



TeachEngineering

Creating a 3D Print



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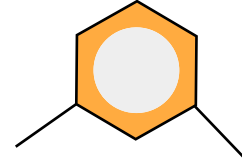
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Objective

Students will be able to create their first 3D print collaboratively.

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It won't take long.

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Let's go!

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Introductory Question

3D printing questions?!

Introductory Question

What's your hook design like? What issues have you encountered so far?

Discuss in your groups for **two minutes** and then we will discuss as a class.

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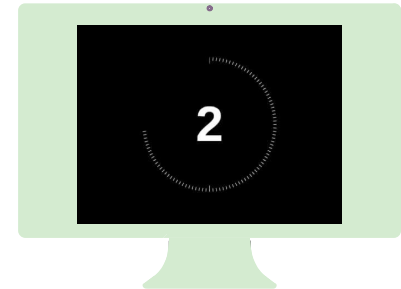
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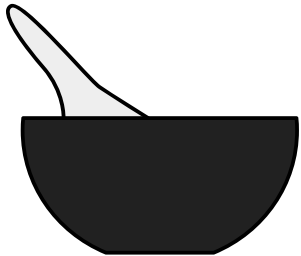
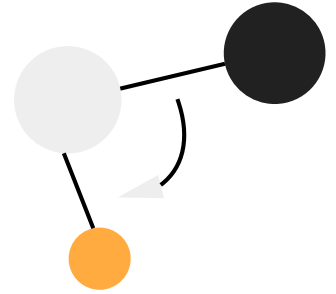
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Starting the CAD Process

Baby steps.



The Steps

Just as a reminder, here are the steps from last time:

The Problem: What are you trying to solve? Every print needs a purpose, a problem that it solves.

Measurements: Start by figuring out what you need to attach it to and measure the dimensions of it.

Sketching: Try drawing a sketch, given the dimensions.

Modeling: Use the sketch with dimensions on the CAD software (we will work on this together).

We already know the problem. Next, you will be getting measurements and sketching.

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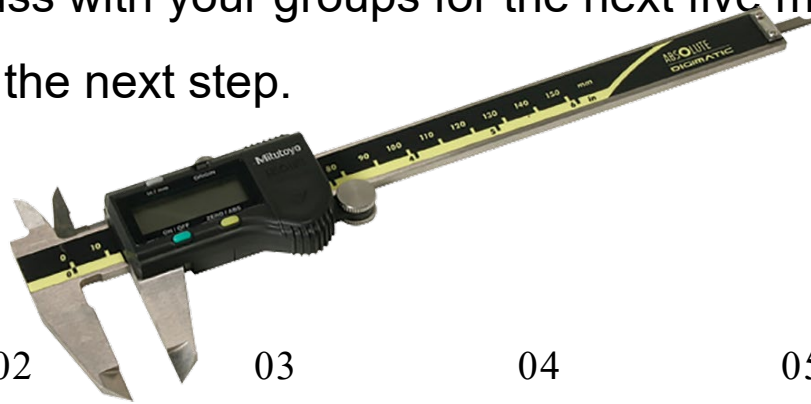
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The Measurements

Look at the mass that you have in front of you. You want to create a hook for it, so think about how thick the hook would have to be (you can use **calipers** to help you out with imagining this). Also think about the length of the hook. Discuss with your groups for the next five minutes and then we will continue to the next step.



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The Sketch

Now that you have written down the measurements, do a sketch. A two-dimensional sketch. For convenience, it might be helpful to create a side view or top view, then the other “dimension” will be created when we make it together.

Spend another **five minutes** doing this and then we will look at how to model it together.

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Creating the Model

Make sure someone in your group has a computer. Navigate to cad.onshape.com on your browser and create your account.

I'll make sure at least one person in your group is on the website and I'll walk around if there are any issues we need to troubleshoot. We'll take **two minutes** to do this.

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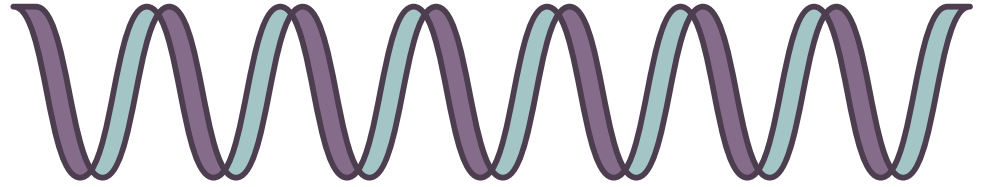
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CAD Software Guide

It won't take long.

A Quick Guide

Let's take a look at these things together;

- How to change default units
- How to create a document
- Creating a sketch and using sketching tools
- Extrusion to make 3D model
- How to make additional sketches
- How to remove parts of a model (making a hole or pocket)

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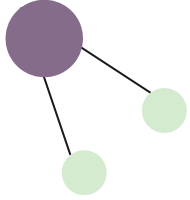
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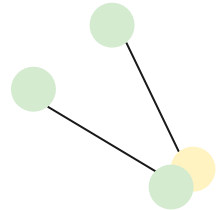
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Can you do it?



Your Turn

From now until the last ten minutes of the period, you and your group will create your model. Make sure everyone has a decent understanding and ask for help if you need it - not just from me, but from others around you too.

As you begin 3D printing more frequently, you might make use of students who have been working with CAD software for a while. They will be able to help you not only with 3D printing, but also later cutting - which makes use of OnShape as well.

In the last ten minutes, I'll show you how to send the print to me again.

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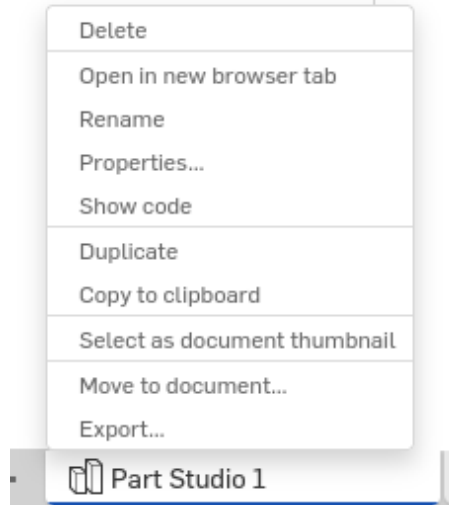
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Let's go!



Finding the Export Button

Go down and right click (or double click if you don't have a mouse) where it says Part Studio 1.



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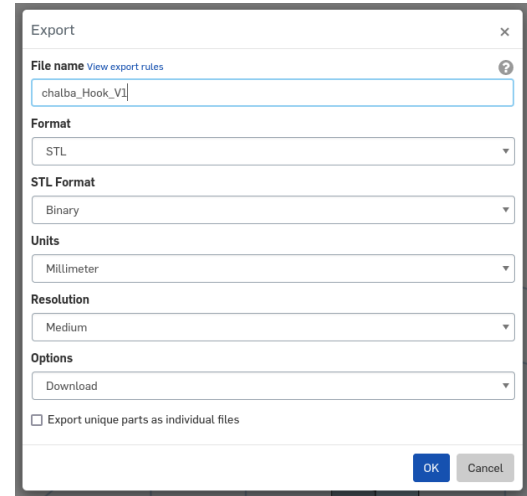
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Exporting STL

Export the file with the STL format and with a naming scheme that makes sense. I use chalba to identify my files because “ch” are the first two letters of my name and “alba” is my last name. That makes it easy to find.



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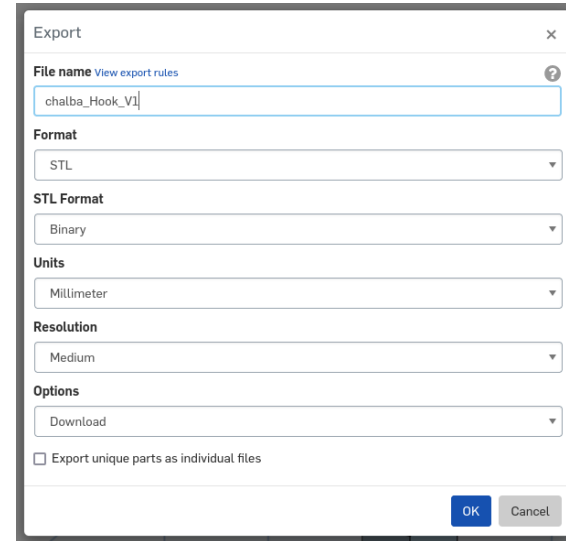
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Sending STL

Send the STL file to me via email and I'll put all of the files from the class on one printer, to be ready for tomorrow.



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