



Fab Lab Essentials

Vacuum Forming - Ice Tray



Name	Period	Score
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Introduction

There are many ways to solve a problem. Sometimes it is as simple as applying a piece of duct tape. Other times it takes months or years for a product to progress from an idea into full-scale production. Often engineers and designers use a specific set of steps (sometimes called a design process) to find the best solution to a problem.

In this activity your team will act as designers in a company that markets and sells business novelty products. Your task is to create a fun and usable ice cube tray for a restaurant business to create signature ice cubes. A design process that progresses from brainstorming to presenting a final design will be used and documented. Each member of the team will have a product to present to the company executives for final approval.

Equipment

- Laptop computer with Inventor
- CNC Mill or other means to make molds
- Vacuum Form Machine
- Fab Lab Notebook
- Scissors
- Pencil
- Pen

Materials

- Pieces of wood no larger than 6" x 6"
- Double stick tape
- Vacuum Form Plastic sheets

Procedure

In a team of three or four, using only the materials provided, design and CNC mill a mold to be used in conjunction with a vacuum form machine to produce a creative, fun ice cube tray for each member that can be used as a sample design to show restaurant clients. You also need to create a fictional name and logo for your company to be a basis for your design drawn in the Fab Lab notebook.

Brainstorm-Each member of the team will draw a minimum three brainstorming ideas for your phone stand in your Fab Lab notebook. The more ideas you generate the better. You may handle and inspect the materials and research examples from the internet but you cannot copy anything directly or down load any copy written or trademarked material from the internet.

Design- Sketch an annotated solution in your Fab Lab notebook. The design needs to be such that it can be transferred into Inventor and made into a STL file. The design needs to be a reverse form in order for the mold to be used in a vacuum form machine making a correct usable end product. All changes from your design idea to the actual ice cube tray prototype need to be documented.

Load your files into the appropriate software on the computer attached to the CNC mill you are using and run the file.

Once your mold has been made, follow the instructions for the 10-B Thermo-Vac in the  video clip at [<https://www.youtube.com/watch?v=74I7hfbgi0s>].

When all ice cube trays from your team are complete you will present your design for approval of the large group.

Scoring

Your members in your team will receive points for the following.

Creativity: Up to 15 points for creativity in the design and use of each individuals materials

Teamwork: Up to 10 points for how well your team works together

Performance: Up to 5 points for creating a functional key chain.

Conclusion

1. What other materials can be used to create molds for the vacuum form machine?
2. What methods can you use to present your solution at the end of a design process?
3. What other products would you use the vacuum form machine for.
4. How is vacuum forming used in the manufacturing process? What Industries would use it?

