

Candy DNA Modeling

- I. Activity intro (Qs may change depending on which order we do the activity in)
 - A. Who knows what DNA is? (wait for answers)
 - B. Here's what DNA is.**
 1. DNA is a *molecule*.
 - a) What's a molecule? (wait for answers)
 - (1) A molecule is a tiny building block chemical that makes up most of the world. Molecules come in lots of different shapes and sizes, but most things, living and not living, are made up of molecules.
 2. DNA is a *codebook*.
 - a) What's a code? (wait for answers)
 - (1) In computers, code is a set of instructions that the computer follows to do stuff, like open up the internet to get on facebook.
 - b) DNA contains all the instructions that your body follows to do stuff, like get you born, let you grow up, and let you walk to school.
 3. DNA is inside *every living thing*.
 - a) This means you have something in common with even the weirdest living things out there--you and a crab both have DNA in you, telling your bodies how to operate.
 - C. The structure of DNA was discovered by a STEMInist! Rosalind Franklin! Did anyone already know that?



1.
 - D. When you look at DNA under a microscope, it kind of looks like a winding ladder. This is called a *double helix*. We are going to model this structure today using my favorite thing, candy.
 - E. Why does anyone think the structure of DNA matters? Why do scientists study DNA so much? (wait for answers)

1. The structure matters for understanding how DNA makes copies of itself. Anytime babies are made, whether that's human (babies) or animal (babies) or bug(babies) or (even) plant (sprouts) DNA is making copies of itself.
 2. DNA structure also matters for understanding how evolution (or how species change and new species form) happens.
 3. It's difficult to understand anything in biology without understanding how DNA works. So, understanding how any living thing works--whether that's how diseases happen, how animals evolve, or how bugs find their mates, you have to understand DNA.
- F. So, let's build a DNA model! We have 4 different colors of marshmallows here that we are going to put together to build DNA. Has anyone heard of DNA base pairing before? Does anyone know what the base pairs in DNA are? (wait for answers)
1. Right! The base pairs in DNA are the actual code that tells your body what hair color to give you, how tall to make you, what color eyes to give you, etc. There are only 4 base pairs in all of DNA. Only 4 base pairs that pair together in special ways to make all of life on earth, which is pretty amazing.
 2. Base pairs give instructions to *proteins*, which are another type of molecule that goes and actually makes up the color of your hair/eyes/skin, etc.
 3. Who has already heard of the base pairing rules in DNA? Well, they are pretty easy, all you have to do is remember 4 letters: A, C, T, and G.
 - a) A and T always go together. C and G always go together. I remember it because C and G look pretty similar, and A and T both have straight, sharp lines in them.
 - b) The marshmallows are our base pairs. The twizzlers are what helps bind all the base pairs together and gives it the double helix shape. In the actual DNA molecule, the twizzlers represent a "sugar phosphate backbone". Everyone try saying that out loud, it's kind of a mouthful. "Sugar phosphate backbone."
 - (1) All that means is that the most sturdy part of DNA's structure is made out of 2 different molecules: a sugar, and a phosphate. A phosphate has a thing called phosphorous in it, which you eat all the time if you've ever eaten meat or nuts or beans.
- G. Here's how to make the DNA molecule (pick out which colors are which bases):
1. Put together your A marshmallows and T marshmallows on the same toothpick.
 2. Put together your C and G marshmallows on the same toothpick.
 3. Connect the toothpicks with marshmallows evenly spaced along the licorice

- a) Repeat until your licorice strand is full
 - b) Holding the ends of the licorice sticks, twist your structure slightly.
- 4. Call over a group leader to take a picture of you and your creation! Then you may eat it. ;)