



# **EN1740 Computer Aided Visualization and Design**

Spring 2012

3/22/2012

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***Last Time:***

- Additional Top-Down Design

***Tonight:***

- Finish Top-Down Design
- Renderings
- Form Project Groups



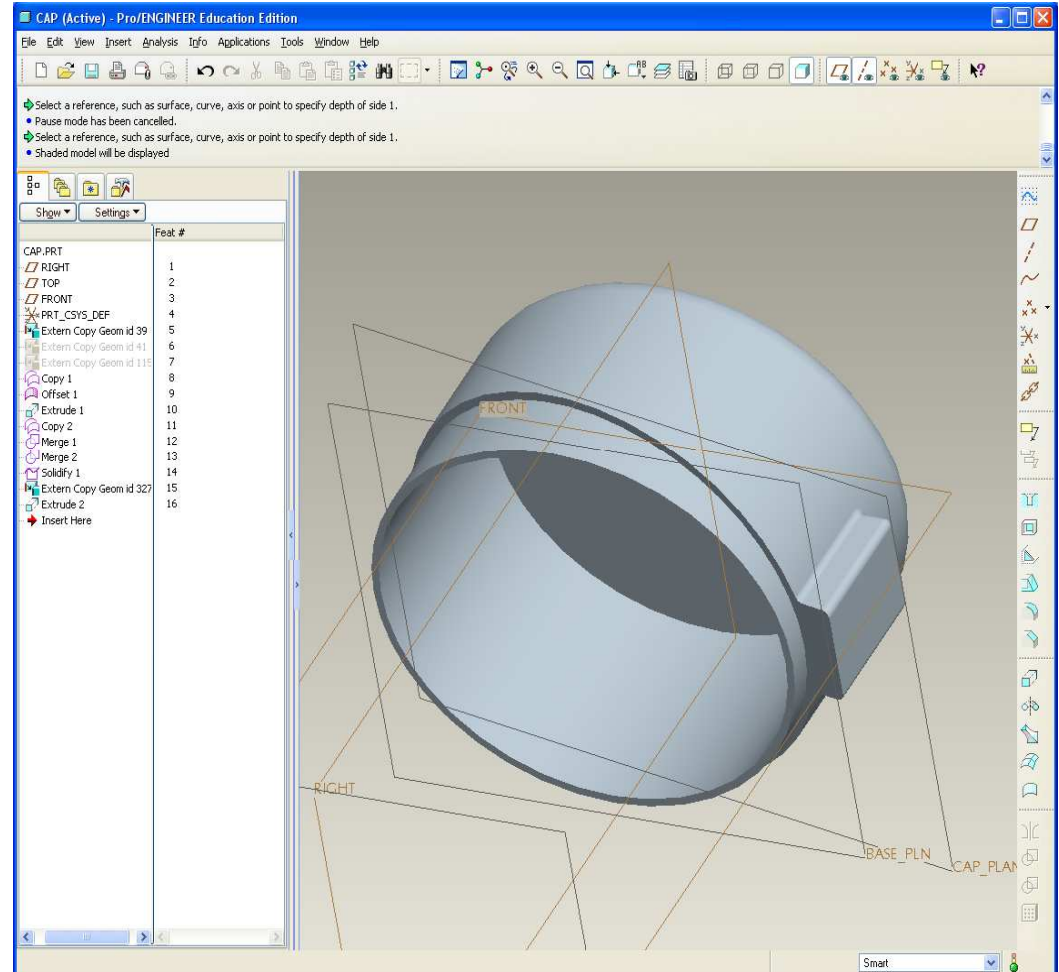
## AutoCAD Next Up?

- We're going to tackle an introduction to AutoCAD in the next few lectures
- Please go to Autodesk's educational community site and register
  - [www.Autodesk.com/edcommunity](http://www.Autodesk.com/edcommunity)
- Once registered you'll be able to download AutoCAD 2012
  - Please do so in anticipation of the lectures to come



## EXERCISE – Top-Down Design Tools

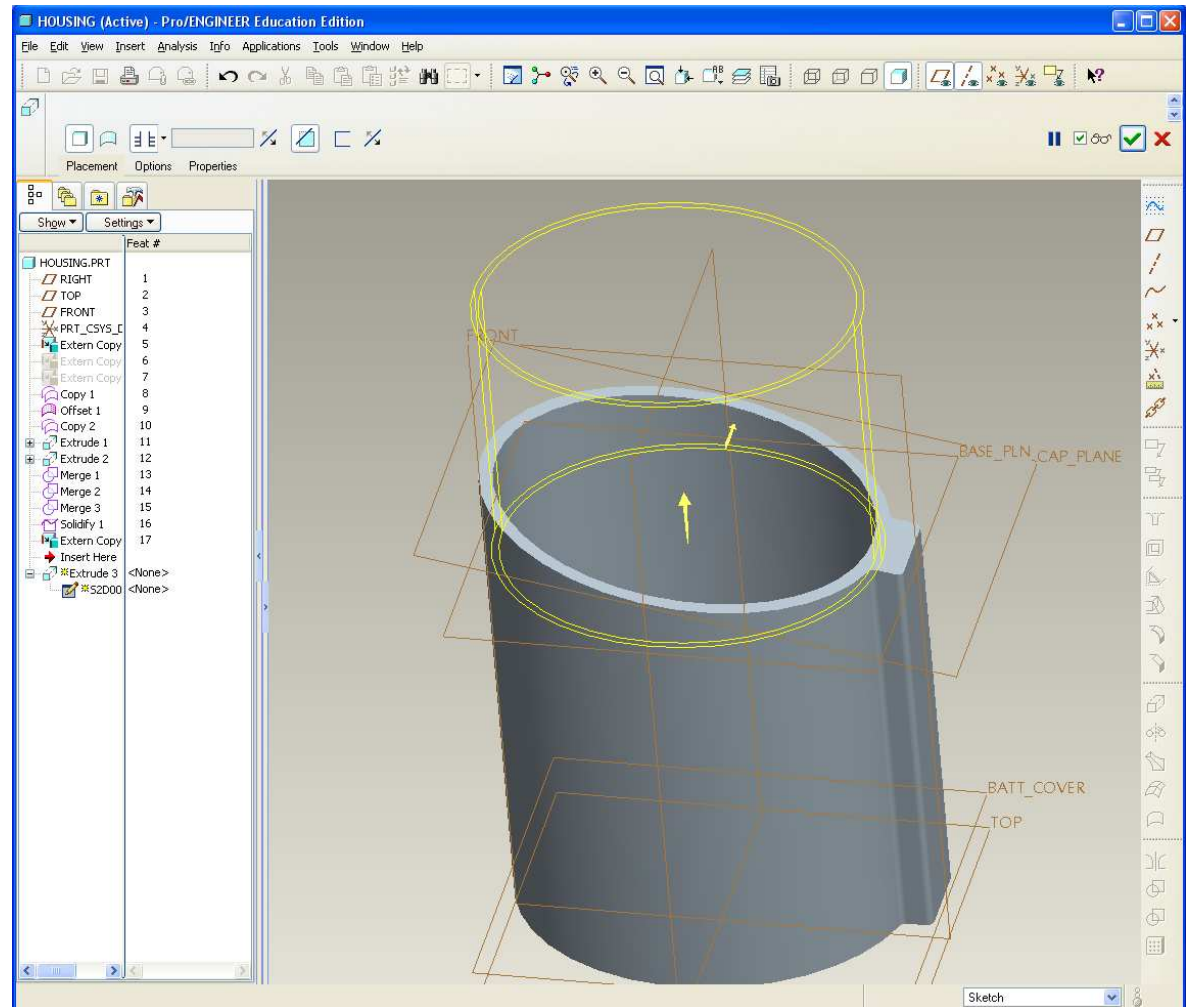
- Extrude a solid feature from the BASE\_PLN to the bottom of the part
- Sketch on the BASE\_PLN
- The USE EDGE tool will give the inside curve
- OFFSET EDGE (.060) for outside edge of feature
- Select 'Extrude to Selected...' and select the CAP\_PLANE surface





## EXERCISE – Top-Down Design Tools

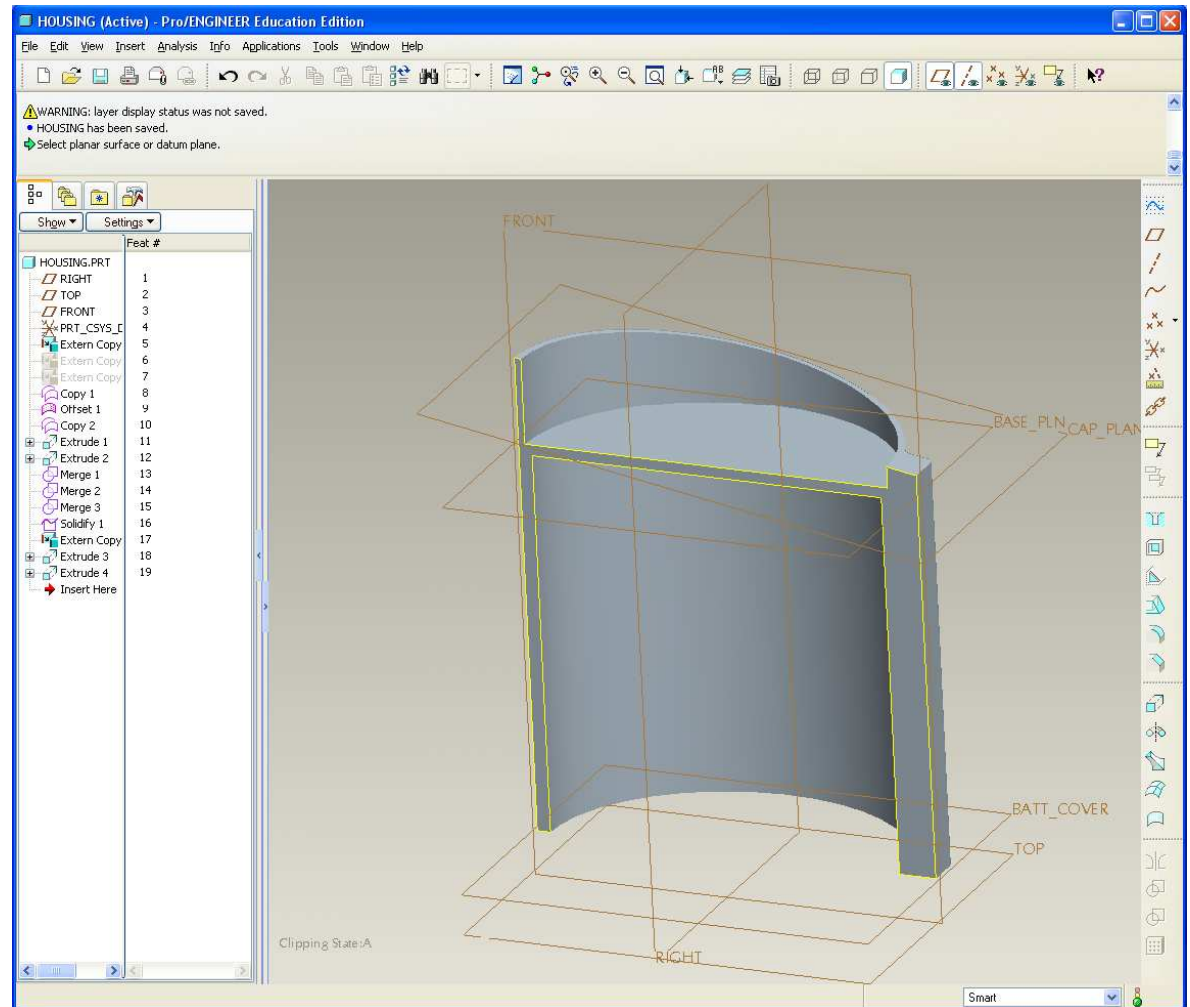
- Basically repeat steps down for CAP
  - Copy BASE\_PLN
  - Extrude solid feature from it
- This time:
  - Cut from the solid
  - Offset .065





## EXERCISE – Top-Down Design Tools

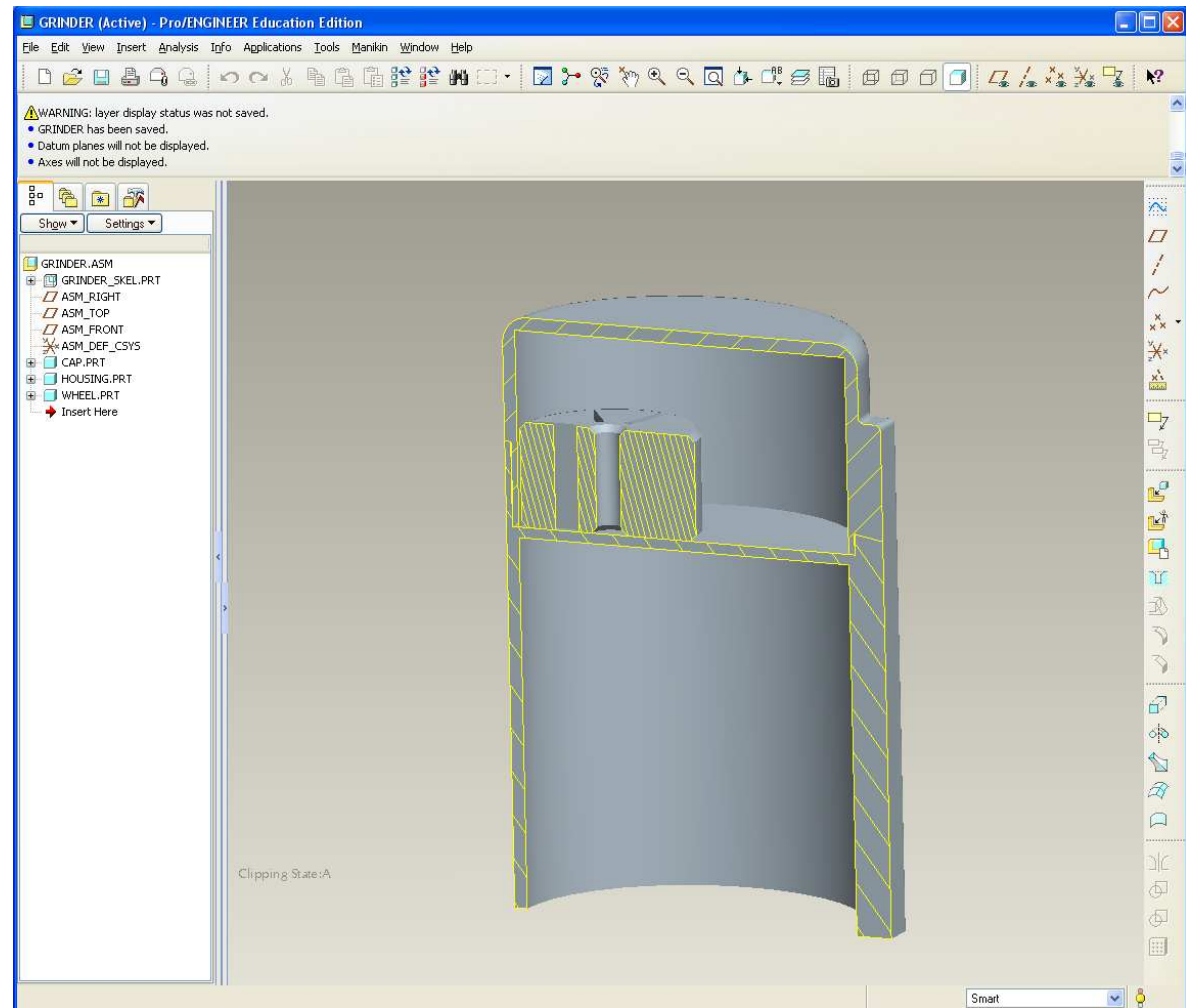
- Extrude a partition between where the coffee will be ground and where the electronics will live
- Web thickness is .100in





## EXERCISE – Top-Down Design Tools

- Back to the assembly, insert the WHEEL component
- ***How much coffee can we fit in the space allotted for grinding?***

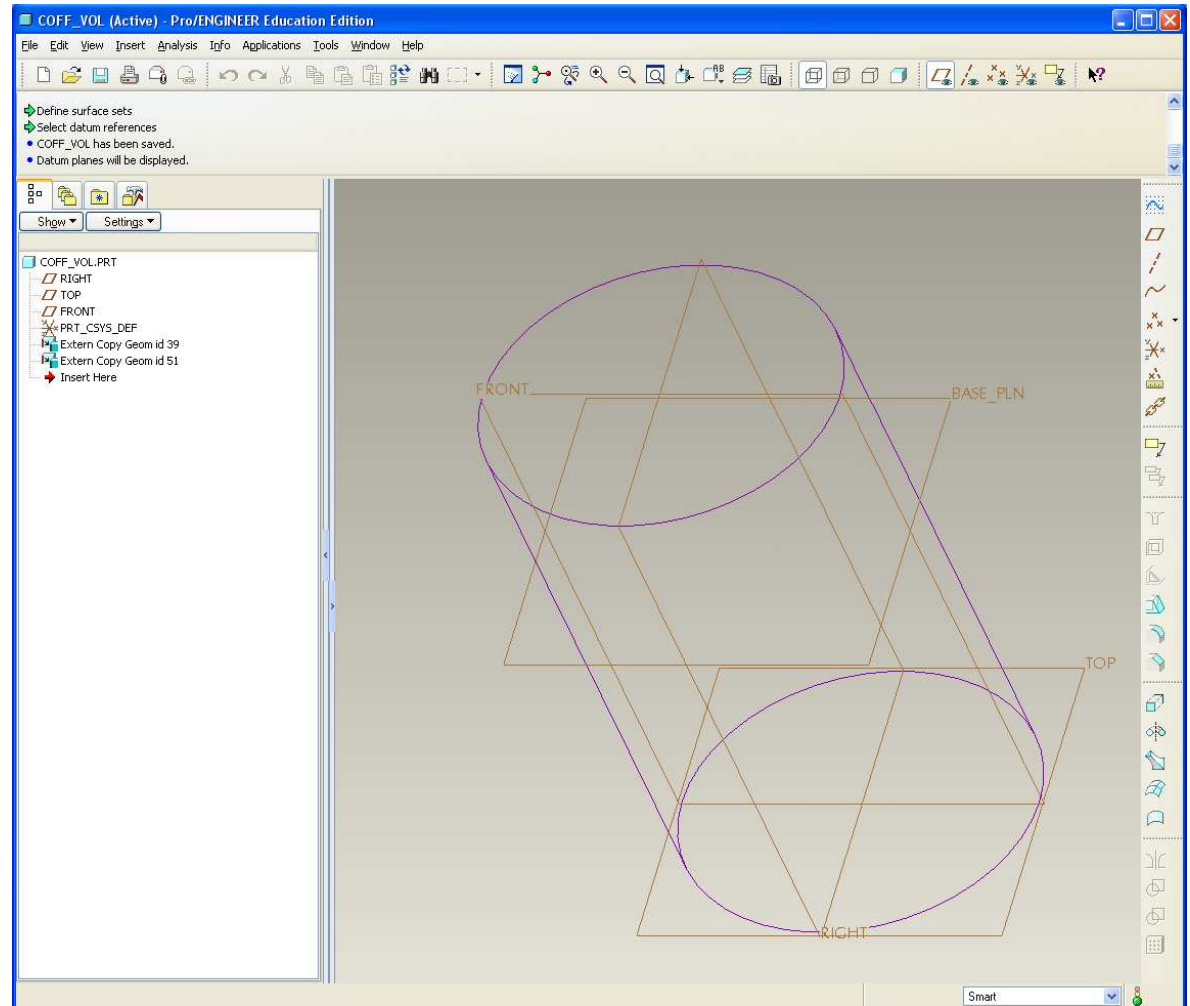




## EXERCISE – Top-Down Design Tools

**Create a new model to measure the coffee volume**

- File > New > coff\_vol.prt
- Copy outer surface from ID model
- Copy BASE\_PLN from skeleton



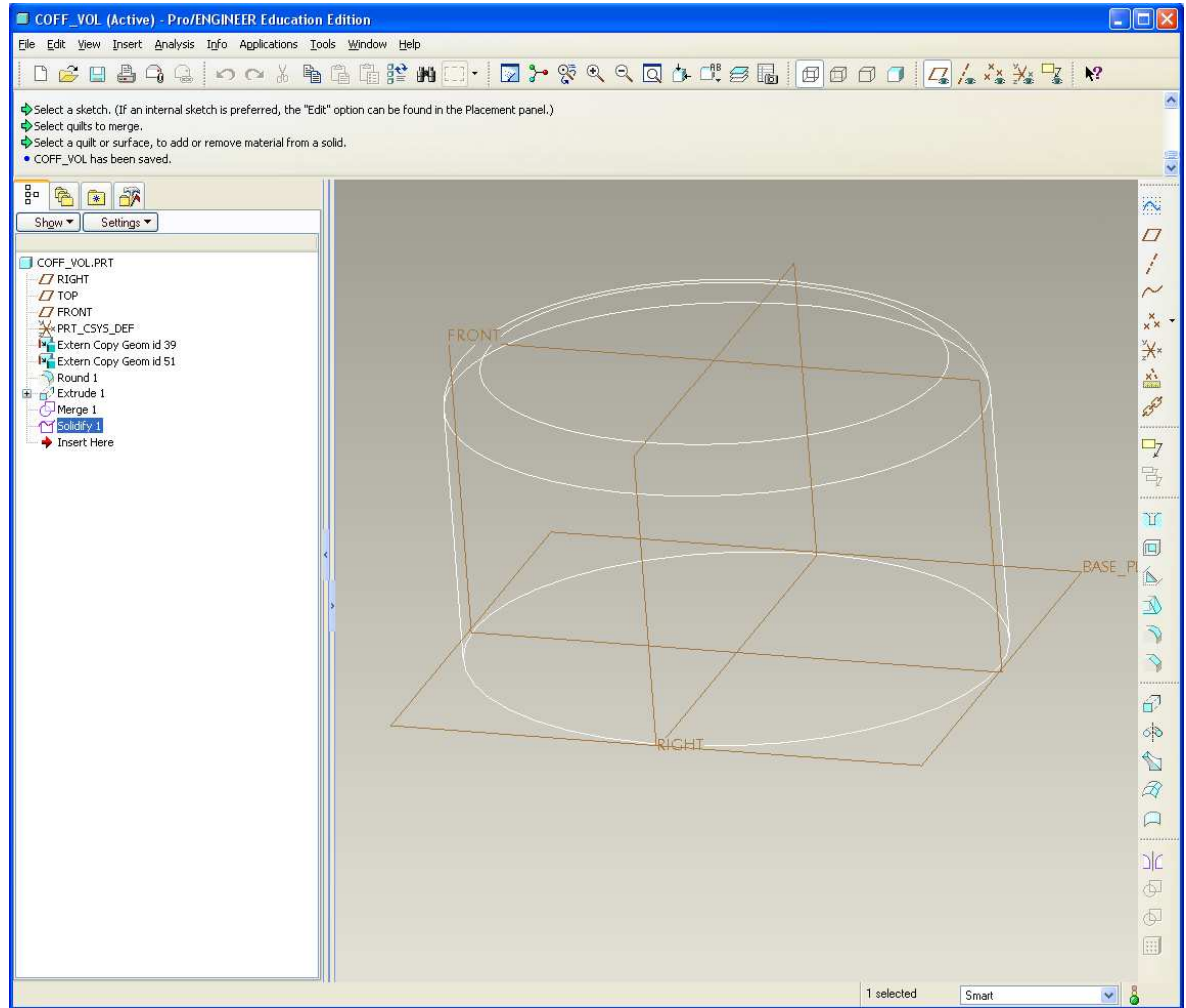




## EXERCISE – Top-Down Design Tools

***Create a new model to measure the coffee volume***

- Solidify
- Add R.250 round to top
- Trim solid at BASE\_PLN

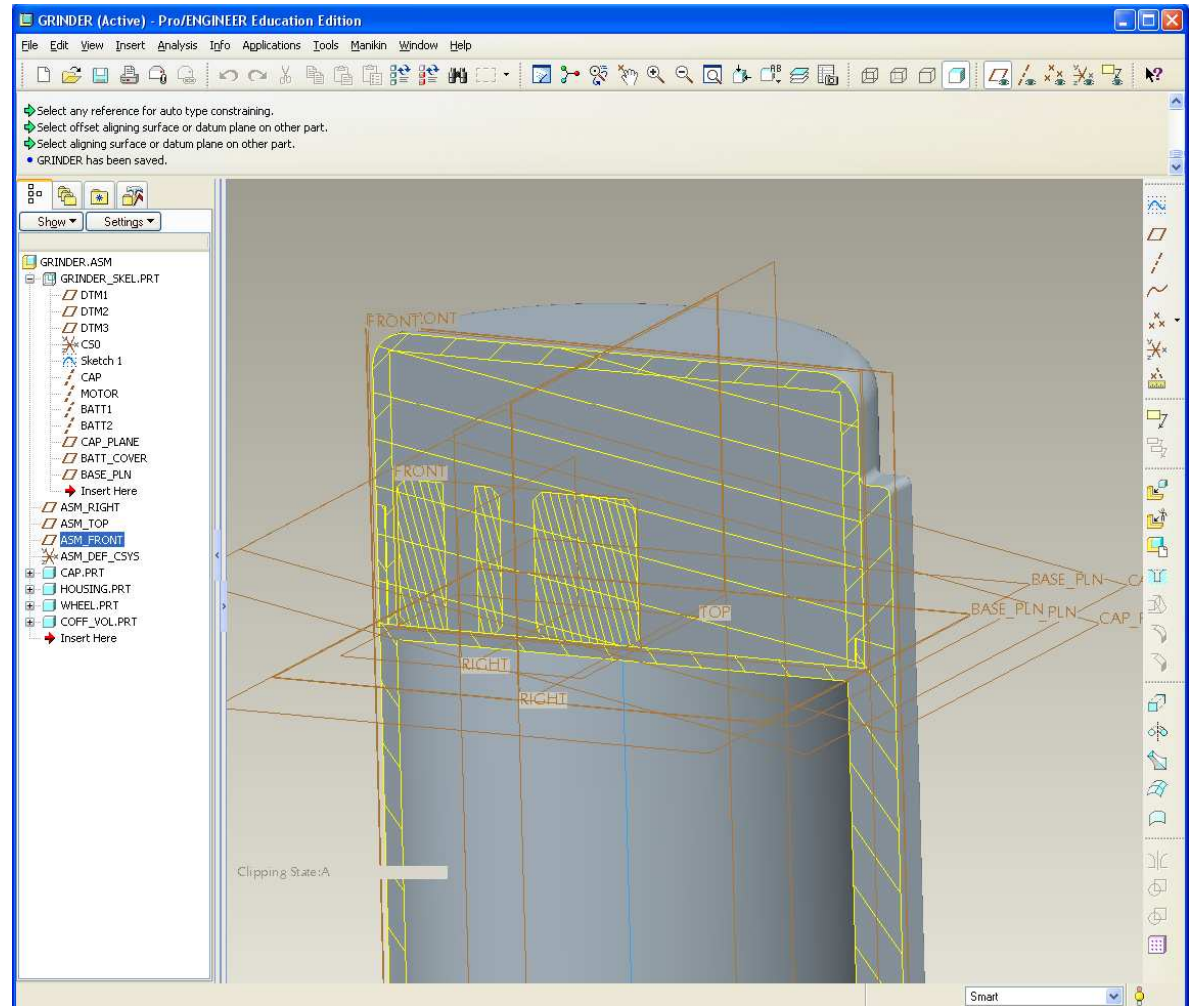




## EXERCISE – Top-Down Design Tools

**Create a new model to measure the coffee volume**

- Assemble coffee volume part into top level assembly

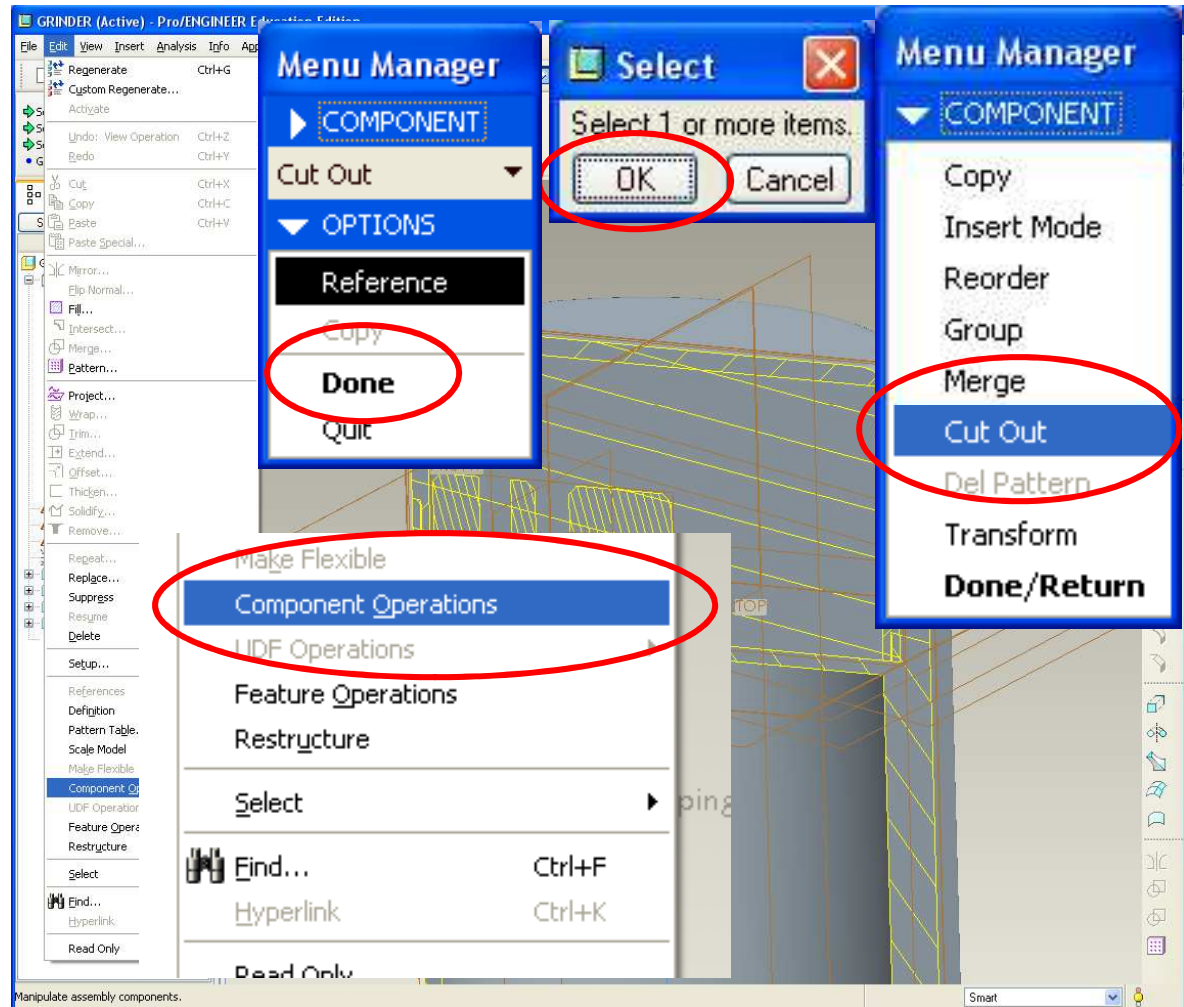




## EXERCISE – Top-Down Design Tools

### *Use Component Operations to determine volume*

- Edit > Component Operations
- Cut Out
- Select volume model > OK
- Select cap part > OK
- Done
- Done/Return
- ***Repeat with Housing and Wheel***

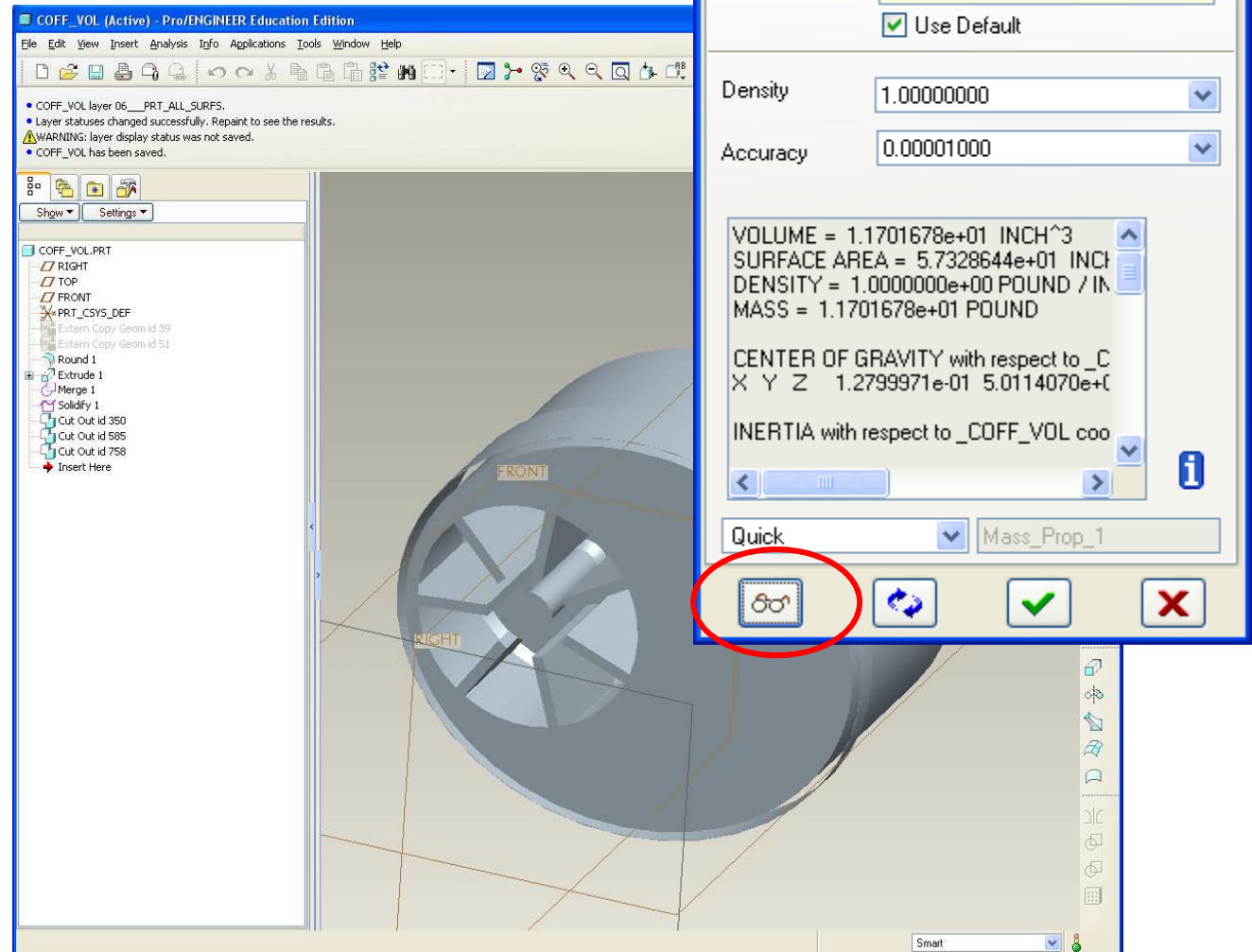




## EXERCISE – Top-Down Design Tools

### *Use Component Operations to determine volume*

- Go back to volume model
- Analysis > Model > Mass Properties
- Click the goggles





## *EXERCISE* – Top-Down Design Tools

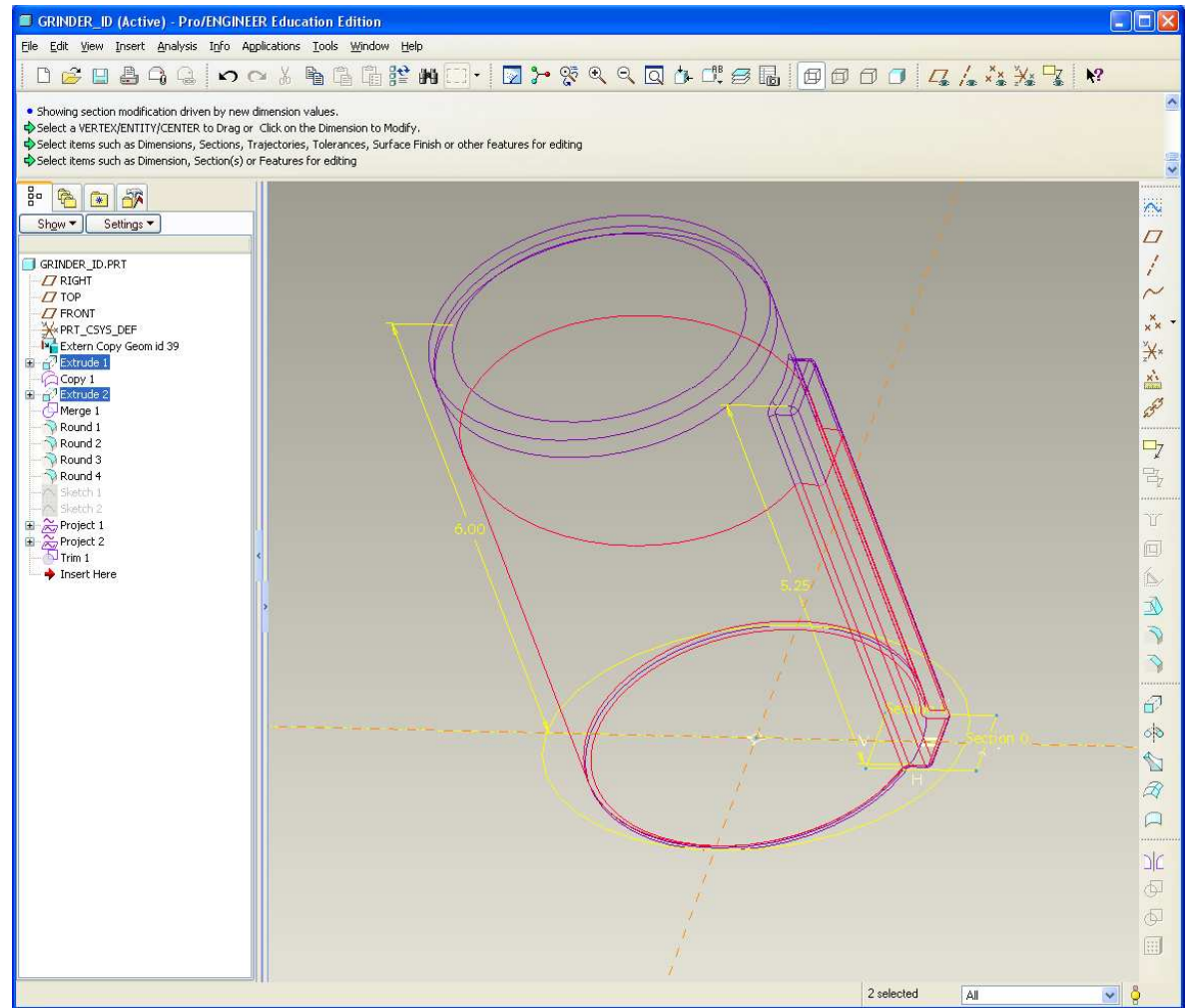
***Fast forward.....built the model and customer feedback is in***

- As a result of focus group study we have to change the model:
  - Ellipse cross section isn't “*ellipsey*” enough
  - Not enough volume of coffee in grinder
  - Straight curve interface has been done, need a new look
- ***Back to ID model***



## EXERCISE – Top-Down Design Tools

- Edit ellipse on base feature
  - Modify Rx to 2.25
- Modify spine feature
  - Should extend 2.47 from RIGHT
- Regen

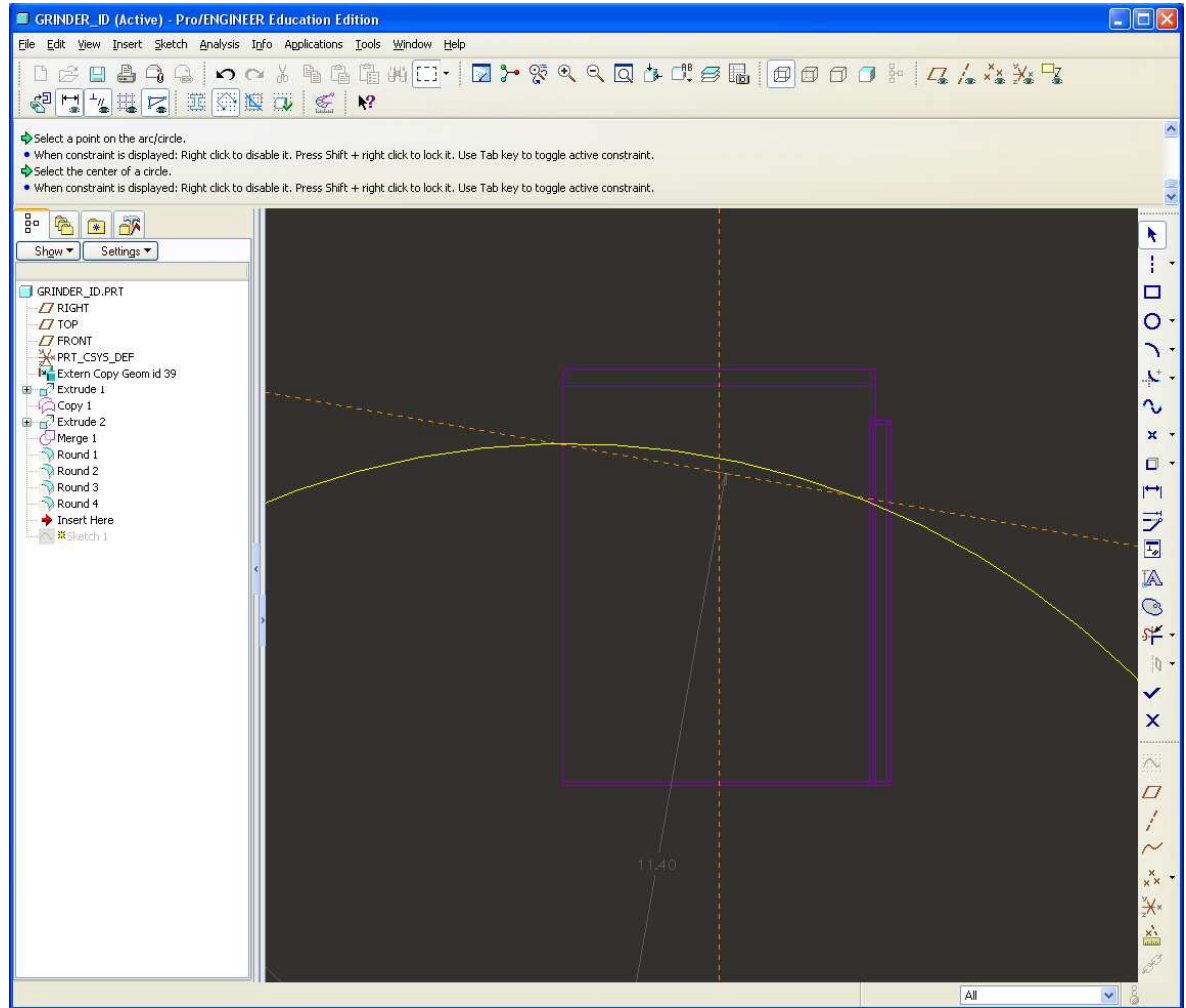






## EXERCISE – Top-Down Design Tools

- Replace straight sketch with circular section
- 16.00 dia; center 3.00 down and 1.25 to the left

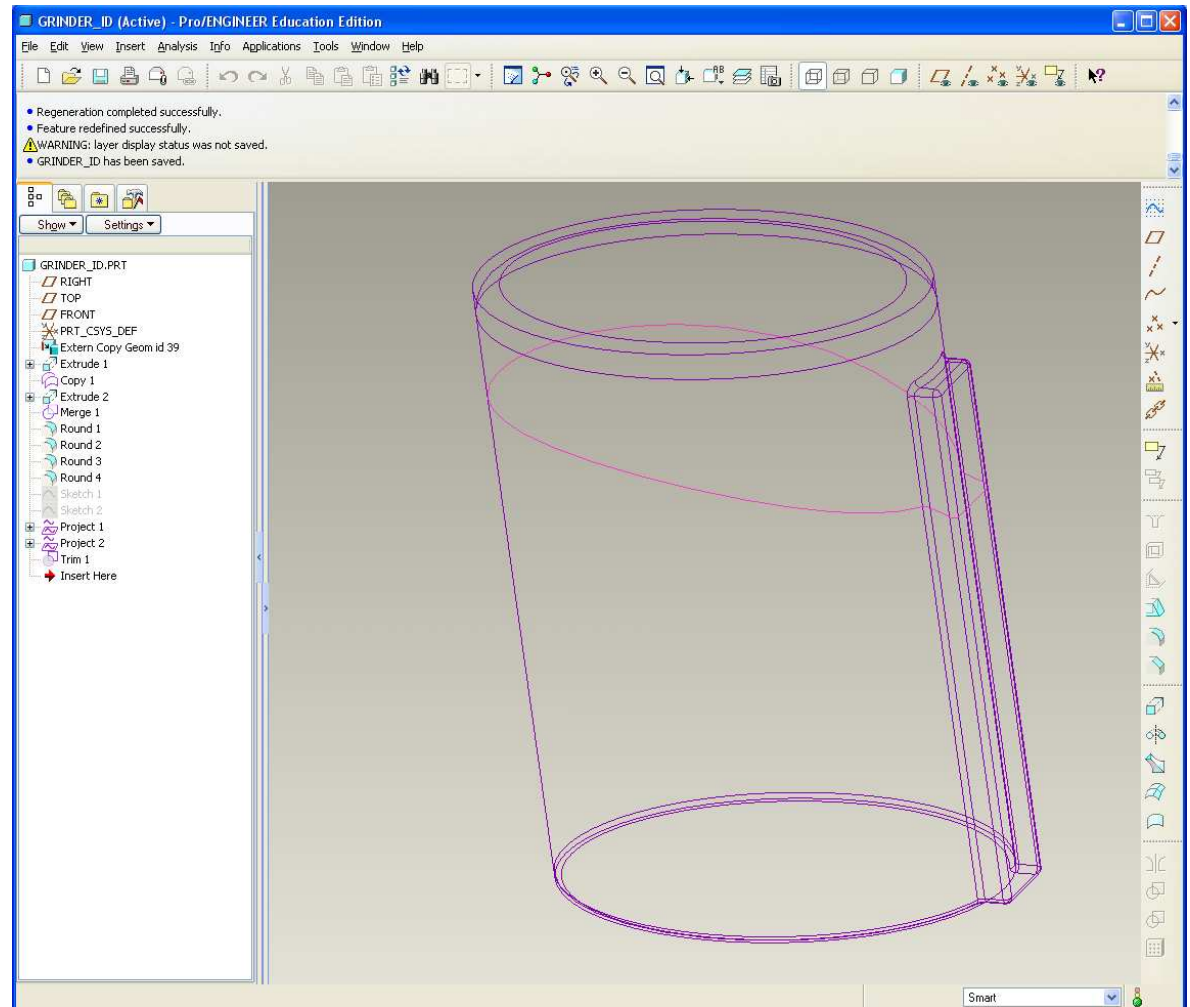




## EXERCISE – Top-Down Design Tools

*ID model is updated*

- Move on to the parts



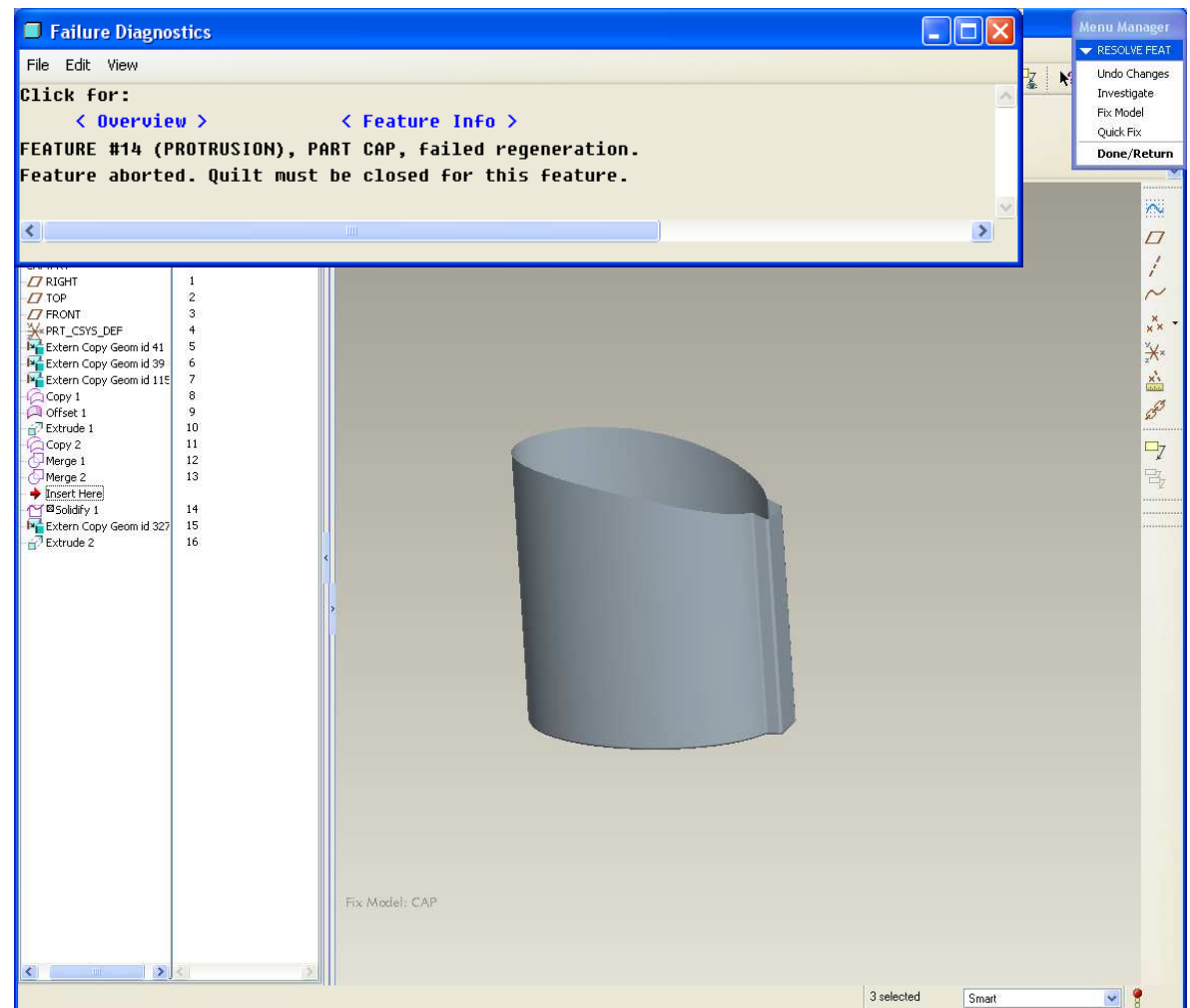




## EXERCISE – Top-Down Design Tools

### *Part update*

- Regenerate the Cap
  - Failure mode
- Clip suppress

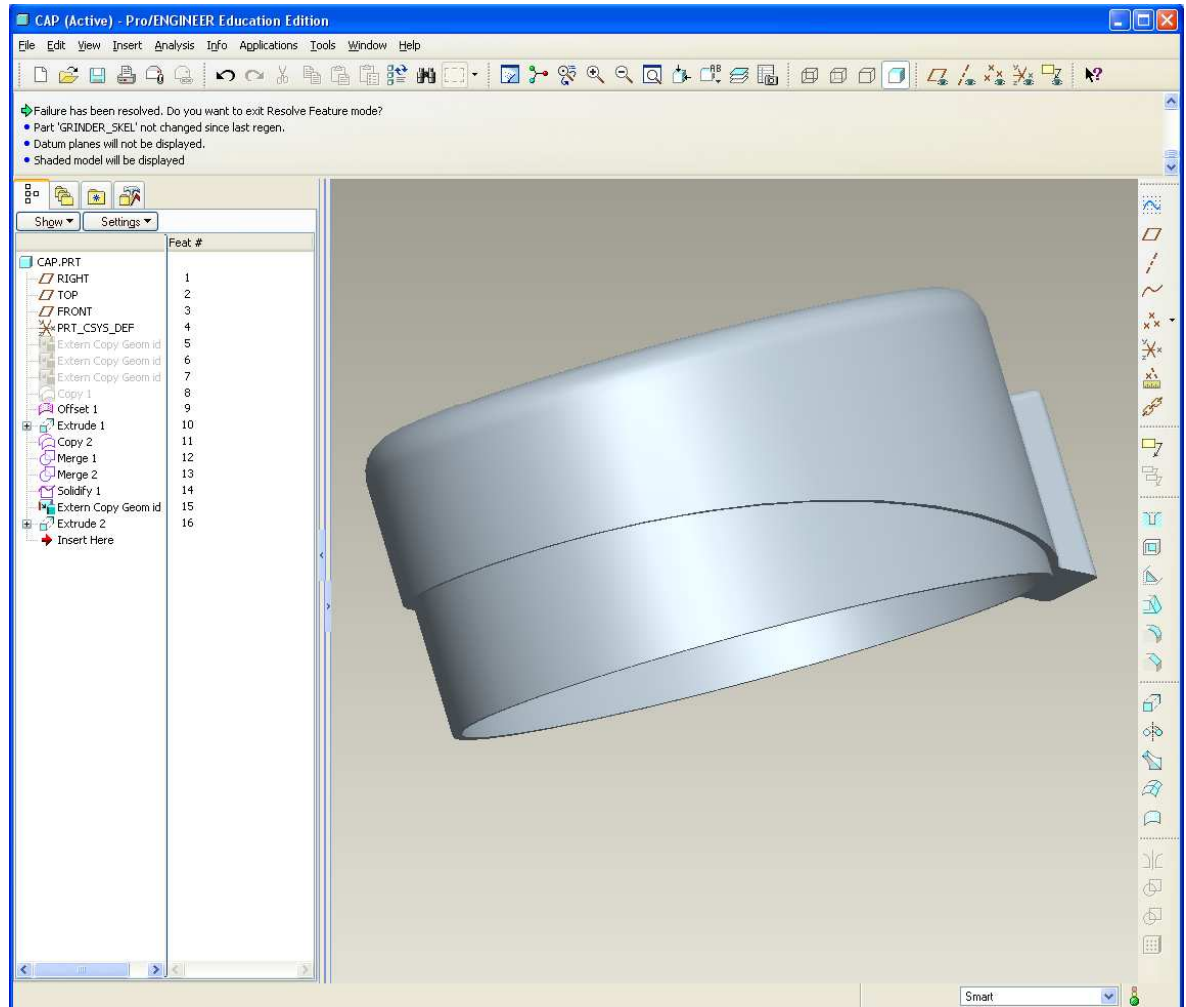




## EXERCISE – Top-Down Design Tools

### *Part update*

- Go into ID model and copy redefined curve
- Need to update some references
  - It's faster to go through Failure Mode than start over!!
- Here we are

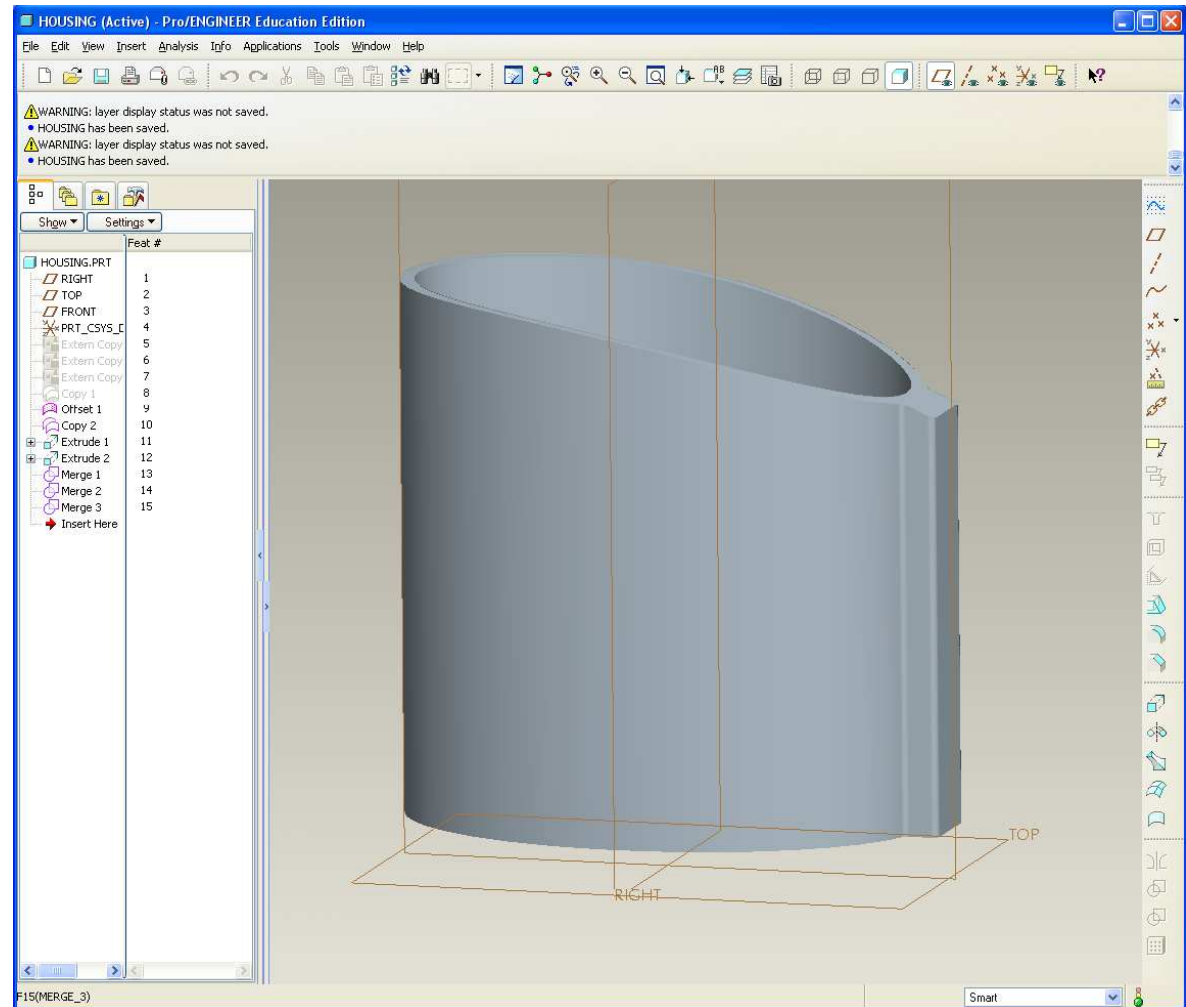




## EXERCISE – Top-Down Design Tools

### *Part update*

- Same steps with the Housing

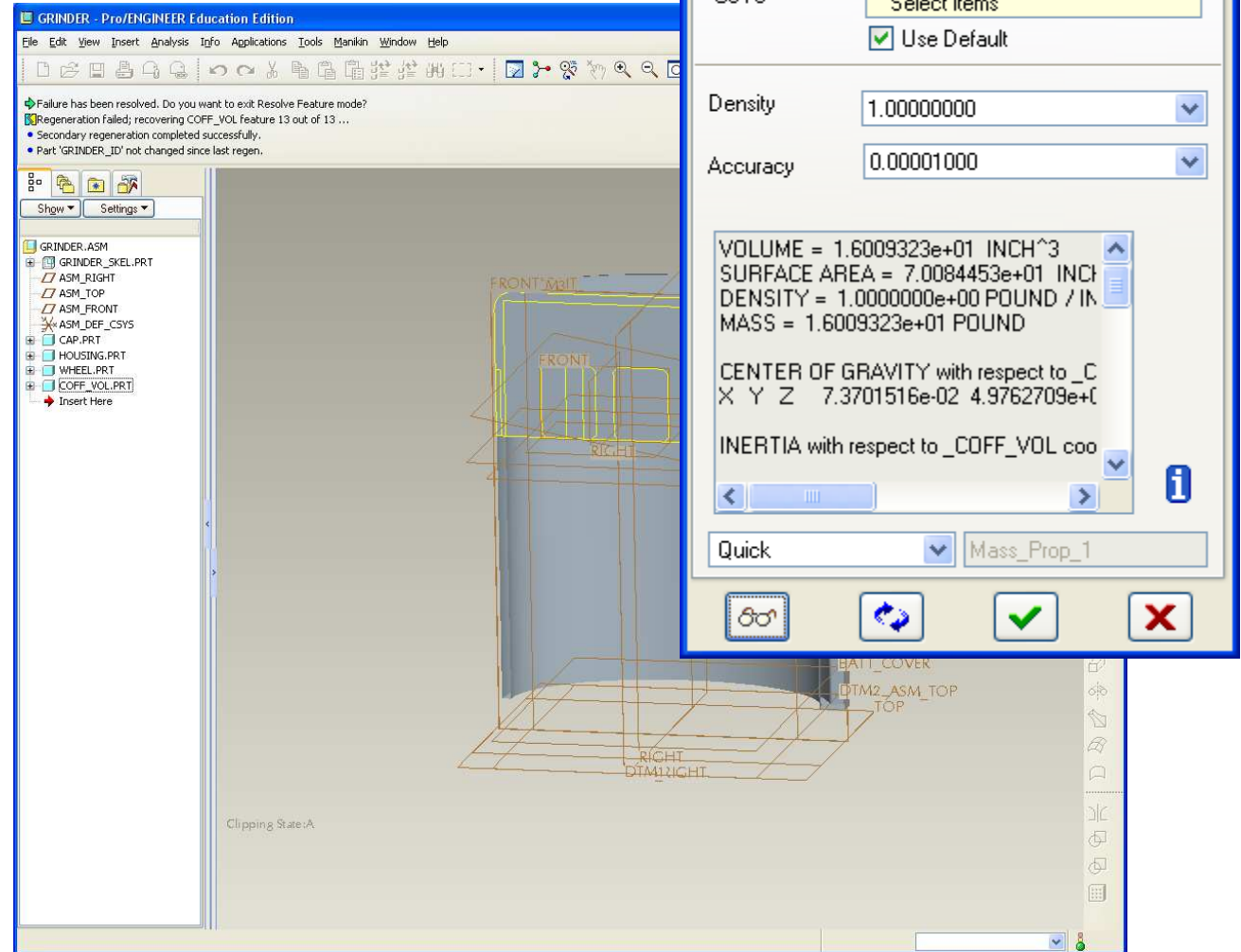




## EXERCISE – Top-Down Design Tools

### Assembly update

- May need to redefine a few things here and there, but the volume number comes back out.





## *EXERCISE* – Top-Down Design Tools

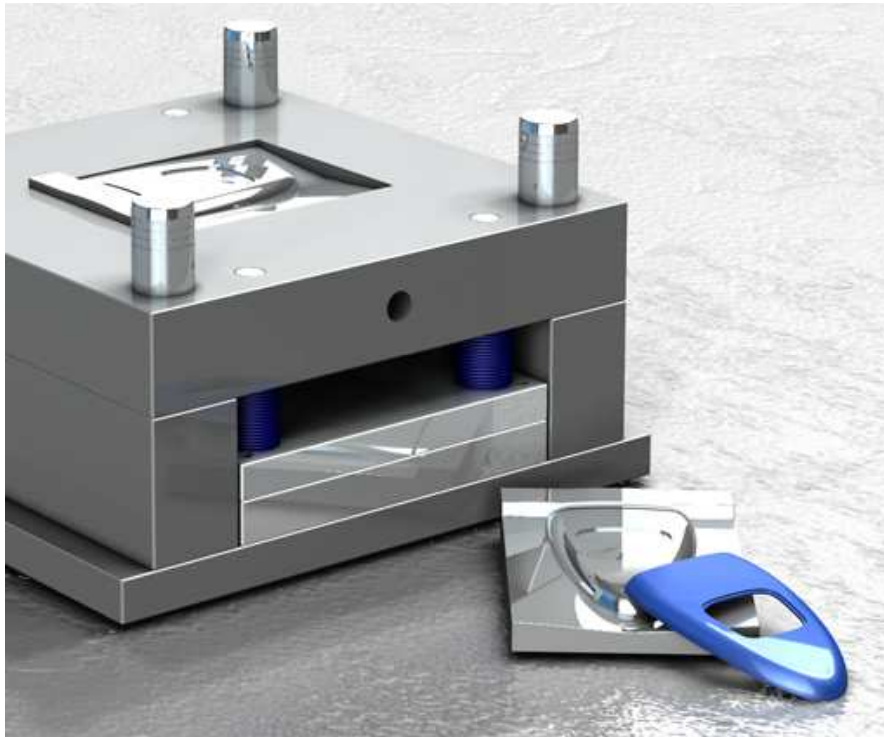
### ***Summary – Where did we use Top-Down tools***

- Skeletons
  - Provide a layout for entire product and position of primary systems
- Shared Geometry
  - Allows for single-source, product-level geometry specification
- Component Operations
  - Use product components to garner other information



## Rendering

*Photo Quality Images of CAD models*



<http://www.ptc.com/product/creo/advanced-rendering-extension>

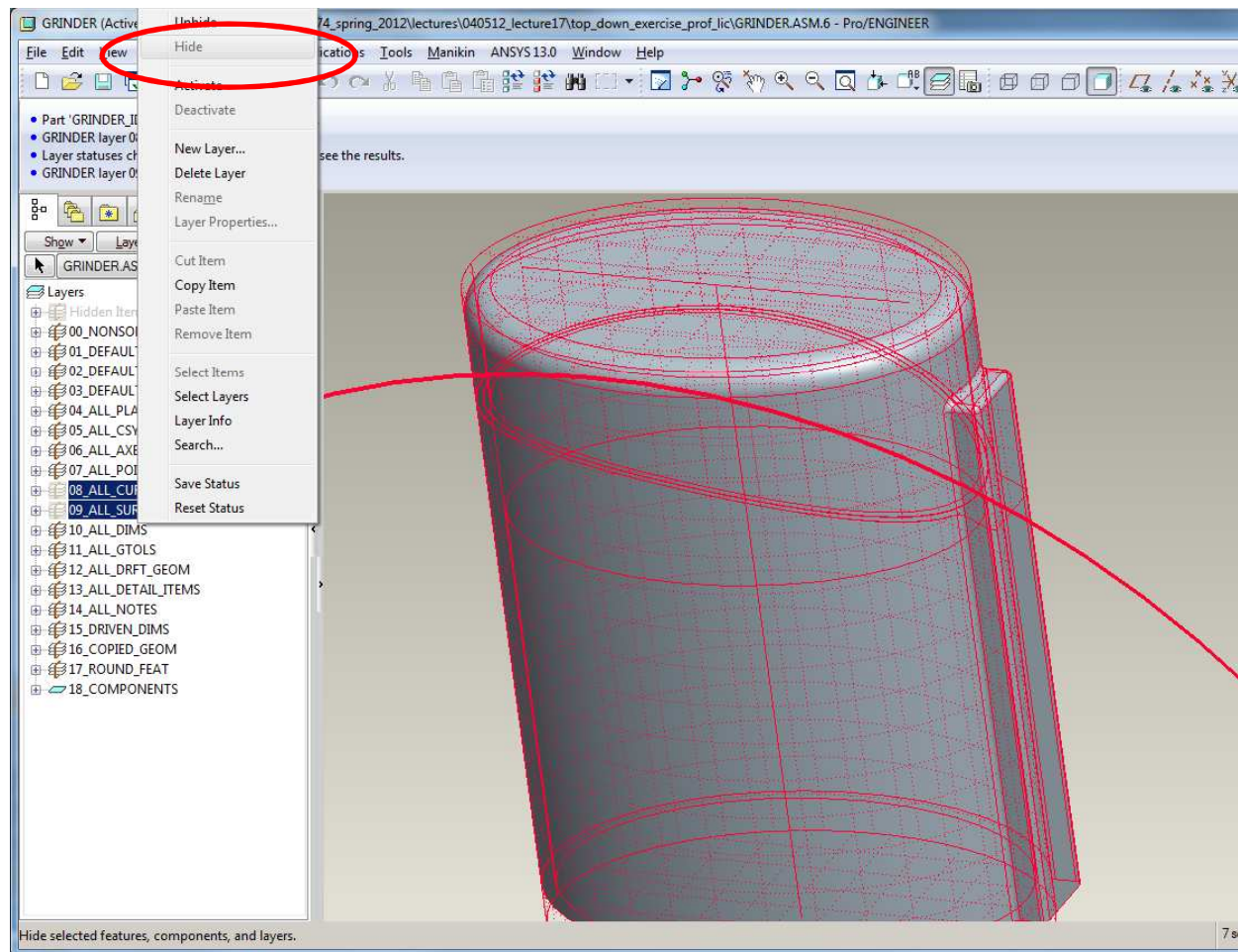




## EXERCISE – Rendering

### *Blank Surface and Curve Layers*

- Click Show above model tree and select 'Layer Tree'
- Highlight the 'All Curves' and 'All Surfaces' Layers
- RMB > Hide
- RMB > Save Status

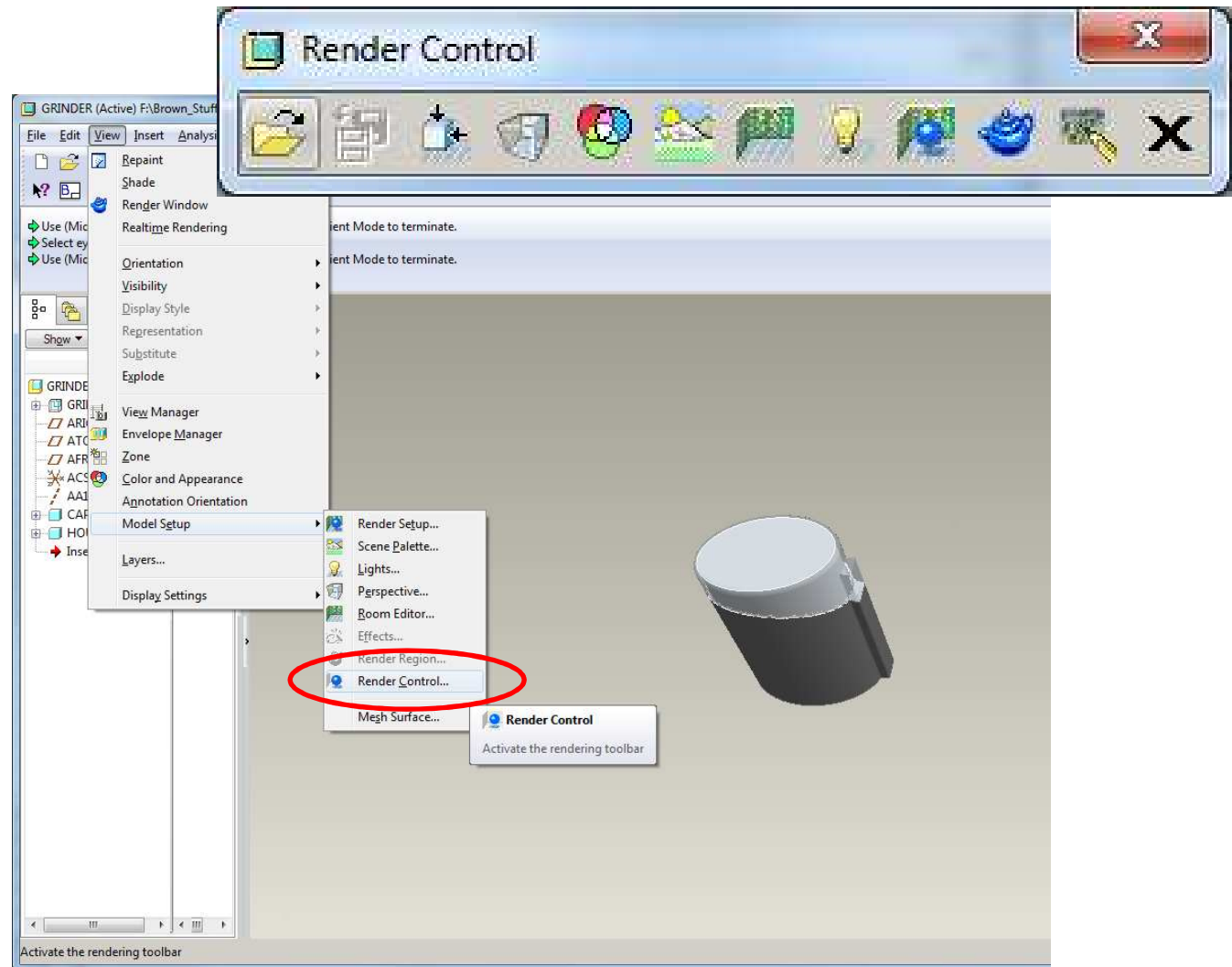




## EXERCISE – Rendering

### Render Controls

- One-stop shop for all things related to rendering
- View > Model Setup > Render Control



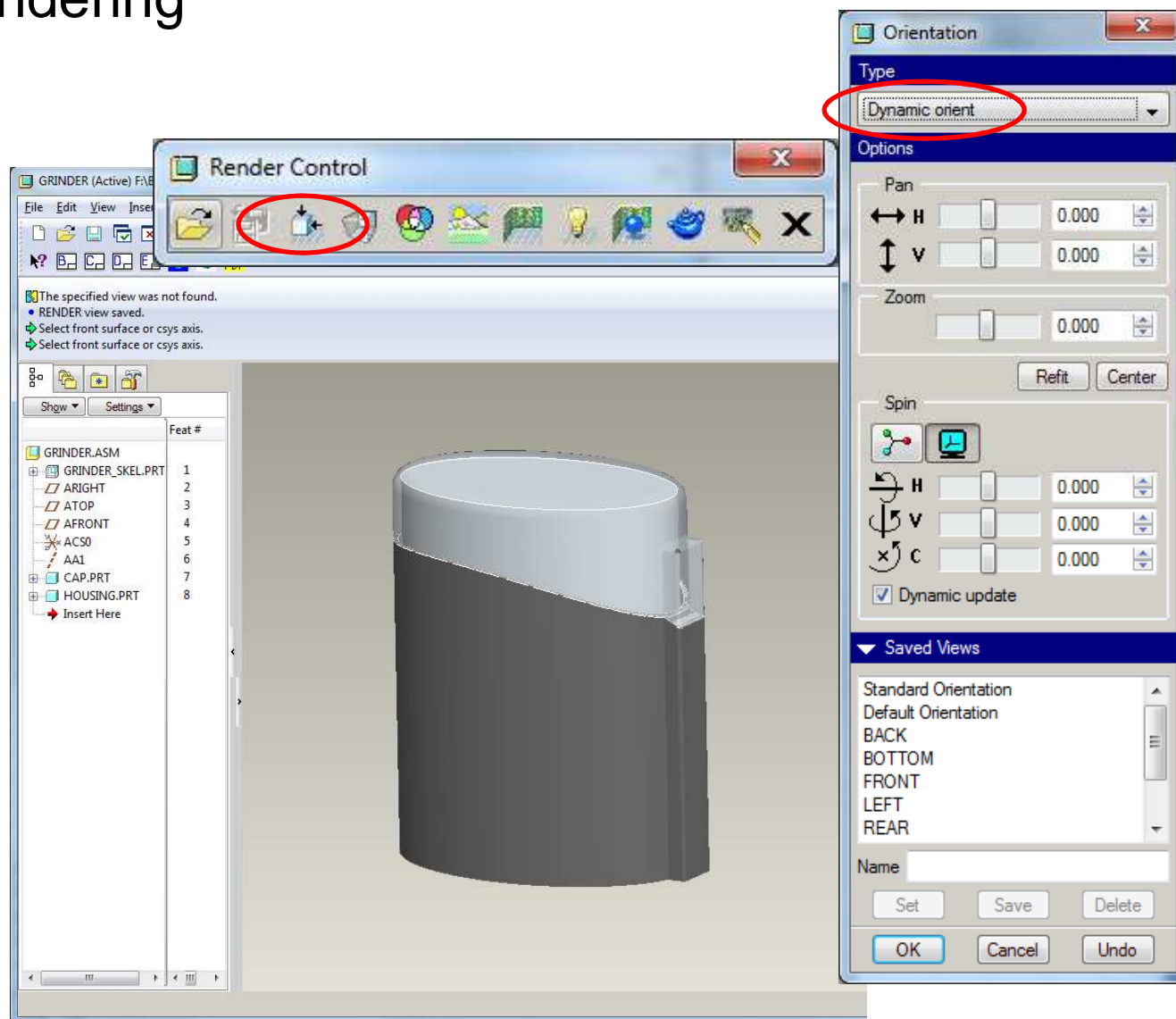




## EXERCISE – Rendering

### Orientation

- Save an orientation so the model can be put back in the same place for updates
- Use Dynamic Orientation
- Remember to Save with a name you'll remember

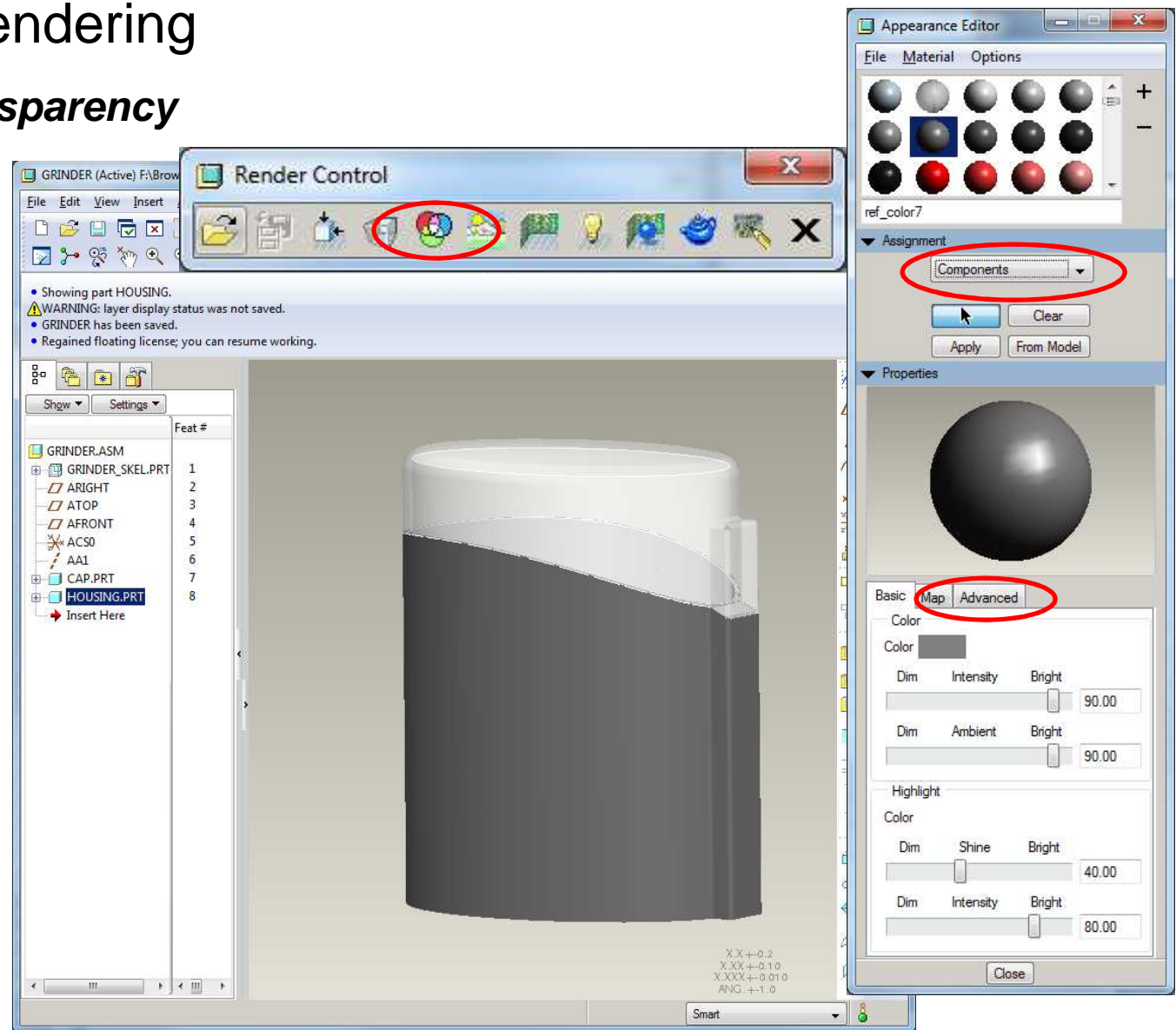




## EXERCISE – Rendering

### *Set Colors and Transparency*

- View > Color and Appearance (or from tool bar)
- From the drop down, select Components
- Select Component
- Select Component and click Apply
- See Advanced tab for transparency

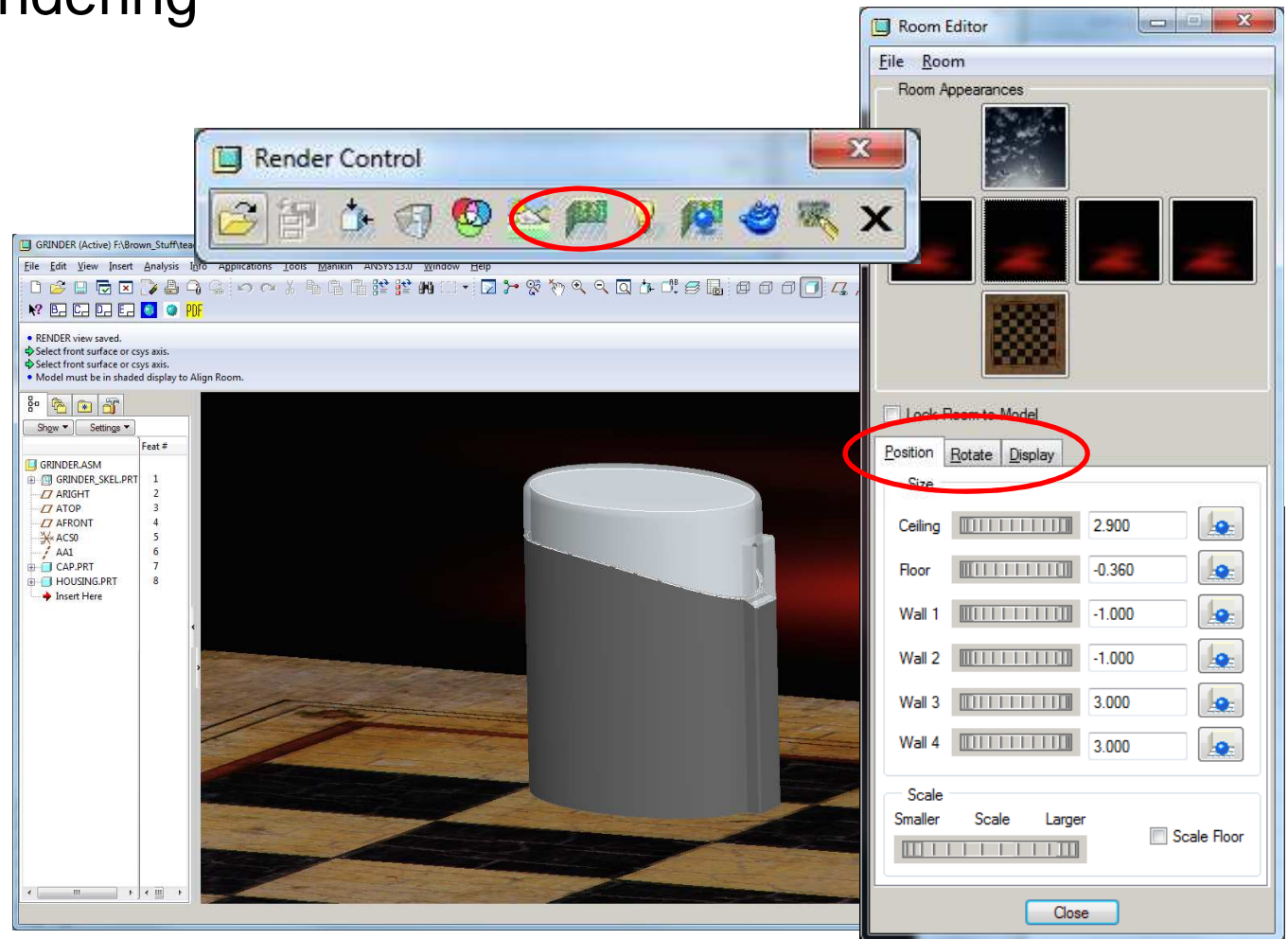




## EXERCISE – Rendering

### Room Editor

- Set the stage – create a scene for the model
- Using the Position, Rotate and Display tabs orient the model to the space





## EXERCISE – Rendering

### Room Editor

- Uncheck everything but the Floor and Wall 2
- Apply textures and render

