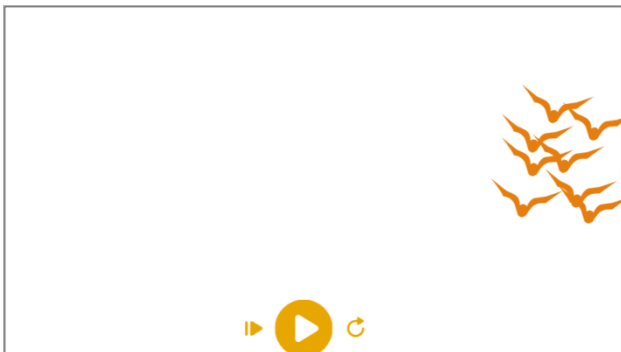
Combined layers are useful in a number of ways:

- **Organizing objects:** Combined layers are a good way to group related objects, just like you place related documents in the same directory on Google Drive.
- **Applying tweens:** When you apply a tween to a combined layer, it applies to all of the objects in that combined layer.
- **Changing position in layer stack:** If a set of related objects is placed in a combined layer, you can move them up or down in the layer stack as a set by moving the combined layer.
- **Changing object properties:** When you change an object property of a combined layer, such as its fill color, that change applies to all objects in the combined layer.

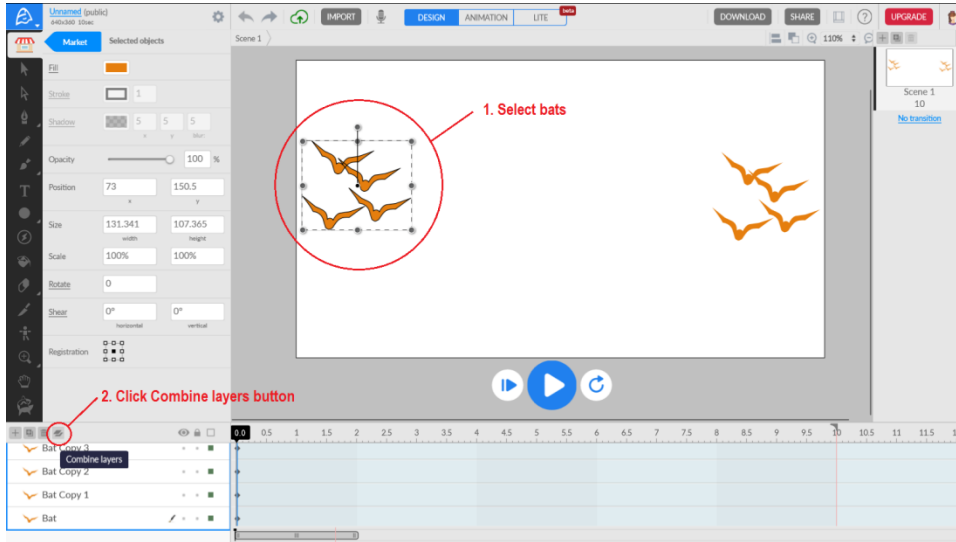
As an example, suppose you have two sets of bats and you want each set to fly to the opposite side of the canvas.



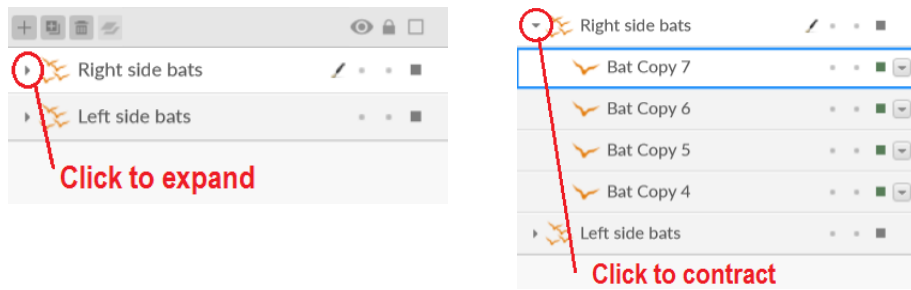
You start by moving each of the bats on the left side to the right side. Now it's time to move the right-side bats to the left side. The problem is you can't tell which bats are which.



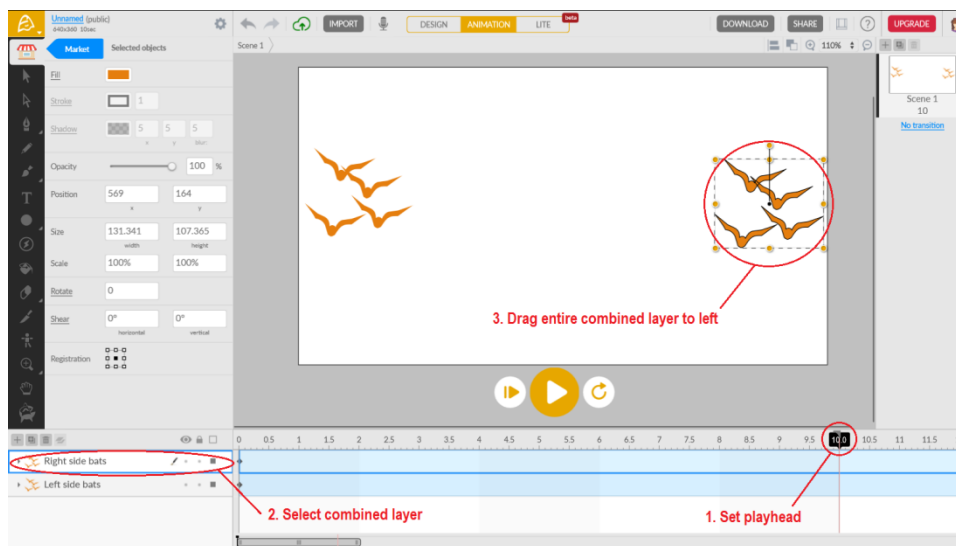
To solve this, move the bats back to the left by undoing the moves. Now select the bats on the left and click the Combine layers button. This creates a combined layer containing the bats on the left.



Repeat this for the bats on the right and rename each combined layer. There are now only two layers in the layers list, one for the left-side bats and one for the right-side bats. You can use the triangle left of the layer's name to expand or contract the list of objects in the combined layer.



To move the bats, select the “Right side bats” combined layer from the layers list and move the bats to the left, then select the “Left side bats” combined layer and move the bats to the right.



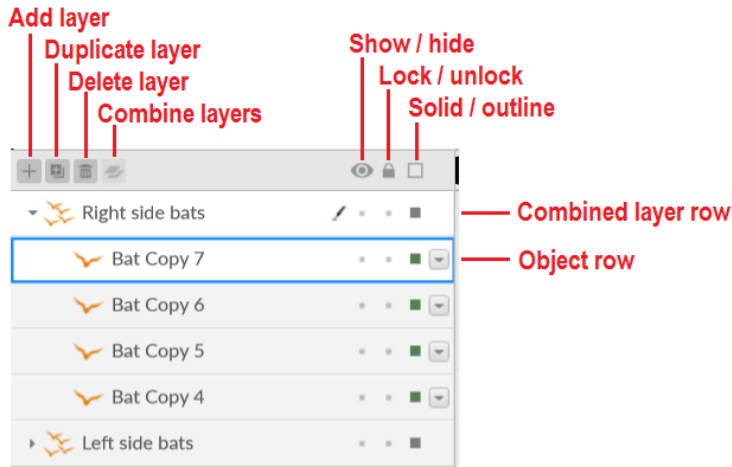
Other operations on combined layers

Some other things you can do with combined layers are:

- Hide all of the objects in the combined layer.
- Lock all of the objects in a combined layer.
- Display the objects in a combined layer using outlines.

These operations are useful when there are too many objects on the canvas and it is difficult to select or see individual objects. When an object is hidden or locked, it cannot be selected or modified. This makes it easier to work with the objects around it.

The show/hide, lock/unlock, and display as solid/outline operations can be applied to all objects (click the icons at the top of the layers list), all of the objects in a combined layer (click the icon in the combined layer's row), or an individual object (click the icon in the object's row).



The difference between groups and combined layers

You may also be wondering about the difference between a group and a combined layer, since both allow you to combine objects and apply tweens.

The main difference is how tweens are applied to objects inside the combined layer or group. When you apply a tween to a combined layer, that tween is applied individually to each object in the layer. If you move an object out of the combined layer, the tween still applies to the object. On the other hand, if you apply a tween to a group, that tween applies to the group as a whole. If you break the group apart, the tween disappears.

This may not sound important, but it is. For example, it is impossible to animate the bird in the Bird project using a combined layer. You can make the wings flap forever, but you can't get them to move across the screen. The problem is the repeating loop at 2.0 seconds gets in the way of the movement tween, which lasts 10 seconds.

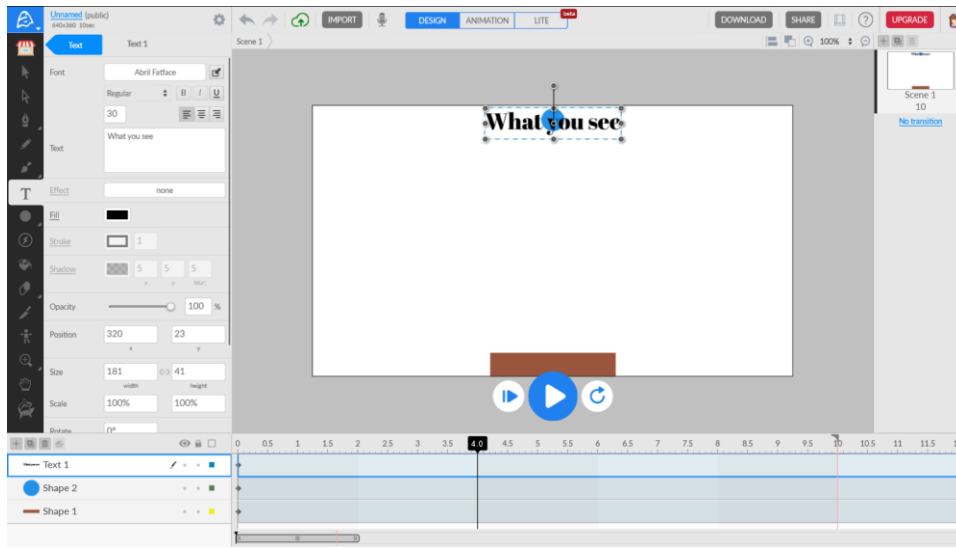
If you don't understand this, don't worry about it. Instead, just follow these rough guidelines:

- If you are combining objects to make a new object (like the shark or the bird), use a group.
- If you are organizing separate objects (like the bats), use a combined layer.

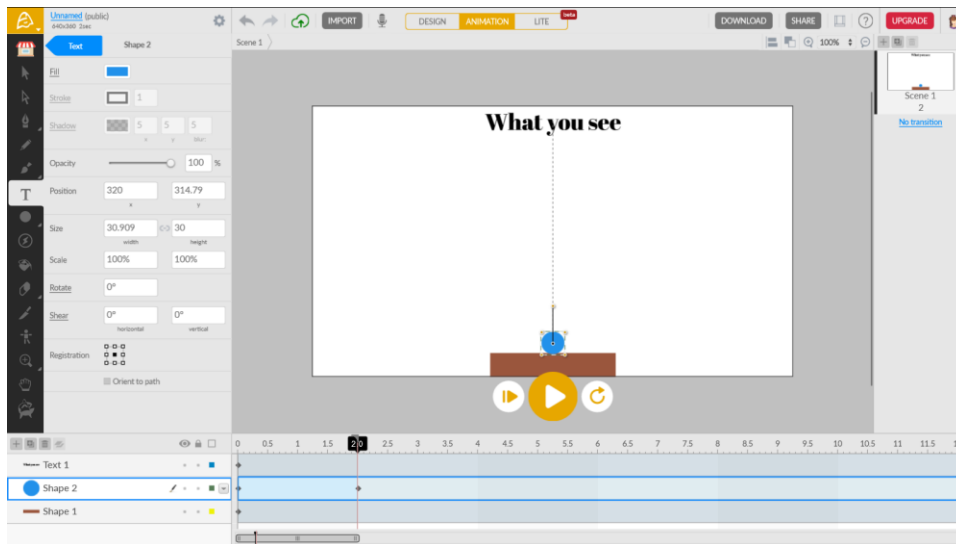
4.4 Ball 1: Creating a movie with multiple scenes

In this exercise, you will learn to create movies (animations) with multiple scenes.

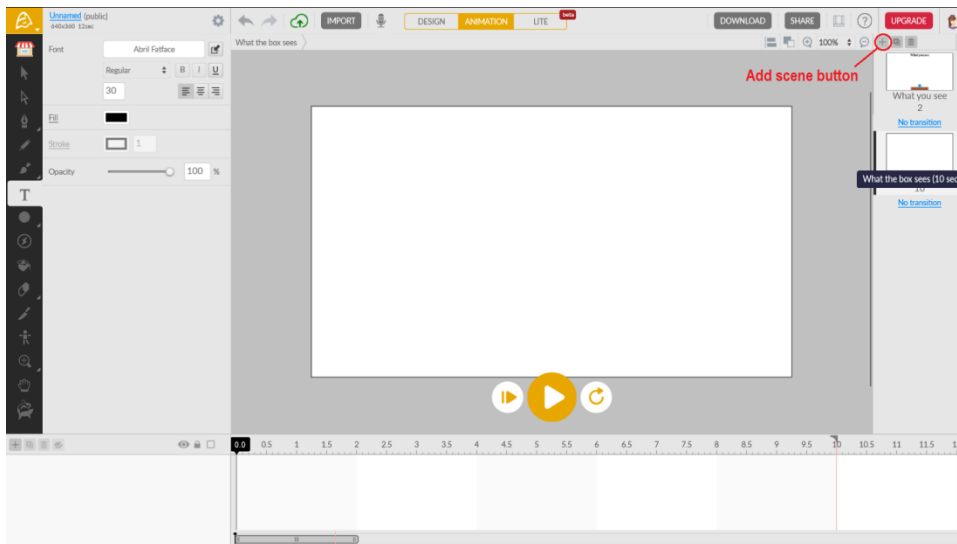
1. Create a new project named Ball and draw a ball, a box, and the words “What you see”.



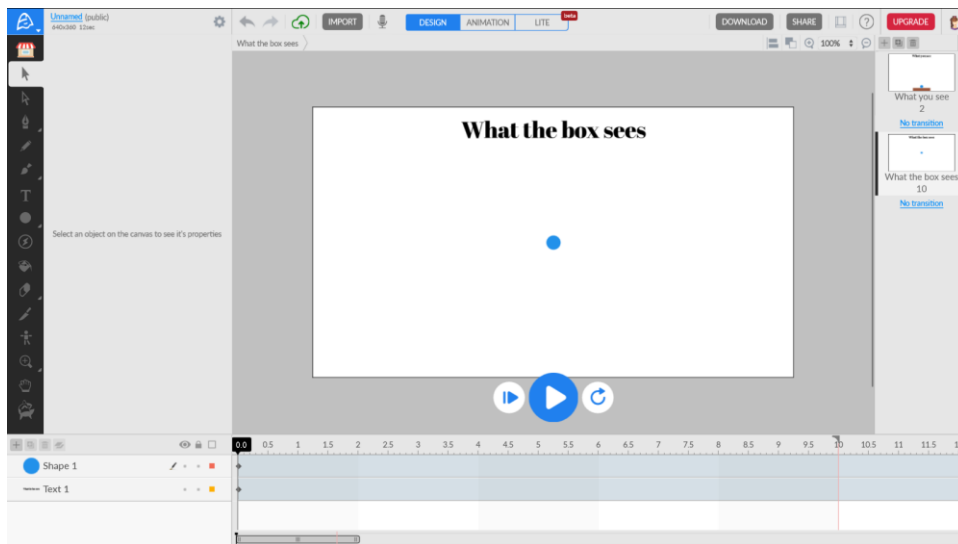
2. Set the Design/Animation switch to Animation, set the playhead to 2.0 seconds, and move the ball straight down so it is sitting on top of the box. Set the end marker to 2.0 seconds.



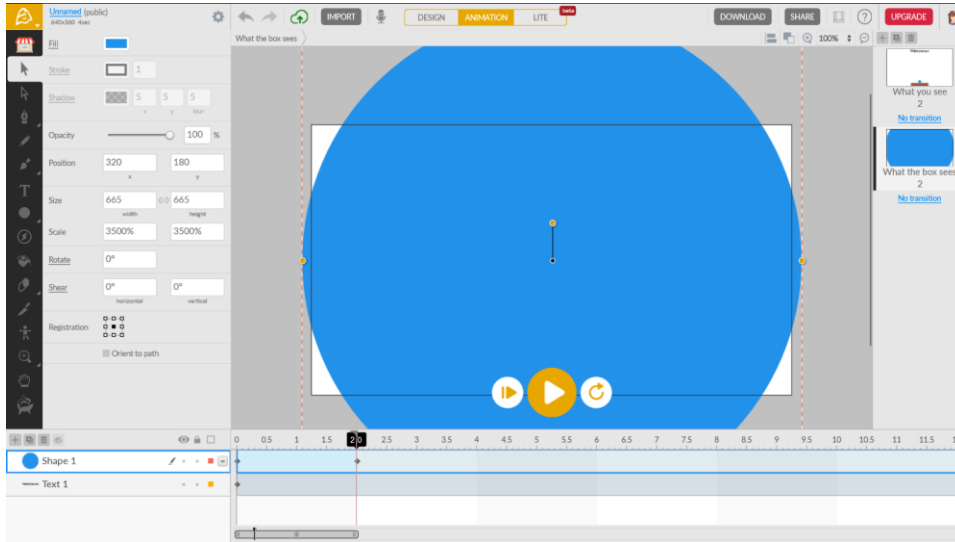
3. Click the Add scene button and name the first scene “What you see” and the second scene “What the box sees”.



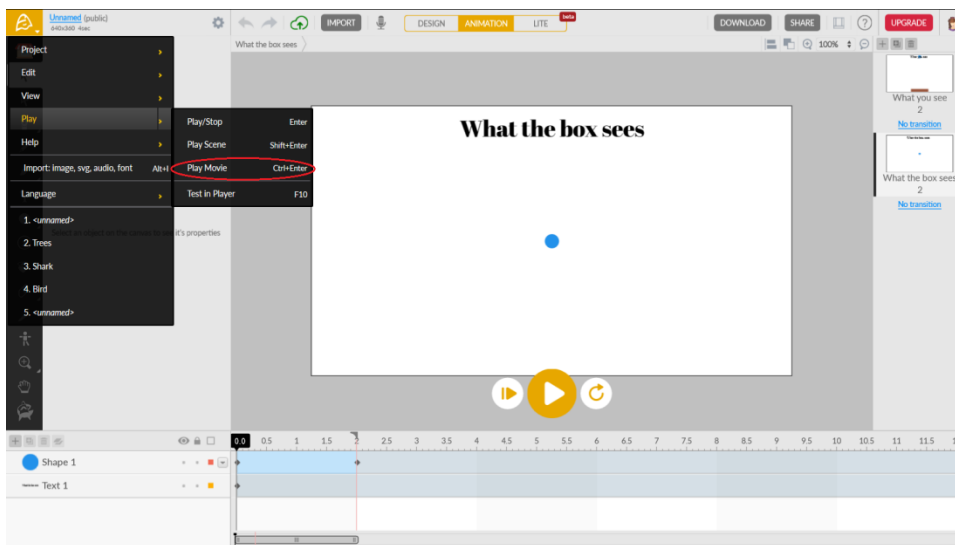
4. Set the Design/Animation switch to Design and draw a ball and the words “What the box sees”.



- Set the Design/Animation switch to Animation, move the playhead to 2.0 seconds, and change the ball's width and height scales to a large enough number (such as 3500%) for the ball to fill the canvas. Move the end marker to 2.0.



- Click on the Animatron symbol in the upper left corner of the screen to show the Animatron menu. Click on Play and select Play Movie. Animatron will play both scenes, one after the other. (If you click the play button, it will only play the current scene.)

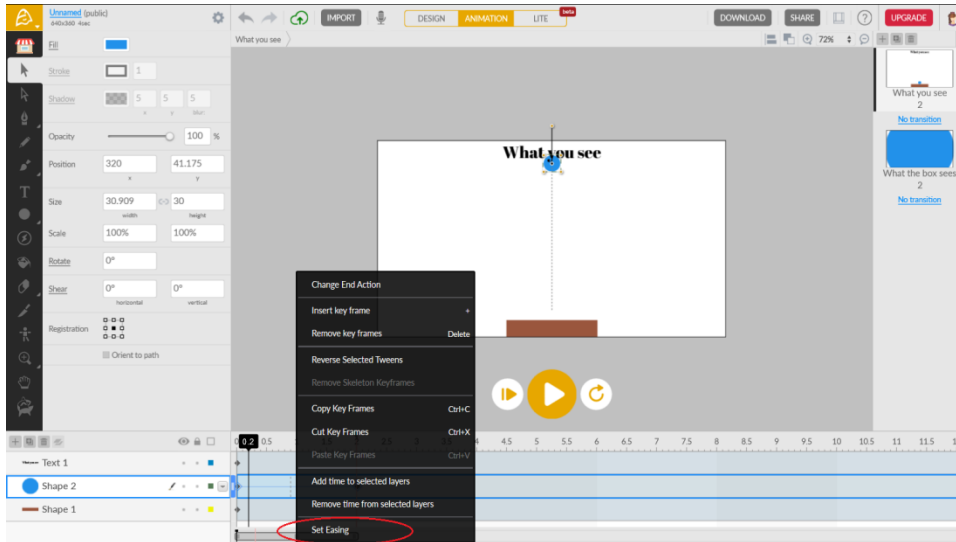


You can create a movie with as many scenes as you like. The order of the scenes in the list determines the order in which they are played.

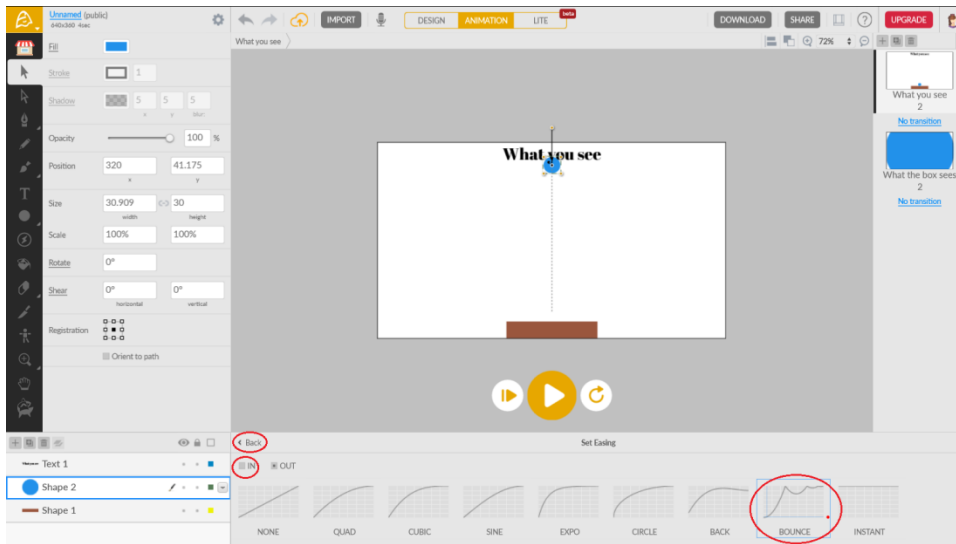
4.5 Ball 2: Changing tween speed with easing

In this exercise, you will learn how to change the speed of a tween with *easing*. Normally, a tween is applied smoothly. That is, an object will move or grow or rotate or fade at a constant speed. With easing, you can change the rate at which a tween is applied. For example, you can have an object move faster and faster as it moves along a path.

1. To change the easing for the falling ball in the first scene, select the “What you see” scene, right-click on the timeline for the ball between 0.0 and 2.0 seconds, and select Easing.



2. Uncheck the IN box, select BOUNCE, and click on Back. Play the scene and watch what happens.



On the Set Easing menu, IN and OUT refer to whether the action is applied at the start (IN), end (OUT), or both start and end (IN/OUT) of the tween. The easing name tells you what action will be applied. For example, Bounce causes the tween to bounce back along its path and doing this at the end means it will only bounce after it hits the box.

3. Apply Out Bounce easing to the ball in the “What the box sees” scene as well. This means that the scale tween will be applied with a bounce at its end. Select Play/Play Movie from the menu and watch your movie.