

---

This document is published under the Creative Commons License:



Attribution 4.0 International (CC BY)

If you have any questions, please contact us via twitter at @bobbyli22

Please post any feedback to @ResPlat on twitter!



AUTODESK®  
INVENTOR® 2016



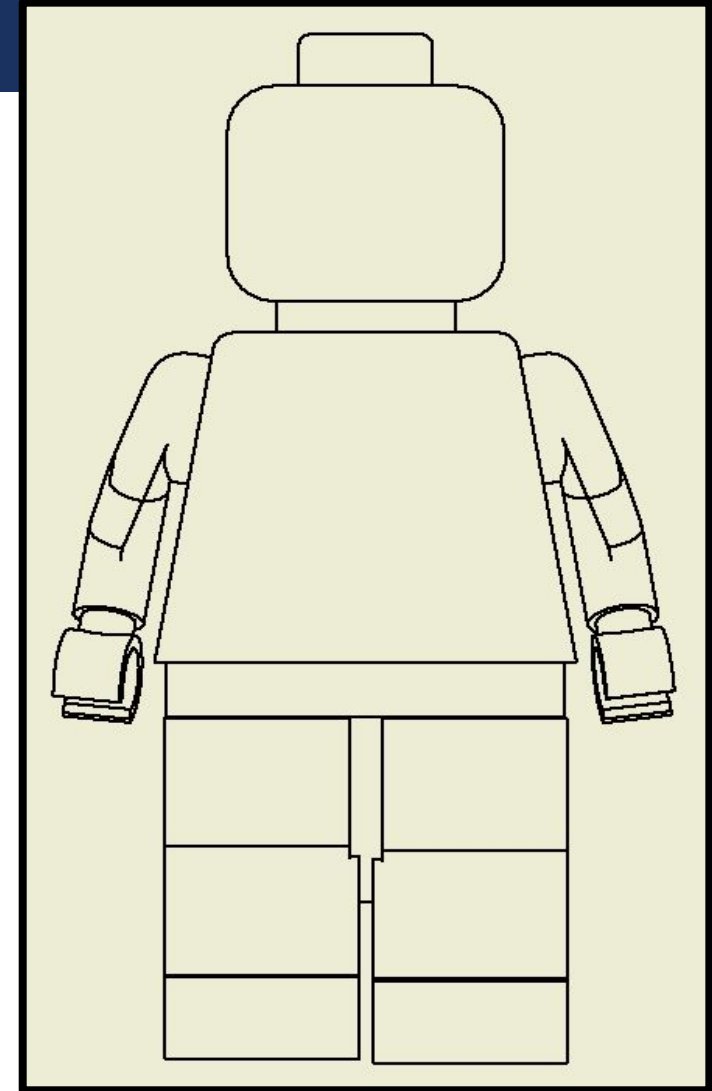
AUTODESK®

# INTRODUCTION TO DRAWINGS WITH AUTODESK INVENTOR

## DESIGNED FOR RESEARCHERS

# ENGINEERING DRAWINGS

- A drawing of your design can communicate important information about it, including: manufacturing, purchasing, customer service, etc.
- The drawings module documents components that have been made in the **parts** or **assemblies** modules as 2D drawings or images.





# READING ENGINEERING DRAWINGS

## LESSON 9

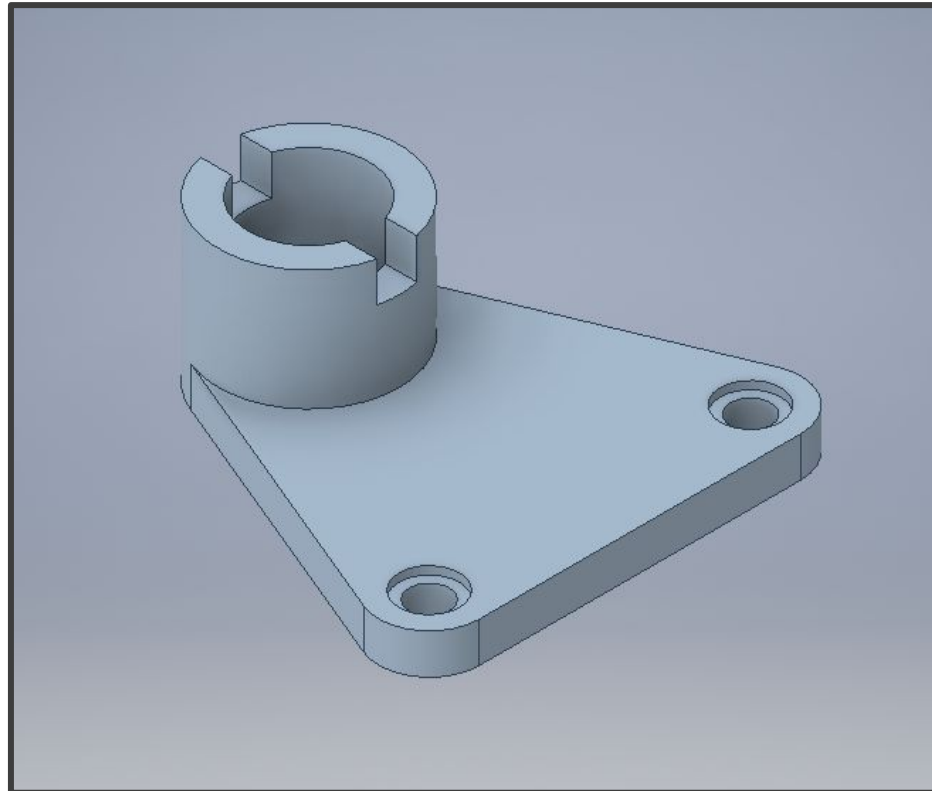


# MOTIVATION

- We will first begin with interpreting a couple of simple engineering drawings.
- You will attempt to model two engineering components, exactly as they have been specified to such that you will have one unique solution to each.
- Save your .ipt files for each component, you will need to use them later.
- We might complete these examples on the board whilst you work, but do not feel obliged to follow along. You can watch as a reference only.

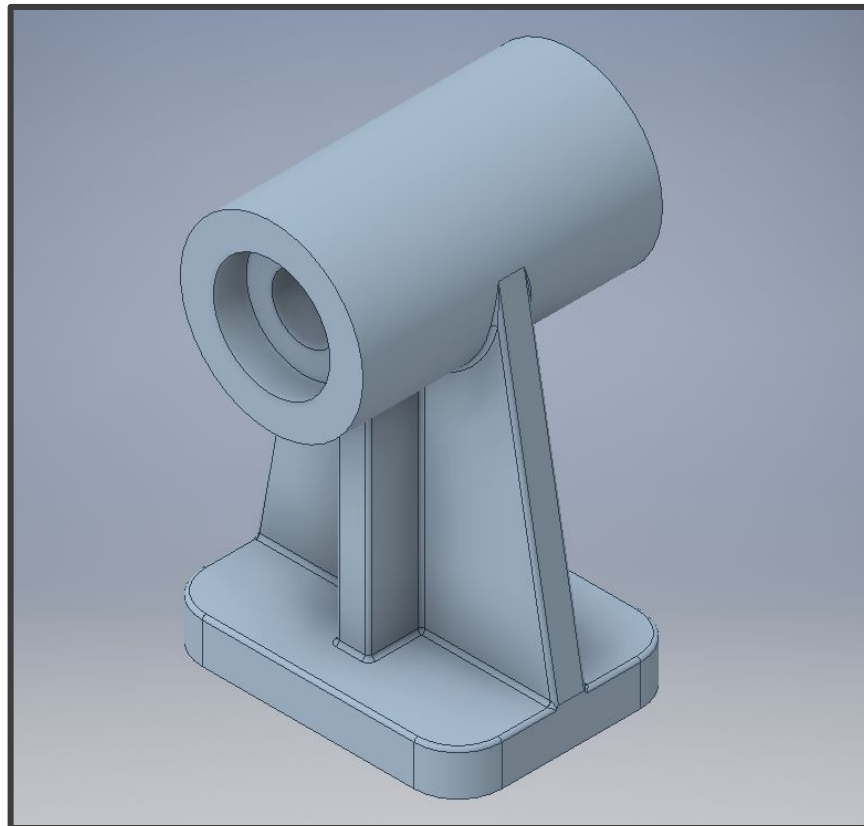
# WORKSHOP CHALLENGE 1

- Create the component based on the engineering drawing provided.
- Open **Workshop\_1** file, *found in “07\_Drawing” folder of the downloaded materials.*



# WORKSHOP CHALLENGE 2

- Create the component based on the engineering drawing provided.
- Open **Workshop\_2** file, found in “07\_Drawing” folder of the downloaded materials.



# CONCLUSION

- Something to think about:
  - *Did you manage to follow the drawing to produce one unique solution?*
  - *Were there any dimensions what were left undefined, or you had trouble defining?*
- These engineering drawings were relatively **clean**, they managed to define all or many of the **critical dimensions needed** to produce the component with only a small number of dimensions.
- In your own engineering drawings where you give to other people to read, these documents should be kept **minimal** but still indicate all of the required **detail**.
- You will need to be able to find a **balance** between the two criterion, so you may need to think about what information you want to include in these documents.





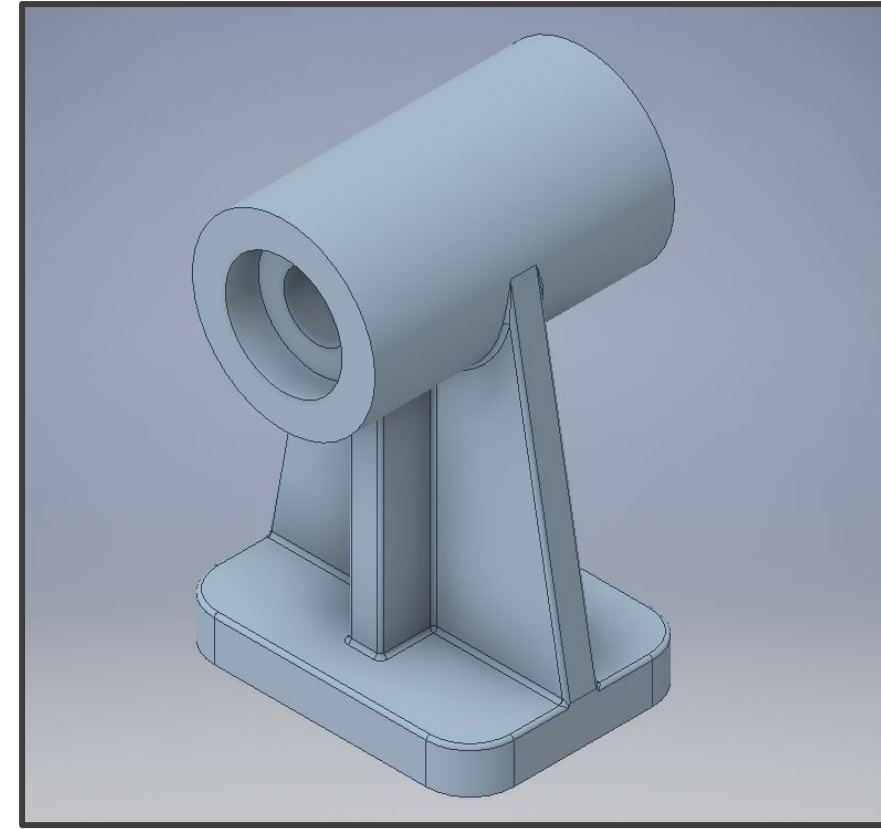
# CREATING ENGINEERING DRAWINGS

## LESSON 10



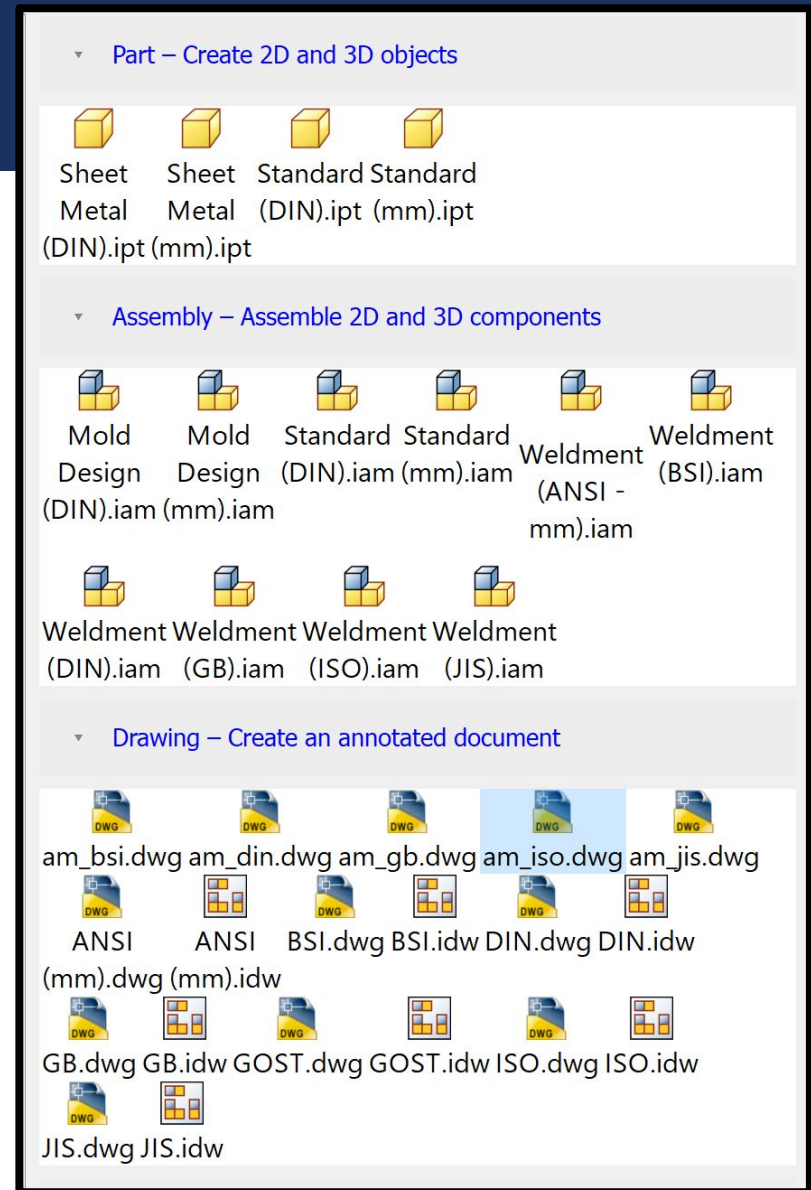
# MOTIVATION

- In this lesson, we will use the example of Workshop 2 part file which you have made previously to recreate the engineering drawing.
- We will look at how we produce engineering drawing documents: the **main** drawing and annotation features.
- Authoring your files, and other important information on standard engineering drawings.
- Export to common drawing formats (i.e. PDF)



# CREATING A DRAWING FILE

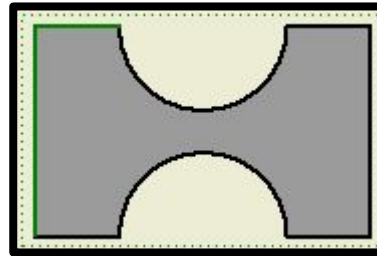
- The drawings module uses the .dwg or .idw format.
- The available options for drawings are set to a number of common engineering standards.
  - ANSI
  - DIN
  - ISO



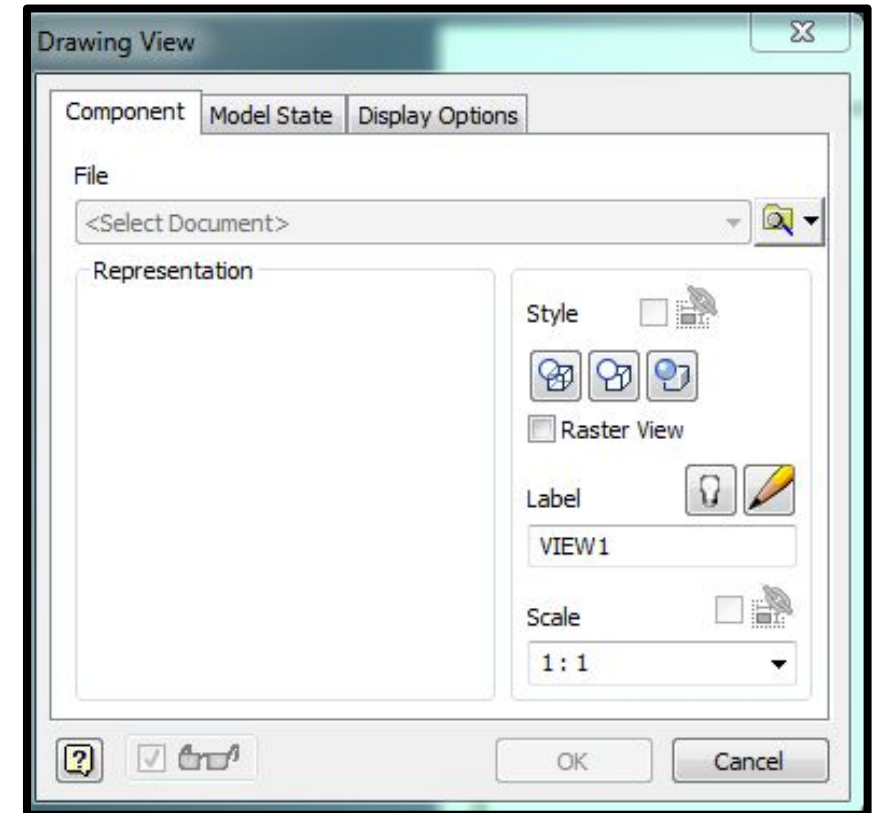
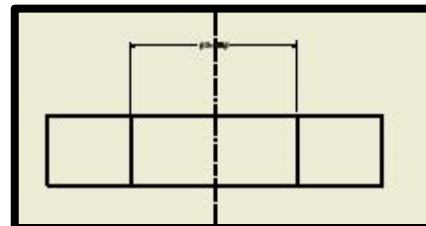
# DRAWING FEATURES

- A **base** produces the first image of the drawing, extending outwards you will be presented with the **auxiliary** and **projected** drawing views.
- There are **visual styles** to drawings:
  - Hidden lines shown
  - Hidden lines removed
  - Shaded
- Select a **scale ratio**.

*top view*

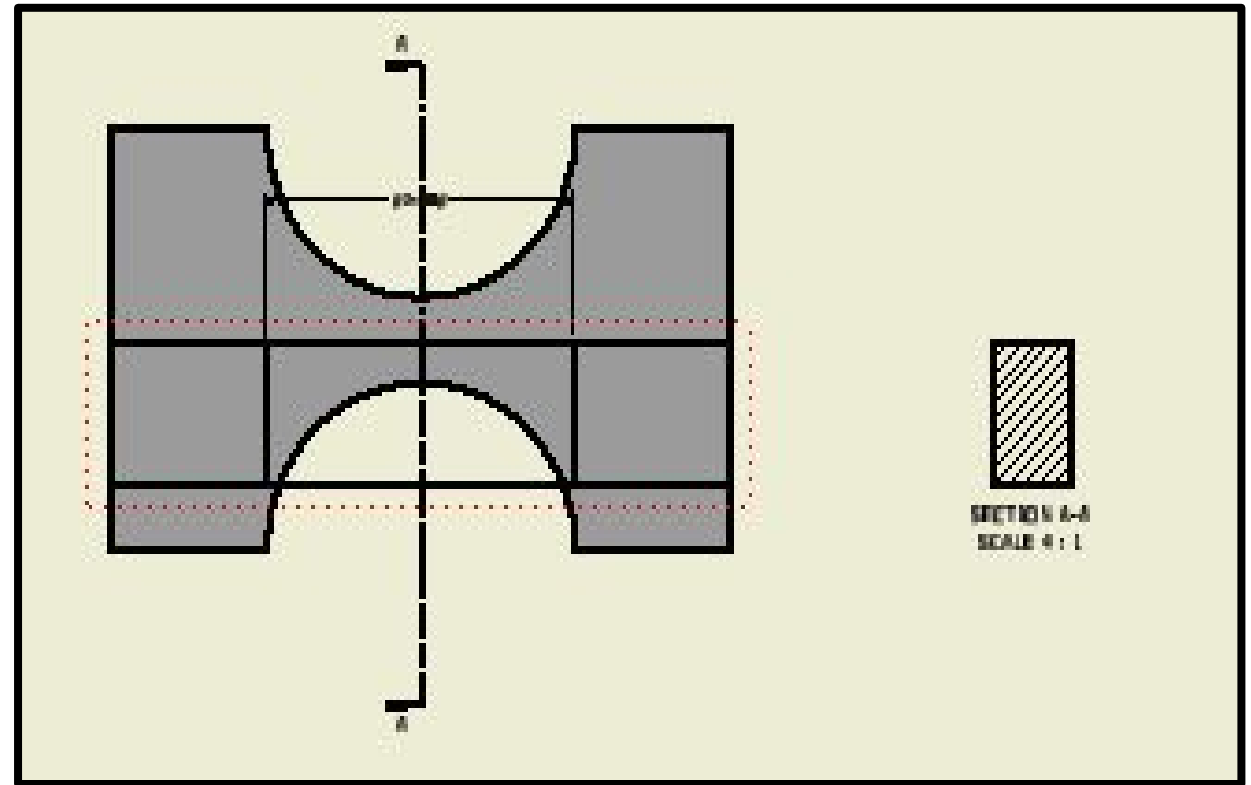


*side view*



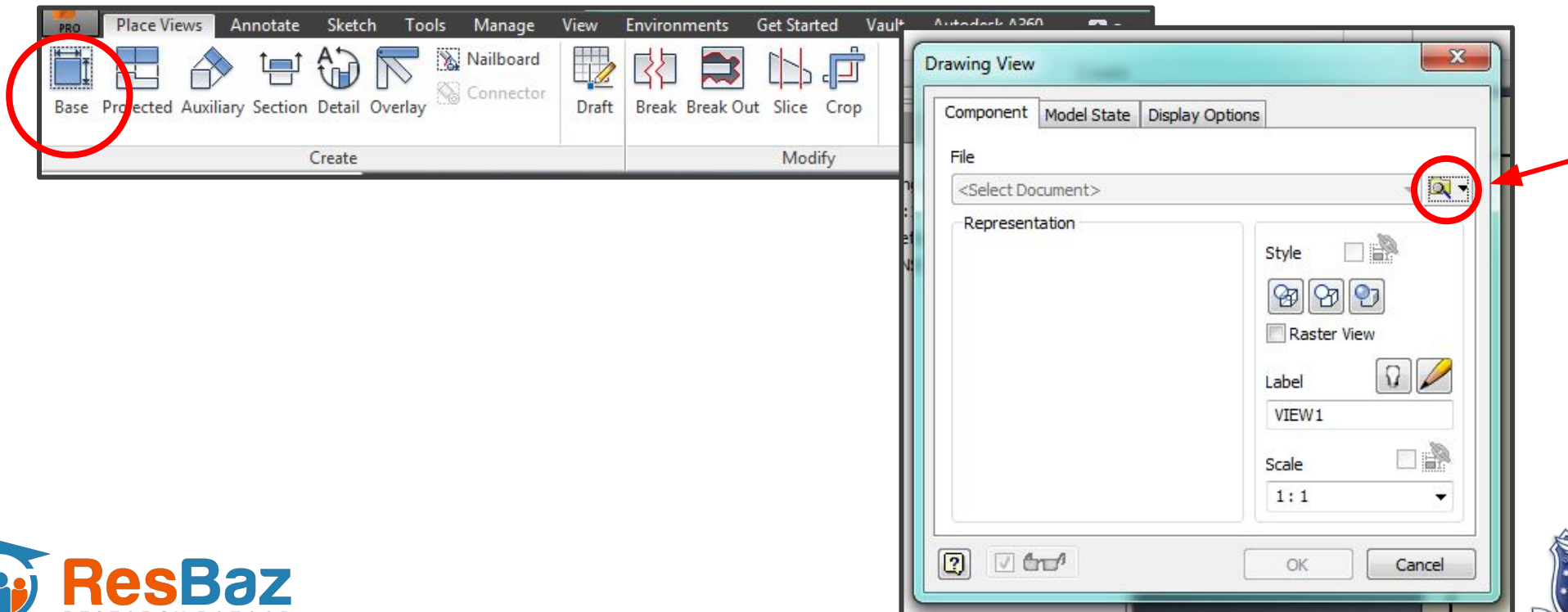
# DRAWING FEATURES

- Section – shows internal detail.
- Annotate your drawings:
  - Dimension
  - Retreat
  - Welding
  - Parts List



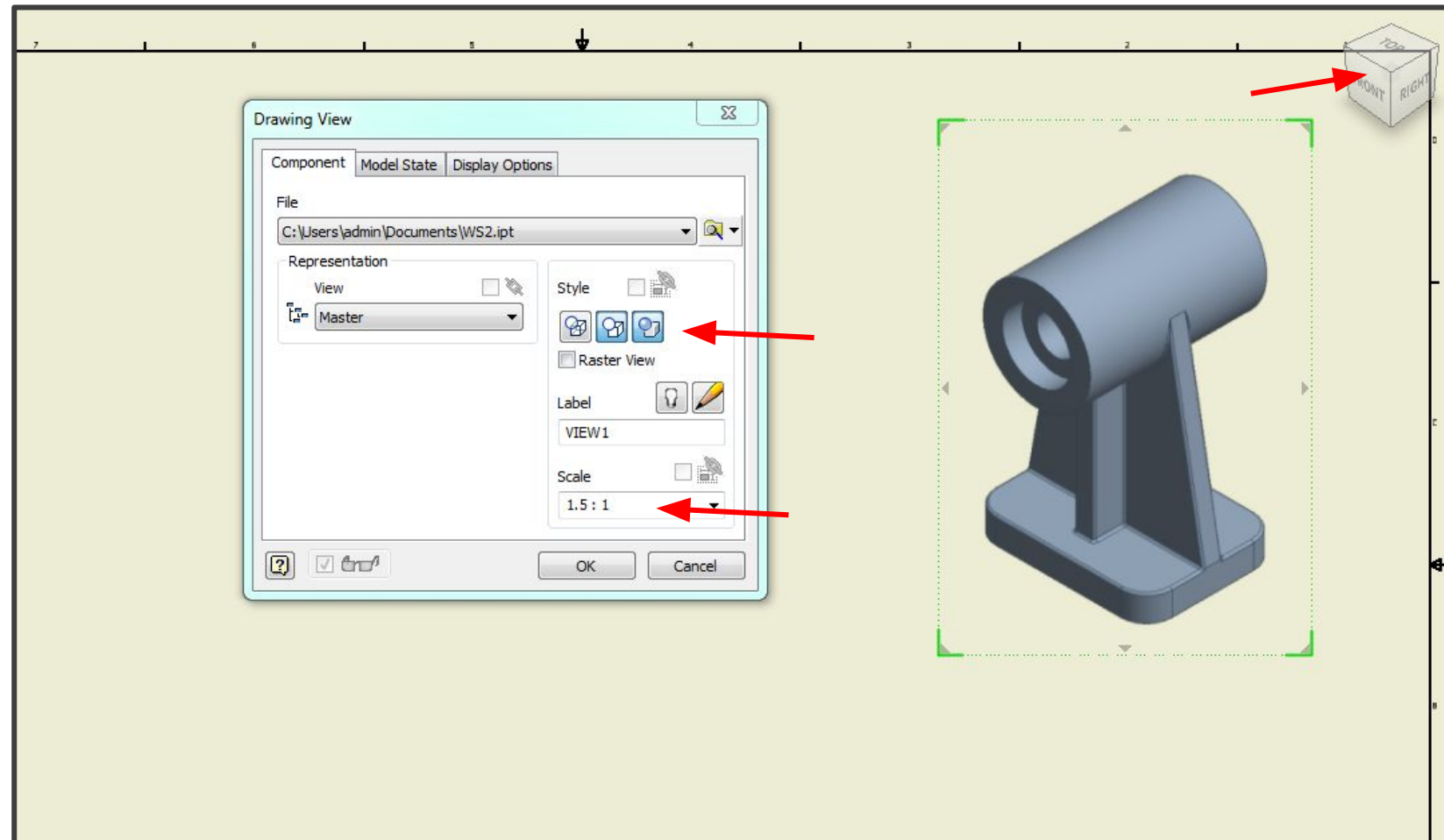
# EXAMPLE: BASE VIEW

- Select the **base** command and **import** the part or assembly file you want to use.
- *The program will auto import the last file you worked on.*



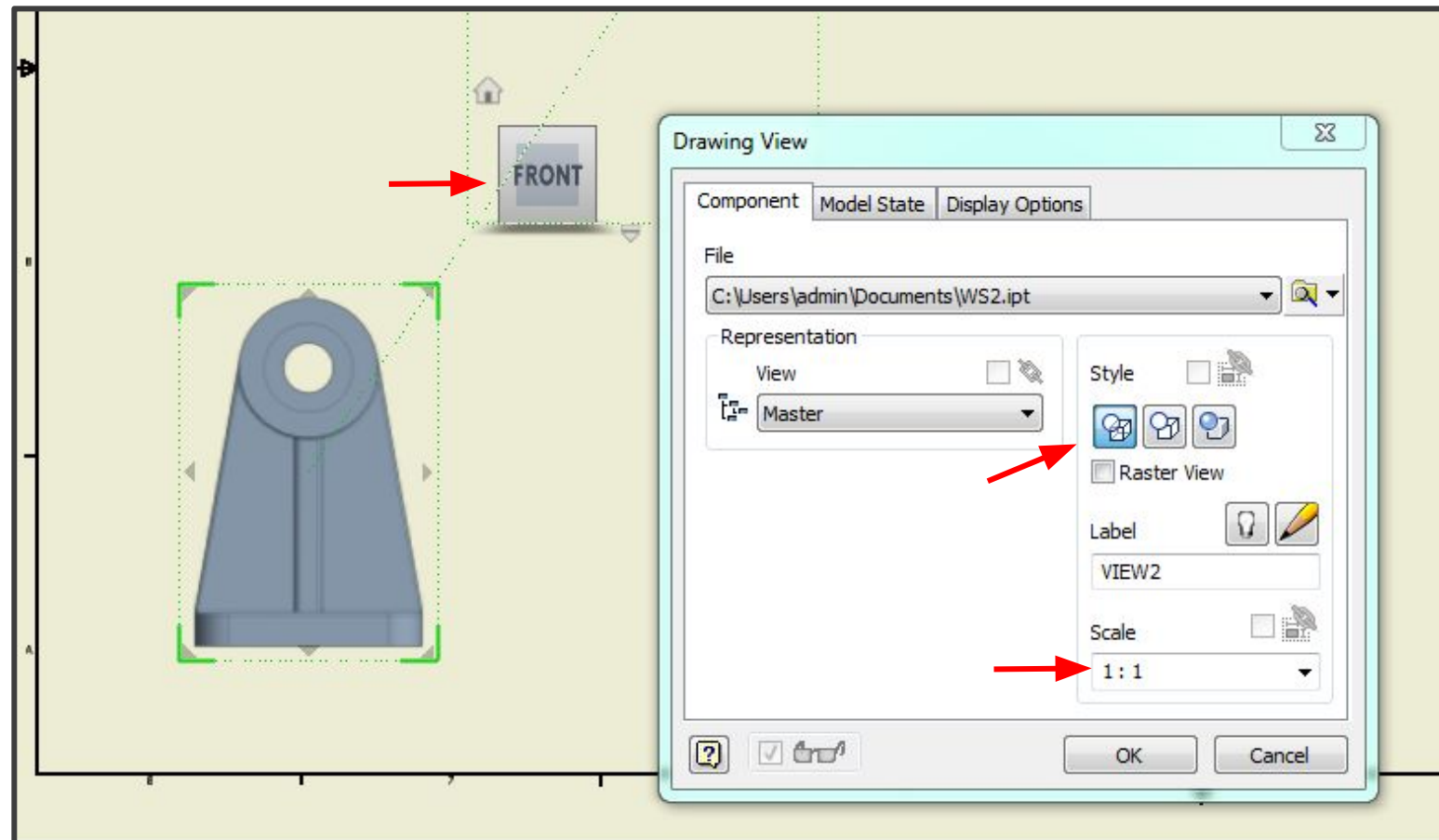
# EXAMPLE: BASE VIEW

- The image can also be moved anywhere on the document.
- *Select the top-right corner of the navigation cube to orientate.*
- *Select no hidden-line and shaded visual styles.*
- *Input a 1.5 : 1 scale ratio.*
- *Select 'ok'.*



# EXAMPLE: PROJECTED VIEW

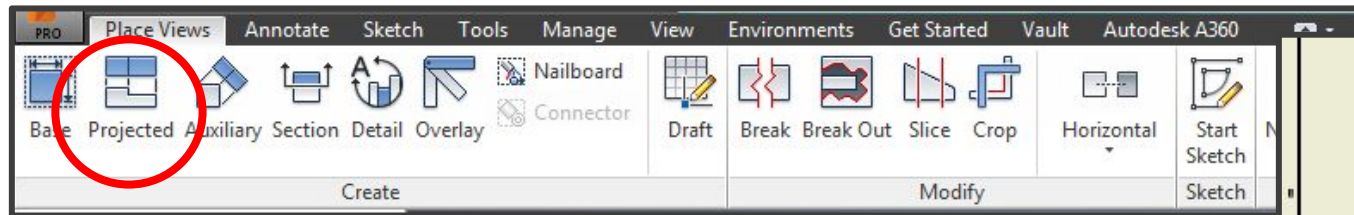
- **Projected** views use base views as a **reference**. So we will begin by drawing a second base view.
- Select the base command.
  - *Use a front view orientation.*
  - *Hidden-lines enabled, no shading.*
  - *Use 1.2 : 1 scale ratio.*
- *You may find that the program will also auto-dimension your drawing.*



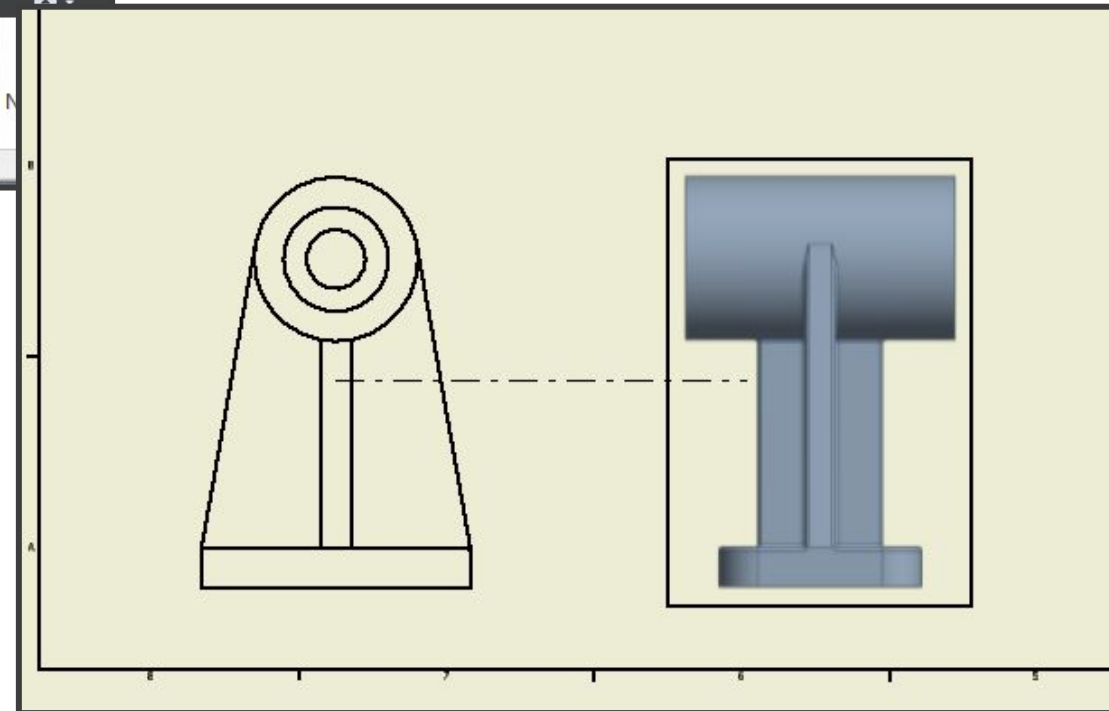


# EXAMPLE: PROJECTED VIEW

- Select the **projected** command.
- Select the base **reference** drawing and move your cursor to any other position on the document to place your projected view.

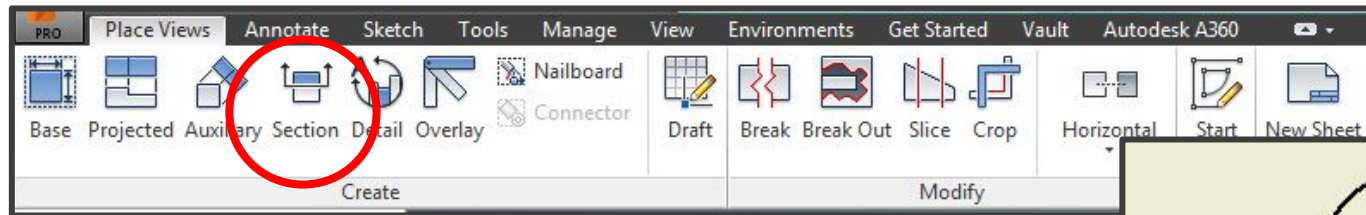


- Right-click '**create**'.

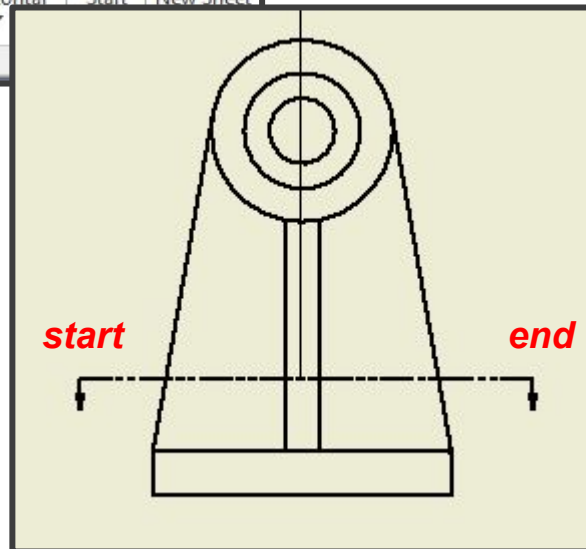


# EXAMPLE: SECTION VIEW

- Select the **section** command.
- Select the base **reference** drawing, then select the **start** and **end** points of a line which will act as your cross-sectional cut.

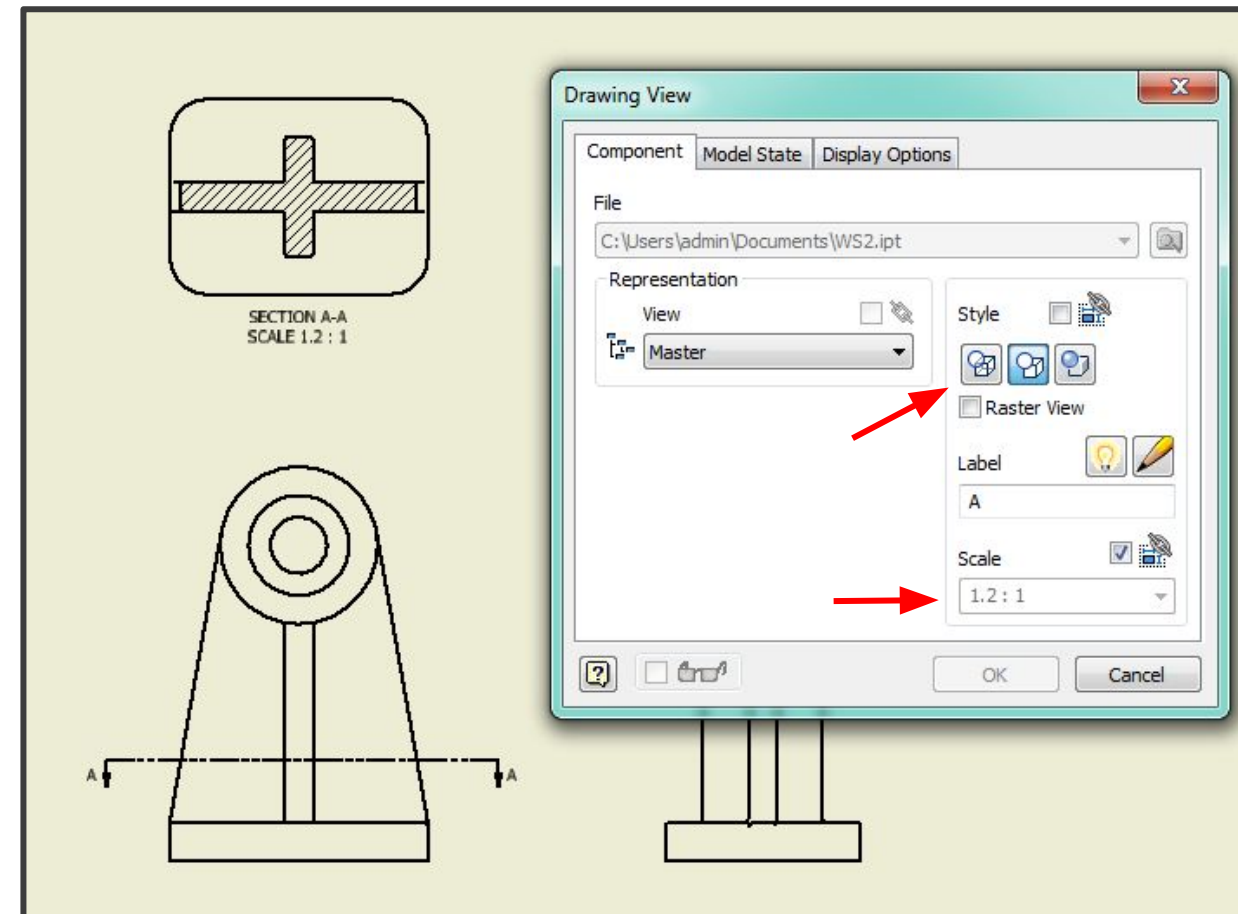


- Right-click '*continue*'.



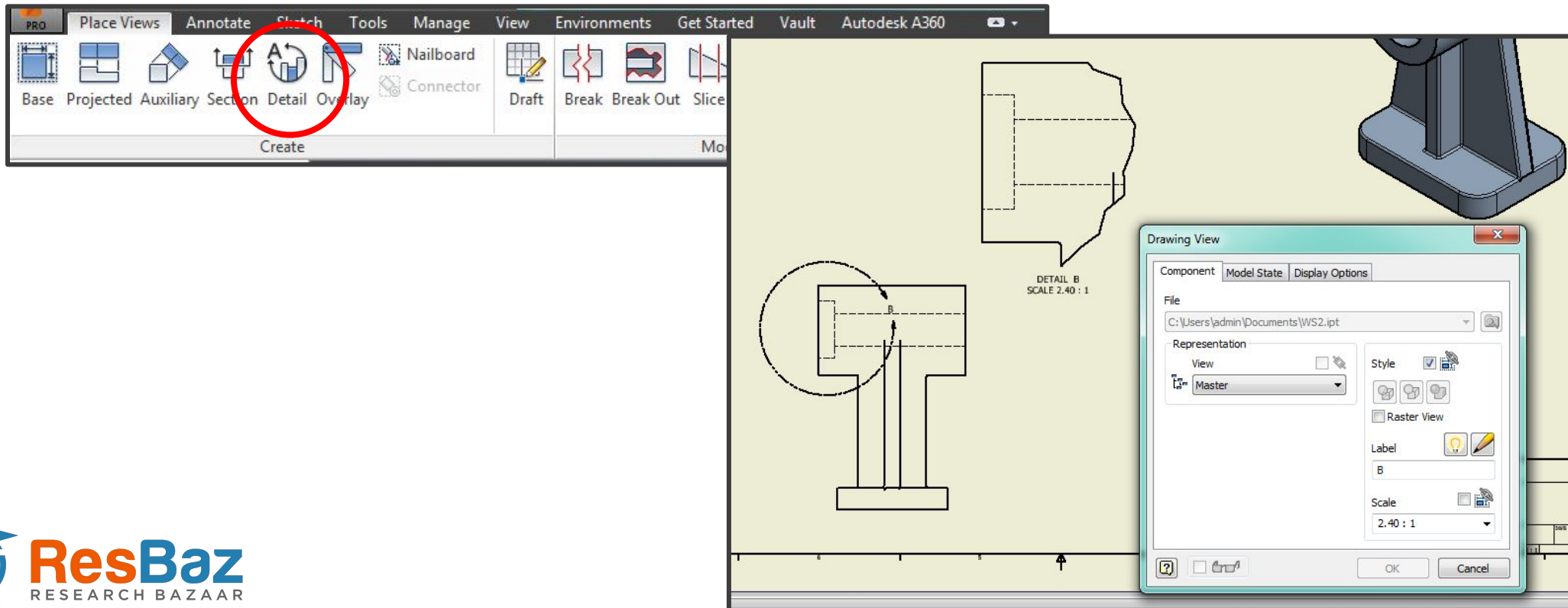
# EXAMPLE: SECTION VIEW

- Place your **sectional view** by moving your cursor to any other position on the document that would **linearly align** with the reference cut.
- Hidden-lines enabled, no shading visual style.
- Use same scale ratio as the reference view. *The scale option would normally be shaded out so you cannot change it anyway.*



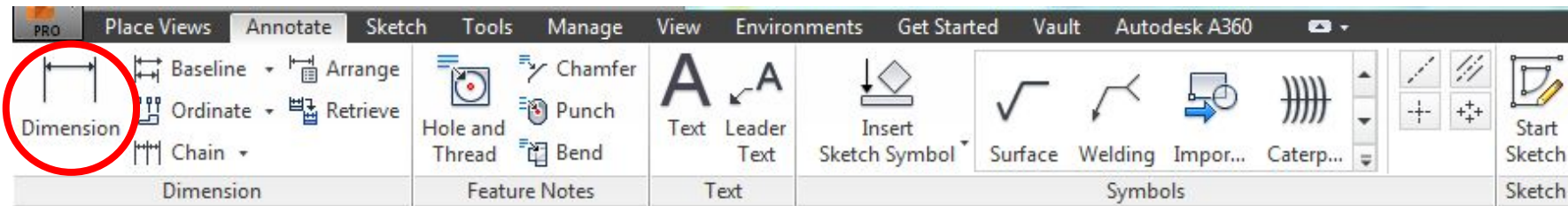
# EXAMPLE: DETAIL VIEW

- As an extra challenge, see if you can use the **detail** command.
- You will need to select a reference drawing, and a section of that drawing to magnify.



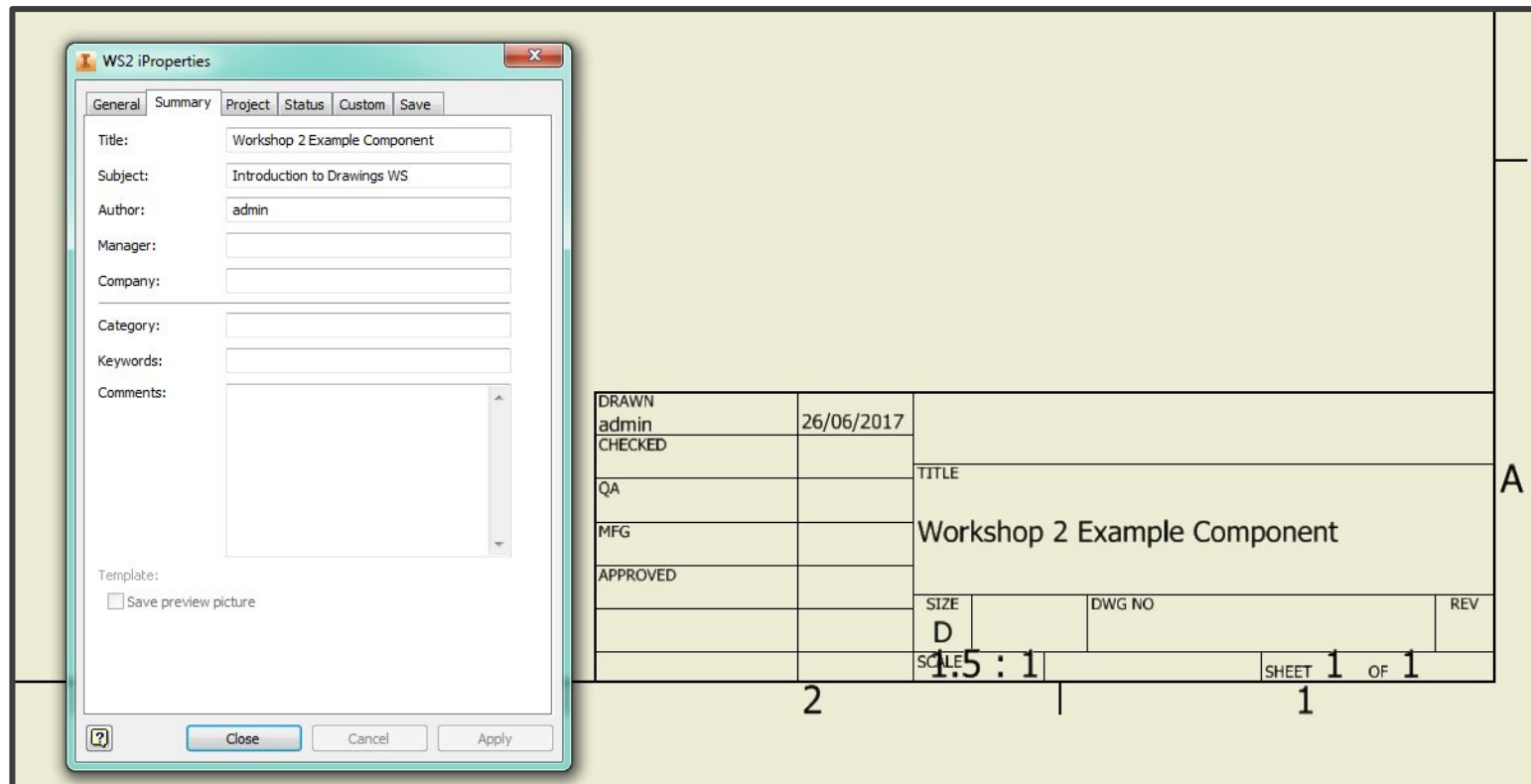
# EXAMPLE: ANNOTATION

- In this example we will be **annotating** our engineering drawings to including our own **dimensions**.
- *Annotating dimensions works the same way as the dimensioning constraint command shown in the parts module.*
- *Is your font size super tiny?*
  - <https://knowledge.autodesk.com/support/inventor-products/troubleshooting/caas/sfdcarticles/sfdcarticles/How-to-change-font-size-in-the-dimension-after.html>



# EXAMPLE: DRAWING PROPERTIES

- Similar to the *iProperties* for a part or assembly file, drawing files need information that identify it as important or useful to a project.
- This information is displayed in the bottom-right corner of any standard engineering drawing document.
- Filling out the required information in the *iProperties* tab will automatically populate the fields in the drawing.



The image shows a screenshot of the 'WS2 iProperties' dialog box and a portion of an engineering drawing. The dialog box is open to the 'General' tab, showing the following fields:

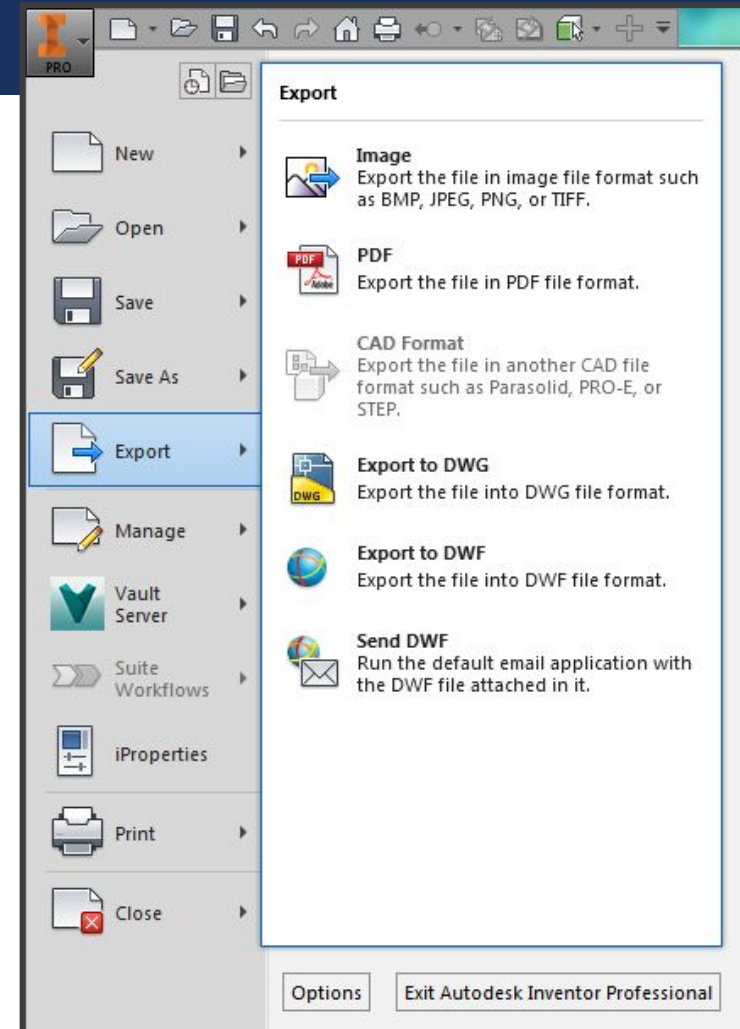
- Title: Workshop 2 Example Component
- Subject: Introduction to Drawings WS
- Author: admin
- Manager:
- Company:
- Category:
- Keywords:
- Comments:
- Template: ☐ Save preview picture

The engineering drawing shows a title block with the following information:

DRAWN	admin	26/06/2017		
CHECKED				
QA			TITLE	
MFG			Workshop 2 Example Component	
APPROVED				
			SIZE	DWG NO
			D	
			SCALE	1.5 : 1
			SHEET	1 OF 1

# EXAMPLE: EXPORT

- Under the main Inventor icon, select the **export** option.
- Select the required **format type**:
  - Images are .jpg .png
  - PDF documents are .pdf
  - Drawing files are .dwg
- Name your file and 'save as' in the window that appears.





# CONCLUSION

- We examined engineering drawings by first reading and interpreting the information on them to create a component.
- This might give you some insight into how you might want to structure your own engineering drawings and what information you want to include to present to a viewer.
- You produced an engineering drawing and saw that there is a number of options surrounding the representation of the component:
  - *Different orientations, Projected view, Section view, Detail view*





# THANK YOU FOR ATTENDING!!

If you are interested in more trainings or events: <http://melbourne.resbaz.edu.au>

