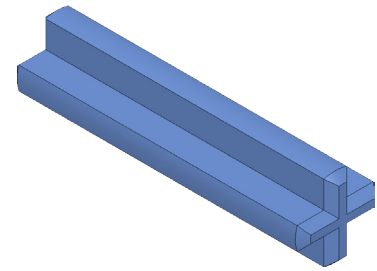




# E's Small Car Lego Axle

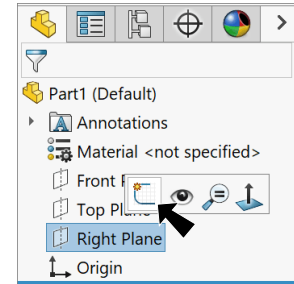


## A. Create Block.

Step 1. Click **New**  on the Standard toolbar, click **Part Metric**  and OK.

Step 2. Click **Right Plane**  in the Feature Manager and click **Sketch**  on the context toolbar, **Fig. 1**.

Step 3. Click **Circle**  (S) on the Sketch toolbar.




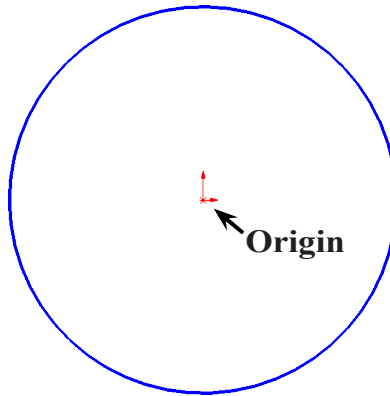
**Fig. 1**

Step 4. Sketch a circle starting at the Origin , **Fig. 2**.

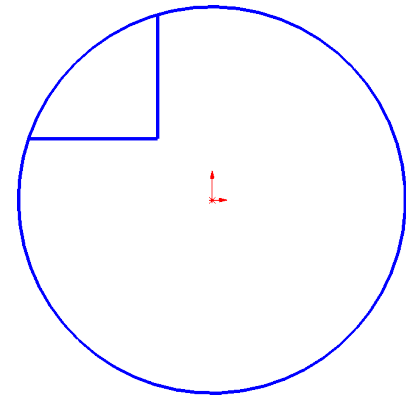
Step 5. Click **Line**  (L) on the Sketch toolbar.

Step 6. Sketch **two perpendicular line off circle**, **Fig. 3**.

Step 7. **Unselect Line tool**. To unselect, right click graphics area and click **Select**  from menu.

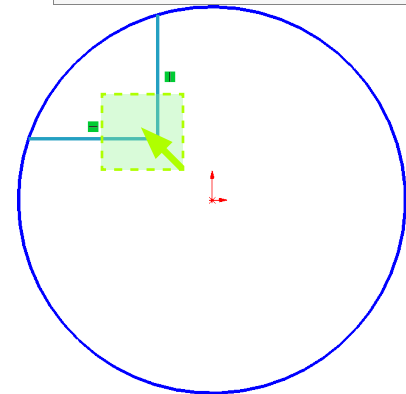
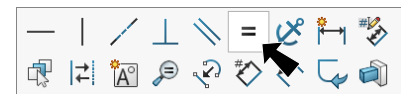


**Fig. 2**



**Fig. 3**


Step 8. **Drag selection to left to select both lines** and click **Make Equal**  on the context toolbar, **Fig. 4**.



**Fig. 4**

Step 9. With the two line still selected, click **Circular Sketch Pattern**  **Circular Sketch Pattern** in the **Linear Sketch Pattern flyout**  **Linear Sketch Pattern** on the Sketch toolbar.

Step 10. In the Circular Sketch Pattern Property Manager set:  
 under Parameters, **Fig. 5**

click in the center for pattern  box

click **Origin**  (Point 1), **Fig. 6**

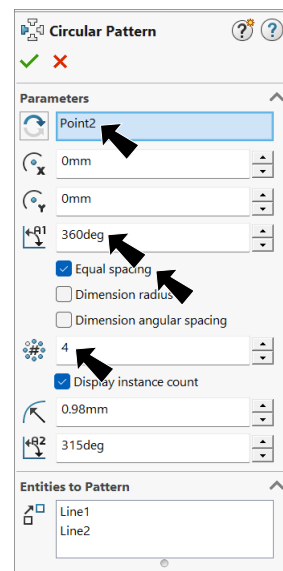
**Angle**  **360**

select **Equal spacing**

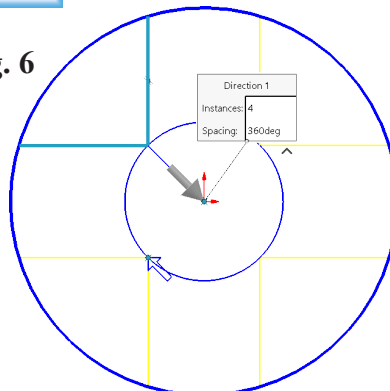
**Number of Instances**  **4**

under Entities to Pattern  
 both lines preselected

click **OK** .



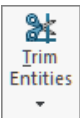
**Fig. 5**



**Fig. 6**

Step 11. Click **Smart Dimension**  (S) on the Sketch toolbar.

Step 12. Add dimensions, **Fig. 7**.

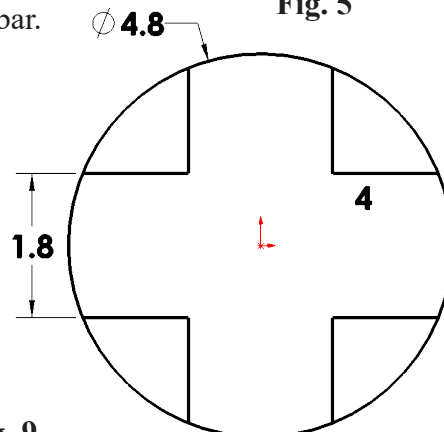
Step 13. Click **Trim Entities**  (S) on the Sketch toolbar.

Step 14. In the Trim Property Manger:

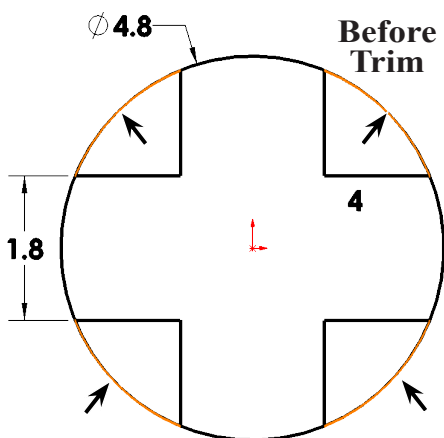
select **Trim to closest** , **Fig. 8**

Trim the segments (4) of circle between the lines, **Fig. 9**.  
 Click segments to trim.  
 Results shown in **Fig. 10**.

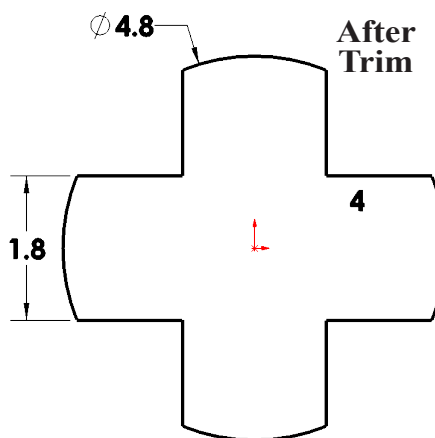
Click **OK**  when done.



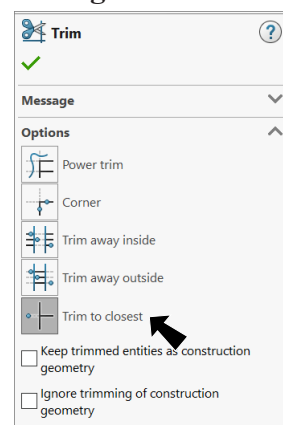
**Fig. 7**



**Fig. 9**



**Fig. 10**



**Fig. 8**

## B. Save as "LEGO AXLE".

Step 1. Click File Menu > Save As.

Step 2. Key-in **LEGO AXLE** for the filename and press ENTER.

## C. Create "LEGO AXLE BLOCK".

Step 1. Click Tools Menu > Blocks > Save.

Step 2. In the Save As dialog box, **Fig. 11**  
key-in **LEGO AXLE BLOCK**  
for the filename  
navigate to:  
**Documents\Tech Ed 25-26\CCAT**  
click Save button.

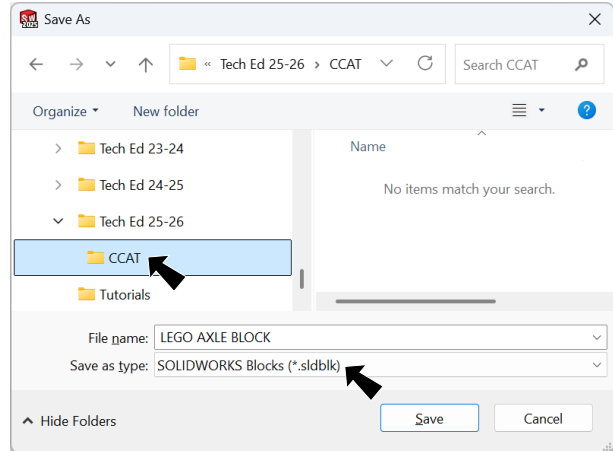


Fig. 11

## D. Extrude.

Step 1. Click **Offset Entities**  on the Sketch toolbar.

Step 2. In the Offset Entities Property Manager set:  
under Parameters, **Fig. 12**

**Distance**  **.3** (clearance for Axle hole)

check **Reverse**

uncheck **Bi-directional**

under Construction geometry

check **Base geometry**

click any **entity**, **Fig. 13**

**yellow offset circle on inside -**

**base geometry (construction) on outside**

click OK .

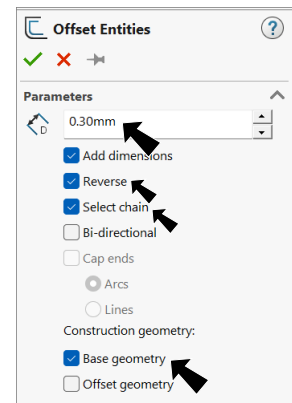


Fig. 12

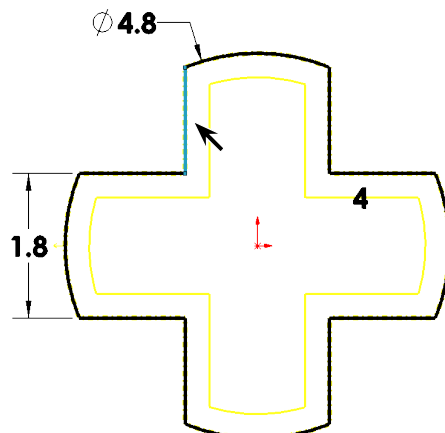


Fig. 13

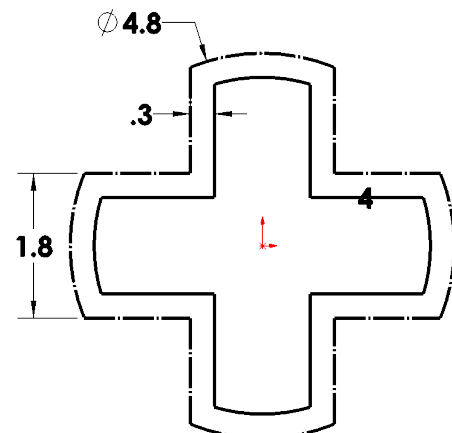


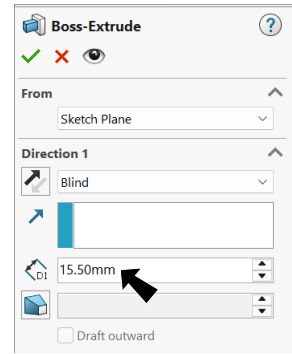
Fig. 14

Step 3. Click **Features**  on the Command Manager toolbar.

Step 4. Click **Extruded Boss/Base**  on the Features toolbar.

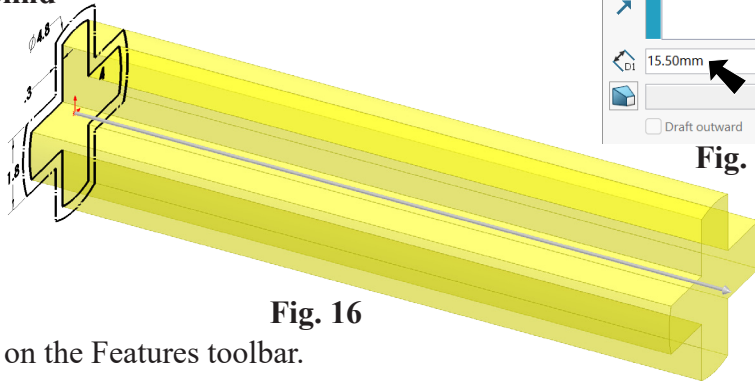
Step 5. In the Property Manager set:  
under Direction 1, **Fig. 15**  
End Condition **Blind**

**Depth**  **15.5**  
click OK .

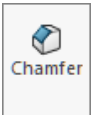


**Fig. 15**


Step 6. Save  (Ctrl-S).






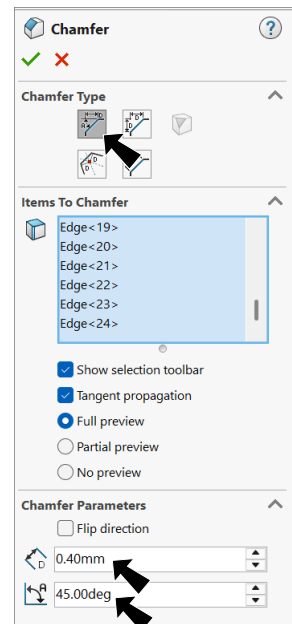
**Fig. 16**

Step 1. Click **Chamfer**  on the Features toolbar.


Step 2. In the Chamfer Property Manager set:  
under Chamfer Type, **Fig. 17**

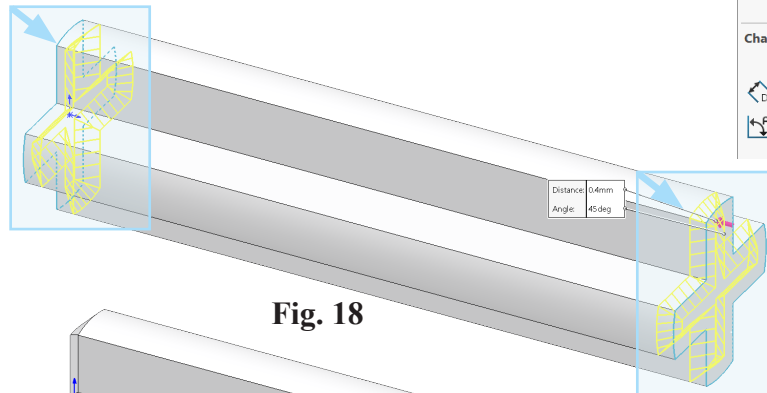
select **Angle Distance**   
**drag a selection to right select all end edges and drag  
another selection at other end to select end edges, Fig. 18**  
under Chamfer Parameters

**Distance**  **.4**  
**Angle**  **45°**  
click OK .

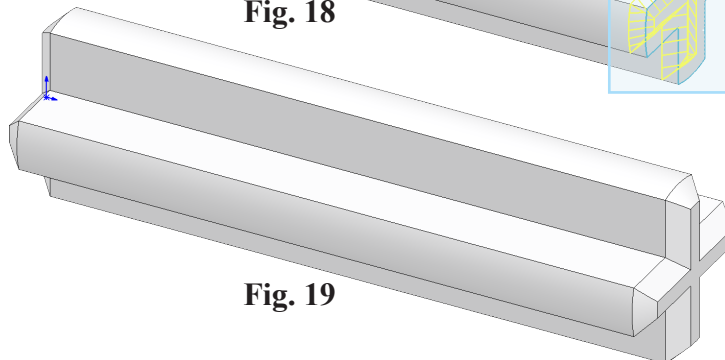


**Fig. 17**

Step 3. Save  (Ctrl-S).




**Fig. 18**



**Fig. 19**

## F. Mate References.

Step 1. Click **Reference Geometry**  on the Features toolbar and **Mate Reference** from the menu.

Step 2. In the Mate Reference Manager set:  
 under **Primary** Reference Entity  
 click **cylindrical face**, Fig. 21  
 click OK .

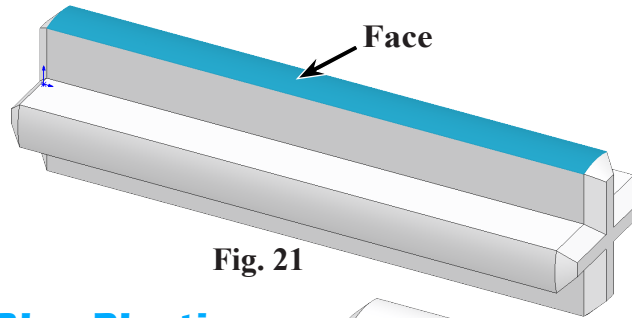


Fig. 21

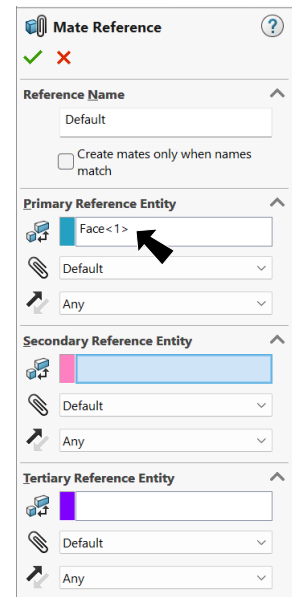


Fig. 20

## G. Appearance: Blue Plastic.

Step 1. Click part, click **Appearance Callout**  on the context toolbar and click **LEGO AXLE** , Fig. 22.

Step 2. In the Appearances Task pane, expand **Plastic**, click **Medium Gloss** and in the lower pane select **blue medium gloss plastic**, Fig. 23.

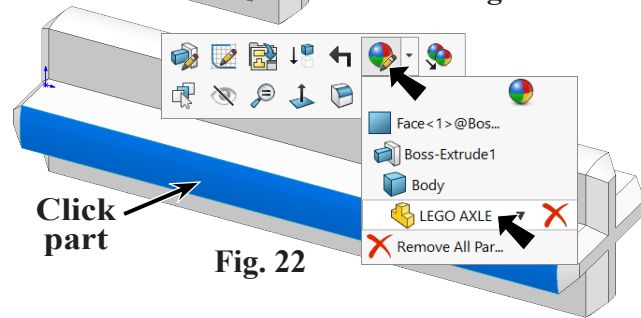



Fig. 22

Step 3. In the Appearances Property Manager:  
 under **Color**, Fig. 24  
 set **RGB values**  
**R 103**  
**G 136**  
**B 198**  
 click OK .

Step 4. Save  (Ctrl-S).

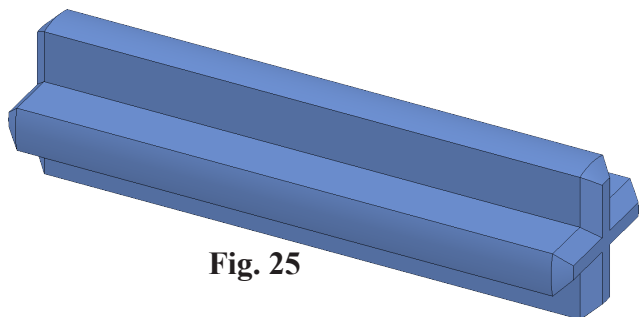


Fig. 25

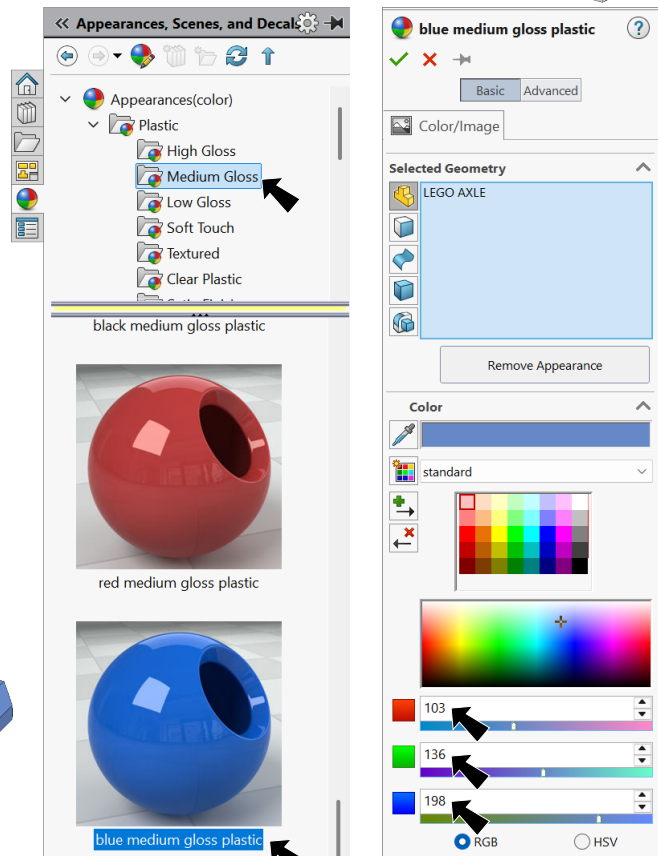


Fig. 23

Fig. 24