

Engineering CAD using Onshape

Event Student Guide

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Engineering CAD Event Overview

The Engineering CAD Event is sponsored by and co-created with Onshape. Onshape is a cloud-native CAD and data management software that allows anyone to create parts, assemblies, and drawings.

In Engineering CAD, teams of two students will collaborate to accurately model parts and assemblies from provided drawings as quickly as possible. Students will be scored on the accuracy of their models with the time from start to submission serving as a tiebreaker.

From the perspective of a student competitor, the process of participating in an event should follow these steps:

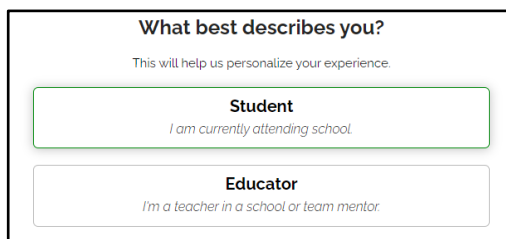
1. Check in with the Event Supervisor or volunteer to track your attendance and acquire a drawing packet.
2. Set up your devices by connecting to the internet, setting up your mouse/keyboard, and logging into Onshape.
3. When the event begins, flip over the drawing packet and find the assignment that has been created for the event.
4. 1 member of your competition duo will start the Onshape assignment and use the Share functionality to send it to the other teammate.
5. Create the parts and the assembly shown in the drawing packet. Make sure to follow dimensions closely and to set the material of the part.
6. Once done, ensure you or your partner clicks the blue Submit button at the top of the screen.
7. Log out of Onshape, hand in your drawing packet, and get ready for your next event!

The following sections will describe in greater detail each step of this process. If you have any questions or feedback please contact competitions@ptc.com.

Signing Up for Onshape

Science Olympiad students, coaches, and organizers are eligible for a free Onshape Education account. This will enable you to access Onshape's full suite of CAD features. Fill out the form at onshape.com/en/education/sign-up to create your account.

For Students: Sign up for an Onshape account and ensure that you sign up as a *student*. If you are unsure about information to enter relating to your school, please use the Science Olympiad website, address, and name.



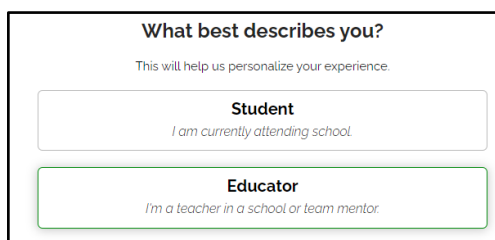
What best describes you?
This will help us personalize your experience.

Student
I am currently attending school.

Educator
I'm a teacher in a school or team mentor.

For Educators and Coaches : Sign up for an Onshape account and ensure that you sign up as an *Educator*. If you don't, you will not be able to create an Onshape Class required to administer and collect student submissions.

Please name your Classroom something that students will know is for Engineering CAD practice.



What best describes you?
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Have an Existing Onshape Account?

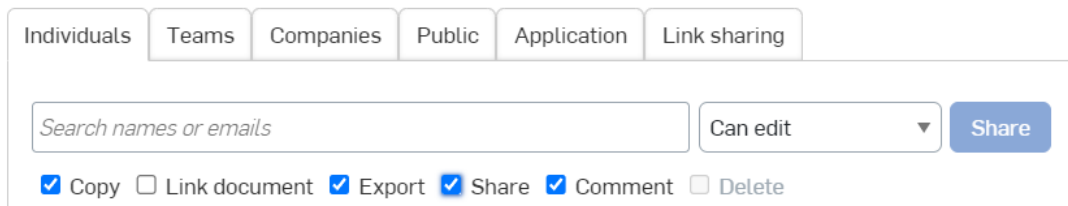
If you already have an existing account that is not an education account or your education account has expired, you will need to upgrade your account to an Education account.

Please go to cad.onshape.com/upgrade/edu and you will be automatically upgraded to the Student plan on the account logged in with your given browser. If you are not logged in, you will be prompted to do so and then upgraded.

Starting the Event as a Student

To access the starting document, students will follow these steps:

- From the documents page, click on the  Classes filter on the left-hand side of the screen.
- Click on the classroom that corresponds to this Engineering CAD event.
- **One student** from each team needs to click on the classroom to view the assignments list from the classroom. Click on the assignment and then click the blue Start assignment button.
- The student who just started the assignment needs to click on the Onshape logo to return to the documents page and click on the  Created by me filter on the left-hand side of the screen.
- Right-click on the student starting document that was just created and select "Share..." or hover over the document and click the  icon.
- Enter the email address for the Onshape account of the other student participant and make sure to provide Edit access as well.



Individuals Teams Companies Public Application Link sharing

Search names or emails Can edit Share

Copy Link document Export Share Comment Delete

- Once both students are in the document, start modeling!

Tips for Students During the Event

As students are working in Onshape to complete the Engineering CAD event, here are some tips and strategies to keep in mind:

KEY THINGS TO REMEMBER:

- **Never change the name of the part studio and assembly tabs!**
- **Use the existing part studios and assembly - no need to make your own!**
- **Keep in mind that time is the tiebreaker.** Don't rush, but don't spend unnecessary time checking parts you are confident in.
- **Set materials on all parts!** With no material set, parts can't be graded.

Other Helpful Tips:

- Analyze parts and break down the steps to model it before jumping in.
 - A clear plan of attack will make the modeling process much faster.
- Double-check entered dimensions and perform multiple measurements to make sure the modeled part matches the drawing.
- Use patterns, mirrors, and duplicated geometry to reduce the amount of time spent creating features.
- Evenly split the amount of modeling work that each student is doing.
- Use clear dimensioning and sketching schemes so your partner can understand your work and double-check it.

Finishing the Event as a Student

Once the 50 minute timer for the event has ended, the student who started the assignment **must** click the blue “**Submit Assignment**” button at the top of your Onshape modeling window.

Please log out of accounts as well and do not continue to work on the assignment. It is very easy to verify whether work was done after the event due to the automated graded system and Onshape’s Versions & History features.

Onshape Learning Resources

Onshape has developed a large library of learning resources in the Onshape Learning Center. Both new users and existing users will be able to find helpful workflow tips, best practices, and tutorials.

The Onshape Learning Center can be accessed here:

<https://learn.onshape.com/>

Some courses that we highly recommend:

- [CAD Basics Learning Pathway](#)
- [Onshape Fundamentals Learning Pathway](#)

Some applications that we highly recommend:

- [Science Olympiad Checker in the Onshape App Store](#)
 - This app provides a great method for checking your models against an answer key model; this same app is used to do Engineering CAD Grading.
- [CAD Challenges App in the Onshape App Store](#)
 - This app provides great part, multi-part, and assembly modeling challenges with automatic grading and model comparison if needed. While this doesn't exactly mirror Engineering CAD, it's a great practice tool!

Practice Model & Drawing Sets

It's important to practice for Engineering CAD with drawing sets that match what you will encounter in your competitions.

The Onshape Education has created a living document of practice tests for teams to use. Each provided model set includes the blank starting documents as well as the answer key - you can use the answer key to grade your work or see the process by which each model was created. Check it out below!

[Engineering CAD Practice Exam Library](#)

Contacting Onshape Education for Feedback & Help

If you need assistance with Onshape, are looking for exam document review, or have any general questions, please reach out! You can contact Onshape Education at competitions@ptc.com.