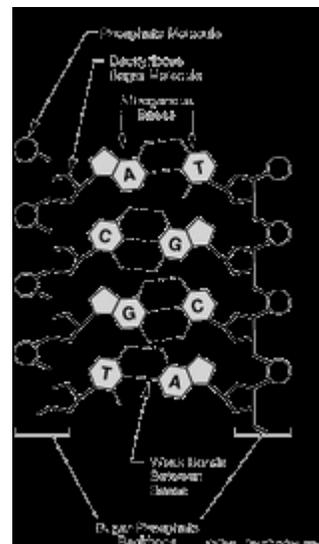


Sweet DNA



Introduction:

Making DNA models can be informative, fun, and in this case tasty. Here you will learn how to construct a DNA model using candy.

But first, what is DNA? DNA is a nucleic acid that contains the genetic information for the reproduction of life. Its shape is called a double helix which means it looks like a twisted ladder. DNA is composed of nitrogen bases (adenine, thymine, guanine and cytosine) on the rungs of the ladder, and sugar and phosphate molecules making up the sides of the ladder.

Materials:

- 2 Twizzlers (sugar-phosphate backbone)
- 4 Red Gummy Bears (adenine)
- 4 Yellow Gummy Bears (thymine)
- 5 Green Gummy Bears (guanine)
- 5 Orange Gummy Bears (cytosine)
- 9 Toothpicks

The Twizzlers represent the DNA sugar-phosphate backbone (the sides of the ladder)

The Gummy Bears represent the DNA nitrogen bases. The bases match up in a specific pattern

In this case, red pairs with yellow, representing adenine pairing with thymine; and green pairs with orange representing guanine pairing with cytosine. This is the only way that bases pair in DNA. The bases are abbreviated A, T, G, C.

Procedure:

- 1) Put one red and one yellow gummy bear on a single toothpick. Stick the bears on the toothpick head first.
- 2) Repeat until there are no more red and yellow gummy bears – you should have four toothpicks.
- 3) Put one green and one orange gummy bear on a single toothpick. Stick the bears on the toothpick head first.
- 4) Repeat until there are no more green and orange gummy bears – you should have five toothpicks
- 5) Arrange the toothpicks like the rungs of a ladder in the following order:
 - Orange on left, green on right
 - Red on left, yellow on right
 - Red on left, yellow on right
 - Green on left, orange on right
 - Yellow on left, red on right
 - Orange on left, green on right
 - Green on left, orange on right
 - Red on left, yellow on right
 - Green on left, orange on right

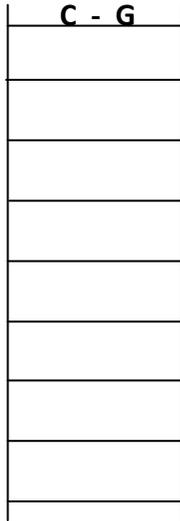


- 6) Line up the Twizzlers on either side of the gummy bear rungs and press toothpicks into the Twizzlers – be careful not to poke yourself with a toothpick.
- 7) Pick up your DNA model and give it a little twist.

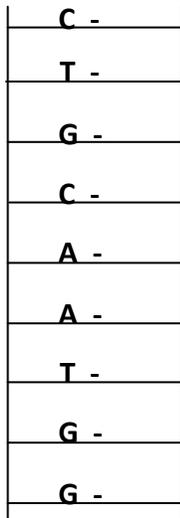
You have just made one sweet DNA double helix! Now, on to the questions...

Questions:

- 1) The gummy bear colors in your model represent the nitrogen bases on the rungs of the DNA ladder. Scientists represent the bases by the letters A, T, G and C. Write down the letters that correspond to the gummy bear rungs on the DNA model you just built. I've labeled the first rung for you:



- 2) Notice that since A only pairs with T and G only pairs with C, if your DNA model were to be cut in half so that each half had only one ladder side and only one of the base pairs, you would be able to rebuild the an identical looking model even if you had only one half of the model. In the model below, I have filled in the base pairs on one side, you fill in the other half:



- 3) Why might this be an important feature of a DNA molecule?