

Leaf Dryer Prototype Test Plan

- Objectives:
- 1) To determine how much heat dissipates depending on distance from fire.
 - 2) To determine if our mass flow rate calculations are accurate for our prototype.
 - 3) To determine the relationship between temperature and mass flow rate.
 - 4) To determine at different flow rates the time it takes to dry leaves.

Important Notes:

- This will be a scale model of our system, independent of the water purification system.
- The materials for the box siding will not be the same for the final product.
- We are only trying to gauge air flow and temperature at this time. If necessary, humidity will be tested in a later experiment.

Measurement tools:

- thermocouple
- scale
- stopwatch
- measuring tape

Other tools and Supplies:

- step ladder
- basil leaves
- duct tape
- Ziploc bag
- container

Objective 1 Procedure:

Step 1 - Create our heat source from Kon Tiki.

Step 2- Measure the ambient air temperature starting at the flames of the fire. Then take a temperature measurement every .5 feet until 4 feet above the fire.

Objective 2 & 3 Procedure:

Step 1- Place dehydrator on stand above flames. Place thermocouples directly below box, on the bottom of the plate, and inside box.

Step 2- Take initial temperature readings

Step 3 - Take readings every 2 minutes for a span of 20 minutes for:

- a. Temperature of inside of the box, outside of the box, and the sheet metal

- b. Volumetric flow rate by placing Ziploc bag filled with air over inlet pipe and measuring the time it takes to dissipate.

Step 4 - Increase height of chimney and repeat steps 1-3.

Step 5 - Gather results for analysis.

Objective 4 Procedure:

Step 1 - Measure initial mass of basil leaves. Place leaves in dehydrator box.

Step 2- Follow steps 1-2 in the procedure above.

Step 3- Take temperature readings of inside of the box, outside of the box, and the sheet metal every 5 minutes. Take out leaves and measure weight every 5 minutes until dried.

Step 4 - Increase height of chimney and repeat steps 1-3.

Step 5 - Gather results for analysis.