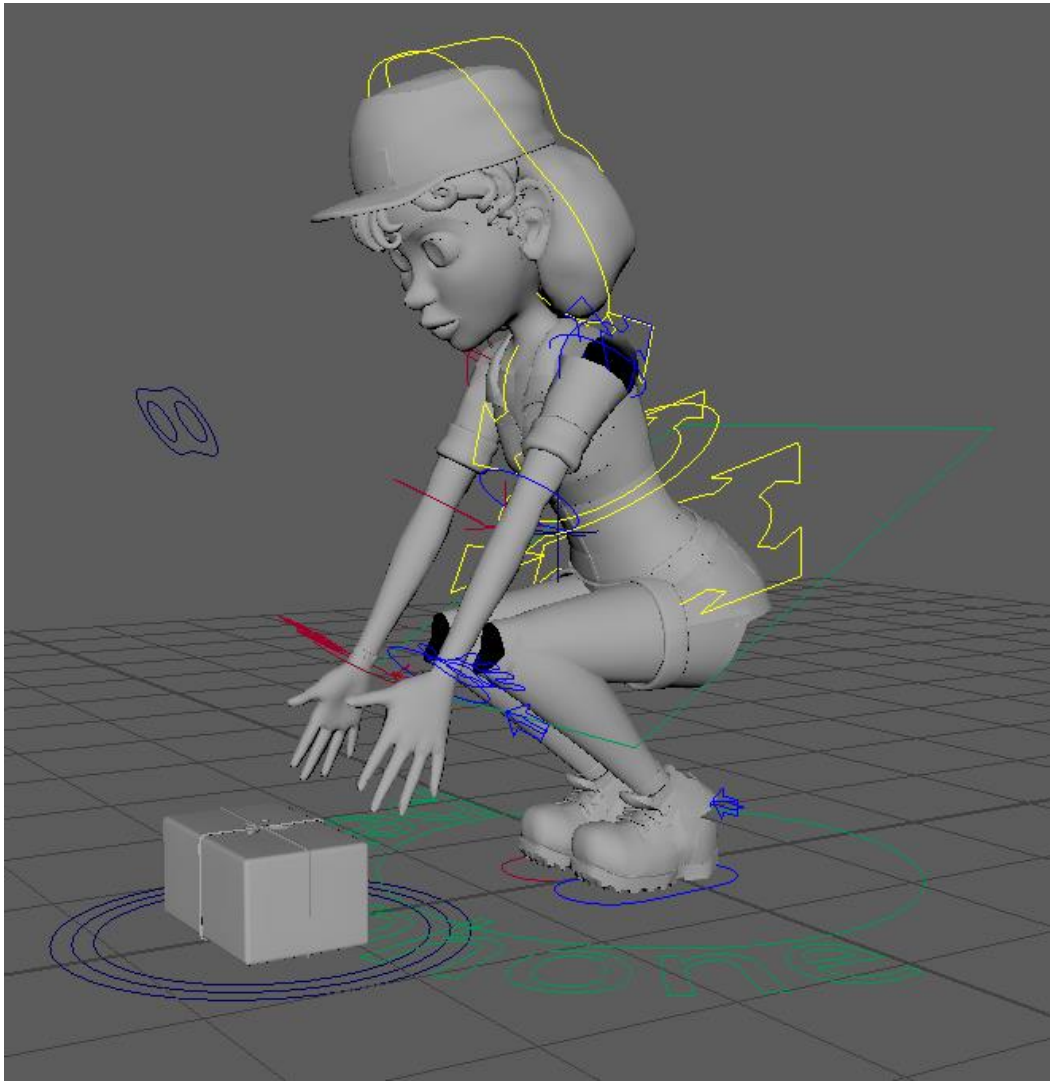
Holding objects

Getting your characters to hold objects can be a tricky process as there are a few things you should be careful of.

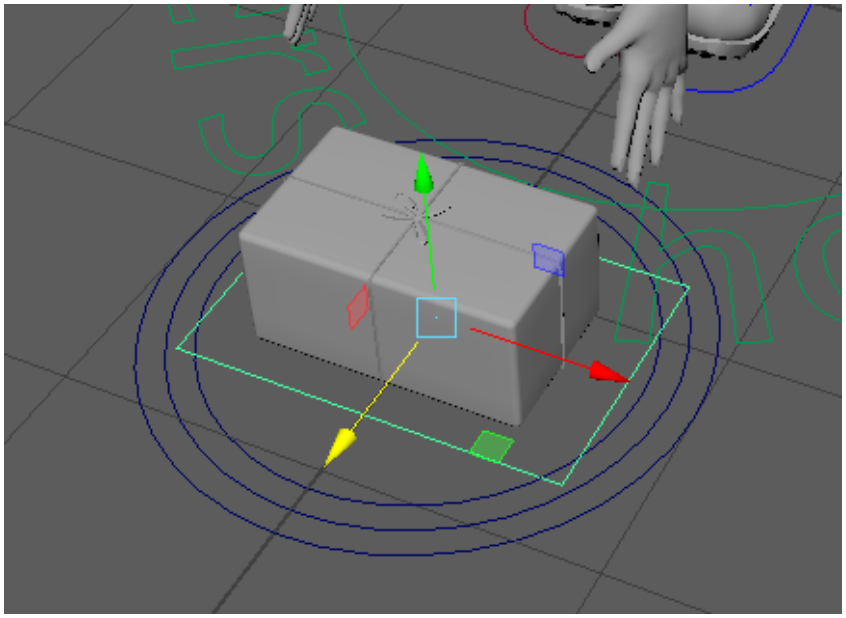
As an example, I'll be using Persephone holding a package. For her to hold the package, the object will have to be constrained to her hands to make it follow her body. To make it easy to use, you can create a controller on the package that will let you control if the package will follow her right or left hand or to not follow her at all.



You cannot turn a constraint on or off, once you create it the object will always have to be constrained to something. For Persephone to be able to hold the package and let go of it, you can switch what the object is constrained to.

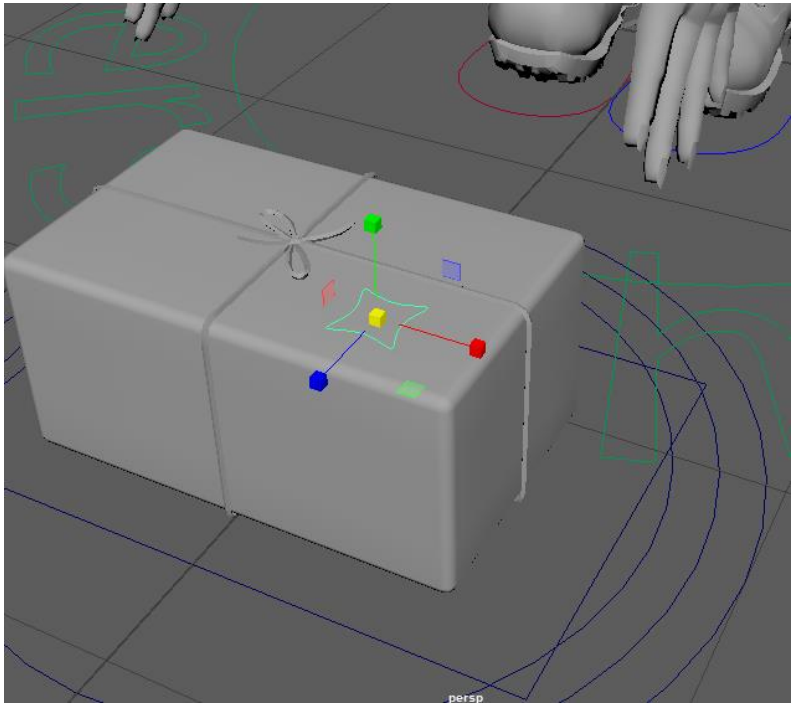
To start, create a NURBS curve on the ground floor. By constraining the package to this curve, it will follow your environment, which makes it able to stay still as the environment won't move.

- **Create – NURBS Primitives – Square/Circle**
  the type of curve does not matter. I used a square as the controllers of my box are already circles and this helped me differentiate between the two
- **Group your curve, and name it pk_world_const_grp**
  If you created a square, the curves are already located in a group. The name does not matter, name it something that goes along with the naming in your scene.



To make it easy to switch your constraints from the environment to her hands, we'll be creating a controller that will let us switch it.

- **Create – NURBS Primitives – Circle**
  In component mode, you can adjust the shape of the controller.
- **Position this controller onto your object and name it pk_const_ctrl**
- **Freeze transformations on controller**



- **Group controller**
- **Name it pk_const_ctrl_grp**
- **Select group, then select PK_01 and press P to parent**
  We're parenting the controller to the geometry of the object. This will make it follow the package.

Your controllers are now in place. Now we're adding the constraints.

- **Make sure your object is grouped, our package is located in a group called pk_01_anim_const_grp**
- **Select pk_world_const_grp, then select pk_01_anim_const_grp**
  When using constraints, you select the object it will be constraint to first, and then the followers. In our case, we select the environment control first, and then the package since we want the package to follow the environment.
  It is important to constrain groups rather than the control directly. If you constrain the control directly you cannot add keyframes anymore, which prevents you from animating the control!
- **In the rigging menu, Constrain – Parent**

- **Select l_hand_anim_grp, then select pk_01_anim_const_grp**
- **Constrain – Parent**
- **Select r_hand_anim_grp, then select pk_01_anim_const_grp**
- **Constrain – Parent**

All your constraints are now in place.

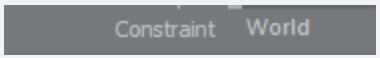
If you don't use a switch controller you are done at this point. Inside the pk_01_anim_const_grp, there is now a parent constraint. If you select it, inside the attribute editor you find these 3 attributes. To switch constraints, simply turn the one you want to 1, and the other 2 to 0 and keyframe it. To switch it, go to the next key, and change the next one to 1 and keyframe again.

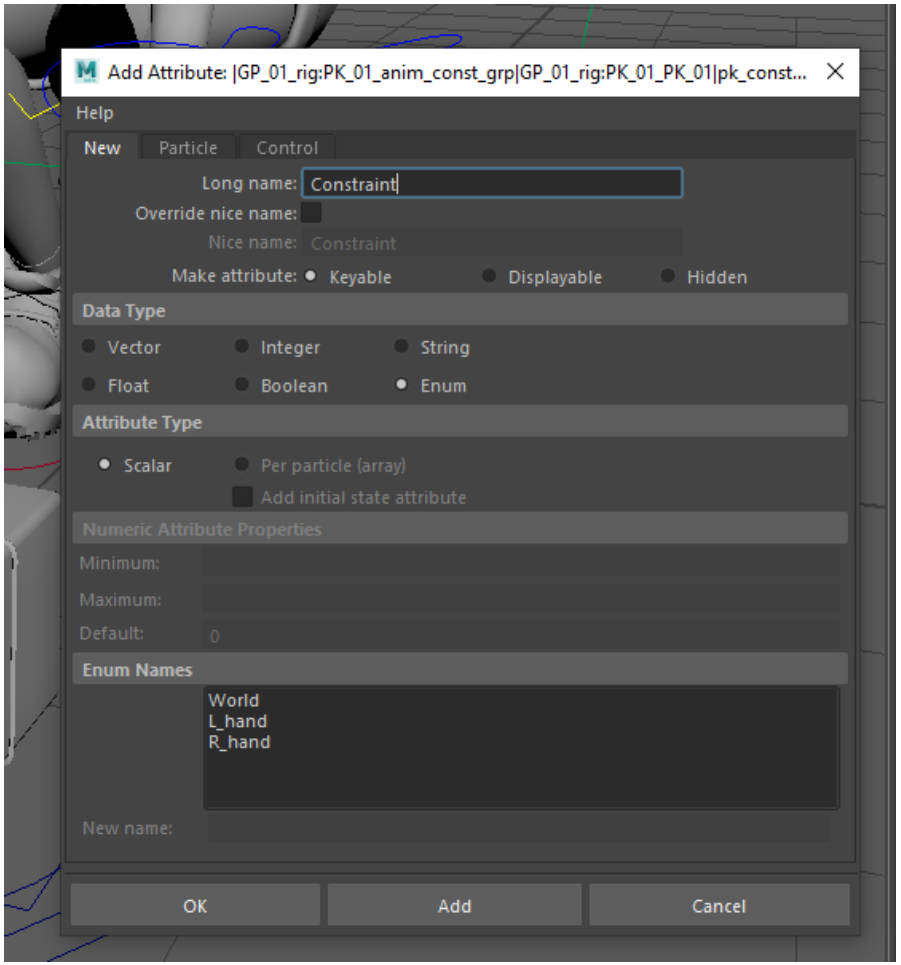
We made a controller to make switching between constraints more accessible and easier to do for the animation team.

To make the controller work, we'll be creating an attribute for the constraints.

- **Select pk_const_ctrl**
- **In attribute editor, click edit – add attribute**
  A new window will pop up that looks like the one in the image
- **Fill in like this**
  - Long name: **Constraint**
  - Data Type: **Enum**
  - Enum Names:
    - **World**
    - **L_hand**
    - **R_hand**
- **Click OK**

In the attributes, you should now see the attribute Constraint.





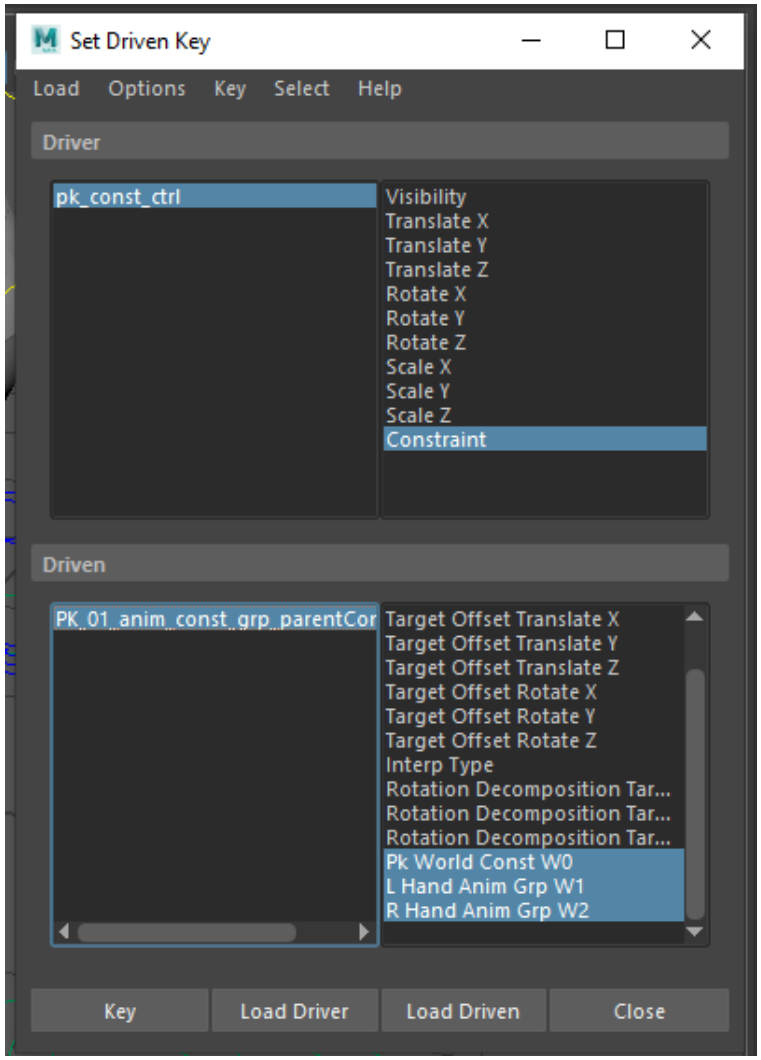
With set driven key, we'll be keying this attribute so that it will work if you change the attributes.

- **In animation menu, Key – Set Driven Key – Set – Option Box**
- **Select pk_const_ctrl – Load Driver**
- **Select pk_01_anim_const_grp_parentConstraint1 – Load Driven**

- **Select pk_const_ctrl on the top-left, set values**
  - Constraint: **World**
- **Select pk_01_anim_const_grp_parentConstraint1 on the bottom-left, set values**
  - Pk World Const W0: **1**
  - L Hand Anim Grp W1: **0**
  - R Hand Anim Grp W2: **0**
- **Click Key**

- **Set values**
  - Constraint: **L_Hand**
- **Set values**
  - Pk World Const W0: **0**
  - L Hand Anim Grp W1: **1**
  - R Hand Anim Grp W2: **0**
- **Click Key**

- **Set values**
  - Constraint: **R_Hand**
- **Set values**
  - Pk World Const W0: **0**
  - L Hand Anim Grp W1: **0**
  - R Hand Anim Grp W2: **1**
- **Click Key**



You're all set to go. Try switching the constraint attribute from world, to hand, and move the character. It should follow!

To switch the constraint, just key the controller when it when it's set to world. On the next frame key it on Hand.

Cleanup

- **Lock & Hide the following attributes**
  - **Translate X, Y, Z**
  - **Rotate X, Y, Z**
  - **Scale X, Y, Z**
  - **Visibility**

You can also make the controller a different color to make it clearer that this one is to switch the constraints.

- **Select pk_const_ctrl**
- **In attribute editor, select pk_const_ctrlShape**
- **Object Display – Drawing Overrides**
  - **Enable Overrides**
  - **Change color to any color you like**