

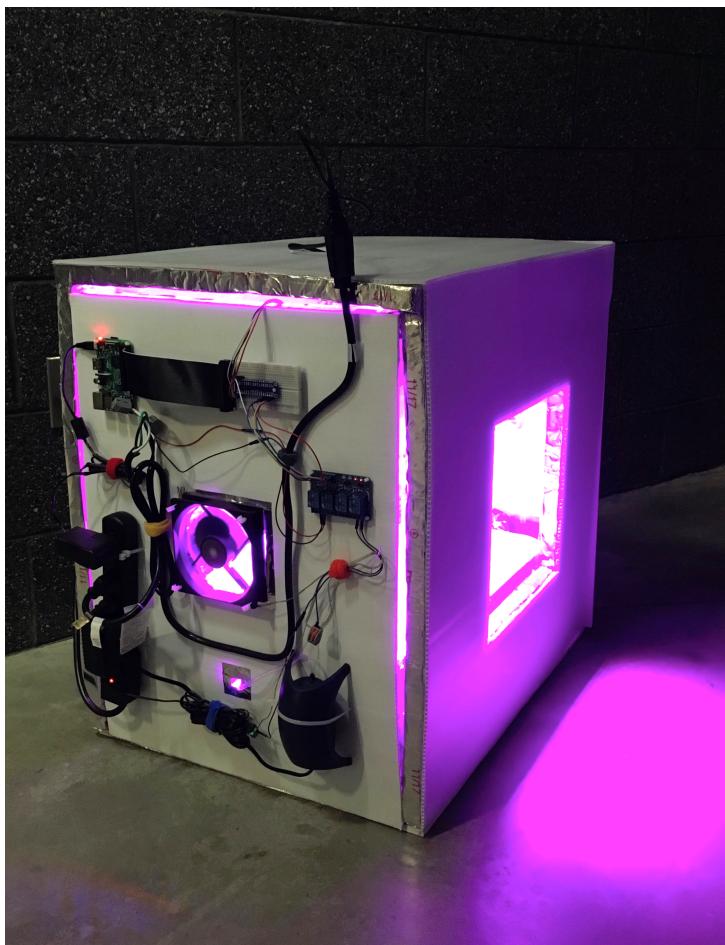
FCS4ALL Low Cost Food Computer Construction Guide

This guide provides instructions to building a low cost Food Computer. After several design iterations, we reached a Food Computer structure that was both simple to construct and to use. Our costs totaled around \$300. To build the Food Computer, we borrowed our tools from the Station North Tool Library (<https://www.stationnorthtoollibrary.org/>). We recommend looking in your community for resources that rent or loan tools for free.

The following instructions describe how to build our Food Computer structure and our brief notes on the tech panel. Because our technology is now out-of-date with the most recent Food Computer version, we do not detail our tech set-up. Please refer to the resources for the latest Food Computer build as a model for the software and hardware components: https://wiki.openag.media.mit.edu/pfc_edu_3.0#get_started.

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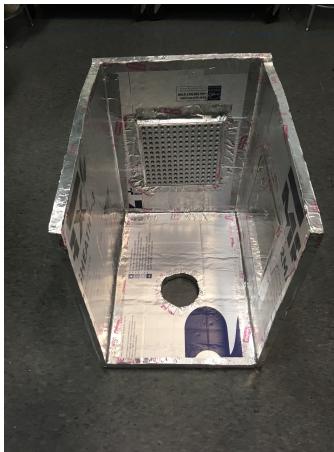


Part 1: Creating the Basic Shell

There are six panels to our Food Computer. The bottom panel is made of PVC board in order to be sturdy enough to carry the weight of the growing equipment inside. The rest of the panels, which includes the tech panel, three side panels, and the top, will be made out of insulation foam to create a closed environment. The tech panel will be attached to the PVC board as a base and the rest of the panels will be attached together to create an outer shell that allows for easy removal and access to the inside of the Food Computer. We create holes in the panels for the air pump and fan (tech panel) and for the light, air vent, and window (outer shell).



Tech panel and bottom



Outer shell (turned on side)



How the shell components fit together

Materials:

- Insulation Foam (11'x9' sheet, 1 inch thickness)
- PVC Board (26"x20")
- Aluminum Foil Tape
- Red and blue LED Grow Light (11"x11")
- Glass square/window (11"x11")

Tools:

- Circular Saw
- Jig Saw
- Drill / drill bits (circular)



Instructions

Preparing the Shell Pieces

1. Cut the panels using the circular saw

1. Measure and cut three 24 by 18 inch rectangles out of insulation foam. These will be the top and the shorter sides (including tech panel) of the Food Computer.
2. Measure and cut two 25 by 24 inch rectangles out of insulation foam. These will be the longer sides of the Food Computer.
3. Measure and cut one 26 by 20 inch rectangle out of PVC board. This will be the base of the Food Computer.

2. Cut holes for equipment using the jig saw

Note: The following measurements are for the materials we used, adjust the sizes to your own materials accordingly.

1. Take a 24 by 18 inch panel and measure and cut a 4 by 4 inch square in the center for the fan. This will be the tech panel.
2. Take a 24 by 18 inch panel and measure and cut a 4 by 4 inch square in the center for the air vent. This will be the panel opposite of the tech panel.
3. Take a 24 by 18 inch panel and measure and cut a 10 by 10 inch square in the center for the light. This will be the top panel.
4. Take a 25 by 24 rectangle panel and measure and cut a 10 by 10 inch square in the center for the window.

3. Cut hole for air pump tube using drill

1. Take the tech panel and create a 1-inch hole (or however big enough to pass through the tube of your air pump).



Longer side panels



Tech panel and air vent panel



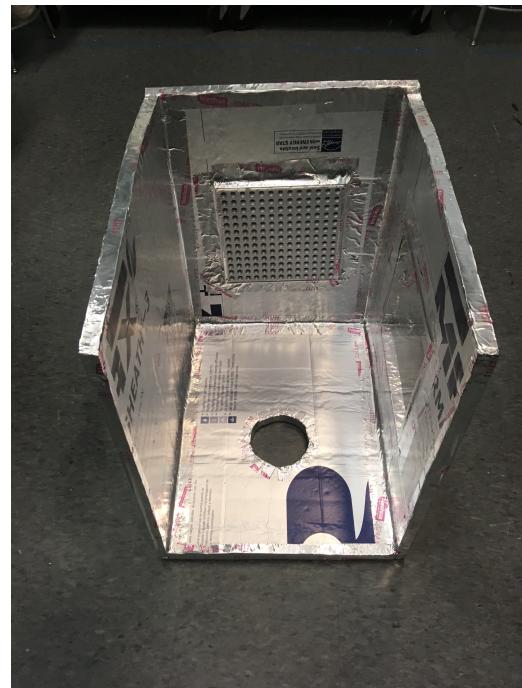
Top panel and bottom panel

Attaching the Shell Pieces

1. Construct the L from the bottom panel and the tech panel
 1. Set the tech panel on top of the bottom panel on the edge of matching size in the center. Use aluminum foil tape to secure the pieces together.
2. Construct the outer shell from the remaining panels
 1. Attach the air vent panel and the two longer panels to the top panel. Use aluminum foil tape to secure the pieces together.
3. Add the window and light to the outer shell
 1. Use aluminum foil tape to tape the light on the inside of the top panel.
 2. Use aluminum foil tape to tape the window on the inside of the side panel.



Make sure the tech panel is centered so the shell will fit securely over the L



Make sure to check that the edges of the panels fully line up

Part 2: Enhancing the Exterior

This section helps reinforce the structure and protect it from damage. However, feel free to skip this section if you are low on funds; it does not impact the Food Computer's functionality.

Materials:

- Corrugated Plastic (12'x10' sheet)
- Glue Spray
- Air vent (5"x5")
- Zip Ties

Tools:

- Circular Saw
- Jig Saw
- Ice pick (any sharp tool to poke through shell)



Preparing the Exterior

1. Cut the panels using the circular saw:

1. Measure and cut three 24 by 18 inch rectangles out of insulation foam. These will be the top and the shorter sides (including tech panel) of the Food Computer. We want the corrugated plastic to fit exactly over the foam.
2. Measure and cut two 26 by 24 inch rectangles out of corrugated plastic. These will be the longer sides of the Food Computer. We want an extra inch of length to cover the sides of the shorter panel as well.

2. Cut holes for equipment using the jig saw and drill:

1. Measure and cut the corrugated plastic to exactly match the holes cut in the foam except for the top panel.
2. For the top panel, cut a small hole to allow the plug of the light to reach the tech panel where we will put the extension cord.

Attaching the Exterior

1. Spray the shell with glue (follow instructions on can) and attach corrugated plastic on top.
2. Use the ice pick to poke through holes for the air vent. Insert zip ties into holes to secure into place.

Part 3: Notes on Tech Panel

Design:

- We left the equipment exposed rather than encased in a separate compartment so that students can see it in a classroom setting.
- We found that the exposed design demystifies the Food Computer and facilitates the students understanding of the Food Computer's construction and functionality.
- Although we have a humidity sensor, it is not necessary and we do not use it in our curriculum.

Construction:

- To attach equipment to our tech panel, we used an ice pick to create holes for zip ties to go through.
- We found Velcro useful to organize cords and cables and to keep them from getting tangled.

