**Sweet and Sour Science Script:**

**Source: BBB Society**

Materials:

* Consumables: chocolate, pretzels, sour candy, bitter food
* Ligand-receptor toy



So, today, we are going to be talking about taste. Now, when you guys eat a piece of candy, you can taste the sweetness, right? And when you eat a pretzel, you can taste the saltiness…But how do you know that the candy tastes sweet and the pretzel tastes salty?

Does anyone know why the candy and pretzel taste differently?

Ok…well when you eat something the food breaks down into little pieces, and these little pieces are called ligands, and they interact with your tongue so that you can tell the difference between the tastes. Now what is it about the tongue that allows this to happen?

Well, if you look at your tongue you can see lots of little bumps, right?....Does anyone know what these are called?

That’s right…taste buds, and these taste buds are very special because on these are found special cells called taste sensory cells and these cells are stimulated by the small pieces of food called ligands that come from the candy and the pretzel and they can then send messages to the brain along pathways formed by nerve cells called neurons, and these messages tell it what kind of taste you are eating, and your brain will understand the message and allow you to know that the candy is sweet and the pretzel is salty.

Now you should be asking yourself, how do these ligands stimulate the cell?...well, on these special cells are slots called receptors that the ligand is able to fit into and thus activate the signal to the brain.

Imagine this key represents the ligand, or the smallest piece of candy that you just ate, and this lock represents the sweet receptor that the ligand must fit into on the special cell on your tongue. So, for the message to go to the brain telling it that you just ate something sweet, the ligand must fit perfectly into the receptor just like this lock and key. (demonstrate)

Now there are different receptors/locks for each kind of taste…

Can you name all the different kinds of tastes…(answer: sweet, sour, salty, bitter…)

That’s right! ☺

And each one of these tastes is associated with a different piece of food such as a candy or pretzel because these different pieces of food or ligands have different shapes that only allow them to fit into a specific type of receptor. So, a sweet ligand can only fit with a sweet receptor and salty ligands can only fit with a salty receptor.

Imagine this toy is your tongue and these four slots are the four kinds of taste receptors…sweet, salty, sour, and bitter…and these different shaped blocks are the different types of food ligands…so, as you can see, only the sweet ligand fits into the sweet receptor…etc.

Now do you guys think these four different tastes can be recognized on every part of your tongue…?

Well, actually it has been found that all people share the same tongue map—meaning that the four different kinds of taste are only found on certain parts of the tongue.

Now we want you guys to figure out where each of the different kinds of tastes are found on the tongue…(tongue map activity).

Ok, great! Now we want you to figure out if your tongue has the same map, and we have an experiment for each of you to do in order to find out.

What you will do is take a flavor that matches a specific taste and put it on that part of your tongue to see if YOU can taste it. Once you do this for all four taste flavors you will have established your own tongue map just like a real scientist! Ok, let’s go for it!