**Lesson 2**

**Creating Prototypes**

A picture containing graphics, graphic design, logo, design

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**Activator/Bell Ringer/Starter**

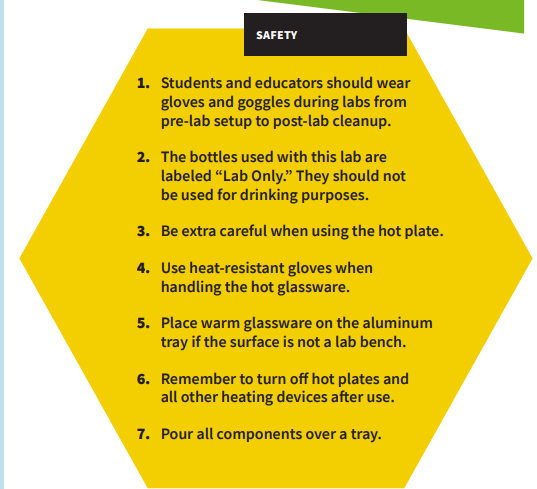
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Identify the most important property or characteristic of my product to my client.

**Lab: Creating Prototypes from a Blueprint**

**Directions:**

1. Form into your groups of 3-4 individuals and select your lab roles.
   1. Project Coordinator and Lead
   2. Project Architect
   3. Project Resource Manager
   4. Project Documentation Specialist
2. Read through the **WHOLE lab** first!
3. Read through the lab safety rules. Please ask any questions about this lab’s rules if you have any.



1. Gather and organize all the items you will need for this lab based on the optimized formulation you documented in your blueprint sheet.

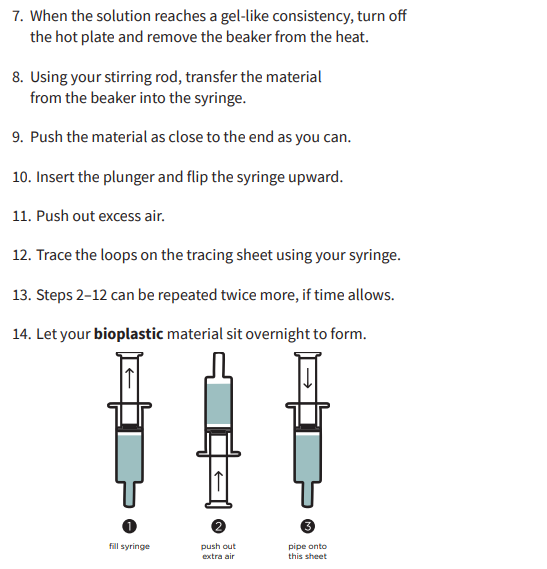
**Lab Protocol**

1. Use the wax pencil to label your beaker with the plasticizer, additive, and starch you’ll use.
2. Tape wax paper onto the tabletop.
3. Select appropriate molds (cookie cutter forms) for your prototype shape or make your own out of clay.
4. Apply a thin layer of coconut oil to wax paper and to the molds (cookie cutter forms or clay). This will help with removing the bioplastic once it hardens.
5. In your 250-mL beaker, use a teaspoon to measure 5mL of your starch and 2.5mL of your acid or base. Mix with the stirring rod.



1. Measure 5mL of water and add to your beaker. Mix with the stirring rod.
2. Measure 5mL of your plasticizer and add to your beaker. Mix with the stirring rod.
3. Mix the solution until uniform.
4. Using the hot plate and a timer, heat the solution on medium heat for 6–10 minutes, stirring for 15 seconds every minute until it starts to thicken.



1. Using your stirring rod, transfer the material from the beaker into the syringe.
2. Push the material as close to the end as you can.
3. Insert the plunger and flip the syringe upward. 
4. Push out excess air.
5. Using your syringe, transfer the material from the beaker into your desired form.

A collage of women writing on a piece of paper

Description automatically generated with low confidence

1. Let your bioplastic material sit overnight to form.
2. Label your bioplastic prototype and set it on the tray to store for the next meeting.

**Post-Lab Clean-Up**

▶ All materials are safe to pour down the drain.

▶ Wipe down your lab bench or tabletops.

▶ Clean beakers, teaspoons, and stirring rods in a warm, soapy water bath with 30 mL of vinegar added.

▶ Dry the tools and lab equipment, then store them properly in an educator-designated area.

**Ticket-Out**

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What do you think makes your group’s project unique? What will your client most value about your product?

|  |
| --- |
| **Your answer:** |