

Experiments at Laura Bassi's School

We are replicating Laura Bassi's home laboratory and performing experiments on similar topics to what she would have explored. Using her method of experiments and observations, students will experience what it might have been like to learn from Bassi.

Experiment 1 – Static Electricity:

Laura Bassi had a state-of-the-art laboratory, including brand new, electricity generating machines. These machines are not like the generators of today; these produced static electricity. The following experiments are designed to create interest and intuition for how static electricity can pull and push objects that are not touching. Rubbing a balloon creates static electricity as negatively charged electrons build up on the balloon's surface. These electrons pull light, positively charged objects (like the can or a thin stream of water) toward them.

Part 1, Rolling a Can

Materials:

- An empty can
- A balloon
- A piece of cloth or clothing

Procedure:

1. Rub the balloon on a piece of cloth or clothing for 40 seconds
2. Place the can on a flat surface
3. Hold the balloon close to the can without touching it, and watch the can roll toward the balloon

Part 2, Bending Water

Materials:

- A balloon
- A piece of cloth or clothing
- Faucet with running water

Procedure:

1. Rub the balloon on a piece of cloth or clothing for 40 seconds
2. Turn on the faucet so there is a thin stream of water flowing out of it
3. Slowly bring the balloon close to the stream of water and watch the water bend towards the balloon.

Experiment 2 – Bubbles:

Laura Bassi studied the nature of air pressure, surface tension, and bubbles, so that is what we will do too!

Materials:

- Bubble solution
- Straws
- Surface that can be wet (e.g. a tray)
- Water
- Spray bottle

Procedure:

1. Put bubble solution in a container deep enough that the solution will cover at least half the length of the straw
2. Make a bubble on a dry surface
 - a. Dip the straw so at least a quarter of it is covered with solution.
 - b. Angle the straw down on to a dry surface and slowly blow out.
 - c. (The bubble will pop)
3. Spray the surface with water
4. Make a bubble on the wet surface
 - a. Dip the straw so it is covered at least a quarter with solution.
 - b. Angle the straw down and slowly blow out, pulling the straw away from the surface while blowing out to increase the size of the bubble.
 - c. (This time the bubble will not pop)
5. Blow a bubble in a bubble
 - a. First, create a bubble on the wet surface.
 - b. Then, dip the straw again in the bubble solution.
 - c. Slowly insert the straw into the bubble and blow.
 - d. Repeat as many times as you want!
6. Testing surface tension
 - a. Blow a bubble and lightly touch it with a dry finger. (It will pop.)
 - b. Repeat with a wet finger. (The bubble will not pop because the wet finger will allow the bubble to maintain surface tension.)

Experiment 3 – Prisms:

The nature of light was another popular subject at the time and Bassi ran experiments to learn about prisms and optics. We will use water to study how light bends and changes.

Materials:

- Clear cup of water
- Pencil that can be placed in cup
- Small mirror to fit in cup
- Flashlight – a flashlight with a focused beam or one which is smaller in comparison to the cup would work best.

Procedure:

1. Start by placing a pencil in the clear cup of water and make observations, how does the pencil look different? The light is bending differently in the water and will make the pencil appear larger.
2. Remove the pencil and place the mirror in the cup at an angle to the ceiling
3. Shine a flashlight parallel to the bottom of the cup so light hits the mirror and is redirected to the ceiling
4. Watch a rainbow appear on the ceiling!