3D Printing BADGE CHECK

Name: _____

Mentor: _____

Date: _____

BADGE PERKS:

Use of 3D printer during non-labs times.

TERMS AND SKILLS YOU SHOULD KNOW:

3D Printing	*.stl*	*Filament*	*Extruder*	*Makerbot*
123D Design	*.svg*	*Shells*	*Raft*	*Supports*

HELPFUL RESOURCES:

(*Include bibliographic info on books, articles, etc. or hyperlinks to helpful online resources. Books included should be in the CLP collection.)*

EXPLANATION OF SKILLS:

This badge certifies that the earner has demonstrated proficiency in designing a 3D object to be printed. Using the 123D Design app, earner will employ the use of the extrude, move, merge, subtract, scale, and text tools to create a badge. The earner will then 3D Print this badge and keep it as proof of their design skills.

BADGE CHECK GUIDELINES:

- You are allowed to use the Badge Resources and other print or online tools if you get stuck during your badge check, but no one-on-one help from others
- You must complete all questions and tasks associated with the badge you're earning
- You must present the evidence of your work to a teen mentor for verification and sign-off

KNOWLEDGE CHECK:

1. What is the name of the material used in 3D printing?
2. What is the name of the piece on the 3D printer that heats the filament and "draws" the 3D object?
3. What type of file do you need to make a 3D print?

SKILL CHECK:

For this Badge check, the earner will create the Badge!

1. Open 123D Design and Import three .stl files (as sketches). A mentor will download these files for you or show you where they can be found.
    a. Badge Circle.svg
    b. Badge Sunburst.svg
    c. CLP Logo.svg
2. Use the **Extrude** tool to extrude these three shapes. Extrude them approximately 5mm.
3. Use the **Move** tool to move the Sunburst off the grid, so that it is floating about 3mm high. Then move it so it is on top of (and overlapping) the Circle. Center the Sunburst in the middle of the Circle.
4. Use the **Combine > Subtract** tool to remove the Sunburst shape from the circle. It should now look like a badge with a sun-shaped indentation in it.
5. Use the **Scale** tool to shrink the CLP Logo (the letter L). Shrink it until it will fit on the circle/badge (leave room for words too). Use Non-uniform scaling to keep the Z height at 5mm.
6. Move the CLP Logo onto the badge, within the starburst-shaped hole. Make sure that it sticks out from the surface of the coin (if not, use the **Extrude** tool.)
7. Use the **Text** tool to type "3D Printing." Adjust the height of the letters until they will fit on the badge.
8. Extrude the letters with the Extrude tool, 4-5mm.
9. Move your 3D letters under the CLP logo.
10. Use the **Combine > Merge** tool to turn the badge, logo, and letters into a single shape.
11. Save your work and export the design as an .stl file.
12. Open the .stl file on a 3D Printing program like Makerbot and print your badge!

UPON COMPLETION:

- Submit sheet with **knowledge check** answers to mentor for review
- Present the printed badge to mentor for review
- If a mentor cannot review your badge check immediately, schedule a time for you and a mentor to go over your badge check

BADGE CHECK APPROVAL:

_____ _____

EARNER'S SIGNATURE MENTOR'S SIGNATURE