

Parenting and Nesting

Grouping layers to make them easier to coordinate.

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▽ Getting Started

Make sure you have copied the **Lesson 06-Parent & Nest** folder from this book's disc onto your hard drive, and make note of where it is; it contains the project files and sources you need for this lesson. Rather than use a single project file, for this lesson we have provided several different project files to make it easier to keep track of all the compositions you will be creating and using.

No layer or composition is an island – at least, not in complex animations. In this lesson, you will learn how to group layers and build composition hierarchies, making it easier to create and manage complex animations. First up will be parenting, where one layer's animation can influence that of others. After that we'll work with nesting and precomposing compositions: ways to bundle together layers, keyframes, and effects into one comp and treat the result as a single layer in another comp.

Approaches to Grouping

There are three general approaches to grouping inside After Effects: *parenting* layers together, *nesting* and *precomposing* compositions, and applying *expressions* to individual parameters. Here is an overview of their relative strengths, weaknesses, and uses:

Parenting: With this technique, you “parent” (attach) as many *child* layers as you want to a *parent* layer. The children remember their relationships to the parent at the time you attach them. Any changes in the parent's position, scale, or rotation results in the children being dragged along for the ride. The children may have their own animation as well, but these are not passed back to the parent. To better visualize this, image a person walking several dogs. The dogs may be running around their minder, but as their minder walks down the street, all of the dogs move down the street as well.

The advantage of parenting is that all of the layers involved are in the same composition, which makes them easy to keep track of. A disadvantage is that changes in

opacity are not passed along from parent to child, so you can't use parenting to fade out a group of layers together. Effects are also not passed from parent to child.

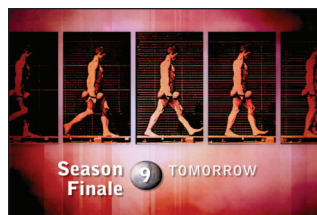
Nesting: The process of adding a composition to another composition is referred to as *nesting* comps. The nested comp (often referred to as a *precomp*) appears as just another layer in the second comp. You can animate, fade, and apply effects to the nested comp layer as if it were a normal movie file. The primary difference is that it is “live”: You can still go back to the first (nested) comp and change it, and those changes will appear immediately in the second (master, or main) comp without the need to first render the precomp.

Another use for nesting is that a single source comp can be nested into more than one master composition. The same source comp may also be nested several times into the same master comp. By doing this, you can easily change the original nested comp, and the change will ripple through to any comp it is nested into. This is ideal for creating repetitive elements such as animated logos that may be used multiple times throughout a project; some animators may refer to this process as creating an “instance.”

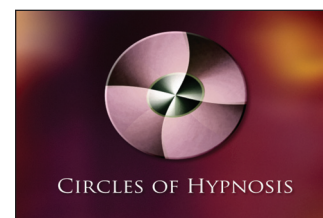
Precomposing: When building a chain of nested compositions, ideally you're thinking ahead: You use several layers to build an element in one comp, then use the result nested into a second comp. However, the creative process is rarely that orderly and logical. You might build a complex composition, only to later think, “You know, life would be easier if I could just group these layers into their own nested comp...”

Well, you can: The process is known as *precomposing*. You can select one or more layers in the current comp and “send them back” into their own comp (called a “precomp”) that automatically becomes a nested layer in the current comp. It's almost as if you planned it that way ahead of time. Once you do this, as far as After Effects is concerned, there is no difference between the resulting precomp and a normal nested comp.

Expressions: After Effects also allows you to connect virtually any parameter to another parameter. This involves creating small pieces of JavaScript code referred to as *expressions*. We cover expressions in the next lesson, but in short, basic expressions could be considered a highly targeted form of parenting, where only individual parameters are connected rather than all transform properties at once. The big advantage is that you can connect any parameter you can keyframe – not just position, scale, and rotation.



In this lesson, you will learn several ways to group together layers to make complex animations easier and to re-use elements multiple times in the same composition.



▽ tip

Effects and Children

Effects applied to a parent are not passed along to its children. To apply the same effect to a group created by parenting, use an Adjustment Layer (Lesson 3), or nest their comp into a new comp and apply the effect to the resulting layer.

▽ factoid

Family Trees

You can create parenting chains where one layer is parented to a second, the second layer is parented to a third, and so on. This makes parenting an essential tool in character animation: For example, you can attach a hand to a forearm, a forearm to an upper arm, and the upper arm to a body.



Use Parenting to make the text and planet scale up as a group, with the text rotating around the planet.

▼ Choosing a Responsible Parent

When grouping together layers using parenting, it is important to think about who should be the parent and who should be the child.

A parent's animation gets passed along to its children. Therefore, the layer that is going to be doing the least animating often makes the best parent – that way, the children are free to run around the parent without their animation being passed onto the parent.

Parenting

In this first parenting exercise, you will be grouping together two layers to make it easier to animate them as a unit. In it, the “child” will keep its animation, which will also be affected by its parent.

1 For these first two exercises, open project **Lesson 06 > 06a-Parenting.aep**. In the Project panel, twirl open the **Comps** folder, then double-click the comp **Parenting1*starter** to open it.

Press **0** on the numeric keypad to RAM Preview this comp. It consists of a movie of a globe rotating, and a Photoshop still image of text on a circular path.

For this animation, let's make the text and planet scale up as a group, with the text rotating around the planet. We'll then try to fade them out as a unit.

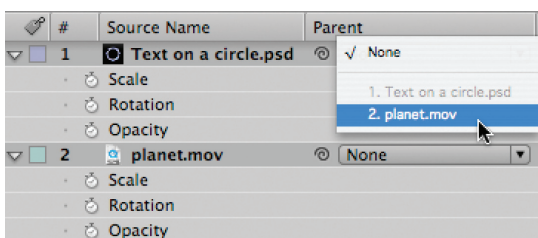
2 Select both layers, then press **S** to reveal their Scale followed by **Shift R** to reveal Rotation and **Shift T** to reveal Opacity. If you scrub these values for each layer, they will act independently of the other layer. Undo to get back to their original state.

3 To set up a parenting group, you need to reveal the Parent column in the Timeline panel. If it is not already visible, you can either right-click on any column header in the Timeline panel and select **Column > Parent**, or use the keyboard shortcut **Shift F4**. We tend to drag the Parent column to reside alongside the layer names, making it easier to read who is connected to whom.

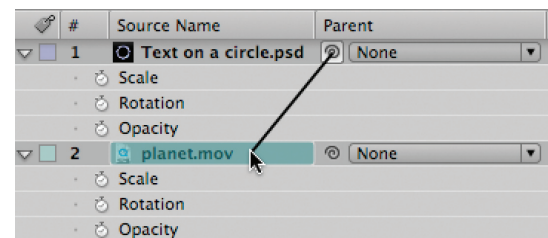
The next step is deciding who the child should be, and “parenting” it to the layer you want it to follow. In our case, we know we want to rotate the text independent of the planet. Therefore, it would be best if the text was the child, so that its rotation will not get passed onto the planet.

4 There are two ways to assign a parent:

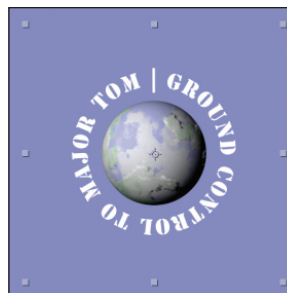
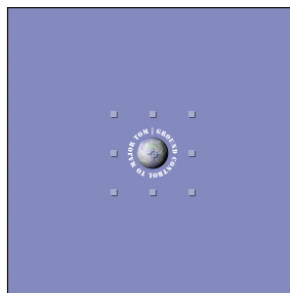
- Click on the Parent popup for the prospective child **Text on a circle.psd** and pick its new parent – **planet.mov** – from the list that appears.
- Alternatively, click on the spiral icon (the pick whip tool) in the Parent column for the child and drag it to the name of the layer you wish to be the parent.



4 There are two ways to attach a child to a parent: Use its Parent pop-up (left), or its pick whip tool (right).



5 Scrub the Scale for **Text on a circle.psd**; only that layer scales. Return it to 100%, then scrub Scale for **planet.mov** – when you scale the parent, both layers scale as a group. Note that the Scale value for **Text on a circle.psd** does not change; its scale value is now shown relative to its parent.



- Press **Home** to make sure you are at 00:00, then click on the stopwatch for **planet.mov**'s Scale to enable keyframing. Enter a value of 0%; both layers will disappear.
- Move the current time marker to 02:00 and set Scale back to 100%, returning both parent and child to full size. Press **F9** to make this an Easy Ease keyframe.

5 As the parent (the planet) scales up, the child (the text) scales up as well, by the same proportional amount.

6 Now let's rotate the child layer:

- Scrub Rotation for **Text on a circle.psd**; it rotates, but its parent does not.
- Press **Home** again, and enable keyframing for **Text on a circle.psd**'s Rotation. Return its value to 0°.
- Press **End**, and enter 1 for Revolutions (Rotation's first value). The second keyframe should read 1x+0.0°.

RAM Preview: The text rotates as both scale up together, then continues to rotate without affecting the parent.

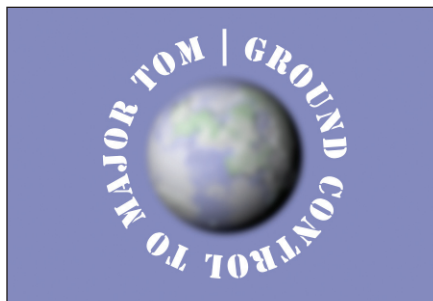


6 Nothing applied to the child – for example, rotation or tint effects – are passed along to the parent.

7 Parenting passes scale, position, and rotation from parent to child, but nothing else:

- Move to 10:00, select **planet.mov**, and press **⌘ Shift T** on Mac (**Alt Shift T** on Windows) to reveal Opacity and enable keyframing.
- Press **End**, and set **planet.mov**'s Opacity to 0%: The text will still be visible. You will have to fade out the Text layer separately.

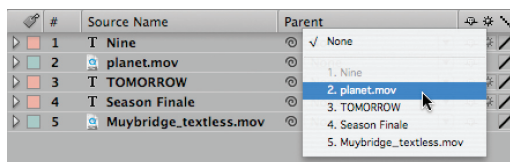
In addition to opacity, effects are also not passed from parent to child. Go ahead and try adding an effect such as blur to **planet.mov**; the text will not be affected. This can be a blessing or a curse, depending on what you are trying to accomplish.



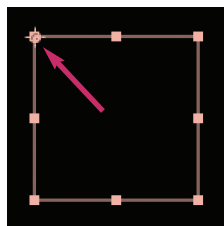
7 Unfortunately, opacity is not passed from the parent to the child so you can't fade out both layers as a group.



- 1 Play the finished movie. You will use parenting to animate the title layers and the Planet 9 logo together as a group. (You will build the background animation in the next exercise.)



- 3 The number 9 and the planet form a logo (left), so use parenting to parent the **Nine** layer to the **planet.mov** layer and make a sub-group (right).



- 4 Null objects appear in the Comp viewer as an outline of a square, with the Anchor Point in its upper left-hand corner. Turn off the background layer to see your new null more clearly.



Parenting with Nulls

Sometimes it is not clear which layer would make the best parent. The solution is to hire a babysitter: a *null object*. Nulls are layers that do not render, but otherwise have normal transform properties such as position, scale, and rotation.

- 1 Bring the Project panel forward, open the **Finished Movies** folder, and play **Parenting2.mov** to see what you will be building. Close the movie when done.
- 2 Double-click **Comps > Parenting2*starter** to open it. Then press **Shift F4** to reveal its Parent panel.

Parenting Chain

- 3 When you start parenting, first build any sub-groups that make sense to handle as one element. In this case, the number 9 and the planet form a logo.

Click on the Parent popup for **Nine**, and select **planet.mov** to be its parent. Now when you move the planet, the number will stay with it.

- 4 Let's employ a null object to move the rest of the title layers as a group. Still at time 00:00,

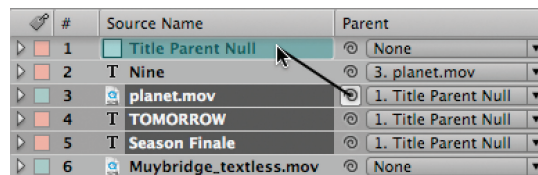
select **Layer > New > Null Object**; it will be added to the timeline.

To rename the null, select it, type **Shift Y** (**Ctrl Shift Y**) to open the Solid Settings dialog, and type a name such as **"Title Parent Null"**, and click OK. In the Comp viewer, the null will appear as a square outline. The null may be hard to see, so temporarily turn off the Video switch for **Muybridge_textless.mov**. Note that a null's Anchor Point defaults to its upper left corner.

- 5 Since scaling and rotation happen around the parent's anchor point, it is important to first move the parent into the desired position *before* attaching the children to it. The center of the planet would make a good center for scaling this group, so let's borrow its Position value:

- Select **planet.mov**, type **P** to reveal its Position, click on the word Position to select it, and use **Edit > Copy**.
- Then select **Title Parent Null** and **Edit > Paste**. The top left corner of the null will now appear centered over the planet.

- 5–6 Copy the planet's position value to the null's position (left). Then select and parent the remaining children to the null (right).



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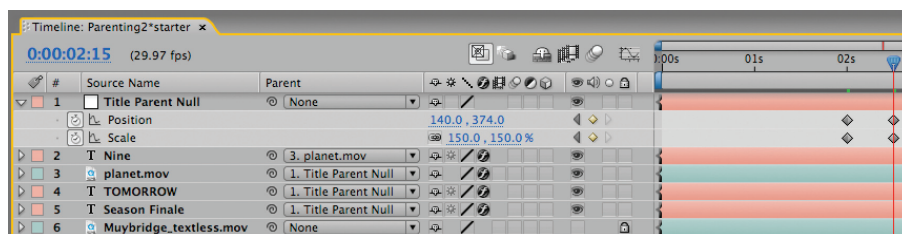
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6 Time to parent the other layers. Click **planet.mov** to select it. Then **(Shift)+click** on **Season Finale** to select layers 3 through 5. (Don't select layer 2, as it is already parented to layer 3.) Then drag the pick whip tool for any of the selected layers to **Title Parent Null**, and they all will become attached to it.

Animating the Null

Now that we have everything set up, we can animate the group. The plan is to have them move forward to make the “9” logo and “Tomorrow” the heroes.

7 Select **Title Parent Null**. Its Position should be visible; type **(Shift) S** to also reveal Scale. Move to 02:00, then click on the stopwatches for Position and Scale to enable keyframing for these parameters, as well as set their first keyframes.



8 Press **'** (apostrophe) to turn on the Action and Title Safe grids. Make sure you position the text in a legal area of the screen.

9 Move the time marker to 02:15. Increase the scale of **Title Parent Null** to 150%; the entire group grows larger and a second Scale keyframe is created.

Then click inside the null's outline and drag it to the left until the planet is positioned just inside the Title Safe lines. The group will move together, and a second Position keyframe will be created. (If only one layer moves, you accidentally grabbed a layer other than the parent null; undo and try again.)

10 To clean up the title, fade out the words to the left: Keyframe the opacity for **Season Finale** from 100% at 02:00 to 0% at 02:15.

Now that the major structural work is done, you can work with the children without worrying about affecting the parent and the overall move. Animate the **planet**, **Tomorrow**, and **Season Finale** child layers to your personal taste. Turn the Video switch for **Muybridge_textless.mov** back on to see the title in context.

Our version is in **Comps_Finished > Parenting2_final**. We scaled up the planet subgroup, slid in **Season Finale**, and applied a Text Animation Preset to **Tomorrow**, all with staggered timing so that each would get their turn at being the center of attention.

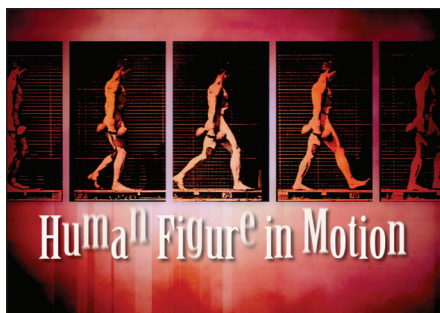
▼ Parenting and Scaling

Scaling a layer past 100% normally reduces its quality. However, the Scale values for a parent and its children are combined before After Effects calculates how to draw the pixels for each layer. Therefore, if a child has already been scaled down, you can get away with scaling up its null object parent without any loss of image quality for the child, as long as the combined scale values amount to 100% or less.

7-9 Keyframe the null object to grow from 100% to 150% (left), and place the planet logo at the edge of the Title Safe area (below) at the second keyframe.



In **Parenting2_final**, we animated each of the children independently, and added a text animation preset to the Tomorrow title. Muybridge images courtesy Dover; background courtesy Artbeats/Digital Web.



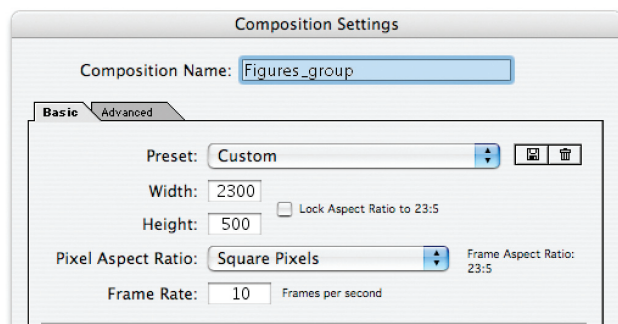
The final composite includes multiple copies of the Muybridge “walking man” animation in a nested composition.

Nesting a Group of Layers

One of the more powerful features in After Effects is the ability to treat a composition as a layer in another comp. This process is referred to as nesting, and is a great way to group layers together.

Creating the Wide Comp

1 Open the project **Lesson 06 > 06-Nesting1.aep**. Look inside the Project panel’s **Finished Movie** folder and play **Human Figure in Motion.mov**: This is what you are going to make. You’ll start by building a wide comp that holds multiple copies of the Muybridge human figure sequence. This wide comp will be nested into a second comp that includes all the other layers.



2 Create a large composition to hold several copies of the Muybridge sequence.

2 In the **Sources** folder, single-click the sequence **Muybridge_[00-09].tif** to select it. The top of the Project panel informs you that its size is 270×500, with a rate of 10 frames per second (fps). The sequence consists of only 10 unique images, so it was looped 10 times in its Interpret Footage dialog. Your first task will be creating a large composition to hold copies of this sequence.

Select the **Comps** folder so that your new comp will automatically sort into it, and type **⌘ N (Ctrl N)** to create a new composition. Enter the following parameters in the Composition Settings dialog:

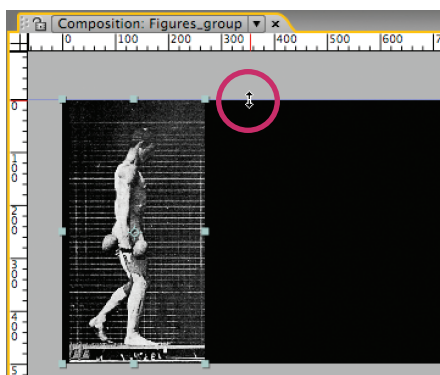
- Disable Lock Aspect Ratio. Set Width to 2300 pixels (more than eight times the width of the sequence), and Height to 500 pixels (the sequence’s height).
- Set the Pixel Aspect Ratio popup to Square Pixels.
- Set the Frame Rate to 10, Start Timecode to 0, and the duration to 10:00.
- Enter a name of “**Figures_group**”, and press OK.

Resize your user interface frames to give the Comp panel as much room as you can, and set its Magnification popup to Fit Up To 100%.

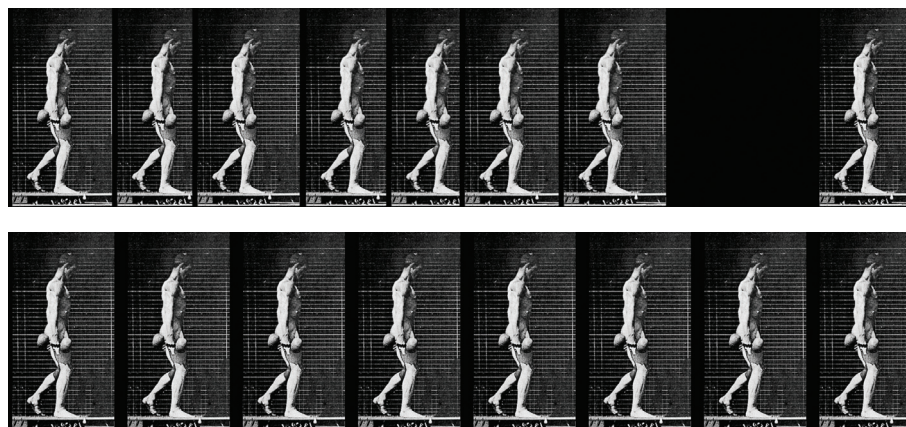
3 Drag **Muybridge_[00-09].tif** from the Project panel to the left edge of the Comp viewer – it should snap into place.

4 To help align additional copies of this sequence, let’s take advantage of *guides* in the Comp panel:

- Press **⌘ R (Ctrl R)** to Show Rulers.
- Click in the top ruler, and drag downward: A blue guide line will appear. Place it even with the top of the comp’s viewing area. If you have the Info panel open, drag until it says the guide is at 0.0.
- Verify that View > Snap to Guides is enabled.



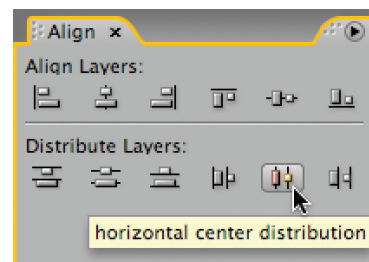
4 Turn on the Comp panel’s rulers and drag a guide down to the top of the viewing area. Placing a guide at Y = 0 will allow you to easily snap layers to the top of the comp.



5 Select **Muybridge_[00-09].tif**, and type **⌘ D** (**Ctrl D**) to duplicate it. Drag it a short distance to the right; your guide will help keep it aligned. (You can also press **Shift** after you start moving a layer to constrain it to the X or Y axis.)

Make five more duplicates, and drag each just beyond the previous copy; there should be seven layers now. Then create one last duplicate, and while dragging it to the right, add **⌘ Shift** (**Ctrl Shift**) so it will snap to the right side of the comp.

6 Type **⌘ A** (**Ctrl A**) to select all the layers. Open **Window > Align & Distribute**, and click on the **Horizontal Center Distribution** button (bottom row, second from the right). Close this panel when you're done, and save your project.



5–6 Create eight copies of the **Muybridge** layer, with the left and right ones justified to the edges of the comp and the others roughly spaced in-between (top left). Click on the **Horizontal Center Distribution** button in **Align & Distribute** (above), and they will be evenly spaced (left).

Nesting the Wide Comp

Next, let's create a main comp to nest this group of **Muybridge** sequences into:

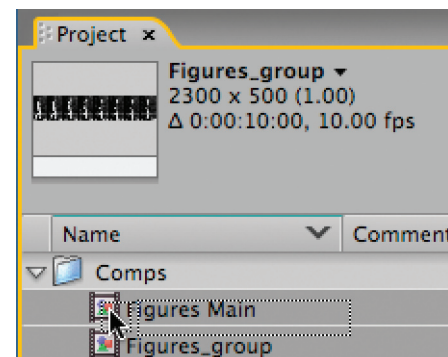
7 In the **Project** panel, select the **Comps** folder and click the **New Comp** button. Set the **Preset** popup to **NTSC DV**. Change the duration to **06:00**, name this comp **"Figures Main"**, and click **OK**. (Feel free to hide the **Parent** panel.)

8 To nest a comp, you have two choices: You can drag your first comp into your new comp, just as you would to add any footage item to a comp.

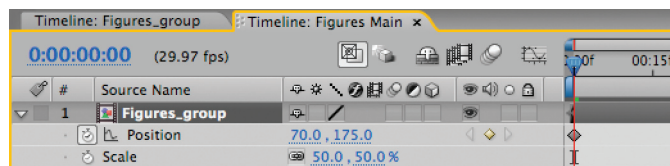
Alternatively, in the **Project** panel you can drag the comp **Figures_group** on top of the icon for the comp **Figures Main** and release the mouse to nest it. After either move, **Figures_group** will appear as a single layer in **Figures Main**.

9 The next step is animating the nested comp to slide from left to right:

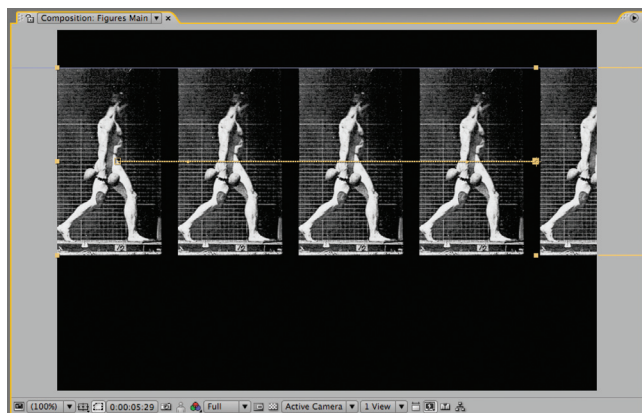
- Select the **Figures_group** layer; press **S** to reveal **Scale** and **Shift P** to reveal **Position**. Set the initial **Scale** value to **50%**.



8 To nest one comp into another, you can just drag it onto the target comp in the **Project** panel. It will then appear as a layer with a comp icon in the target comp.



9 The **Figures_group** comp appears as a single layer when nested so one set of **Position** keyframes can be used to move the eight layers as a group.



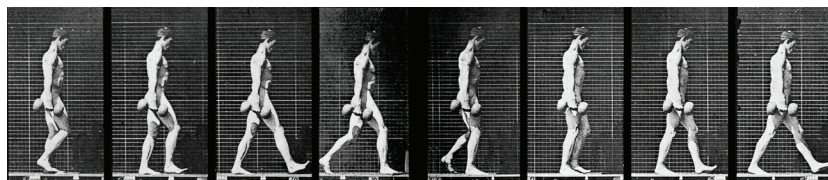
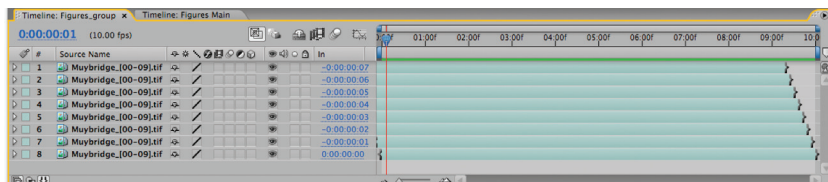
9 *continued* Animate the nested comp to pan from left to right across its new comp. (We changed its label color to gold to make it easier to see its motion path in this figure.)



Opening Precomps

To open a nested comp if its tab is not visible, press **⌘** (Alt) and double-click the precomp's layer in the main comp.

11–12 In the precomp, offset the In time of each layer (below) so that they will appear staggered in time (bottom). This edit will automatically show up in the main comp (below right).



- The rulers from step 4 should still be active. Drag down a guide from the top and place it around Position Y = 50. Then press **⌘** **R** (**Ctrl** **R**) to hide the rulers.
- Drag the layer so that its right side is aligned with the right side of the comp and its top snaps to the guide.
- Enable the stopwatch for Position to create the first keyframe.
- Press **End** to go to the end of the comp (at 05:29) and drag the layer to the right until its left side is aligned with the left side of the comp. You can use the guide or add the **Shift** key while dragging to keep it at the same height.

RAM Preview. The figures should be marching to the right (if not, check you didn't pan the layer in the other direction!).

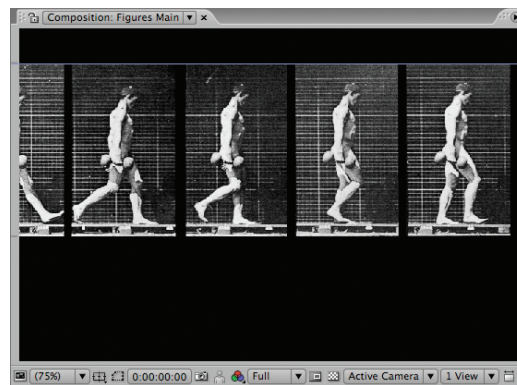
Editing the Precomp

It is common to call a nested comp a precomp, as it renders first, with its result included in the master or main comp. Although the main comp appears to get a “flattened” layer to work with, the precomp is still live: Any changes you make to the precomp will ripple through into the main comp.

10 **⌘**+double-click (**Alt**+double-click) on **Figures_group** to open this nested comp, or select the **Figures_group** tab in the Timeline panel.

11 Let's stagger the timing of the Muybridge sequences so that the layers are not all in sync:

- In the Timeline panel, right-click on any column header, and select Columns > In.
- For layer 7, click on the In value, enter -1 in the Layer In Time dialog, and click OK. The In time will change to -0:00:00:01.



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- Set the In time for layer 6 to -2. Continue to set each layer one frame earlier in time, ending at -7 for layer 1.

Each copy of the sequence will now look different. After sliding the layers earlier, they run out before the end of the comp. In this instance, that's okay because the main comp is much shorter than this precomp.

- 12** Click on the Timeline panel tab for **Figures Main** to bring it forward, and RAM Preview. Your staggered timing for the sequence has been automatically rippled up to this main comp.

Finishing the Project

Congratulations – you've completed the major steps (save your project...). Here are some ideas for dressing up the final composite; please take artistic liberties and use your own sources to create your own design!

- 13** Locate **Sources > Digital Web.mov** in the Project panel, and add it as a background layer to **Figures Main**.

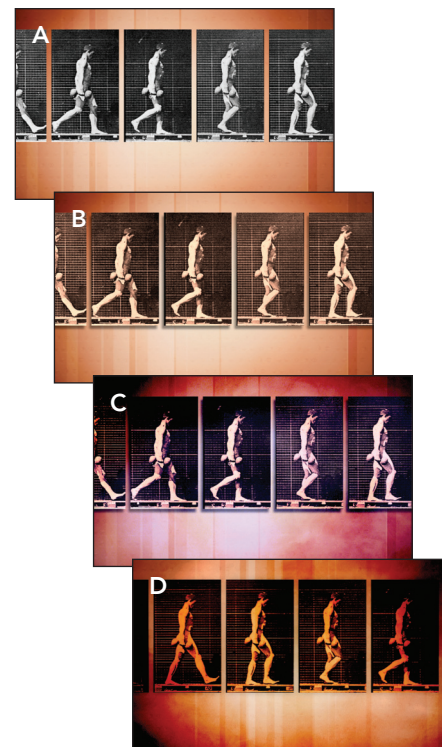
- 14** To better match the background, let's warm up the gray **Figures_group** layer plus give it some dimension:

- Select **Figures_group** and apply **Effect > Color Correction > Channel Mixer**. Set to taste; we increased Red-Red to 150 and reduced Blue-Blue to 80.
- Add **Effect > Perspective > Drop Shadow** and set to taste. Effects applied to nested comp layers affect all of the elements in that comp, with the benefit of having only one set of effects to edit.

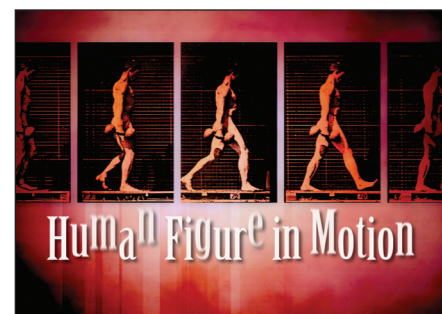
- 15** Now let's add a lighting treatment: Select **Sources > Alien Atmospheres.mov**, and this time add it on top of the other layers in **Figures Main**. Press **F4** to toggle to the Modes panel, and set its mode to **Vivid Light**. This creates a richer look, with a tinge of the new layer's blue color. If you don't like the blue, apply **Color Correction > Tint**: Its default settings will convert the layer to grayscale. Feel free to try out different modes on both **Alien Atmospheres.mov** and **Figures_group** until you get a blend you like.

- 16** If you completed Lesson 5, here's a chance to put your newfound skills to work! Add a title to this composition, such as "**Human Figure in Motion**". Choose whatever font you think works best (we used a condensed font so that it would fit on one line but still be fairly tall), and add **Effect > Perspective > Drop Shadow** to lift it off the background. Then apply a **Text Animation Preset**, or create your own design using **Text Animators**.

Save your project when you're done. If you're curious, our version is **Comps_Finished > Human Main_final**.



- 13–15** Add a background to your main comp (A), then tint and add a shadow to the nested precomp (B). Add **Alien Atmospheres** on top using **Vivid Light** blending mode (C); optionally, convert it to grayscale to remove the blue tint (D).



- 16** For a final touch, add a text animation to your composition.