**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.