

Delaware Science Olympiad

2022 Write It CAD It Demo

In this session, I cover:

- Briefly review the Write It CAD It rules
- Share some basic *OnShape* tips while building the model from the parts.
- Show what the event will look like in the Scilympiad website for the tournament.

Write It CAD It Rules (and preview of Scilympiad.com/DE)

- The Writer:
 - o Once you start the test in the Scilympiad website, you will see screenshot images of the model from different angles.
 - o You have 25 minutes to type the instructions in the free response box. The instructions are autosaved when you click outside of the box.
 - o **IMPORTANT =** ☐ **you must click outside of the free response text box periodically to save the directions that you have typed.**
 - o While there is no advantage to finishing your writing early, if you finish early, you can click "Submit Test." The test will be automatically submitted when the 25 minutes is up.
 - o Drawings and diagrams of the model are not allowed.
- The CADER:
 - o You will start the "test" in Scilympiad. It will have:
 - the link to the OnShape file that you will be using which has the parts needed. No additional parts.
 - The directions for making a copy of the parts file and what to name it.
 - **IMPORTANT =** ☐ **you must make a copy of the file (20 points)**
 - Your partner's directions for you to build the model.
 - The directions for saving and sharing your built model to a specific email address. Click on the "Share" button on the upper right in OnShape and under "Individuals," type in the email provided in Scilympiad and click "Share".
 - The CADER will not submit anything through Scilympiad, but only through the sharing function of Onshape.
 - o You will have 20 minutes to assemble the model in onShape.
 - o Time to assemble is a tie breaker.

OnShape

Once logged in to OnShape, click the following link for the 2022 Demo file:

[2022 HS OnShape CAD file](#)

If the link doesn't work, in *OnShape* click on "Public" on the left menu and in the "Search in Public" bar type **DEJACK2022demo**

Create a copy of the demo file:

- In the upper left, click on ***Make a copy*** (this will be 20 points at the tournament).
- Rename the file. At the tournament you will be instructed to name it to a specific format (this will be 5 points at the tournament).

General Info:

- o Parts Studio – I build the parts for the Event but you may want to build other parts for practice. However, if you haven't used *OnShape* before, don't spend your time building parts. Spend your time learning how to assemble
- o Assembly – practice manipulating the parts to assemble them in to the model.
- o In the Practice Sample that I shared, there are 3 tabs that you see:
 - o Parts Folder – click it and you will see a tab for the parts that I have created
 - o Assembly – the place with all the parts that you can manipulate to assemble in to the model
 - o The model that I assembled
- o RECOMMENDATION --- make another copy of the Assembly tab so you always have the original to go back to.
 - o Right click on the tab name Assembly. On the pop-up menu click ***Duplicate***. Name the file whatever you would like.

General Tips:

- o Hover over icons for tips on how to use them.
- o Select the  in the top right for the Help Menu
- o Select the  in any dialog box to open *OnShape* Help.
- o Scrolling the sheet that you have displayed
 - o CTRL + SHIFT + arrow key
- o Zoom In/Out
 - o SHIFT Z – Zoom In
 - o Z – Zoom Out
- o Rotate
 - o Arrow keys – rotate 15°
 - o SHIFT + Arrow key – rotate 3°
- o Assembly Toolbar
 - o The only icons you should need are
 - Undo/Redo

- You might choose to use the Fastened Mate icon – this is a fixed attachment. Lots of other options not used
- o On left – Instances and Mates Menu
 - o An entry for each part, simply numbered part 1, 2, 3 etc.
 - Click on a Part and it will be highlighted and selected in the workspace.
 - Click on that same part again and it will unselect it.
 - o Mate Features – you’ll see these as we start connecting pieces if we are using the Fastened Mate tool. Double click on any mate in the list and it will display the menu for that Part or Mate and highlight the Part or Mate
- o View Cube –
 - o Faces
 - o Arrows – left, right, up, down
 - o Rotation arrows
- o Part Axis – triad manipulator
 - o Double click to see the axis for that part
 - o Use the arrows to rotate the part
- o Move a part – right mouse and drag

Let’s assemble

1. Use the View Cube to check out the parts before starting so you have a general idea of the parts. Only spend a few minutes on this.
 - a. Front, Left, Top, etc
 - b. What parts are there? Large Star, Flower, Triangle, 2 spheres with one having a hole, double circle, table, 2 circles with one having a hole, bridge, square with hole
 - c. Note that some parts are not symmetrical
 - i. Triangle hole is near top point of triangle
 - ii. Flower has 2 small circles and 2 large circles. One of each has rounded edge.
2. On the model the star looks like the base so I will start my building there. Your partner’s directions may have you start with another part.
 - a. On the **View Cube**, click on the **FRONT** view.
 - b. Move the star to an open area in the workspace.
3. The *flower* is attached to the top of the *star* on the 1st point. The flat bottom of the *flower* sits on the *star*. The center bottom of the small circle with the rounded edge sits on the point of the *star*. The center line of the *flower* connecting small circles lines up with center of the *star* point.
 - Look at the flower. Notice that all the attached circles are different. Large vs small; rounded edge vs flat.
 - On the **View Cube**, click on the **FRONT** view.
 - o All the parts are showing their view in the **Front** plane

- Click and hold the *flower* and drag it to position it on the *star*. Let go of the *flower*.
 - On the **View Cube**, click the left side arrow to rotate the workspace.
 - Click on **BOTTOM**.
 - Now click and hold the *flower* and drag it to position it touching the *star*.
 - On the **View Cube**, click the side arrow to rotate the workspace. Click on **BACK**. Check if it is lined up correctly.
 - To rotate the *flower* on the *star*, click the *flower*. The **Part Axis** is displayed.
 - Click and hold the Rotate Arrow
 - Drag it until the *flower* lines up with the *star* as needed for the model.
 - You can also enter degrees to rotate the part in the degree box that is displayed.
 - If need to align the flower on the star ,use the Rotate Arrow tip to move the flower in the direction of the arrow. You can also click and hold the *flower* and drag it to the appropriate spot.
 - Click off the *flower* to unselect it.
4. The *triangle* is attached to the top of the *flower*. The *triangle* stands on the *flower* with the hole at the top. The flat bottom of the *triangle* sits on the *flower*. The center line of the *triangle* bottom lines up with center line of the *flower* connecting small circles.
- Look at the flower and the triangle by rotating the cube. Need the triangle to sit on the flower so it needs to be rotated 90°
 - On the **View Cube**, click on the **LEFT** view.
 - Click on the *triangle*. The **Parts Axis** is displayed. Click on the Rotate Arrow
 - Drag it until the *triangle* is perpendicular to the star.
 - You can also enter degrees to rotate the part in the degree box that is displayed, in this case 90°
 - Click and hold the *triangle* and drag it to position it on top of the *flower*.
 - On the **View Cube**, click on the **FRONT** view.
 - Click and hold the *triangle* and drag it to position it on the *flower*.
 - Let go of the *triangle*.
 - On the **View Cube**, click the side arrow to rotate the workspace. Click on **FRONT**.
 - To rotate the *triangle* on the *flower*, click the *triangle*. The **Part Axis** is displayed.
 - Click on the Rotate Arrow
 - Drag it until the *triangle* lines up with the *flower* as needed for the model. In this case, the center line of the *triangle* bottom lines up with the center line of the *flower* connecting small circles.
 - You can also enter degrees to rotate the part in the degree box that is displayed.
 - If need to realign the *triangle* on the *flower*,
 - Click the tip of the Rotate Arrow to move in that direction

- Or, Click and hold the *triangle* and drag it to the appropriate spot.
This allows you to move it in any direction
 - Click off the *triangle* to unselect it.
- 5. What if you just realized that you put the *flower* on the wrong *star* point but you already placed the *triangle* and maybe other parts on it?
 - On the **View Cube**, click on the **FRONT** view.
 - Click the *flower* so that it is selected. Click on the *triangle* (the flower is still selected). Click on any other parts that need to be moved as a group.
 - Click and hold the group of parts and drag it to where it needs to be.
 - Use the **Part Axis** for the group to rotate it if needed.
 - Click off the group when done.
- 6. The *double circle* is attached to the top of the *star*'s 4th point. It is centered on the tip with the *small circle* on top.
 - Find the double circle.
 - On the **View Cube**, click on the **FRONT** view.
 - Click and hold the *double circle* and drag it to the star to position it on the *star*'s 4th tip..
 - On the **View Cube**, click on **BOTTOM**.
 - Click and hold the *double circle* and drag it to position it touching the top of the *star*. Let go of the *double circle*.
 - On the **View Cube**, click on **BACK**. Click and hold the *double circle* and drag it to adjust it to center it on the star tip.
- 7. The *bridge* is attached to the top of the *star* on the 3rd point. The bottom of the *bridge mid support* sits on the point of the *star*. One end of the *bridge* is in the center of the *star*, lined up along the center of the *star point*.
 - Locate the bridge. It needs to be rotated 90° to be able to sit on the *star*.
 - On the **View Cube**, click on **LEFT**.
 - Click on the *bridge*. The **Part Axis** is displayed.
 - Use the rotate arrow to rotate it 90°
 - Or enter 90 and enter
 - Click on the *bridge* and drag it to position it on top of the *star*.
 - On the View Cube, click on **Front** to view the top of the star
 - Now click and hold the bridge and drag it to position it on the top of the star's 3rd point.
 - On the **View Cube**, click on **BACK** to check if it is lined up correctly.
 - To rotate the *bridge* on the *star*, click the *bridge*. The **Part Axis** is displayed.
 - Click on the Rotate Arrow and rotate it to line up with the middle of the star..
 - If needed, click on the bridge and drag, it to the appropriate spot.
 - Click off the *bridge* to unselect it.

8. The *sphere* with the hole is attached to the top of the *bridge*. It is centered on the top edge and the hole points up.
 - Find the sphere with the hole.
 - On the **View Cube**, click on the **FRONT** view.
 - Click and hold the *sphere* and drag it to position it on top of the *bridge* in the center.
 - On the **View Cube**, click on **BOTTOM**.
 - If needed, click and hold the *sphere* and drag it to position it correctly on the *bridge*.
9. At the high school competition, not all parts will be in same plane or a simple 90° or 180° rotation away. Most will be. You may need to look at the various views for the parts that you are trying to connect to decide on the quickest way to get a part to where it needs to be.
10. At the junior high competition, all parts will be in same plane or a simple 90° or 180° rotation away. I will try my best to be sure that is the case.

SHARING your OnShape file

You **MUST** share your **OnShape** file with the event supervisor's email through **OnShape's** sharing function. In **OnShape**, click on **Share** in the upper right of your workspace. In the Share Settings Dialog box, type the email address which will be provided and click **Share**:



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☐ Share with Onshape support

OnShape Public Space – BONUS!!!!!!!!!!!!

- o Click on the OnShape name in the top left (Go To Document menu)
- o Click on Public on the left menu
- o In Search enter WICI and click search
- o Make a copy of any to practice with