

# *Particles:*

Particles are point masses that have many user defined attributes such as radius, position, velocity, etc.. that can be set using the *Particle Inspector*. Particles are moving, interactive bodies used in a *PhysicsWorld* simulation. There are three basic ways to create and add particles to your simulation:

1. The *New Particle* button on the *Particle Inspector*.

Clicking this button creates a custom particle positioned at (0,0)

## 2. The Palette Panel

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By using the *Define Particle* button, the user will call up *Particle Definition Inspector*. The user can then proceed to define a type of particle that will be used in the simulation. The particle type defined by the *Particle Definition Inspector* will then be added to the pop-up list on the palette.

The user can select the type of particle that he wants from the pop-up list. If the user clicks and holds in with the left mouse button, he can drag that particular type of particle onto the world view. When the particle is over the place on the world view where the user wants it, he lets go of the mouse button, and a particle will be created at that position.

### Particle Definition Inspector

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The user can predefine types of particles with the *Particle Definition Inspector*. The user enters the name of the type of particle, the default velocity, charge, mass,

and radius for that type of particle. There is also a color well for the user to define the color of the particular type of particle. There are also new and remove buttons. The new button lets the user to define a new type of particle, and the remove button deletes the current type of particle from the particle pop-up list. (To create a new particle, the user must click on the *OK* button, on the particle type created before the new particle type)

### 3. The copy and paste method.

Single click on the particle you wish to make a copy of. This will make the particle the *World View's* first responder. Next invoke the paste command. This

will create a new particle with the same parameters as the copied particle, but its initial position will be slightly displaced. If you cut a particle, it is like first pasting a particle, then deleting it. In other words, if you cut a particle, you delete it, but then you can paste it back. The copy, cut, and paste commands work in the same fashion as standard NeXTstep copy, cut, and paste commands. To invoke the copy, cut, and paste command use the menu cells under the *Edit* menu.

By double clicking on a particle, the Particle Inspector for that particle will pop up on the screen.

You can set the particle's initial position in two manners. The first being by the

*Particle Inspector's Initial Position* text fields.

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The other way is to set a particle's initial position is by clicking on the particle, and holding the mouse button down, drag the mouse cursor to the desired initial position and let the mouse button up. This will reposition the particle to the mouse's new location.

Highlighting Particles:

When the user clicks on a particle the particle will become highlighted to show the user which particle is the editable one. (the one that is able to be copied, pasted, or cut) If the user drags the particle, it will stay highlighted, and when the user drops the particle, it will remain highlighted. An example of a highlighted particle is below.

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