**Test #1:**

What Is The Test/Purpose: To Find The Best Way To Insert The Gene DREB1 into Soybeans and Corn.

Note: For all of these processes you will use cell(s) of the plants and then insert the cell back into the plant.

What Is Needed:

* All
  + Soybean and Corn Cells
  + The gene DREB1 in plasmid form
* Gene Gun:
  + 1 modified Crosman air pistol
  + Helium Gas
  + Plastic rupture disks
  + Several gold spheres, coated in a plasmid
  + Screen mesh
  + Plant
* Heat Shock
  + Test tube
  + Cup of ice
  + Heat bath
  + Micropipette
  + CaCl2

Different Methods to Test

* Gene Gun: A kind of gun that shoots a DNA coated metal particle with a 22 caliber charge into the the plant’s tissue.
  + General Procedure:
    - Coat gold sphere in plasmid DNA
    - Load gold spheres onto mesh and load into gene gun
    - Pressurize gas chamber
    - Increase pressure slowly until rupture disk will break
    - Expanding gas forces gold spheres through mesh and into cells below.
* Heat Shock: Mix the gene (in the form of a plasmid) with a cell from the plant in a common tube, then place it in ice, briefly transfer it into a heat bath, and then quickly transfer again into the ice.
  + General Procedure:
    - Add the cell(s) to a test tube
    - Add the plasmid to the same test tube
    - Add CaCl2 to the test tube
    - Place in ice for 10 minutes.
    - Put the test tube in a 42 degree celsius for 50 seconds
    - Quickly put the test tube back into the ice bath for another 2 minutes
* Viral Transduction: Expose the plant cell to a virus that carries the gene in it.
  + General Procedure:
    - We were not able to find a good procedure for this test.

**Test #2: Are instructions usable without prior knowledge**

Physical testing: Provide instructions, determine if participants can accurately follow instructions.

What is Needed

* 1 or more instruction packet
* A printer
* A shovel
* A bucket
* Seeds

General Procedure:

* Provide sealed instructions packet to participant
  + Note, ensure packet labeling is not in a language spoken by participant
* Ask participant to unseal, and analyze the instructions
* Variation A
  + Ask participant to transcribe the interpreted meaning of each instruction in detail
  + If participant asks any questions about the instructions, transcribe the question but do not answer them.
* Variation B
  + Ask participant to act on instructions with provided tools
  + If participant has any trouble or misinterprets any instructions, note them.