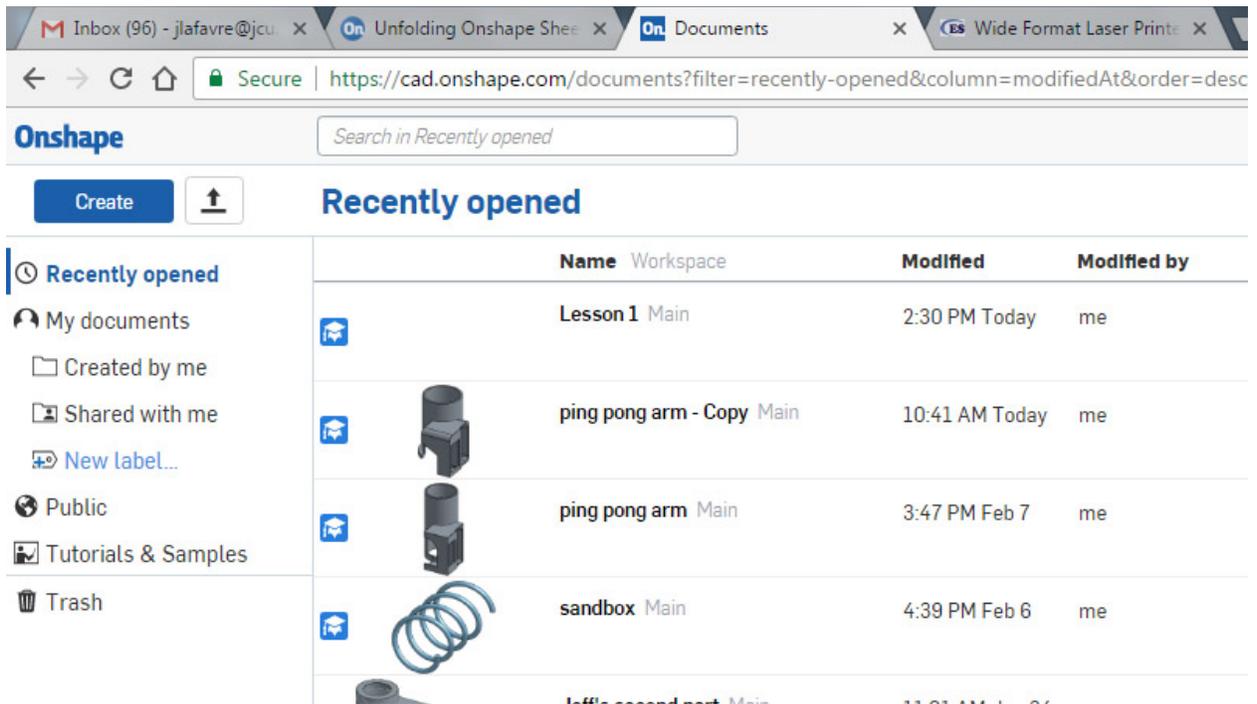Lesson 1 – Learning to use Onshape

The image below shows the computer screen after signing in to Onshape.

Onshape drawings and 3-D models are contained in "documents." A document can contain a model of just one part or it can contain many parts and drawings.

After sign in, a list of documents will appear in the main window. If you want the list to contain only your documents, then click on "**My documents**" in the left menu. You can select another category if you wish, like "**Public**." Public documents are those shared by other people and anyone working in Onshape can look at them and make copies. If you want to open a document, just click on it in the list. If you want to create a new document, click on the **Create** button.

**Creating Your First Part**

Let us get started making parts!

1. Click on the blue **Create** button.
2. In the **New document** box, enter a document name, select **Private** or **Public** (your only choice will be Public if you don't have an education account), then click **OK**

3. In your workspace you should now see three planes: Front, Right and Top (like the image below). These are the planes of a 3-D object.
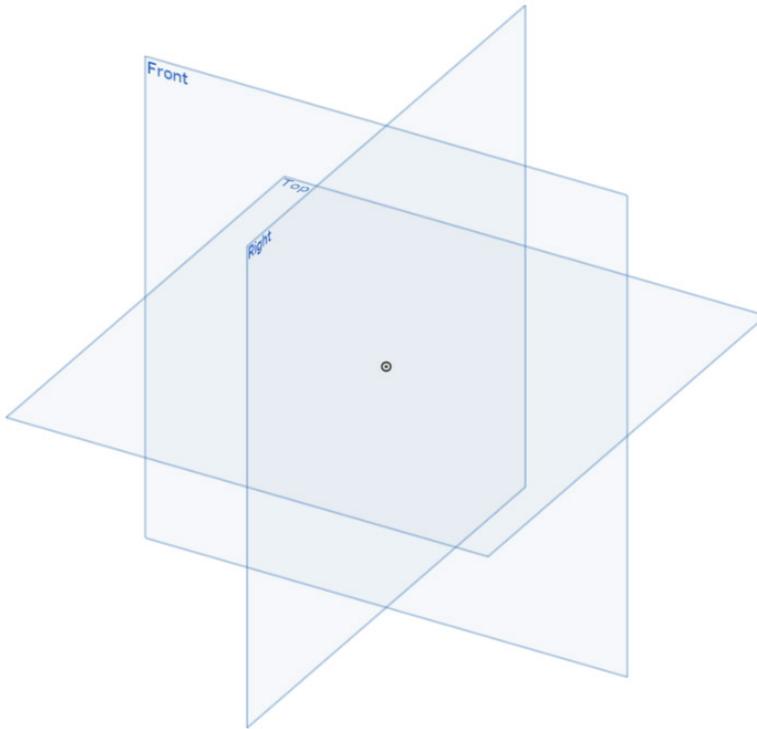

4. To create a 3-D object, first make a two-dimensional "sketch." Click the **Sketch** button near the upper left corner of the window. You will draw this sketch on the **Top** plane. Click on **Top** in the left menu. This sets the Top plane as the location of your sketch.
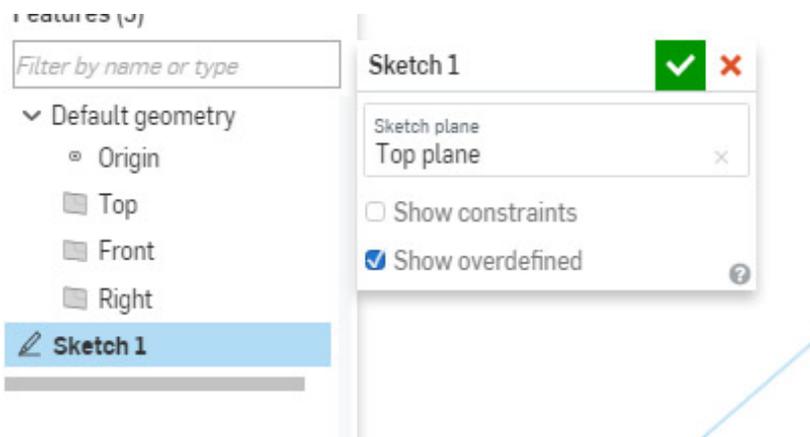
5. Move your mouse to an empty part of the workspace (outside the plane markers). Click the **right** mouse button and select **View normal to sketch plane**. Your screen should now display the Top plane as seen in image below.
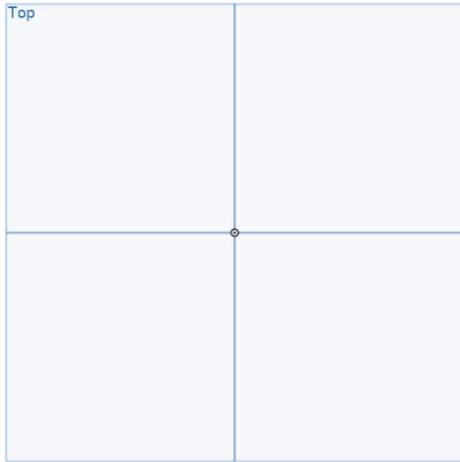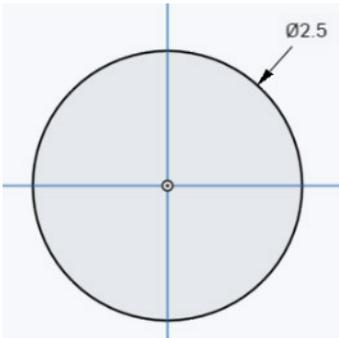
6. Select the **Circle** drawing tool ⊙ by clicking on it. Move the mouse cursor until it touches the center point of the top plane (the point should change to an orange color). Click to set the center point of the circle. Move the mouse cursor away from the center and a circle will appear. Click the mouse again to set the size of the circle. You should now have a circle drawn on the top plane (see illustration below).
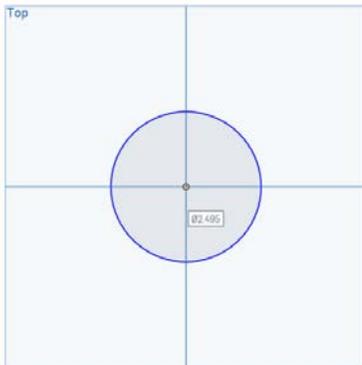
7. Notice that the circle has a blue line. The color blue indicates that the size of the circle has not been fixed yet. Select the Dimension tool by clicking on it. Move the mouse cursor over the circumference of the circle (the circle should change to an orange color). Then click the mouse. Move the mouse cursor away from the circle and click again. Now a dimension box will appear. Enter the number 2.5 in the box and press Enter key. Your circle now has a diameter of 2.5 inches. Also notice that the circle line is now black, indicating that it is **constrained** (fixed in
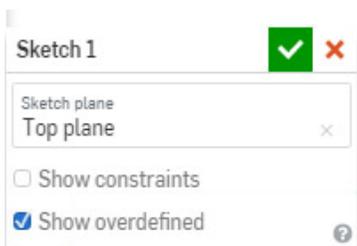
size and location).

8. Select the Circle drawing tool ⊙ and draw another circle with its center at the center of the top plane. Make this circle 0.25 inches in diameter.
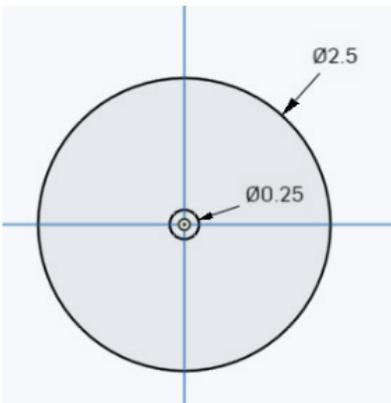

9. You have finished your first sketch! Click on the green box with check mark for Sketch 1 to close it.

10. Convert the circle in Sketch 1 into a 3-D object. Click on the Extrude tool   . Then click on the circle to extrude it. In the Extrude 1 box, the settings should be: Solid, New, Face of Sketch 1, Blind, 1 inch depth.   Click the green box with check mark to close Extrude 1.
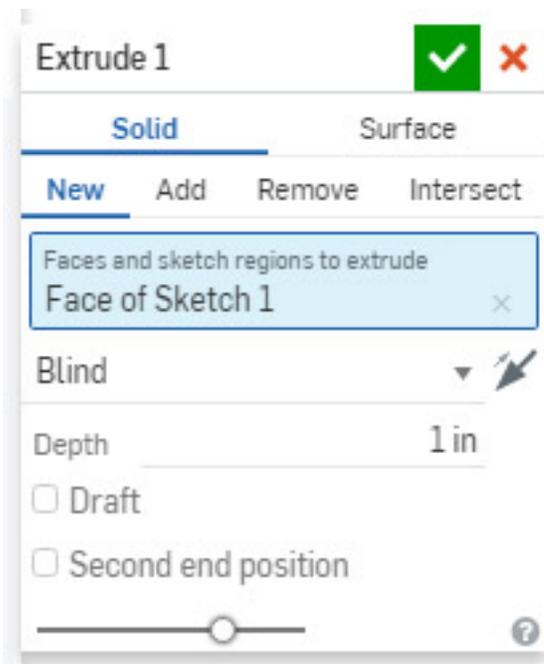
11. While holding down the right mouse button, drag the mouse to the left to rotate the image of your 3-D object. Now you will see that you have created a wheel. It has a diameter of 2.5 inches and a width (depth) of one inch. Additionally, there is a 0.25-inch diameter hole in the center of the wheel.
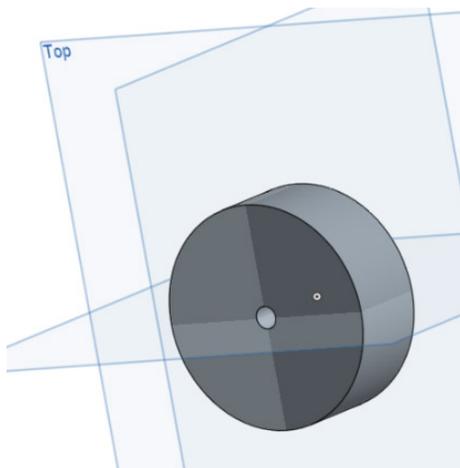
12. In the **Feature** list on the left side of the page, click on **Extrude 1** with the right mouse button. Then select **Delete** in the context menu. This will remove **Extrude 1** from your model so that you can create another 3-D object using Sketch 1.
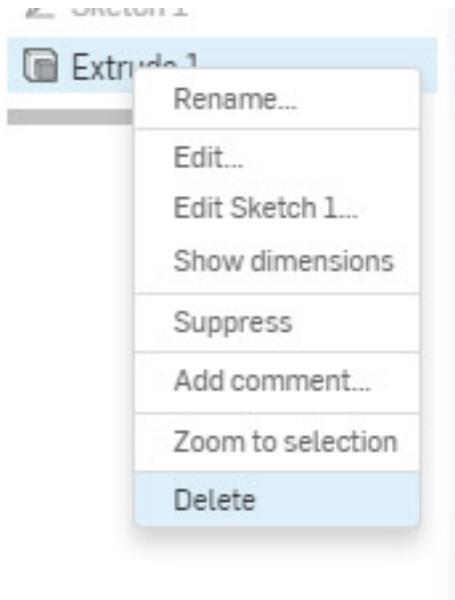

13. Use the **Revolve** tool to turn your circle into a ball. Before you can do that, you need to edit

    Sketch 1. Double-click on Sketch 1 in the list on the left to open it. Select the Line tool and draw a vertical line through the center of the circle. Then close the sketch by clicking on its green square with check mark.
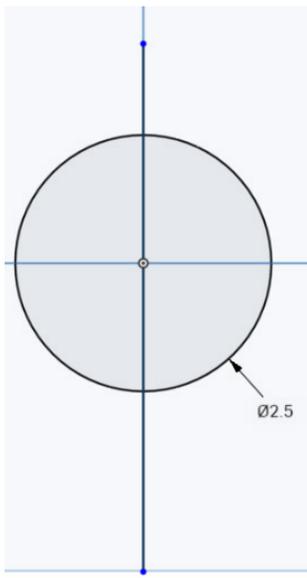
14. Click on the Revolve tool ![icon] . Then use the mouse to select half of the circle of Sketch 1 (it should change to an orange color – see below).
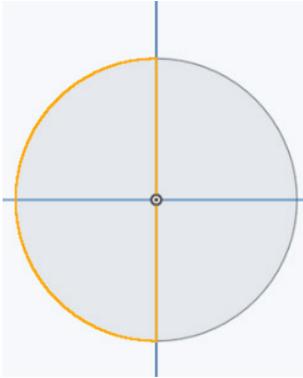
15. Look at the Revolve 1 box on the screen (see image below). Notice that the title is in red text: Revolve 1. This indicates that the revolve procedure is not complete yet. You must select an axis for revolving the half circle. Click into the **Revolve axis** slot (it should then turn blue). Then click on the vertical line going through the center of the circle.
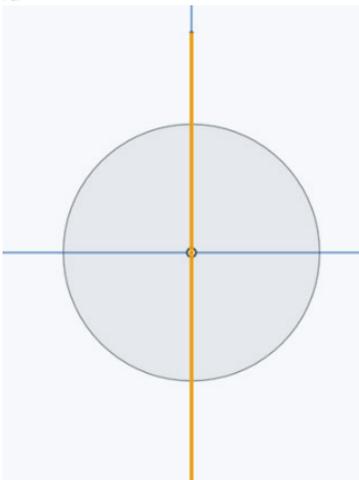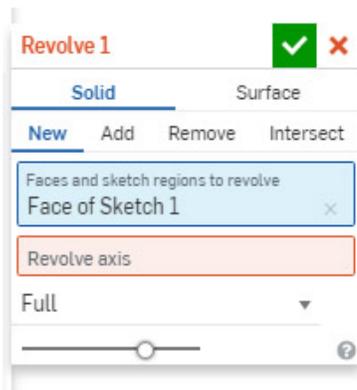
16. Now notice that the title of the Revolve 1 box is black text, indicating that a valid revolve procedure has been set. Also notice that your 3-D object is a ball. You have rotated the half circle a Full 360 degrees around the vertical line to create a ball (sphere). Click the green square with check mark to close the Revolve 1 box.
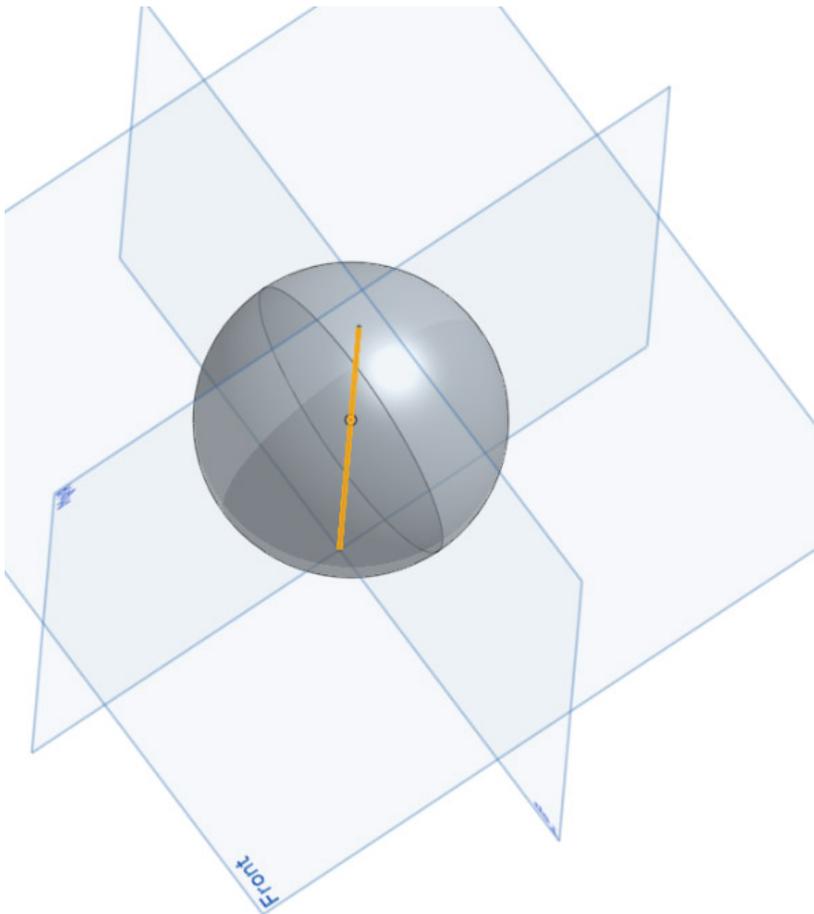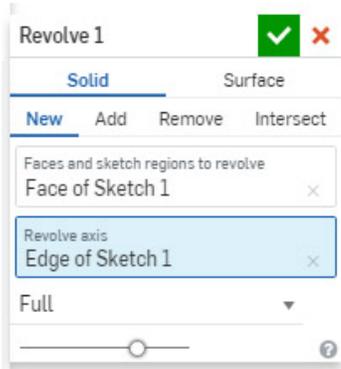
You have completed lesson 1 and have learned how to make a sketch, use the extrude tool to make a wheel and the revolve tool to make a ball.