

# Working with Particle Flow

This section contains tutorials that step you through the basics of how to use the Particle Flow particle system in 3ds Max.

For more tutorials on creating special effects with Particle Flow such as water splashing, mist blowing, the explosive impact of an asteroid into a planet surface, guided missiles trailing smoke and blowing up targets, and more, download the 3ds Max tutorials from *this page*.

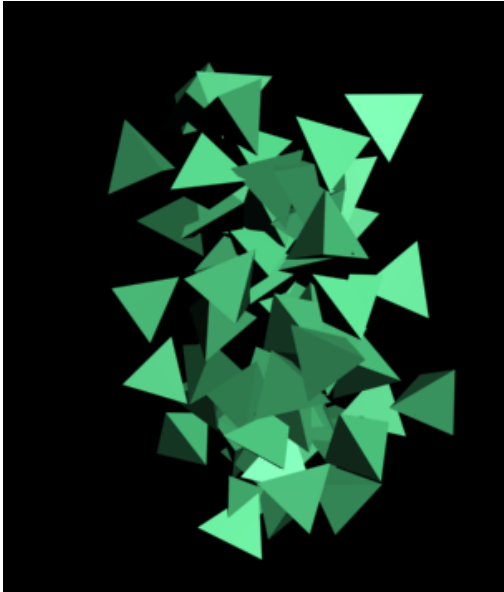
## Features Covered in This Section

- Introduction to Particle Flow and the powerful Particle View editor

- Changing particle shape and color based on test results
- Using BlobMesh with a particle system to simulate viscous fluids
- Using instanced geometry to create particles

## Introductory Tutorial

The best way to understand Particle Flow is by using it. This tutorial will acquaint you with some of the basic methods of working with Particle Flow.



Skill level: Beginner

Time to complete: 30 minutes

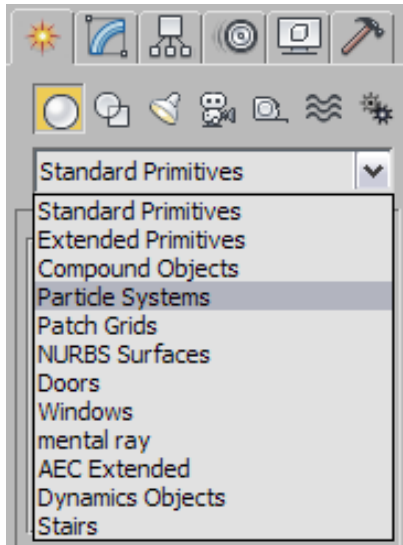
In this tutorial, you will learn how to:

- Create a particle system
- Set up an event that triggers particle activity
- View particle flow animation

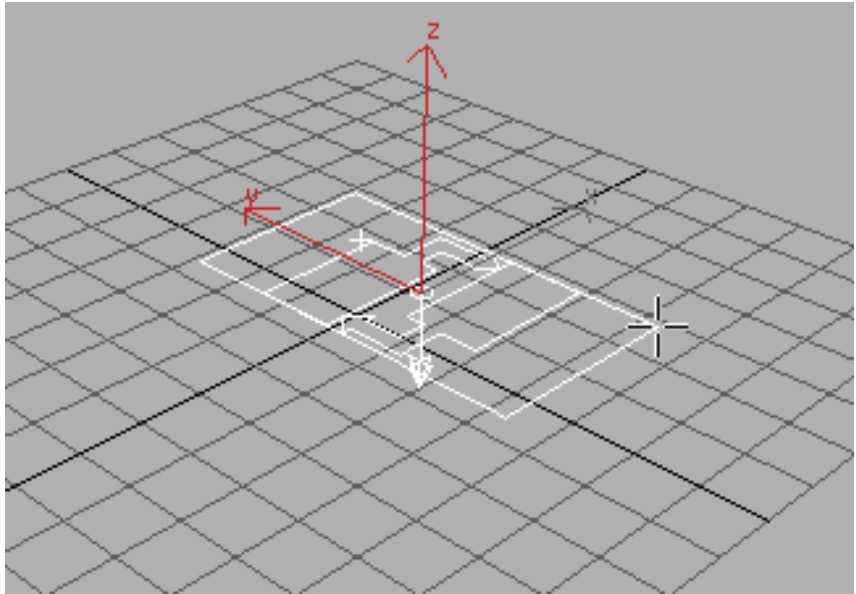
## Create the Particle Flow system:



- 1 Start 3ds Max or, from the Application menu, choose Reset.
- 2 On the Create panel > Geometry category, click the drop-down list and choose Particle Systems.

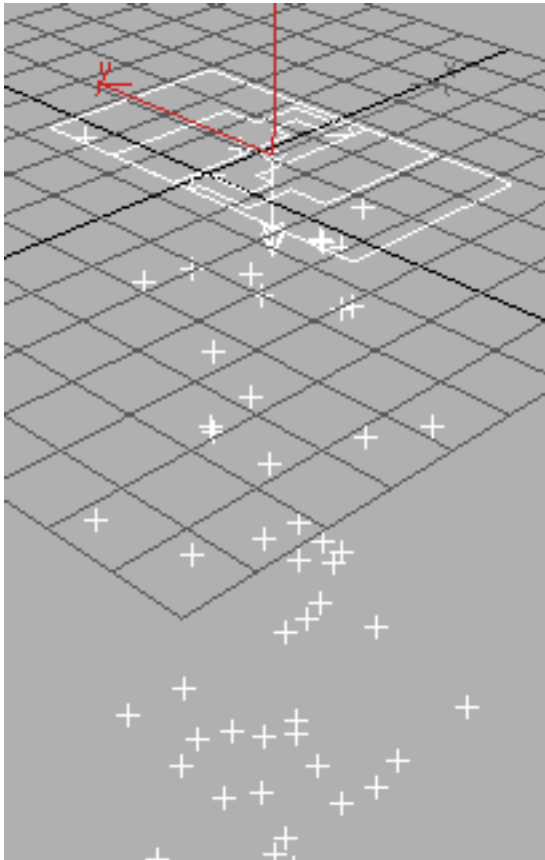


- 3 On the Object Type rollout, click PF Source.
- 4 In the Perspective viewport, drag out a rectangle.



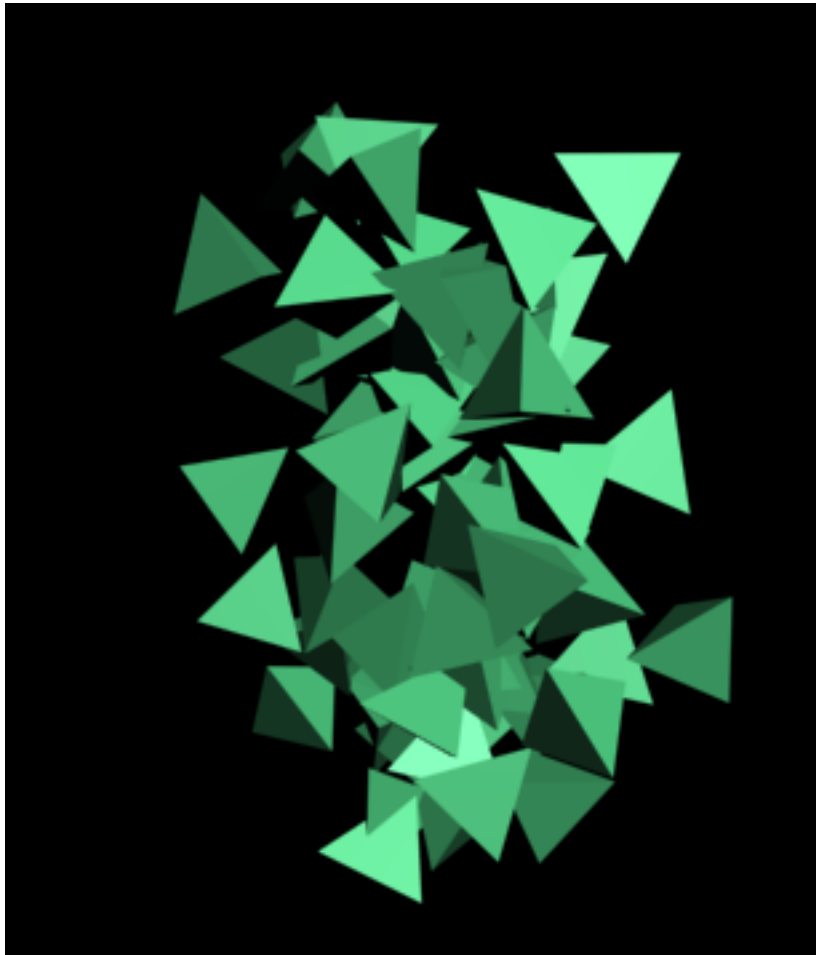
This is the Particle Flow icon, or source, named PF Source 01. By default, it acts as an emitter, but you can also use any other object as an emitter.

- 5 Drag the time slider.



By default, the icon emits particles downward from its entire surface. In the viewport, the particles appear as ticks.

- 6 Go to frame 10, and press F9 to render the Perspective viewport.

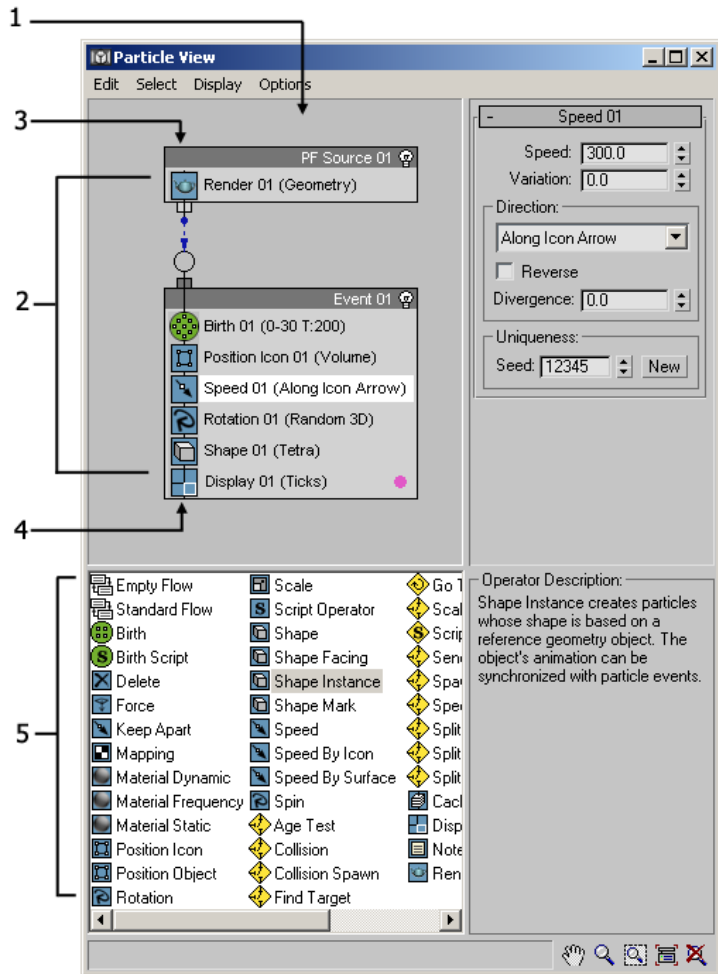


The rendered particles appear in a window. The default particle shape is a tetrahedron, a four-sided triangular solid. Its geometry is very simple, so the system can handle many particles quickly and efficiently, but it gives a good idea of how particles are behaving. Other basic shapes are a low-poly sphere and a cube; Particle Flow also lets you use any scene object as particle geometry.

**Modify the particle system in Particle View:**

- 1 Press the 6 key to open Particle View. The particle source icon need not be selected.

**TIP** You can also open Particle View from the command panel when a Particle Flow source icon is selected.



1. Event display

2. Particle diagram

3. Global event



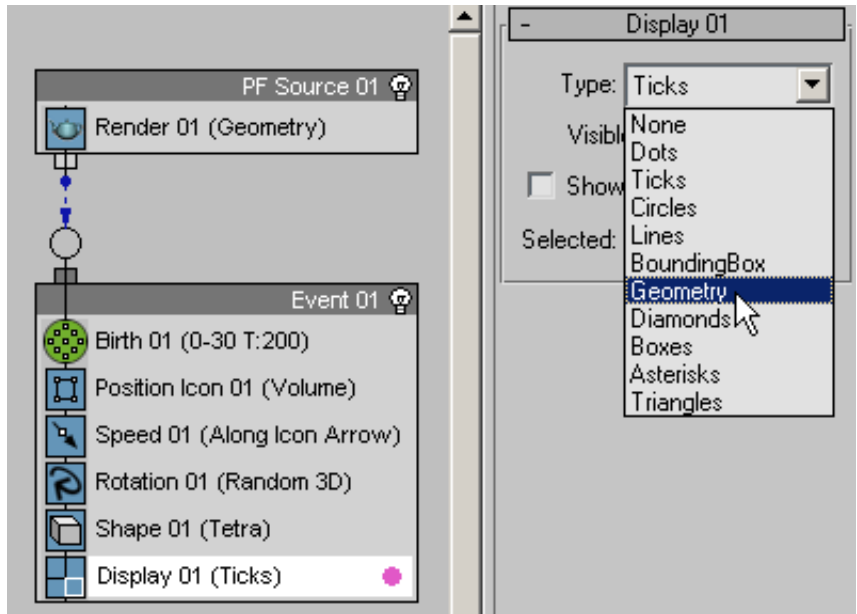


Next, you'll change the particle display type.

- 3 In the birth event, Event 01, click the Display 01 (Ticks) operator at the bottom of the list.

The display type is set to Ticks, as noted in the operator name in the event.

- 4 Next to the Type label, click Ticks, and from the drop-down list, choose Geometry.

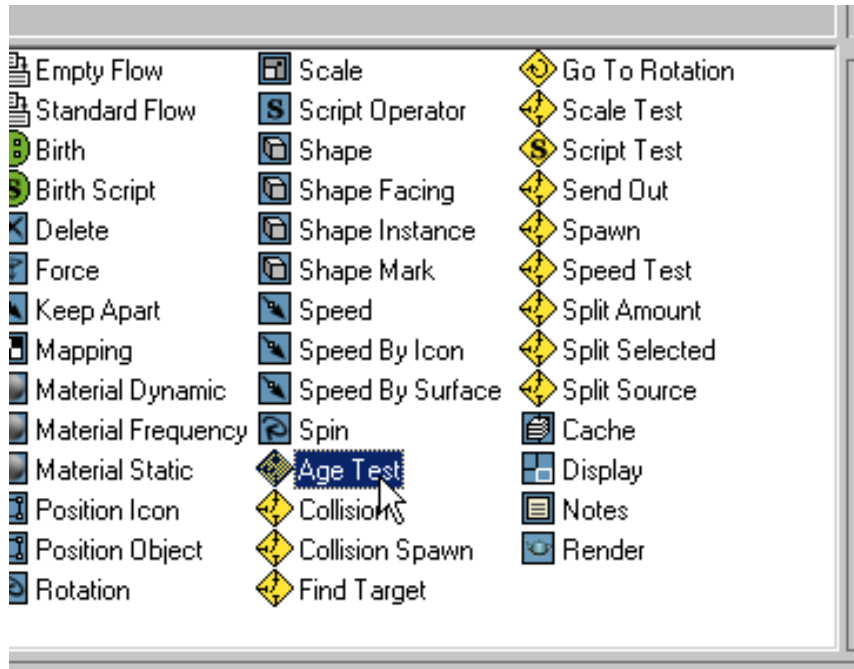


Now the particles appear as tetrahedrons in the viewports.

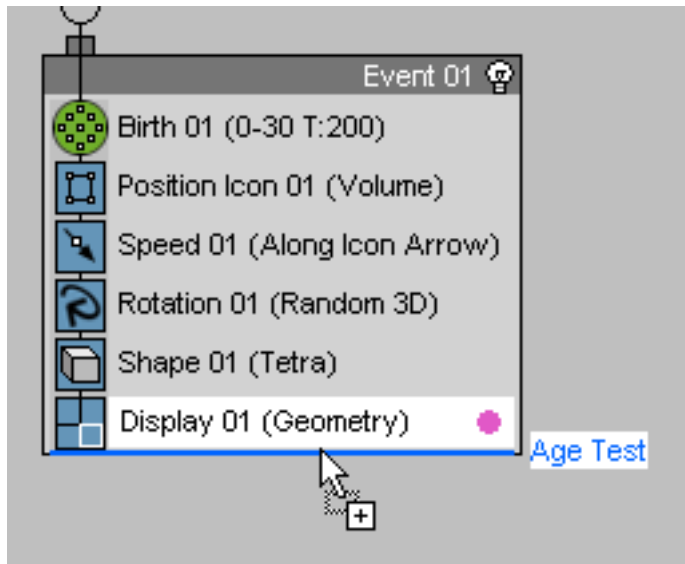
### Wire two events together:

Next, you'll add a test and use it to wire the birth event to a new event.

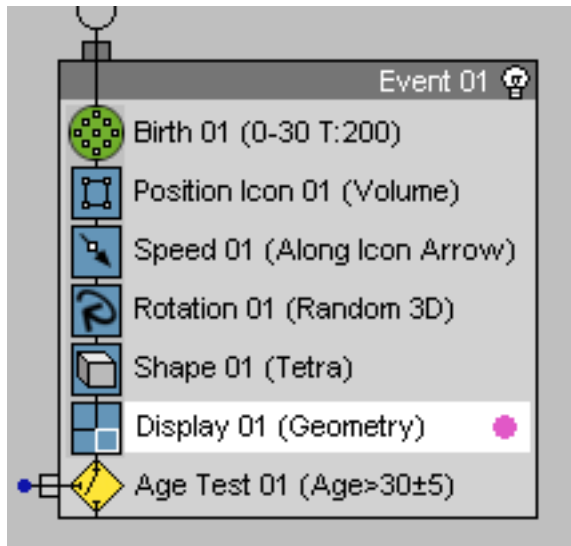
- 1 In the depot at the bottom of the Particle View dialog, find Age Test. It's the first item that uses a yellow, diamond-shaped icon.



- 2 Drag an Age Test from the depot into the Event 01 list, at the bottom of the list.

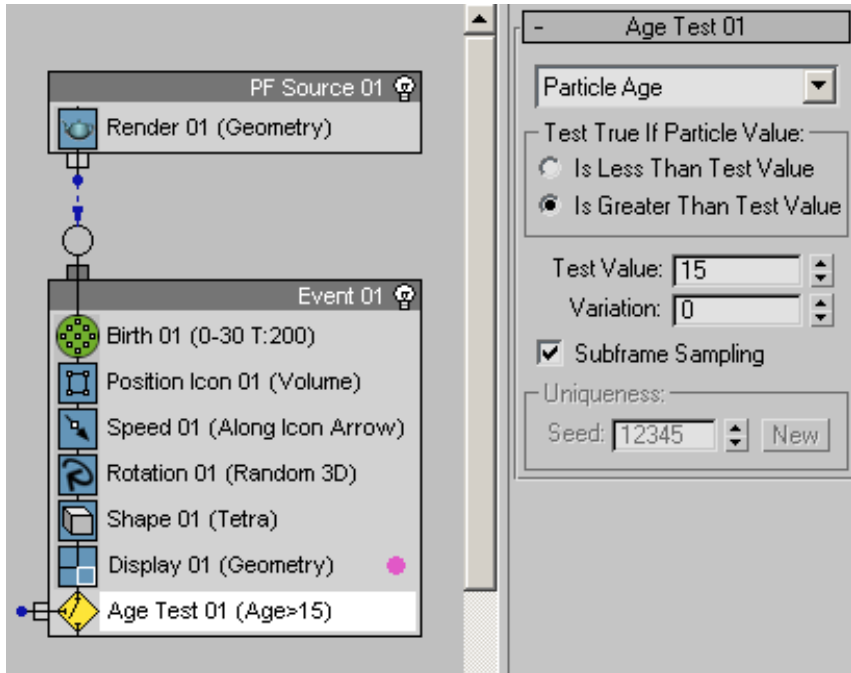


Before you release the mouse button, make sure you see a solid blue line in Event 01 under the Display operator. If the line is red and goes through an existing operator, the Age Test will replace that operator. If you drop the Age Test outside of Event 01 it will create a new event.



Age Test appears in the list, with its *test output* sticking out to the left. This is the part you use to connect the test to the next event.

- 3 Click the Age Test item in the list, and then in the Age Test 01 rollout on the right side of Particle View, set Test Value=15 and Variation=0.



The test type is Particle Age, so this means that all particles that have existed for more than 15 frames will test True, and be passed on to the next event.

Next, you'll create a new event and wire it to the test.

- 4 From the depot, drag the Shape operator (“Shape”) to an empty part of the event display, below Event 01.

The Shape operator appears in a new event, named Event 02. Like Event 01, the event has a circular *event input* sticking out from the top. Also, Particle Flow automatically adds a local Display operator to the event so its particles will be visible in the viewports. You can disable the automatic creation of local Display operators by choosing Options menu > Default Display > Global.

The actual location of an event in the event display doesn't matter; the recommended placement is for the sake of convenience when wiring the events. It also helps to make sense of complex schematics if the events are arranged logically.

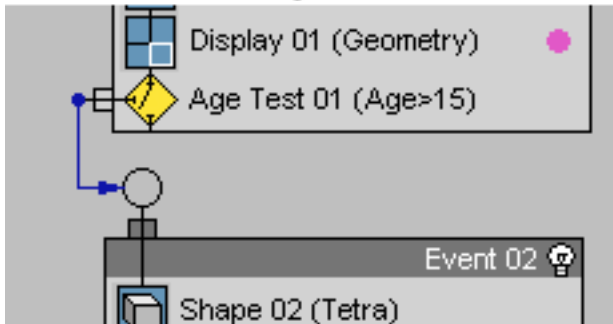
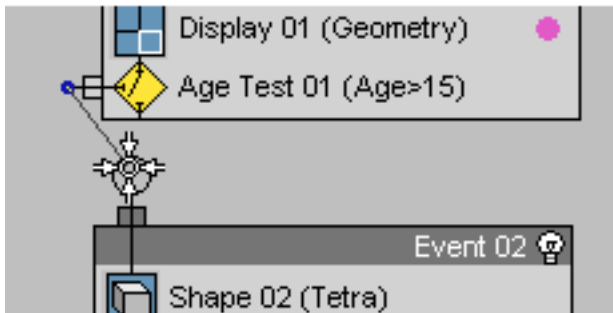
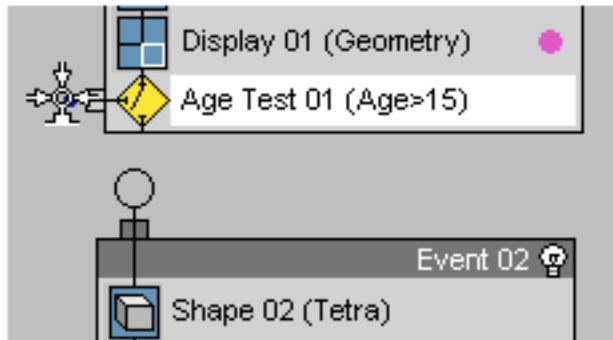
You can move an event by dragging its title bar.

Next, you'll perform the actual wiring of the Age Test to the new event.

- 5 Position the mouse cursor over the blue dot at the left end of the Age Test's test output.

The cursor image changes to an icon depicting three arrows pointing inward toward a circular connector.

- 6 Drag from the event output on the Age Test in Event 01 to the Event 02 input, and then release the mouse button.



As you drag, the cursor image changes from a three-arrow icon to a circular connector by itself when it's over an empty space in the event display area, and then to a four-arrow icon when it's over the Event 02 input.

When you release the mouse button, a blue “wire” appears connecting the two events. This wire indicates that particles that meet the Age Test conditions will pass “through” this wire to Event 02, to be affected by its actions.

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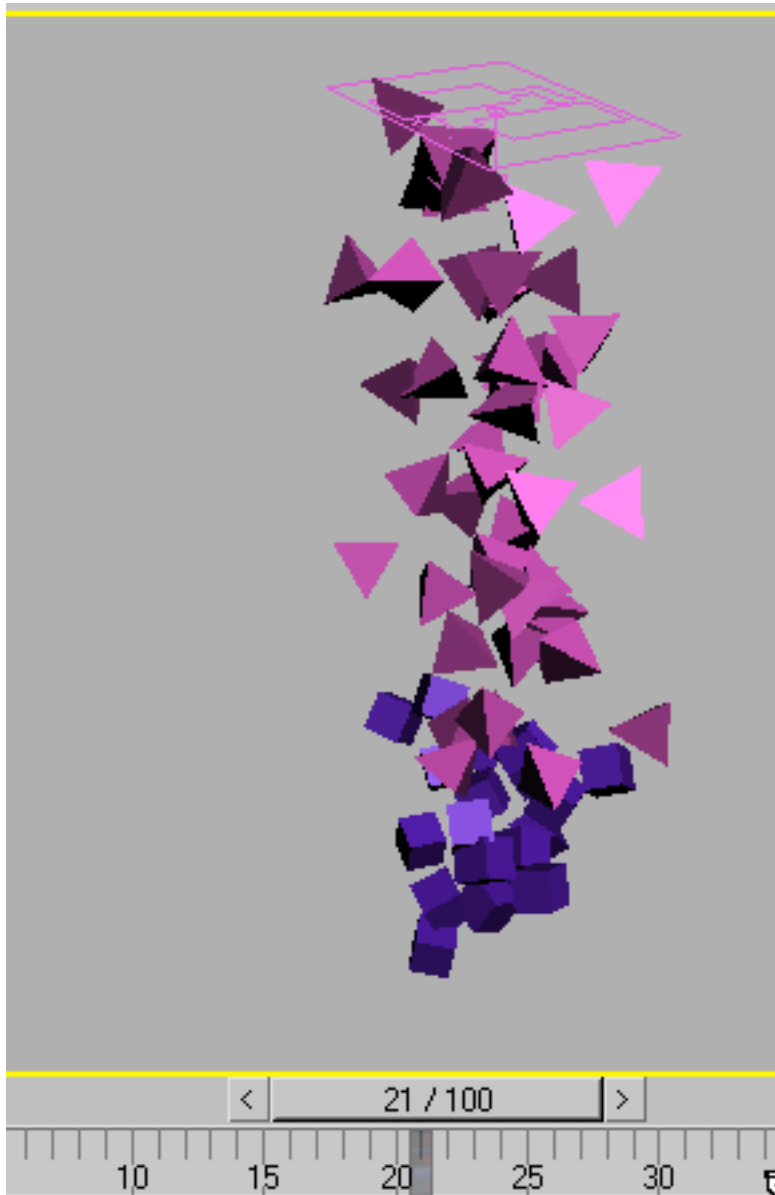
**TIP** You can delete a wire (and anything else in the particle diagram) by selecting it and pressing the Delete key. Feel free to try this now, but undo any changes when you're finished.

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- 7 Click the Shape 02 operator and set Shape=Cube. Also, click the Display 02 operator and set Type=Geometry.

**View the wiring results:**

- 1 Play the animation. Adjust the viewports so you can see the entire particle stream, if necessary.



Starting at frame 16, the particles at the head of the stream change into cubes, indicating that they've entered Event 02. As time goes on, more



and more particles pass the age of 15 and become eligible to go to the next event.

- 2 While the animation is playing, try modifying the different operator settings to see what happens. For instance, click Speed 01 and change the Speed and Direction settings. When you change a setting, the change is reflected in the viewports in real time, even during playback.

Try right-clicking actions and events and using Rename to give them custom names. Even with a custom name, an action's tooltip reveals its type.

Another facility of the right-click menu is to add comments to actions and events. Once you do so, a small red triangle indicates the comment's presence.

## Summary

Congratulations! You now have a working knowledge of Particle Flow. If you'd like to try some more tutorials, please go to *this page* and download the 3ds Max Tutorials Help (or PDF versions) and the Scene and Support Files.