

3D Printing Project Guidelines (25 pts)

[3D Printing Basics info](#)

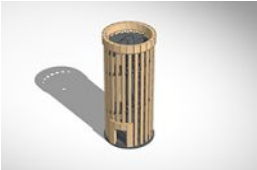



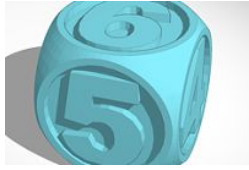
[Tinkercad tutorial](#)

We're using an online program called [Tinkercad](#) to create our designs.

Before you begin the tutorials, you need to create an account on [Tinkercad](#) Use your school email and the Sign Up with Google option (click on "more providers" option)

Step #1: Learn the basics of Tinkercad & submit screenshot

You must complete each of the 5 tutorials below. To earn credit for all of the tutorials, make sure to take a screenshot at the end of the LAST one and copy this image in the box below:

 Learning the Moves	 Camera Controls	 Creating Holes	 Scale, Copy, Paste	 Die on the Workplane
---	--	---	---	---

Screenshot of last tutorial:

Step #2: Create a personal & creative 3-d design then include a screenshot

Below are some ideas for project. Your only limitation will be that the final printed cost must be under \$3, however size is not important to the design stage. Read the rubric before you begin & be creative! Add details that make your design unique. You must include in your written reflection how you made your design personal, creative and/or useful to you during the creating/designing stage.

- 1) [Keychain:](#) or [Luggage Tag](#) (Personalize it...make it more than just some letters)
- 2) Invention - create something that solves a real life problem and/or is useful to you ([Example](#))
- 3) Action Figure or Figurine ([Example](#)) or Miniature Board Game Pieces ([Example](#))
- 4) Jewelry ([Example](#)) or something decorative to hang (like an [ornament](#))

Screenshot of final product from Tinkercad:

Step #3: Determine the cost of your design, share final STL file & screenshot

- 1) Save your final Tinkercad design as an STL file in your google drive. (EXPORT your tinkercad file to your chromebook, access your DOWNLOADS and ADD the STL file to your google drive)
- 2) Upload the STL file to this [3d print calculator](#) to determine the final cost to print. The parameters for the calculator can be found [HERE](#). Dilate your design, if necessary, and take a screenshot of the the final calculator
- 3) Your final STL final needs to be linked to [THIS SPREADSHEET](#) by SHARING a link to the file.
Add final printing parameters

Screenshot of final cost calculator

Step #4: Use your chromebook to take a picture of your final print and include it on our [GOOGLE SLIDE](#) (each person can insert an individual slide)

Step #5: Submit a written reflection on Google Classroom.

Discuss what you learned in this project...

Phase 1--Designing: How did you come up with your design? How was it personal/important/useful to you? What details did you add to make it more personal & creative?

Phase 2--Creating: What do you think about the 3D design process? What is the most interesting thing you learned? What was the most challenging part of this project?

Phase 3--Sharing: AFTER you have your printed design, reflect on what you might have done differently...did it come out looking just as you expected? What could you add or do differently the next time you design a 3-d print? How could you now use the skills you learned to design something you might need?

Grading Rubric

- 1) Complete & submit all 5 tutorials by _____ _____ 10 pts
- 2) Link to final 3-d design (see rubric) submitted by _____ _____ 12 pts
- 3) Final written reflection by _____ _____ 3 pts

Functionality _____ 3 pts	Excellent Solved all aspects of the problem/design challenge with 100% accuracy. Design reflects critical thinking and addresses a specific need.	Proficient Solved most aspects of the problem/challenge, but has 1 incorrect component. Design meets the need it was designed for.	Satisfactory Solved aspects of the problem/challenge, but has 2 missing/incorrect components. Design nearly meets the need it was design for.	Poor Multiple missing or improper components. Design doesn't meet the need it was designed for.
Design Efficiency _____ 3 pts	Excellent No wasted material, printed to the correct scale.	Proficient Little wasted material, printed to the correct scale. Could have been oriented differently to save material.	Satisfactory Scale is off, printed a little too large or small.	Poor Scale is off, printed way too large or too small.
Originality & Creativity _____ 3 pts	Excellent 3D print is personalized and unique with multiple components added.	Proficient 3D print is completed but is similar to another design. Could have added more details.	Satisfactory 3D print is completed but is too similar to another design. Design is random and creativity is minimal.	Poor 3D print not original and was downloaded from the internet or uses pre-made parts.
Aesthetics _____ 3 pts	Excellent Final project is creatively balanced and extremely accurate.	Proficient Final print is creatively balanced and accurate but has some design flaws.	Satisfactory Final print is random and somewhat accurate. The design did not follow the "YHT" design rules.	Poor Final print is random and not very accurate

Inspiration for creating your own unique design:

[MakerBot Professionals Videos](#)

[Thingiverse](#)

[TinkerCad Gallery](#)

