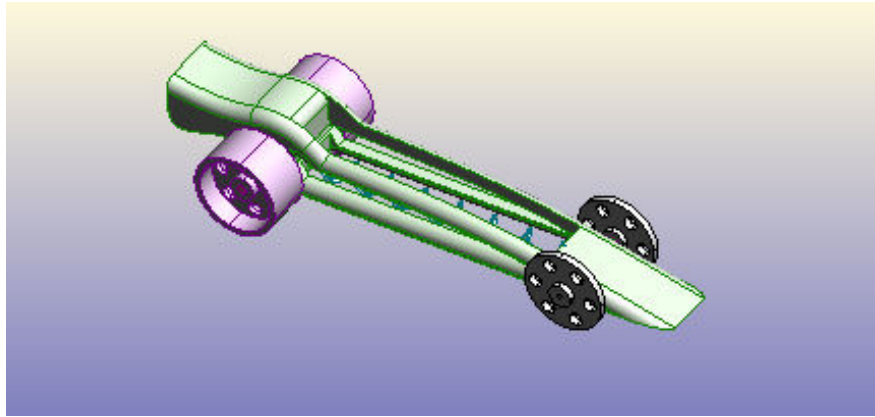


Project: **CO² Racers**

A Complete Design Tutorial



Pro/Desktop v8

Tech Ed

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updated 12/07

Table of Contents

Design Files 3

Options/ Units 3

Side View 4

CO2 hole 9

Top View10

Assembly11

Drawing Files12

MultiView Drawing12

Title Block14

Building Template Drawing16

Printing Your Drawings19

Album Files20

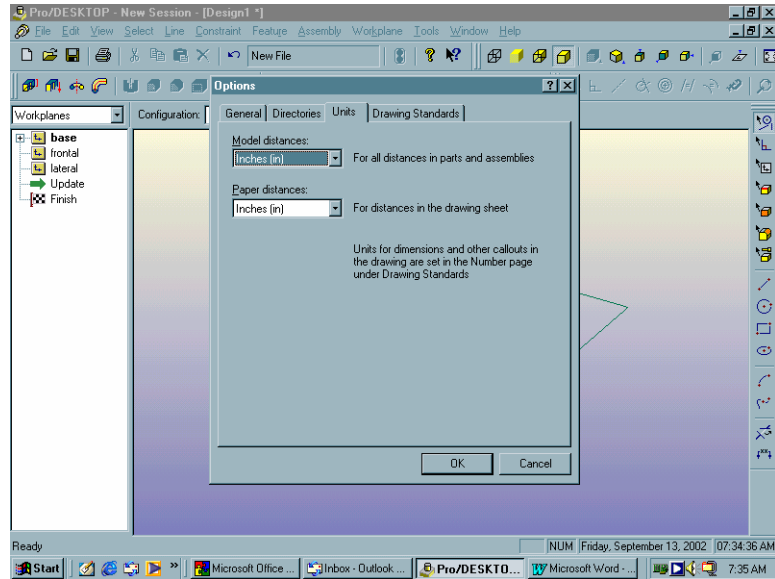
Make a folder in the *grade 8* class folder on the 'Y' network drive. Label it **YOURLASTNAME**

Design File .des

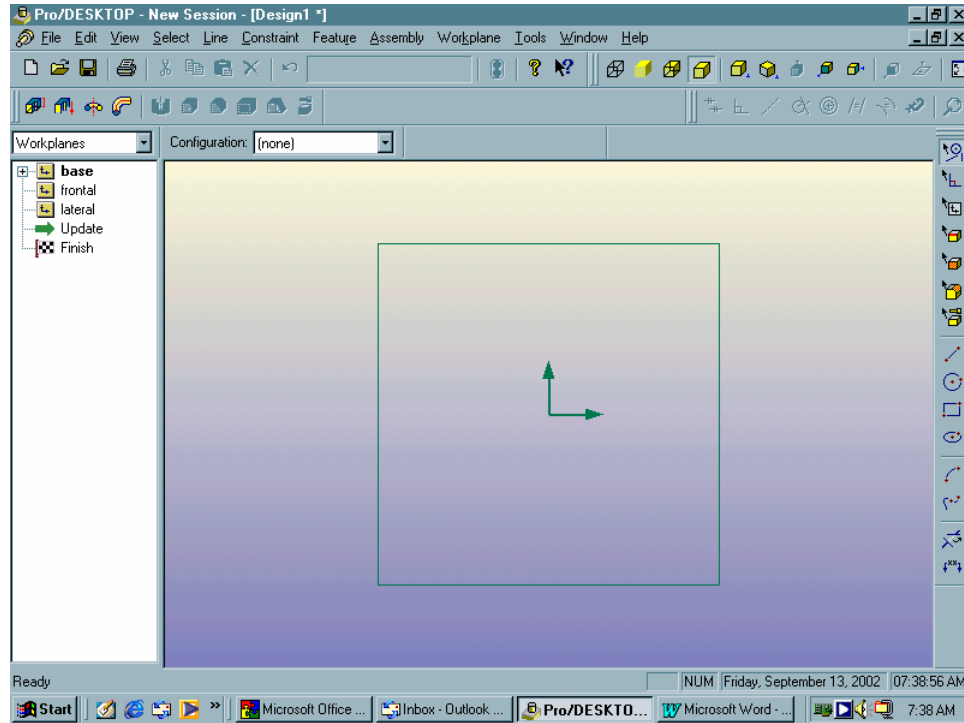
Start Pro/Desktop

Begin a new **DESIGN** page, maximize the views.

1. Go to **TOOLS/ OPTIONS/ UNITS**. Change both boxes to inches (in).

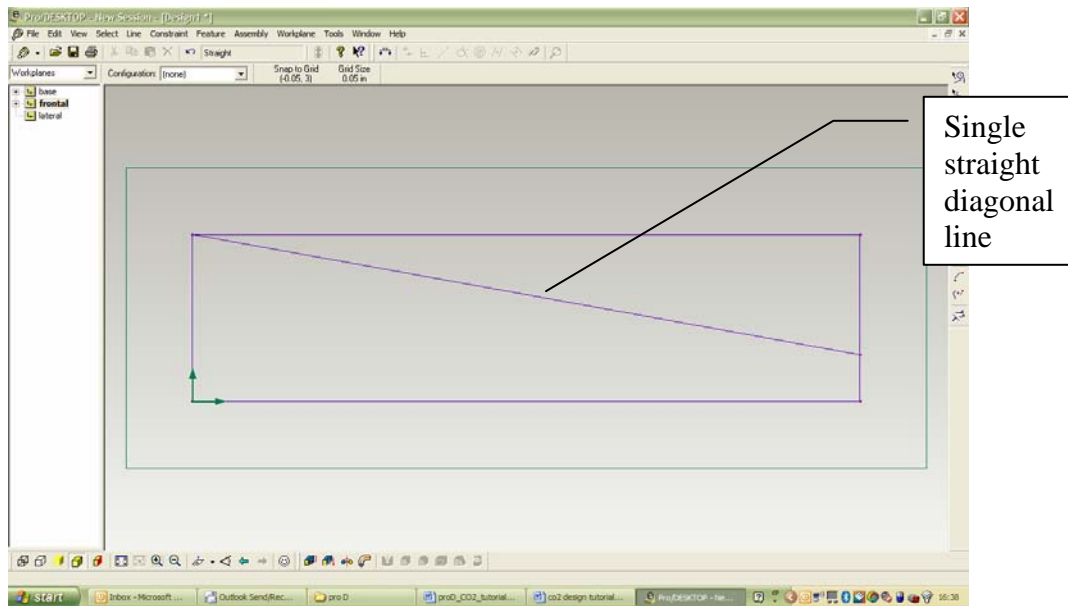


Side View



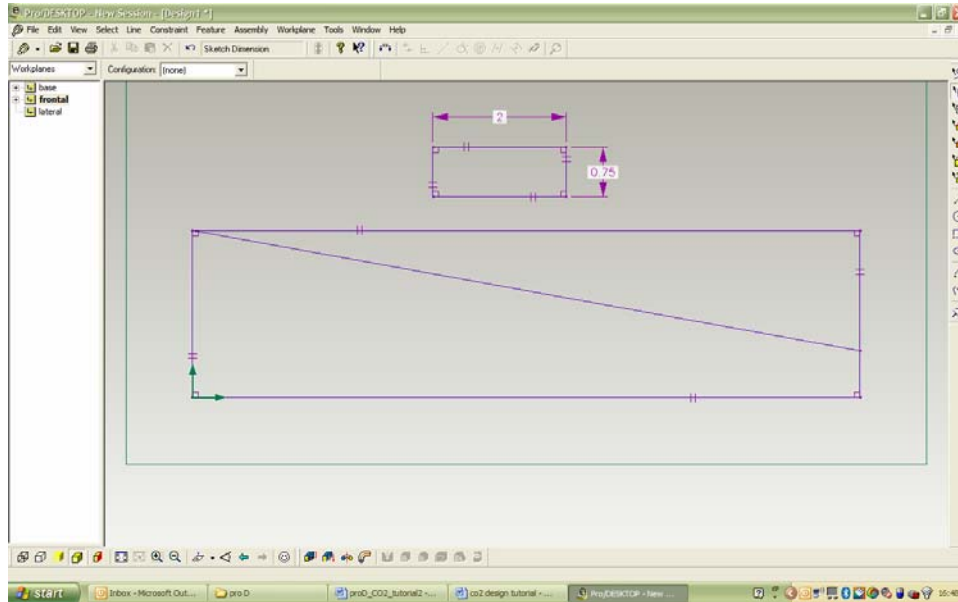
2. **Right mouse click** on the **Frontal workplane**. Select **new sketch**, rename *side view*. **OK**
3. **Shift W**, to view in 2D

4. Select **Rectangle** (from tools at right). Start to draw a rectangle at 0,0, this is the intersection of the 2 green arrows. Make sure this is the lower left hand corner of the rectangle.
5. Use the **Sketch Dimension Tool** (bottom right) and re-size the rectangle to 10" x 2.5" if needed. Delete the dimension lines.
6. Use the single line tool to add a single straight diagonal line as shown below in the picture. Save



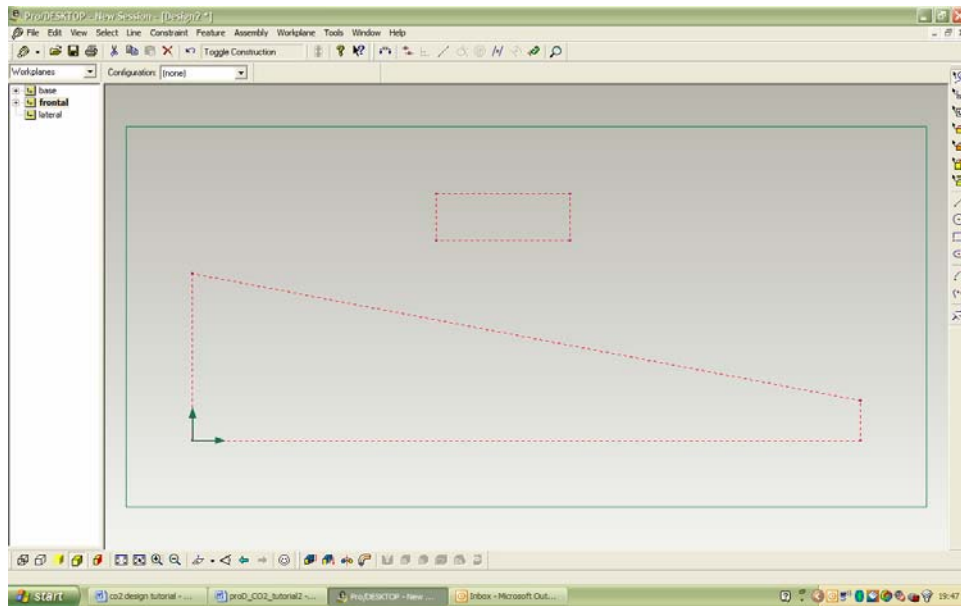
7. **Shift A**, allows the design to fill the screen. This is the greatest size allowed for the side view of your car. You are going to put cuts, curves, angles, cut-outs and holes in this space. You will use your Working Drawing (last sketch sheet).

8. One constraint (something you have to work with, or work around), is the hole for the **CO2 cartridge**. You have to show where it will be, while you create the side view design, so that you don't remove too much "car". To do this- draw a 2" x .75" rectangle somewhere outside of your car box.

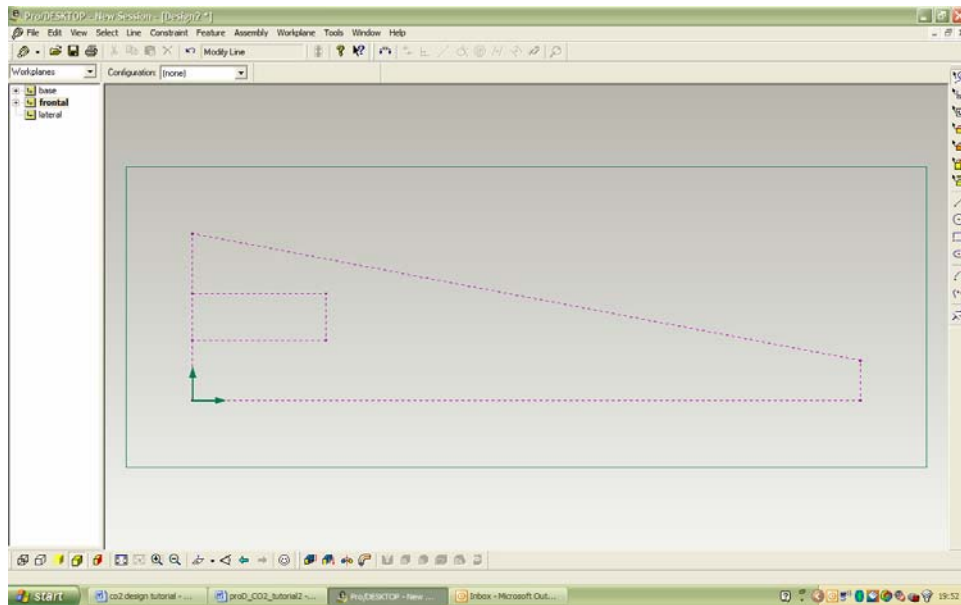


9. Delete the 2 dimensions.

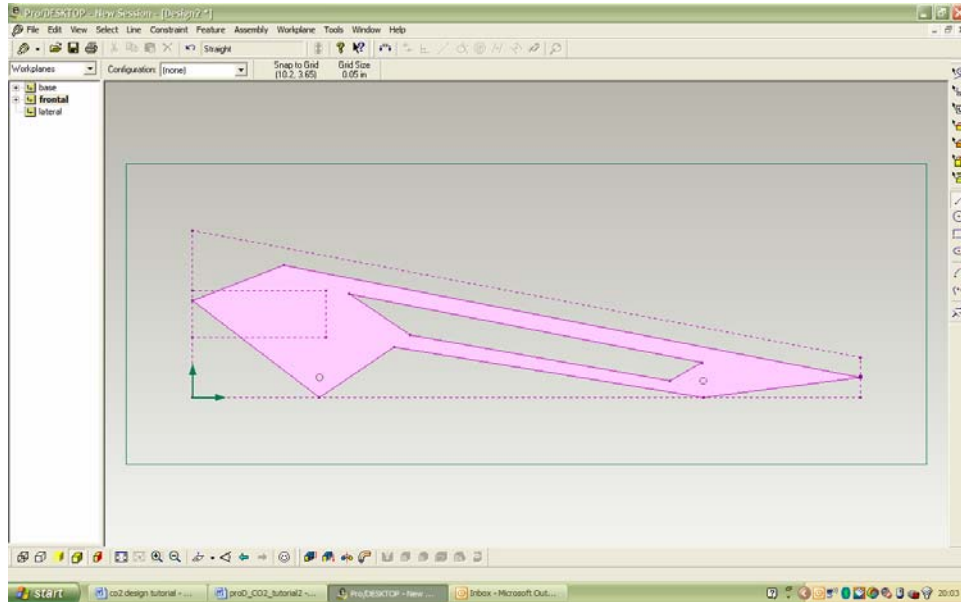
10. Select all lines, **right mouse click**, select **Toggle Construction**. All lines will become dashed lines. Save
11. Use the *Delete Line Segment* Tool (bottom right) to remove the top horizontal line and the top part of the right vertical line. This will give you a block similar to the wood you'll use in the wood shop during fabrication.



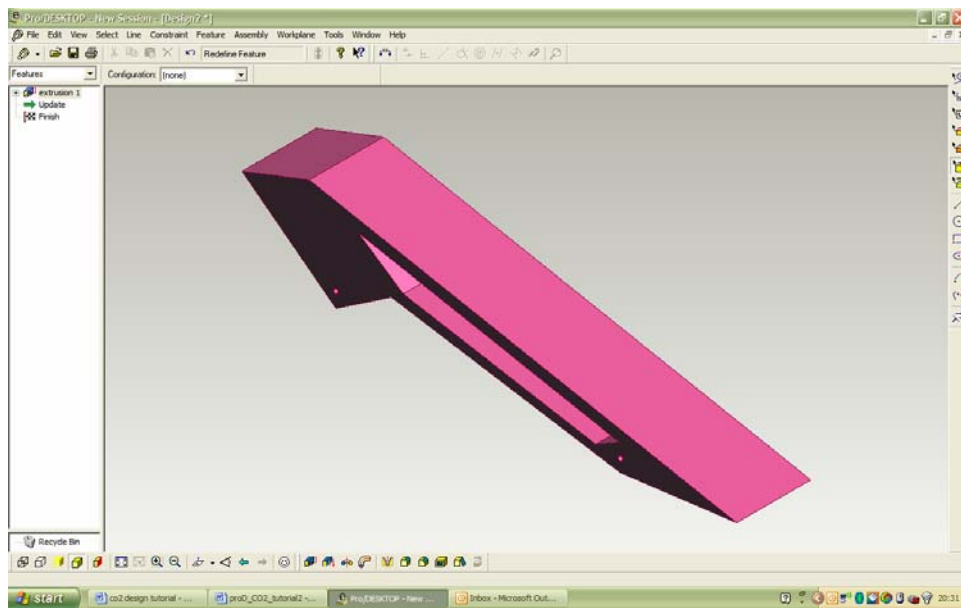
12. Drag this CO2 “hole”, use the **Select Line Tool** (top right), Select or **Shift Click** on all 4 lines to select it. Move it to the left end of the car box. Eyeball it evenly. Save



13. Add your 2 axle holes for the front and rear wheels. Select the circle tool, draw small holes.
14. Use the single line tool, and/ or arc tool to draw your dragster design'n side view in the block. You must stay inside the construction/ dashed lines. You must draw a single line with no misses or crossed lines.



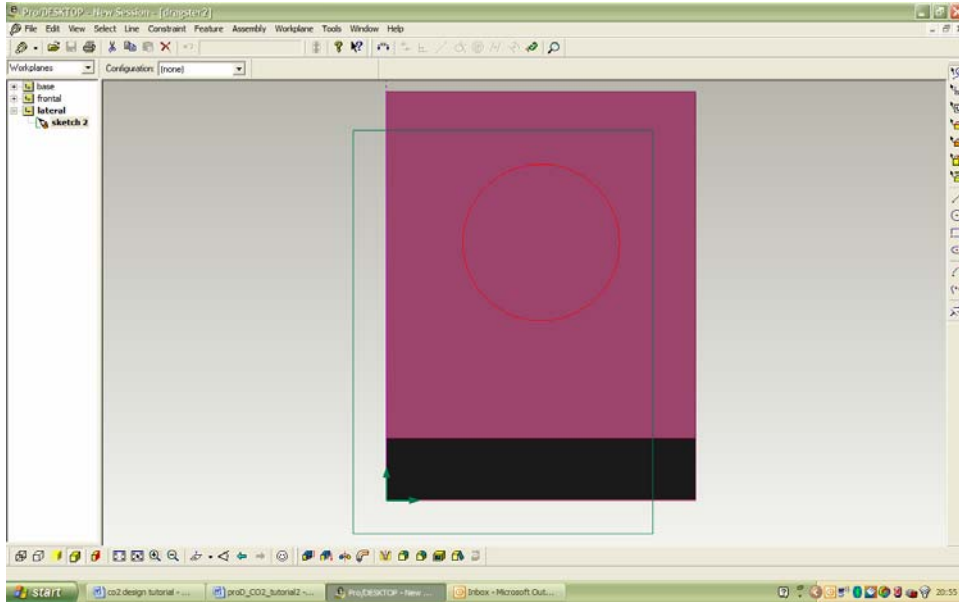
15. Save
16. **Shift I**, to look at your design in 3D or isometric.
17. **Feature/ Extrude/ Add Material/ 1.5"/ Below Workplane/**



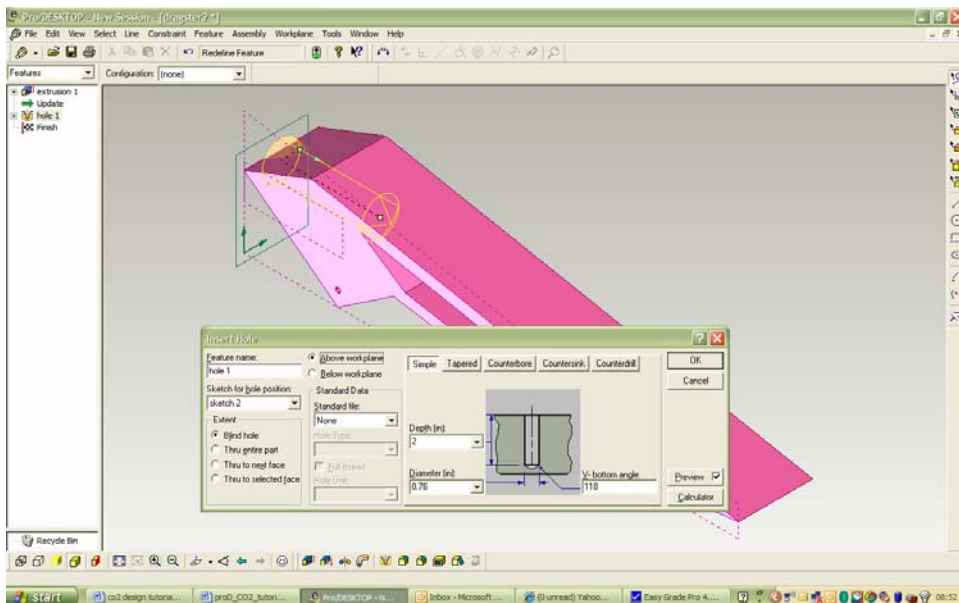
18. Save

CO2 Hole

19. Select the **Lateral Workplane** at the left. **RMC to new sketch**, rename as CO2 hole.
20. Shift W, shift A
21. Circle Tool, draw a .75" dia. Place it's center 1.25" from the bottom, and .75 from the side.

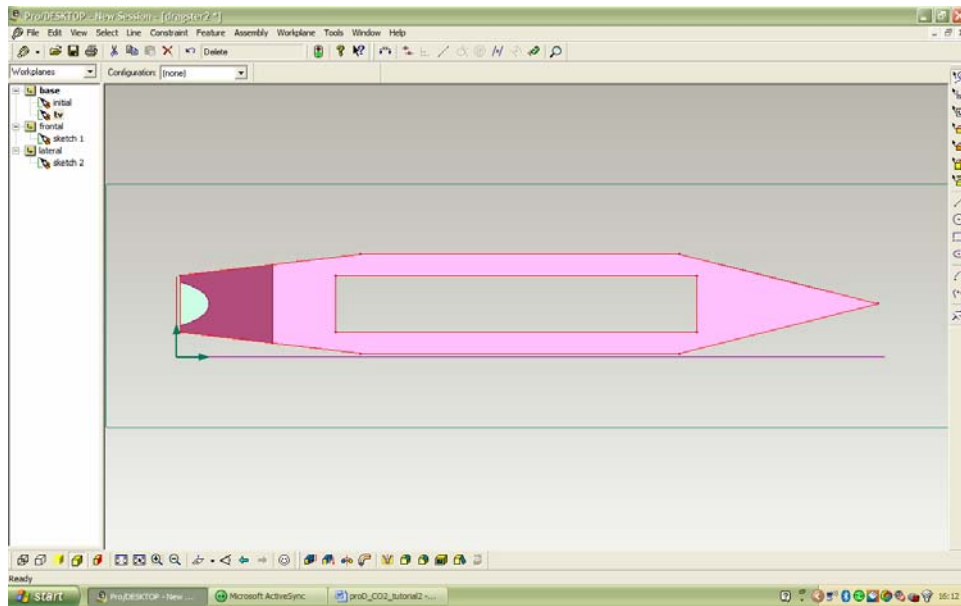


22. Manipulate the design or Shift I to see in 3D.
23. **Insert Holes/ Blind Hole/ Below Workplane/ 2"**



Top View

24. **RMC** on the *Base Workplane* at the left side. **New Sketch/ rename it Top View/ OK**
25. Shift W, shift A. Use the Straight Line Tool to draw your top View design. It must be a single complete line all the way around, with no crosses or misses.

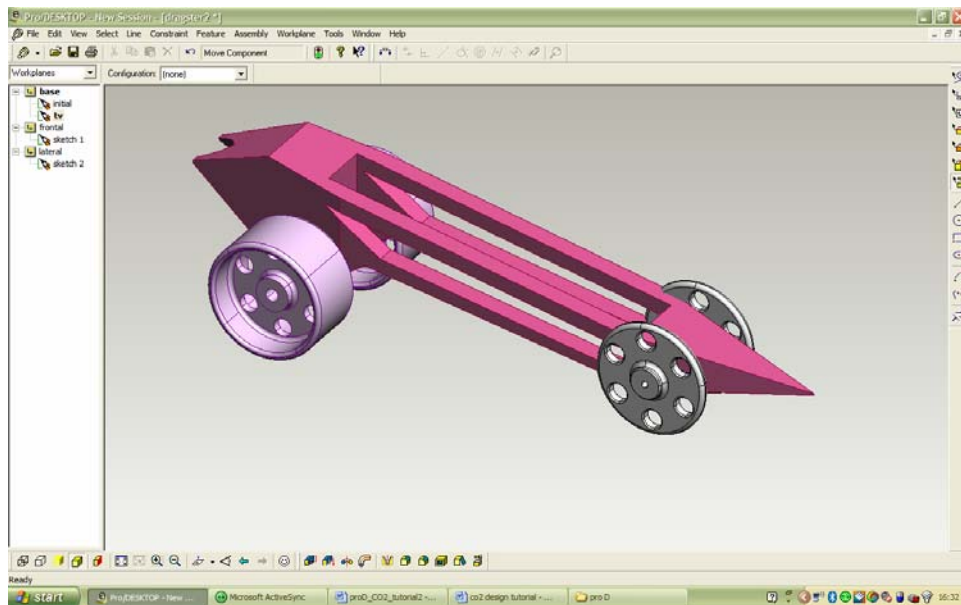


26. **Shift I**. To see the design in 3D. **Extrude/ Intersect/ Above Workplane/ 2.5"/ OK**
27. **Save**
28. Round or chamfer any lines if wanted with small sizes- .2 or smaller.
29. save.

Assembly:

Assembly involves putting wheels on your car. The wheels are already created. You just pull them into the design and place them where you would like them. The Assembly pull-down menu will have the commands to accomplish this task.

30. **FILE/ NEW DESIGN.** SAVE AS, name it “**yourlastname_assembly**”. You will now bring in your design to add the wheels. **ASSEMBLY/ INSERT COMPONENT**, a box will open up, find your “design labeled assembly” and insert it.
31. Front and rear wheels are found in the ProD Folder on the “Y” drive.
32. Insert wheels and assemble using the **Assembly/ Center Axes** command. **Save** Use the **Select Faces Command** to select the *axle hole* of the wheel. *Shift click* to select the *Axle Hole* of the car. **Assembly/ Center Axes**. This will line up the centers of the 2 holes. Use the **Select Parts Command** to move the wheel in to approximate position.



Drawing File .dra

Info

Technical drawings convey the form and dimensional information to skilled workers to manufacture components. A drawing file is a 2D picture of the different views associated with manufacturing your design.

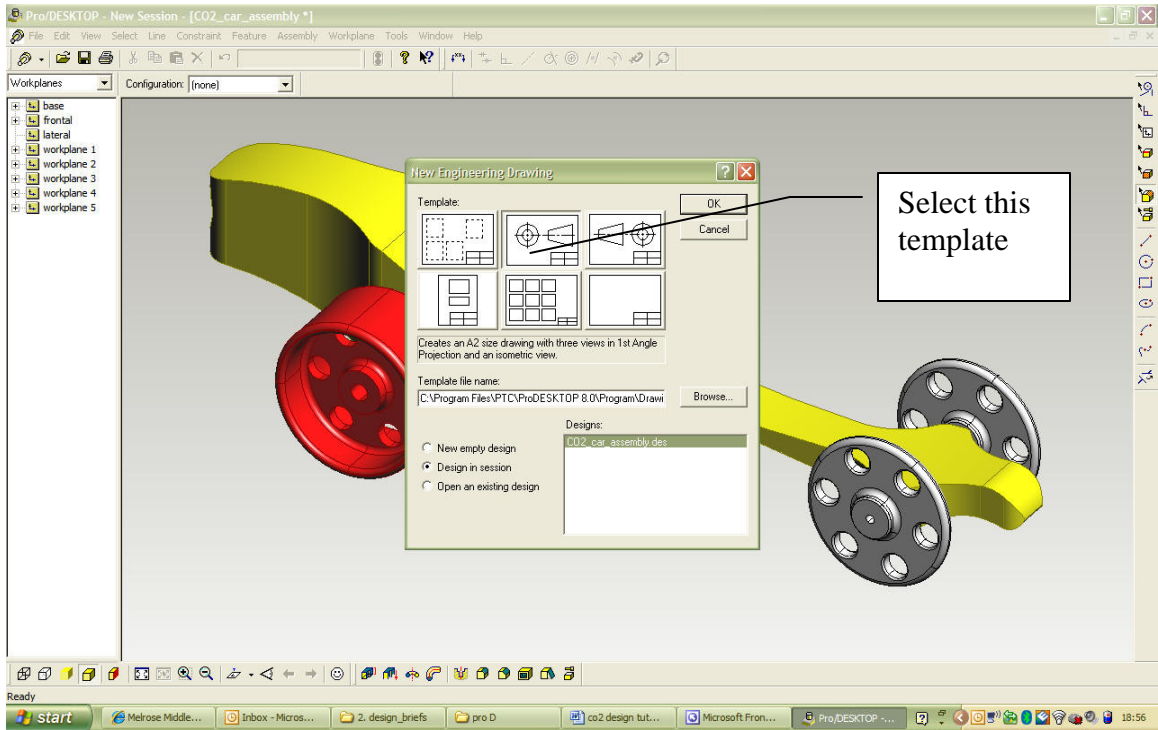
You will “draw” the following:

- A front view, top view and a right side view. You will also include a pictorial isometric drawing.
- A full size top and front view to use in the wood lab as a template when building your car.

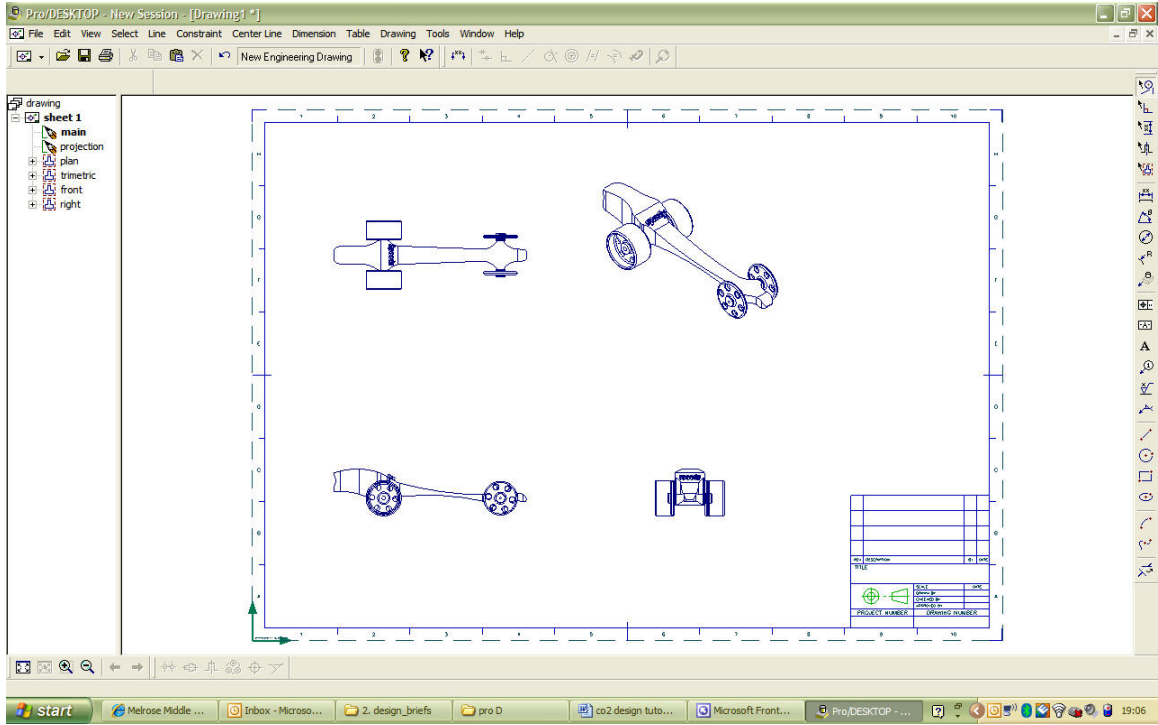
This involves using the Drawing part of Pro/Desktop. The drawings will be automatically made for you as you have already designed and saved the car.

Multi- View Drawing

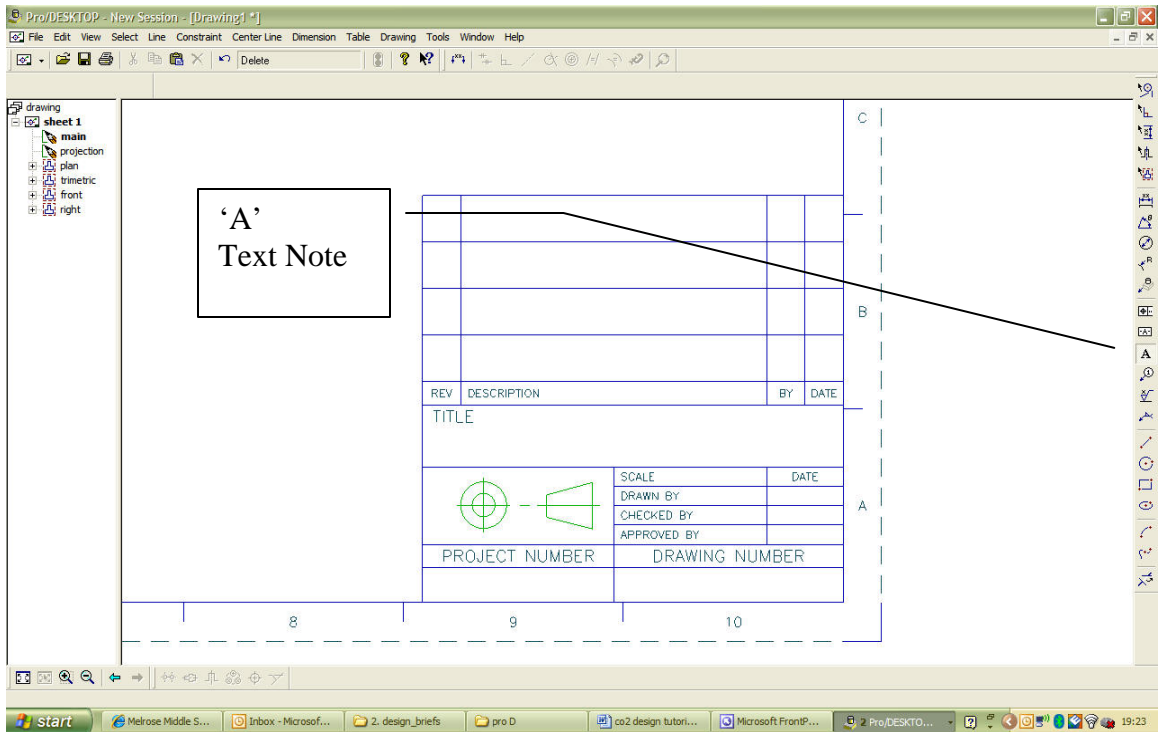
1. With your car body/assembly design still on the screen, make sure it is oriented similar to the picture below. **FILE/ NEW**, select **ENGINEERING DRAWING**. Click OK.



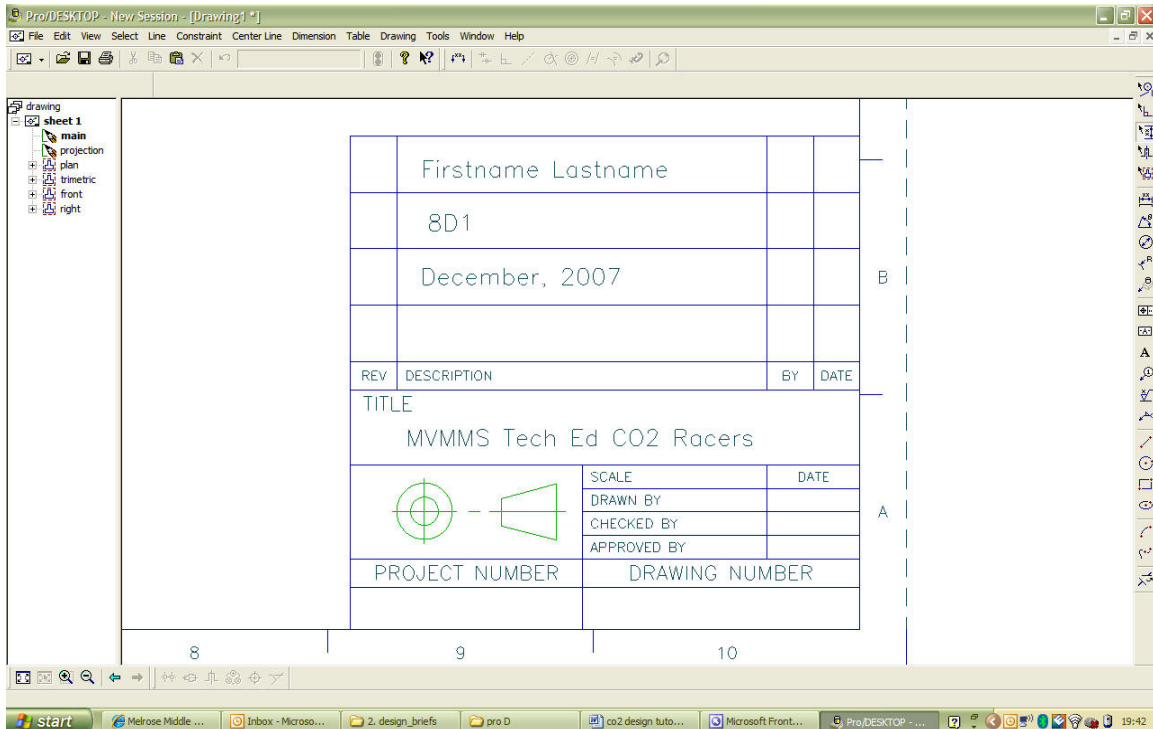
2. **Select the top middle template**, and your Multi-View Drawing will open, showing a front, top, right side and an isometric pictorial drawing.



3. **VIEW/ ZOOM IN.** Zoom in to the Title Box in the lower right of the page. Then select the **TEXT NOTE** button, letter 'A' on tool bar at right.



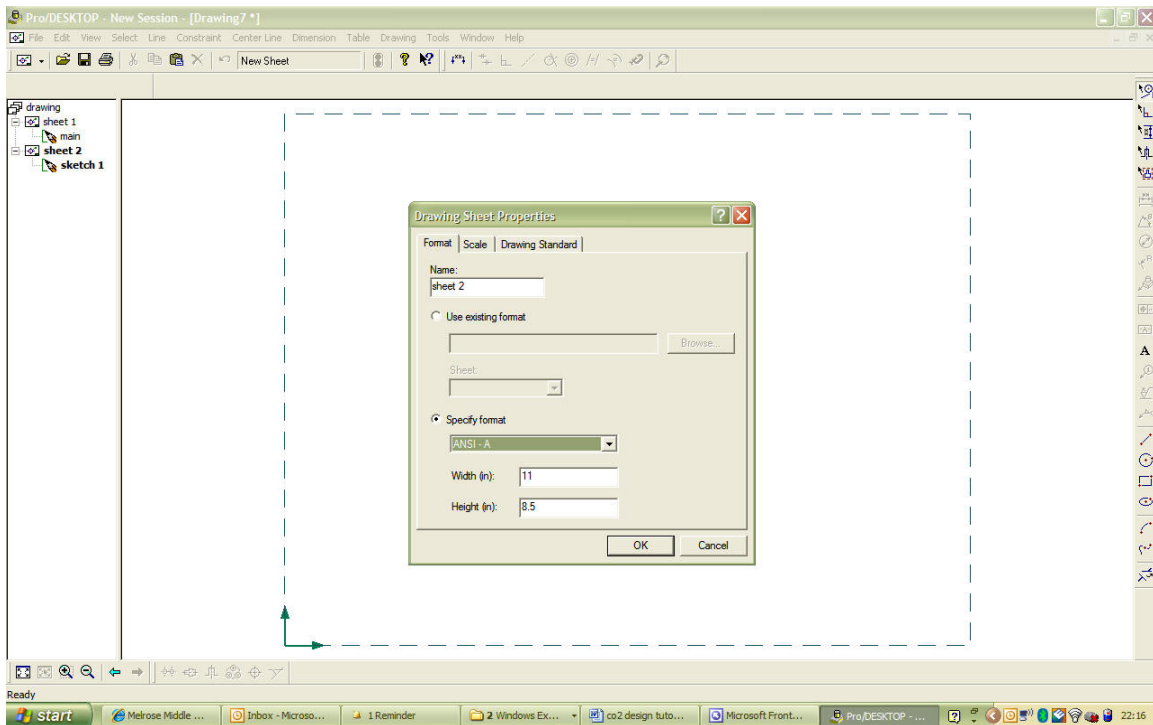
- After clicking on the TEXT NOTE button, hold down the shift key and click in the Title box. The word **NOTE** will appear in red. Double click 'NOTE' and you can now add the drawing title- **MVMMS Tech Ed- CO2 Race Cars**. Place other text notes in the top three cells, add your full name, class and date. **SAVE** .DRA as **lastname_multiview**



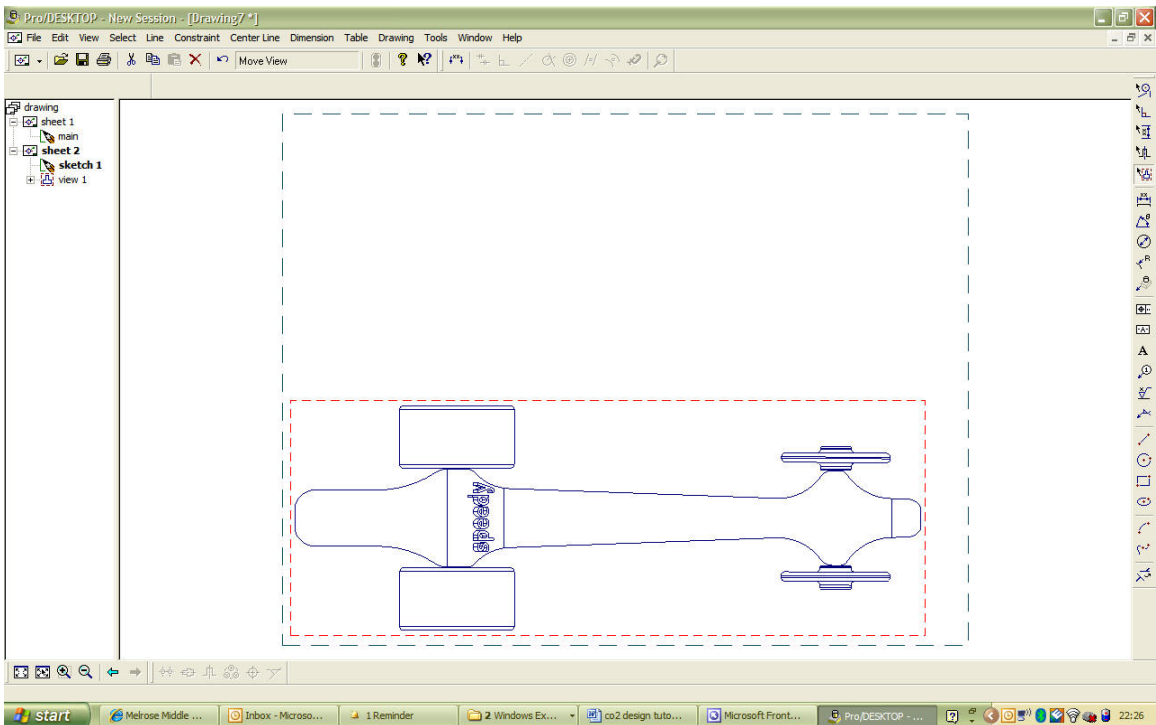
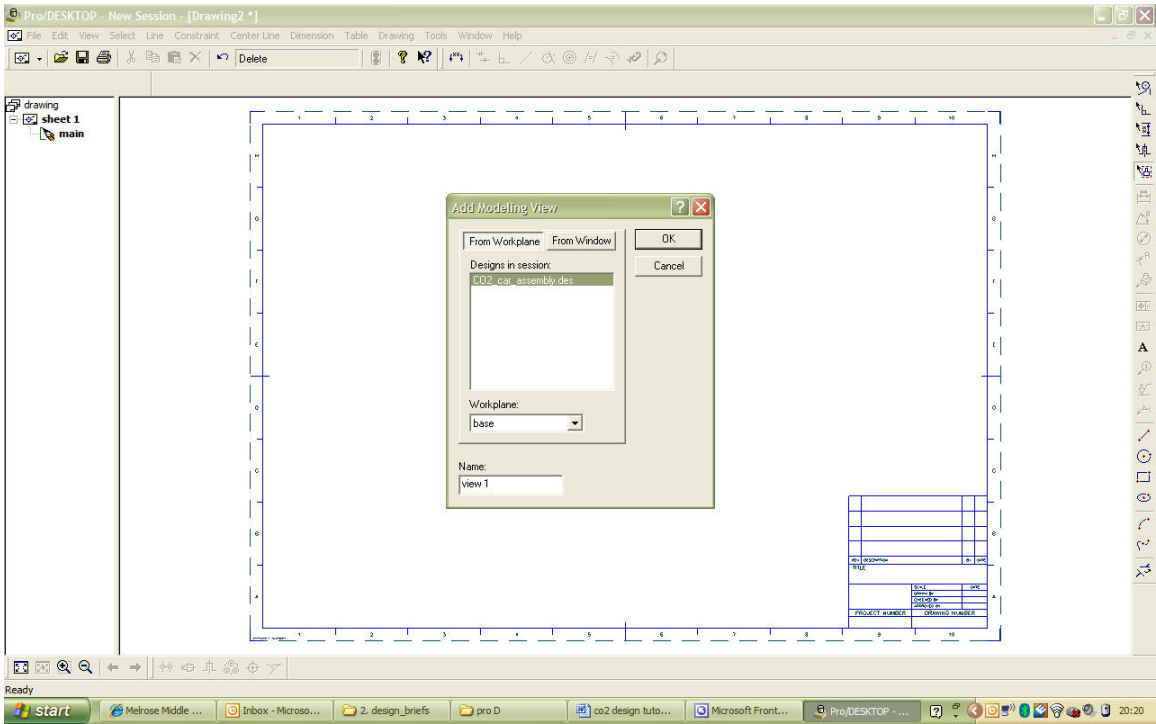
Building Template

5. With your car body/assembly design still on the screen, make sure it is oriented similar step #1 above. **FILE/ NEW**, select **ENGINEERING DRAWING**. Click OK.

6. **Select the bottom right template**, and a blank Drawing Page will open. **DRAWING/ SHEET SETUP**, under the **Format tab**- click specify format, select ANSI-A, under **Scale Tab**- 1 to 1scale, and under **Drawing Standard Tab**- select **ANSI- Inch**, click OK



7. Press Shift A to fill the screen. **DRAWING/ ADD MODELING VIEW**. Make sure **base workplane** is selected.



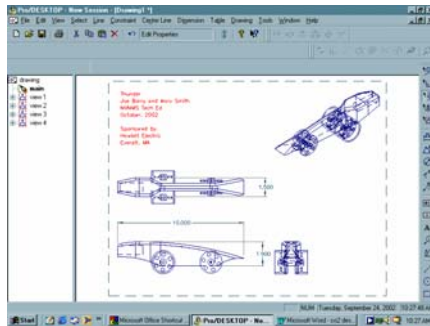
8. **DRAWING/ ADD MODELING VIEW** Do the same as above but add the frontal view. Drag to area above the base view.

9. **SAVE** as **lastname_template**

Printing your drawings:

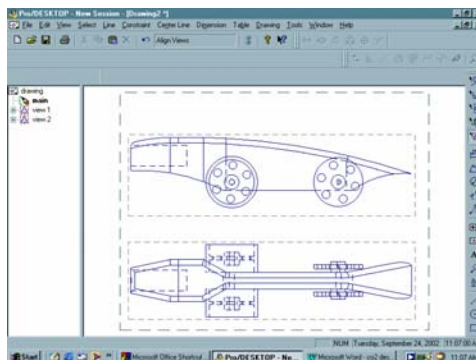
To print the Multi-view drawing:

1. Open your drawing on the screen. Make sure it is the Multi-view Drawing.
2. **FILE/ Print SETUP**. In the Orientation box, select **Landscape**.
3. **PRINT**, in the Scale box, select **Best Fit To Paper**. OK.



To print your Building Template:

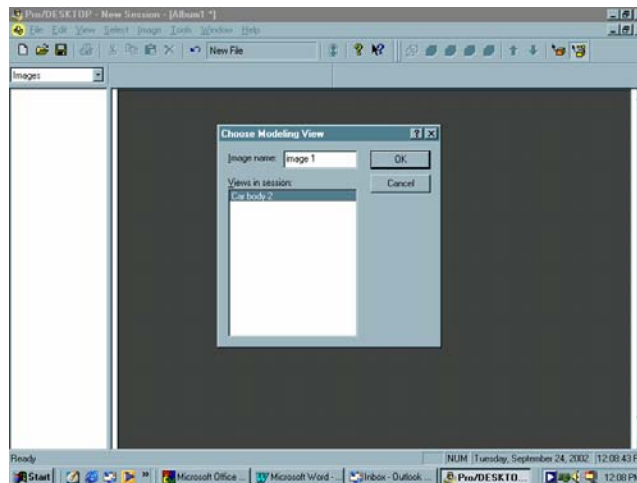
1. Open your drawing on the screen. Make sure it is the Building Template Drawing.
2. **FILE/ Print SETUP** , In the Orientation box, select **Landscape**.
3. **PRINT**, in the Scale box, select **Print true scale**. OK.



Album File .alb

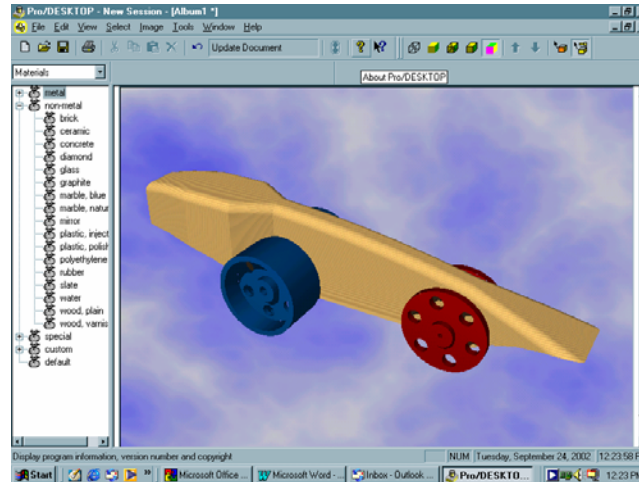
Album is used in marketing/advertising to show the object in real life colors and materials. You will create an album file of your design.

1. Open your car body assembly design (.des).
2. **FILE/ NEW**. Select **Album**. OK
2. **IMAGE/ NEW IMAGE**. Your car body should be in the list available. Select it. OK.



3. Manipulate the car to look the way you wish to show it off. Remember this is used for advertising.
4. **SELECT/ FACES**
5. **TOOLS/ MATERIALS BROWSER**. This gives you the “colors” or materials to change your design.
6. Simply select a material from the lists at the left. Drag the “sack” of material to the face you wish to “decorate”. Hit the update light (stop light), or the F5 key.
7. Continue to decorate.

8. **SAVE** as *YOURLASTNAME_ALBUM*.
9. To color (red, black etc, different from materials) different parts, like your wheels. **SELECT/ PARTS**. Select the part. Right Click. **Set Material Properties. Set Color**. Select the color. OK. Update.
10. **IMAGE/ IMAGE PROPERTIES** will allow you to change the background and lighting.



11. To print- make sure the **Print Setup** says *Landscape* orientation. **File/ Print**.
OK