



printrbot

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## Introduction to 3D Design and Printing

### OVERVIEW

The project takes place in two, two hour sessions. In the first session, students are asked to design a keychain using Tinkercad. This is a simple flat object that can be personalized with letters or symbols and has a small hole to hang from.

In the second session students will draw a solid object (again it can be personalized) and configure Slic3r to print it as an empty vase modifying the infill and top layers. While the printers work, the basics of 3D printing can be thoroughly explained.

### GRADE LEVELS

Tinkercad is very easy to use so the modeling part could be carried out by elementary or middle school children. The second part of the workshop using the printer set up and slicing software is more appropriate for older children if they are to complete the project independently.

### STEPS TO COMPLETION

- 1.) Students are introduced to the idea of 3D printing and how the printers actually function. They could be shown a printer in action and could be shown several pieces that have been produced using 3D printers.
- 2.) Students are shown Tinkercad and are introduced to the interface. They may be led through several tutorials or asked to complete a certain number of the [quests on the Tinkercad website](#).
- 3.) Once the students are comfortable with the design process, they are asked to design a keychain using Tinkercad. This is a simple flat object that can be personalized with letters or symbols and has a small hole to hang from.
- 4.) In the second session students will once again draw a solid object of some kind (again it can be personalized)

5.) This time they are asked to configure their own Slic3r settings to print their object as an empty vase (modifying the infill and top layers.)

6.) While the printers work, the basics of 3D printing can be thoroughly explained.

### FOLLOW UP

As this is meant to be only an introduction to 3D printing, there are any number of follow up activities that might take place. Students might be engaged in a discussion or reflection on what was successful during the activity or on what didn't work well. They might have the opportunity to do a gallery walk and view the pieces that other students have created. They of course, should be challenged from this beginning to see what else they can create.

### EXTENSION QUESTIONS

- How does 3D printing have the potential to disrupt the manufacturing industry?
- What are the most important part of a 3D printer? How does each of them work?
- How can 3D printing be used in a variety of industries? (architecture, medicine, education, electronics, etc)

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