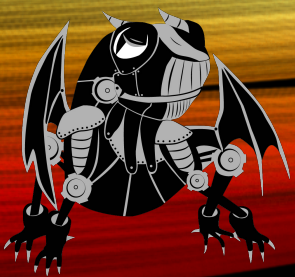


3D PRINTING WITH FUSION 360

Sanjith Udupa - Black Frog Robotics 6134

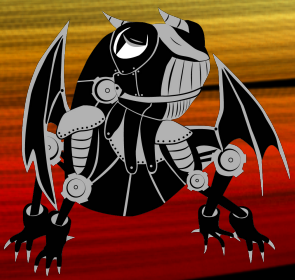


AUTODESK®



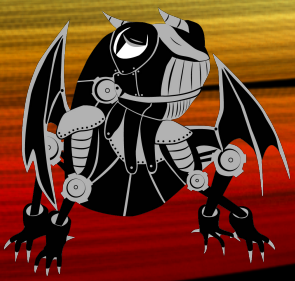
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- 3D Printing in FTC
- Examples
- Designing a model
- Saving + Sending



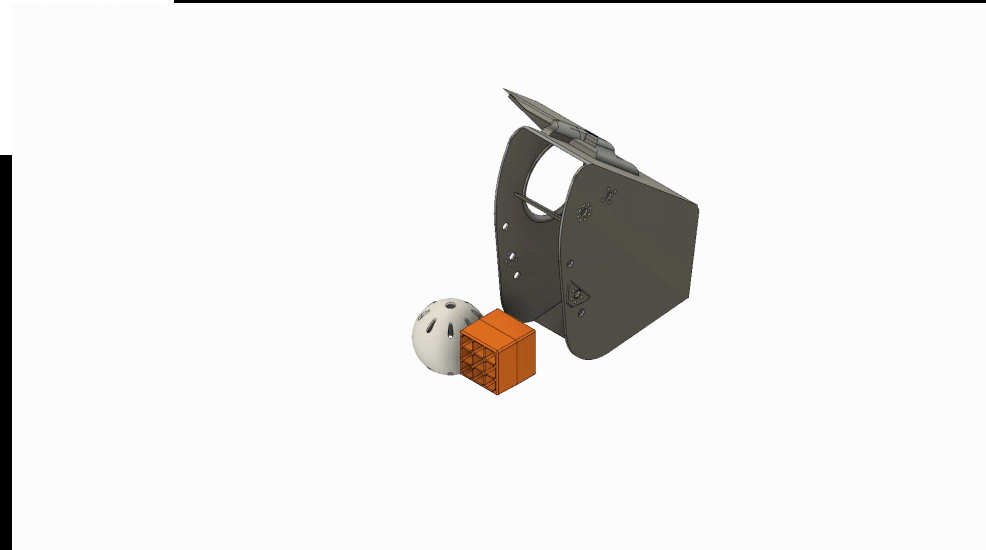
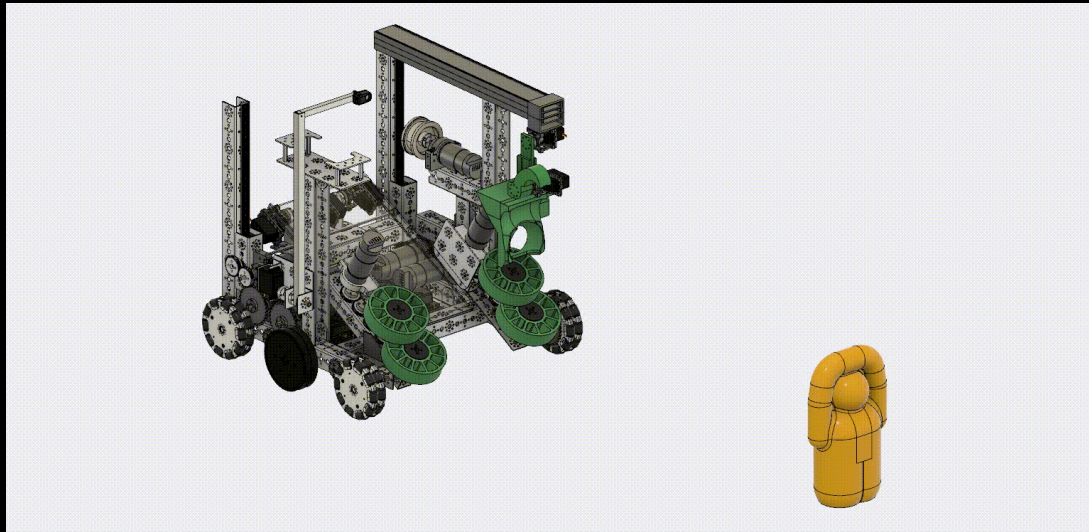
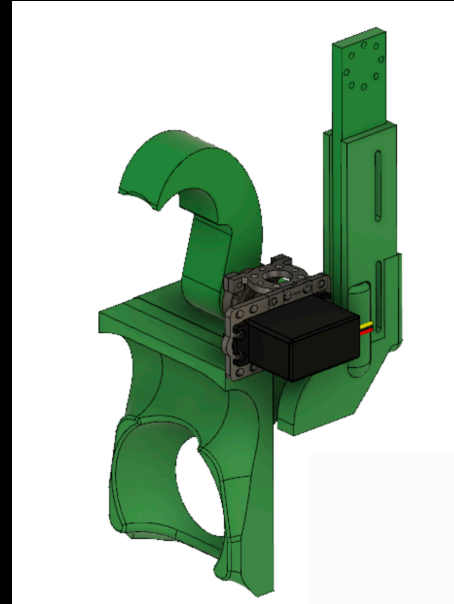
3D PRINTING FOR FTC

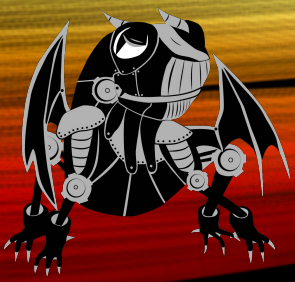
- 3D printing can be useful in FTC.
- You can use it for making custom parts which are not readily available to buy and have very precise angles and measurements that would be hard to cut.



EXAMPLES OF 3D PRINTED PARTS

1. Alliance Marker
2. Ball shooter ramp (Velocity Vortex)
3. Relic Grabber (Relic Recovery)





USES OF 3D PRINTING IN FTC

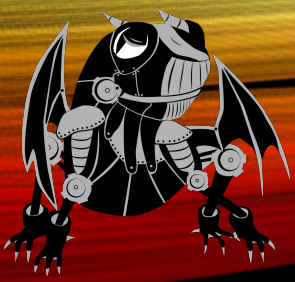
- You can 3D Print parts that would be hard to cut or woodwork. It also allows you to make parts have a set dimensions and be very accurate with curvature and angles.
- You can make accurate measurements and see the measurements before having the product.
- It is relatively low cost and is easy to redo.



DESIGNING YOUR MODEL

STEPS TAKEN TO MAKE THE RELIC GRABBER

- Downloaded the relic .STEP file from andymark.com
- Imported it into our project and put it into the design.
- Created a block and used the combine tool set to the cut mode and made a mold of the relic.
- Made a smaller block and made that cut through the top of the other half of the relic
- Made it stronger and added mounts for the servos



LET'S DESIGN AN ALLIANCE MARKER!

<RG06> Alliance Marker – Robots must include a *Team* supplied, *Alliance* specific marker on two opposite sides of the *Robot* to easily identify which *Alliance* a *Robot* is assigned to. The *Alliance Marker* must be displayed on the same side of the *Robot* as the *Team* number, within a 3" distance of the number. The *Alliance Marker* must be visible to the Referees during a *Match*.

- a. The Red *Alliance Marker* must be a solid red square, approximately 2.5 inches x 2.5 inches (6.35 cm x 6.35 cm).
- b. The Blue *Alliance Marker* must be a solid blue circle, approximately 2.5 inches (6.35 cm) in diameter.
- c. Both *Alliance Markers* must be removeable in order to swap them between *Matches*.
- d. The *Alliance Marker* must be robust enough to withstand the rigors of *Match* play. Example robust materials include: 1) *Alliance Marker* template printed and laminated; mounted on polycarbonate sheet, wood panel, metal plate, etc.



SAVING AND SENDING

- When you have finished, arrange the body on the layout grid as you would like it to print
- Select the body
- Right click the body
- Select "Save as STL"
- In the menu, make sure that "export to 3d print utility" is unchecked
- Select a good location to save it
- Save it, send it to a 3D Printing place.