Module 1:

In this module you will learn how to make simple sketches and extrudes. Then you will be challenged to make a plate from a drawing. You will need to use a correct part name and specify the material of your part.

Pro Time: 12 hours
Fast Time: 24 hours
These times started when I uploaded this document into your project.

Lesson:
Watch the two following videos to learn how to make a sketch and how to extrude.
https://www.youtube.com/watch?v=Pa1fRs-HoGM&index=8&list=PLG_KOHBuXHNfpa1N23ZJfAHsCVbe3fpXG
https://www.youtube.com/watch?v=YUokqFe3LHA&index=12&list=PLG_KOHBuXHNfpa1N23ZJfAHsCVbe3fpXG

Adding Material:
When making a part it is important to add its material. This will allow solidworks to calculate the weight of the part. Watch the following video to see how to set a parts material.
https://cl.ly/3E283B430Q1V
You can then see the weight of the part by going to mass properties in the evaluate tab. If the part you are using is off the shelf the weight is usually listed. You can add this weight by overriding the calculated weight.
https://cl.ly/0m353j0X032w
We usually use aluminum for our parts as it has good strength to weight ratio. Aluminum alloys are named by a series. For most parts we use 6061-T6 aluminum, which is a 6000 series aluminum. The T4 shows the temper. 6061-T6 is good for flat plates but it will snap if you try and band it. For bent parts we use 3000 or 5000 series. (3000 is cheaper). If you're interested, there is more information here https://en.wikipedia.org/wiki/Aluminium_alloy

Part Naming:
We are going to try to follow a specific part naming scheme to keep our parts organized. These name will only apply to parts when make, if they are off the shelf we will use the manufacturer's part name. We are going to follow 254's convention, which is outlined here.
https://www.team254.com/documents/partnumbers/
The part we will be making today is a plate for a gearbox. It is a part with in a gearbox assembly, and this gearbox will be in the top level robot assembly. Try to give it the correct part name using this convention.

Challenge:
In your project there is a pdf of a Solidworks drawing. This drawing shows the plate that you are challenged to make. Work off the dimensions shown in the document and make sure that your sketch is fully defined. You will be able to tell it is fully defined as all the sketch lines will be black instead of blue. Remember to add the material (6061-T4) and proper part name.

Tips:
These tips will hopefully make your learning easier and help you cad quicker. Some are best practices that will help you later when adding this part to an assembly. For example it is good habit to alway extrude of the midplane. (when adding an extrude change the blind to midplane) This will make you part symmetric to the plane you used for your sketch. This will help in assemblies as you sometimes mate off those planes. (this will make more sense when we get to assemblies) When sketching I find it very useful to relate things to the midpoint of a line. You can do this by right clicking the line and pressing select midpoint. This can be shown in the following video.
https://cl.ly/3u3Q453j211P
Another useful sketching tool is construction lines. When you click on a sketch element there is a box to check which lets you click for construction. This will turn the element into a dotted line. These are usually used to help dimension other elements, as lines to mirror across or to mark the midline.