



Grand Blanc High School Robotics Team



Initial Member Level Deliverables Create a Part File

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Mentor(s) to ask if you have questions about, and may sign off on this Challenge: Clinton Bolinger, John Boehnke OR Mike Hasselbach.

Always remember, if you get stuck or have a question, seek out a Veteran Student on your (or another) VEX Team BEFORE you ask a Mentor.

Before Beginning this Challenge:

1. This challenge is a prerequisite for the "Create a Working Drawing from your Part File" Challenge. You MUST complete this challenge before you work on the "Create a Working Drawing" Training.
2. If you are new to CAD, you should complete the "ASSEMBLE CLAW IN AUTCAD INVENTOR" Deliverable Training before starting on this one.
3. Use a device (preferably a personal laptop, Chromebook, phone, etc.) to watch the "Inventor: Introduction to Parts" tutorial by Mike Hasselbach, aka "TheMadCADer"
 - a. If you do not have a device to watch the video, you may use one of the Team computers in the Back Room, if they are available. Please do not use one of the Programming or PR Laptops.
 - b. Link to Mike's Channel: <https://www.youtube.com/user/TheMadCADer>
 - c. Link to video: <https://www.youtube.com/watch?v=nqRIN5cf6rE>
 - d. The wireless internet password is: 2337is1337
4. Take notes in your Engineering Notebook:
 - a. Helpful things to note:
 - What is the first step in any part?
 - How is geometry defined?
 - What is extruding?
 - What is revolving?
5. Check the board in the conference room to see if a Kit is available to check out for this Deliverable Training.
6. Reference the Recommended Completion Schedule calendar (located on the board) to see if this Deliverable is featured for your Team this month:
 - a. If your VEX Team is the featured Team, then proceed with the instructions below.
 - b. If not, ask a Veteran Student Team Member to go with you to ask the Team Captain of the featured Team if they plan to use the materials at tonight's meeting:
 - i. If the materials will NOT be used by that Team, then proceed with the instructions below.
 - ii. If the materials WILL be used tonight, please choose a different training to complete today.
7. Follow the directions listed on the board in the Conference Room to check-out a Kit (if available):
 - a. For this challenge, you will need to choose ONE of the "CAD Objects" - labeled A through D. It's your choice!
 - b. Visit www.team2337.com/checkout on an internet connected device (yours or the Team's).
8. Proceed to one of the CAD Stations in the Back Room.
 - a. If someone is using the computer for something other than Deliverables, politely and graciously ask them if you can use it for your training.
 - b. If you have any trouble, ask your Team Captain to help, and if that doesn't work, *then* approach a Mentor.



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Training Instructions:

AutoCAD Inventor is REQUIRED for this Training; so you must complete the following portions of this challenge on one of the desktop computers in the back room at Premier **OR** download a licensed student edition of AutoCAD Inventor on your personal computer/laptop. Please visit the Team's VEX Website for directions on how to download Inventor.

If you have not already done so, create a personal folder on the EngiNERDs Server:

- a. From a computer in the back room, open an explorer window
- b. On the left side of the explorer window, scroll down and select the "EngiNERDs Shared" drive, go into the "Students" folder
- c. Right click and select to create a "New Folder"
- d. Change the name of the folder to YOUR First Name, Last Name (Example: Clinton Bolinger). Please do not use nicknames, unless it is a shortened version of your real name (i.e Nick instead of Nicholas).

Part One - Measurement:

1. There are different ways parts are measured for their size; for the purposes of this challenge, a tape measure or ruler will fit acceptable tolerances. More precise tools include calipers - which you may use if you want, but it's not required.
2. In your Engineering Notebook:
 1. Use a ruler and stencils (available on the cart next to the Deliverables Shelf in the Conference Room) to create a to-scale drawing of your part. You may need to create more than one drawing to achieve perspective.
 2. Label your drawings with dimensions.
 3. Return the straight edge and stencils to the bin in the Conference Room.

Part Two - Modeling

1. Make sure you've watched the entire "Inventor: Introduction to Parts" tutorial video, and completed the Engineering Notebook portion above.
2. Open "Autodesk Inventor Professional" (version year doesn't matter)
3. Go to "New", and under the Parts category, create a "Standard.ipt"
4. Model the selected part using the techniques described in the video.
5. When finished, save the part file in your student folder.

If you are NOT done with your training by at least 15 minutes before the end of the meeting:

1. Return materials to the bin, and save your work on the Computer.
2. Clean your workspace AND the floor around you:
 - a. Wipe off tables
 - b. Push in Chairs
 - c. Sweep the floor,
 - d. Throw away trash
3. Write your name on a post-it (available on the cart next to the Deliverables shelf in the Conference Room), and attach it to the outside the bin (on the lid),
4. Return the bin to the shelf in the Conference Room, with the label facing upward
5. **DO NOT** complete the online check-in form!
6. If you do not show up for the next two meetings, the kit will be given to someone else.



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Engineering Notebook Entry Instructions:

1. Take notes while you are working in CAD and discuss any difficulties that you may have.
2. Use complete sentences to answer the following questions:
 - a. What did you think of the video? Was it helpful? Would you like to watch more?
 - b. Did you enjoy this task? Why or why not?
 - c. What is the first step in any part?
 - d. How is geometry defined?
 - e. What is extruding?
 - f. What is revolving?
 - g. What did this task teach you about methods of creating parts?
 - h. Why is it important to fully constrain geometry in a sketch?
 - i. Why do you think The EngiNERDs CAD 100% of the parts that we machine or create? How is this advantageous?

To Complete Your Challenge:

1. Ensure that your Engineering Notebook entry is complete, and then:
 1. Open your completed assembly on the computer,
 2. Find one of the Mentors listed on this challenge and escort him to the computer you used, and ask him/her to inspect your completed work,
 3. Ask the Mentor to approve your Engineering Notebook entry and have your deliverables checklist validated,
2. After you've been validated:
 1. Save your work,
 2. Close AutoCAD,
 3. Shut down the computer (only at the end of the meeting).
3. Clean your workspace AND the floor around you:
 1. Wipe off tables,
 2. Throw away trash,
 3. Push in Chairs,
 4. Sweep the floor.
4. Follow the directions on the board in the conference room to check the kit in, and:
 1. Check the kit in using the online form, available at www.team2337.com/checkin
 2. Return the bin to the shelf in the Conference Room, with the label facing outward,
 3. Erase your name from the sign-out board, using a tissue and hand sanitizer.

More Information:

If you ever get stuck or need assistance with Inventor, see if Mike is around. He's always happy to help.

- Numerical values in Inventor can be entered as fractions, decimal conversion is not necessary (example "1/16" can be entered instead of ".0625")
- The **Browser** is among the most important things to have when working in Inventor. Refer to this: <https://www.youtube.com/watch?v=auOG1kTD2Kk>
- There are good ways to make holes and bad ways. Refer to this: <https://www.youtube.com/watch?v=n9kQrODfM3w>