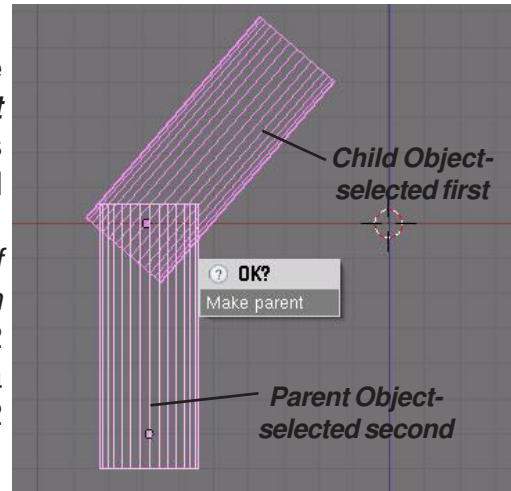


## Chapter 14- Child-Parent Relationships

So far, we've talked about making and editing objects, making them look good and how to render and animate them, but how do we make things like humans or robots or anything else move about that have *several parts connected together*? This is where **child-parent relationships** become useful. It allows us to link things together without actually joining them. This allows the individual parts to move about, but still follow a "master" object.

The concept of child-parent relationships is used in all animation programs and it involves an object assigned the role of a **child** and an object assigned the role of a **parent**. If the **parent** moves, rotates or scales, the **child** must do so too. **On the other end, a child can move, rotate or scale without affecting the parent.** An example would be: a *hand* is the child of the forearm while the *forearm* is the child of the upper arm and the upper arm is the child of the torso. Therefore, if the forearm moves or rotates, the hand must follow and if the upper arm rotates, the forearm *and* hand both must follow. If the torso moves, the entire arm must go with it. This is how you keep a body or machine from going to pieces!

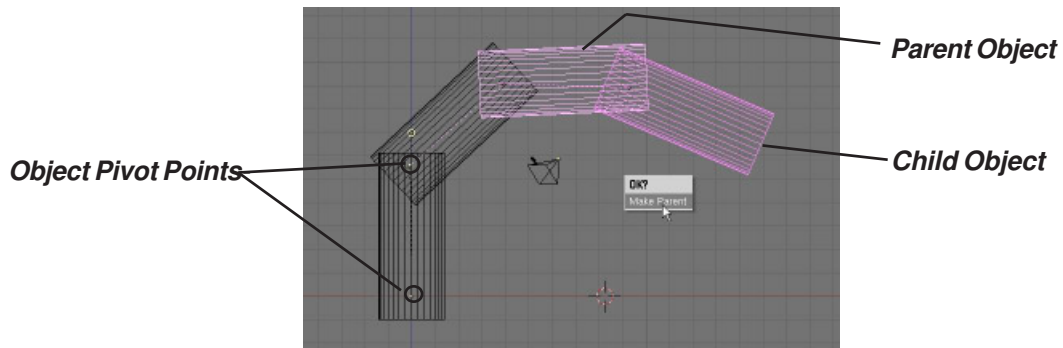
In order to make child-parent relationships in Blender, you need to hold down the "**Shift**" key to select multiple objects. **Select the child object FIRST, then select the PARENT object.** The child object is always selected first. If you have a string of objects that need to be child-parented together (like the arm example), *you can only do 2 parts at a time so start at the end of the chain and do the hand and forearm first, then forearm to upper arm and so on.* After selecting the 2 objects, press "**Ctrl-P**" to make parent. You will see a dashed line drawn between the pivot points of the 2 objects. This shows a child-parent relationship.



**RoboDude Asks:** *I did the Child and Parent selection backwards- How do I undo them? In order to delete a child-parent relationship, select both objects and press "Alt" and "P" to clear parent. This is good when you make a mistake!*

Look at the example on the next page. If we want to child-parent a few cylinders together to make a robot arm, create a cylinder and stretch it out in edit mode by moving one end of vertices. **Remember to pay close attention to the object's pivot point.** If the object needs to pivot like an arm, you will need to keep the point at one end of the cylinder. *Always pay close attention to the object's pivot point in any case. It's easy to forget about it when moving vertices around in edit mode.* You can use the "**Center Cursor**" option in the edit button to locate the pivot to the 3D cursor's location. After you shape one cylinder, exit edit mode and press "**Shift-D**" to duplicate it several times. Locate the cylinders and double check their pivot points. **Moving the pivots after child-parenting them together may cause the objects to move.** Start at the end and select the first 2 objects. Press "**Ctrl-P**" to make the relationship. Check it out to see if it's correct and go to the next set. In the next set, the previous **Parent** object now becomes the **Child** object. Make a simple animation to check the function.

# Chapter 14- Child-Parent Relationships

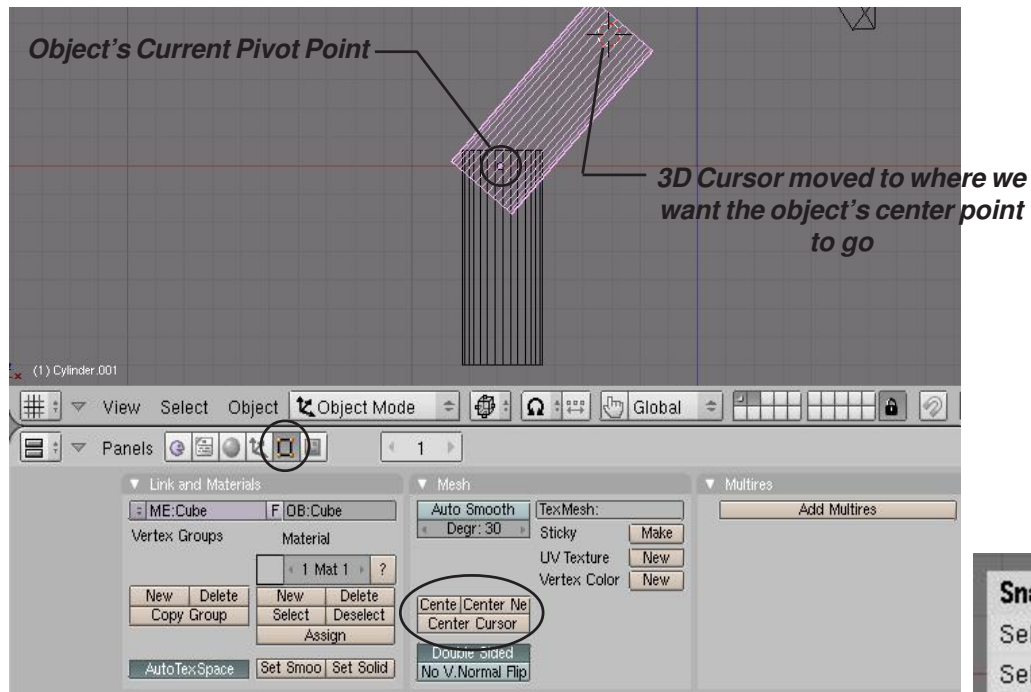


**RoboDude Says:** You can child-parent almost any object including cameras, empties and lamps.



## Review of Moving Object Center Points

In the basic editing chapter, we discussed how to move center points of objects. You were also cautioned about moving an object while in edit mode because the vertices will move, *but not the object's center point*. To move the center point of an object, **select the object**, place the **3D cursor** in the location you want the center point to go, and press the **Center Cursor** button in the **Edit Buttons**.



Don't forget about the "Shift-S" command. It is useful for finding exact locations of object or selected vertices. Also useful for moving things around.

### Snap

- Selection -> Grid
- Selection -> Cursor
- Selection -> Center
- Cursor -> Selection
- Cursor -> Grid
- Cursor -> Active

## Creating a Robot Arm Practice Exercise

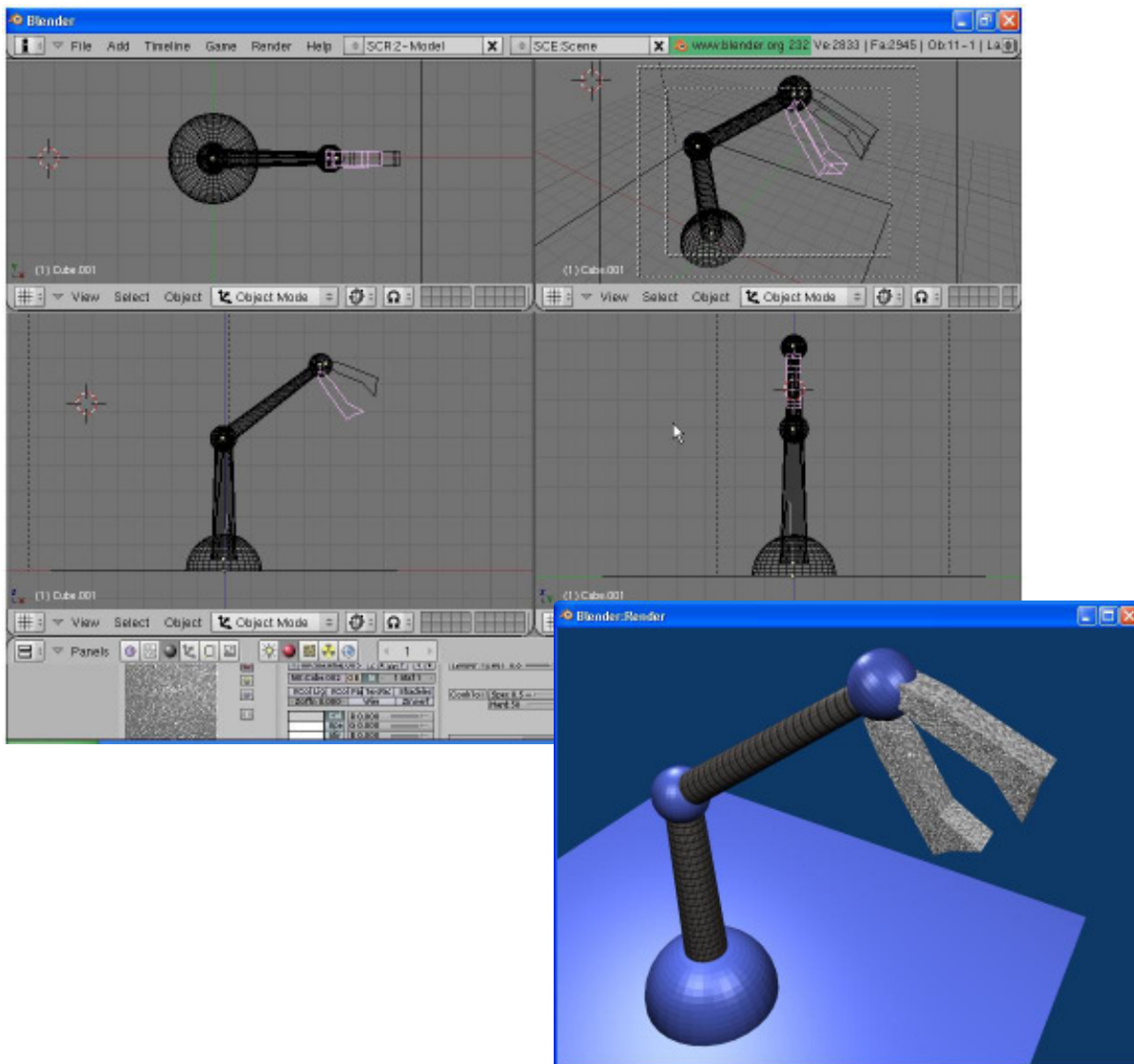
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Create a new Blender scene and set up the views any way you wish. **Your job is to design a robotic arm that is child-parented together and animated.** Create all components using planes, cubes, spheres and cylinders. Place materials on all objects and develop a good scene with plenty of lighting.

**After you create your scene, develop a 150 frame animation of your robotic arm moving in all directions.**

### Challenge exercise:

Try to make your robot arm pick something up off the plane!



**\*\* Call the instructor when finished\*\***