

Simple and Complex Sugars



Complex Sugar Molecule





Bread

Oatmeal



Trends in Nutritional Technology

Smart Sweat Reader

Researchers are in the process of developing a sticky patch (kind of like a band-aid) that athletes can stick on before being active. The patch collects sweat from the athlete, analyzes the sweat, and then sends results to a smartphone. The patch can tell the athlete about his or her glucose (sugar) levels, pH levels, and many other health statistics.



Smart Blood Glucose Reader

Anyone who has diabetes, a medical condition where your body can't regulate the amount of glucose in your blood, needs to test their blood sugar many times a day. This new meter plugs straight into a smartphone and tracks blood sugar data over time. With this technology, patients' blood glucose data can more easily be shared with a doctor.

No Strip Blood Glucose Reader

Another development for diabetes patients is a strip-less meter. Normal blood glucose meters require the user to carry a lot of test strips. Each time you test your blood sugar, a new strip is needed. This new meter uses a longer tape that is stored right in the meter. This means patients can do multiple tests without changing strips!







Steps to Build Your Device

You will use art supplies and building materials to build your device. Make sure your device meets the following requirements:

- Has a place to hold both a glucose strip and cotton swab.
- Allows users to switch out the glucose strip and cotton swab each time a food is tested.
- Has a barcode and company name on one side of the device.

Plan your device below:





Steps to Test Your Device

Follow the steps below to see what type of sugar is in the different foods you are testing.

Step 1: Testing for Simple Sugars

Test each of the foods your teacher gave you to see if they contain simple sugars.

Prepare your first food to test.

- If you are testing a liquid: Place a small amount of liquid in a cup.
- If you are testing a solid: Place a small amount of solid food in a cup. Add a few drops of water. Mix and mash the food with water so it becomes a liquid.

Test your food.

- Place a new glucose testing strip in your device.
- Dip the glucose testing strip in the cup. Make sure the test strip is submerged into the food.
- Hold the test strip in the food for at least 10 seconds.
- Remove test strip from device and put it on a plate.
- Observe the color of the strip. The color may change right away or it may take up to 3 minutes.
- Compare the color of the strip to the chart on the container the strips came in to determine if there is glucose in the food.
- Record your results in your data table. Use a + or a to show whether each food tested positive for simple sugars.
- Repeat these steps with the other food you are testing.



Step 2: Testing for Complex Sugars

Test each of the foods your teacher gave you to see if they contain complex sugars.

Prepare your first food to test.

- If you are testing a liquid: place a small amount of liquid in a cup
- If you are testing a solid: place a small amount of solid food in a cup. Add a few drops of water. Mix and mash the food with water so it becomes a liquid.

Test your food.

- Put gloves on.
- Place a new cotton swab in your device.
- Quickly dip the cotton swab in the water. It should be wet but not completely soaked or dripping.
- Use a pipette to drop 2-3 drops of iodine onto the wet end of the cotton swab. The wet end of the cotton swab should be a a yellowish-brown.
- Dip the swab in the cup. Make sure the test strip is submerged into the food.
- Hold the test strip in the food for 2-3 seconds.
- Remove test strip from device and put it on a plate.
- Observe the iodine to see if its color changes to a dark blue or black color. If it changed to these colors, there are complex sugars present. If it did not change, there are not any complex sugars present.
- Record your results in your data table. Use a + or a to show whether each food tested positive for complex sugars.
- Repeat these steps with the other food you are testing.



Data Table

Food	Simple Sugar + / –	Complex Sugar + / –



Foods For Testing

Examples of foods to test for complex or simple sugars.

Examples of foods that will test positive for complex sugars using iodine but will test negative for simple sugars using glucose strips:

- Plain oatmeal (raw or cooked)
- Cooked rice
- Plain saltine cracker
- Potato (raw or cooked)

Examples of foods that will test positive for simple sugars using glucose strips but will test negative for complex sugars using iodine:

- Apple juice
- Sports beverage (Gatorade, Powerade)
- Banana (or any fruit)
- Candy (as long as its not sugar free)