Design 0100, Weekly Design Guide
Quarter 3, Week 4, Wheel Mount Front and Rear

This week we will start to put together our Go Cart into an assembly. We first have to assembly a sub assembly consisting of our Wheel Tire assembly, our Wheel Mount and Axle plus our front and rear suspension items. We will build two sub assemblies in this example both for the front and rear wheel mounts.

Perform the following steps:

1. Open your Wheel Mount, Axle and Wheel Tire Assembly.

2. With the above files open start a new SolidWorks model by selecting "Assembly" from the "Templates" tab.

3. You will notice the three files that you have already opened are displayed in the Properties Manager to the left of the model area. Choose the Wheel Mount in the Properties Manager.
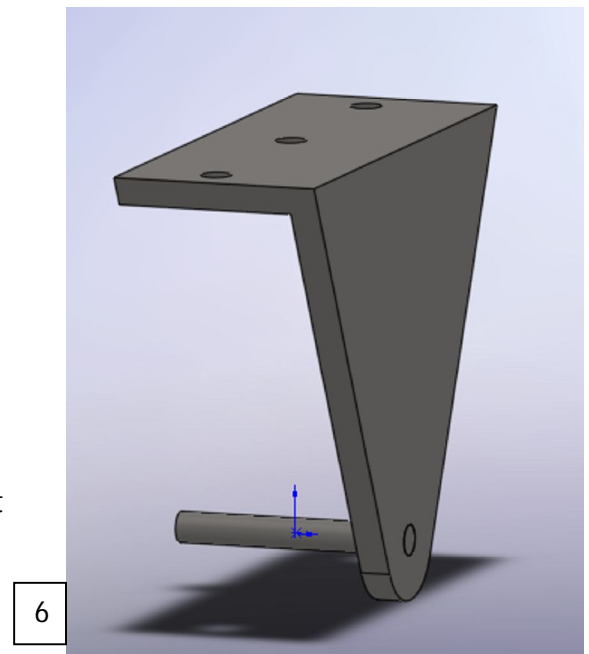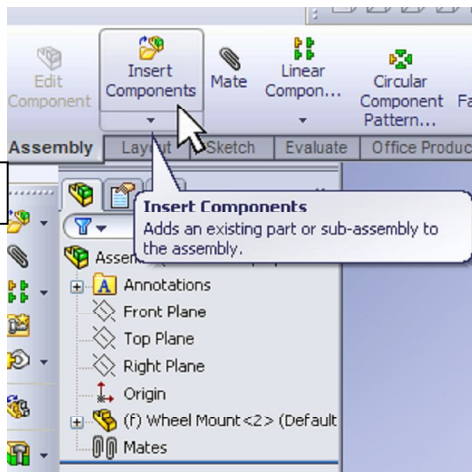
4. Before you go any further you must go to the Pull Down Menu and select the tab "View" then select "Origins". This way you can drop the Wheel Mount right on top of the three primary planes of which the origin is defined by. Now click on the Origin in the center of the model area and the Wheel Mount drops onto the three primary planes, Front, Right and Top.
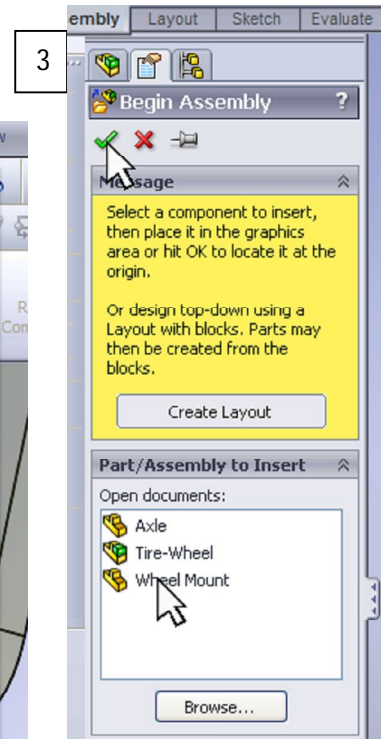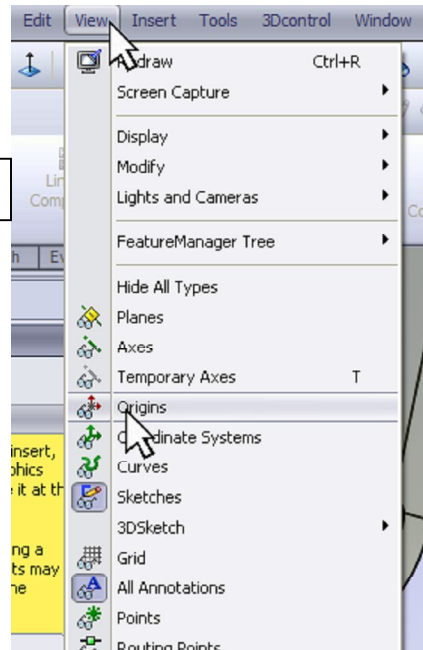
5. The next element is the Axle. Go to the "Command Manager" and select "Insert Components" from the Assembly Toolbar. You will see the same open documents that you saw before.

6. Select the Axle and also drop it on the origin. Because we built these using symmetry they should line up like they do in the image nearby. If they do not please see me.

7. Save your assembly as Wheel Mount Rear into your Go Cart folder. In the description box name it WHEEL MOUNT REAR in capital letters. Now insert the Wheel Tire assembly into the model area. This time do not mate this model onto the origin but follow the steps below so that the Wheel and Tire will rotate about the axle. Go to the Pull Down Menu and select the tab "View" then select "Temporary Axes".

8. In the model area click on the axis that defines the center of the axle and the axis that defines the center of the Wheel or Tire using the "Ctrl" key.
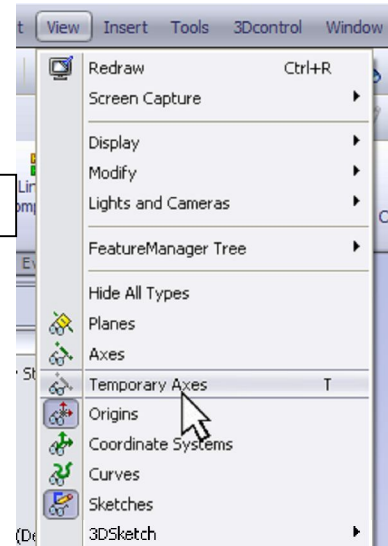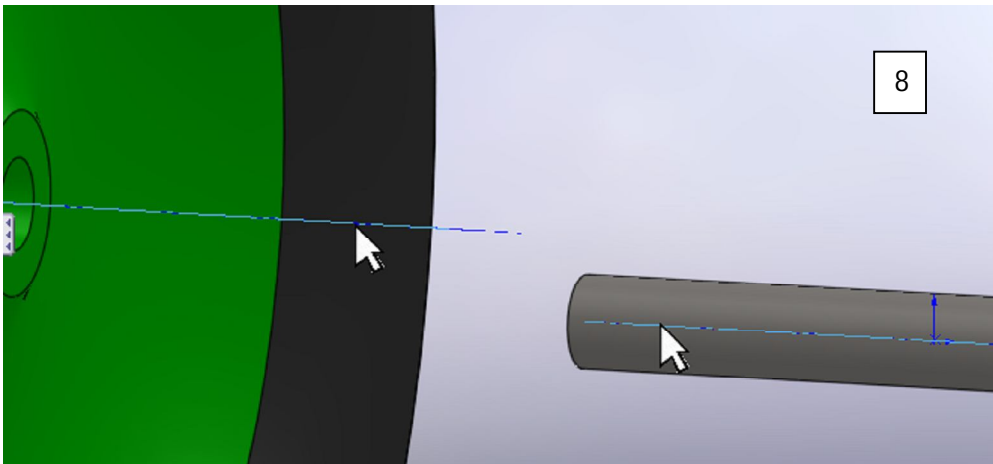
9. Go to the "Command Manager" and select the button named "Mate". The Properties Manager will open up and, by default, it will select the "Coincident" mate. The Wheel and Tire assembly will snap onto the axis of the Axle. Click on the green checkmark.

10. Now select the Right Plane of the Wheel Tire assembly in the Features Manager and also the Right Plane of the Assembly. Click on the "Mate" toolbar like you did above. Choose all of the default selections in the Properties Manager and the Wheel Tire Assembly will now snap into position onto the Axle and Wheel Mount. Because of the mating relations, the Wheel and Tire have the ability to rotate around the axle but is confined about the Right Planes. Try it.

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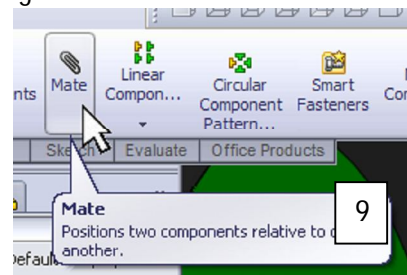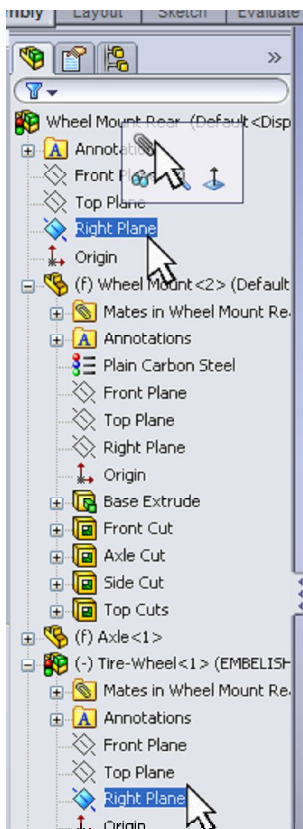
11. Now let's add the Rear Suspension onto the Wheel Mount Rear assembly. Go to the "Assembly" toolbar on the "Command Manager" and select the "Insert Components" tool.   Since the model is not open, click on the "Browse" button. This will open a dialog box. Select the Rear Suspension from the "Go Cart" folder. Click the "Open" button and the Rear Suspension will appear in the model area. Let this item "float" in the Model Area for now.
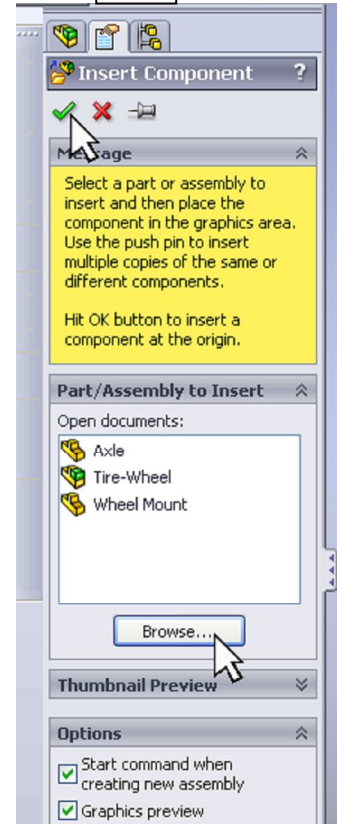
12. Like you did before, mate the front planes together. Choose the Front Plane of the Rear Suspension part and the Front Plane of the assembly together. Now mate the top surfaces of the Wheel Mount and the Rear Suspension together.
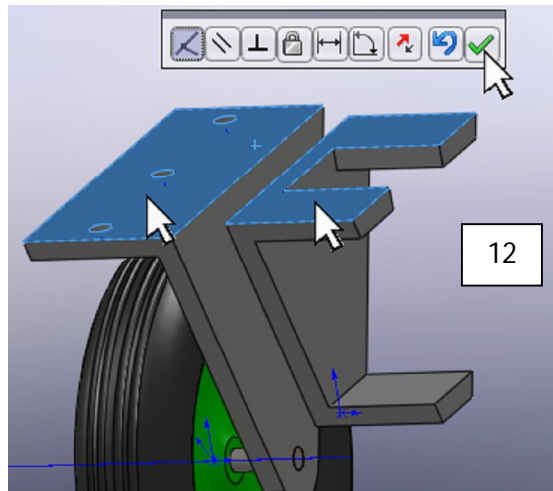
13. The last 2 items to mate together will lock these parts together so that they will not move. This process of mating is similar to defining a sketch. With the Mate Properties Manager open on the left side of the model area choose the face on the Wheel mount shown then turn the assembly and choose the opposing face on the Rear Suspension. The Mate Properties Manager will, by default, select the Coincident mate. Click on the green checkmark.   To test these components, to see if they move, click on a face and push and pull it around. If it is fully mated it will not move and display a message telling you so.
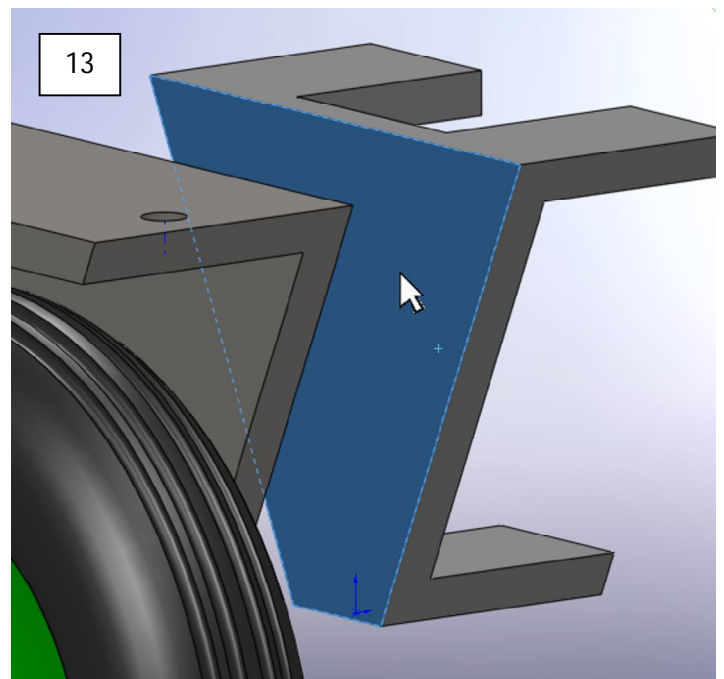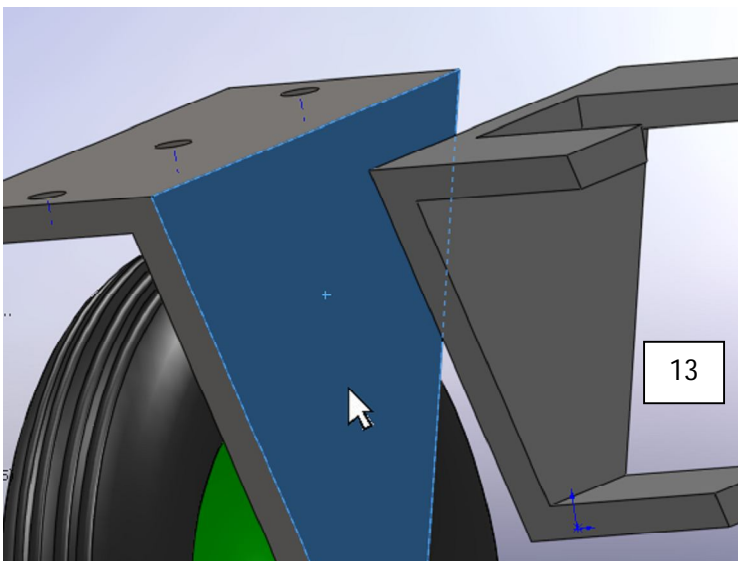
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14. Save your work (Wheel Mount Rear) then go to the "File" pull down menu and choose "Save As". Call the new file Wheel Mount Front. In the description box name it WHEEL MOUNT FRONT. Since the front and rear wheel mount have similar components and built in a similar way we are going to borrow on what already has been produced to create our new assembly. Perform the following steps.

15. Go to the Feature Manger and delete the Rear Suspension as a part from the assembly. In its place you'll insert the Front Suspension. Do this in a similar manner as you did above leaving it floating in the Model Area for now. There will be only 2 mates on this component. The first will be the center vertical axis on the Wheel Mount mated to the vertical axis on the Front Suspension.

16. The second mate will be between the 2 faces shown below. These two mates will allow for rotation about the axes first defined but is confined by the joining of the faces in the second mate.

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