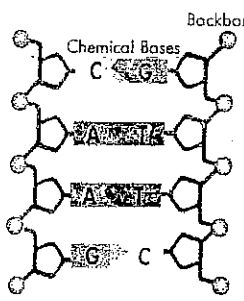
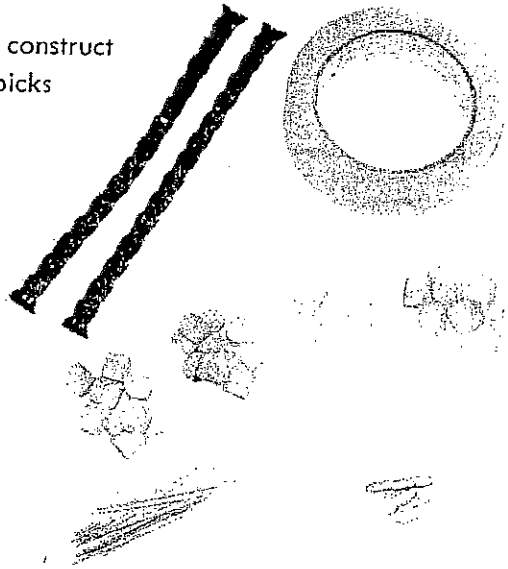
Have Your DNA and Eat It Too!



When isolated from a cell and stretched out, DNA looks like a twisted ladder. This shape is called a double helix. The sides of the DNA ladder are called the backbone and the steps (also called rungs) of the ladder are pairs of small chemicals called bases. There are four types of chemical bases in DNA: Adenine (A), Cytosine (C), Guanine (G), and Thymine (T). They form pairs in very specific ways: Adenine (A) always pairs with Thymine (T) and Cytosine (C) always pairs with Guanine (G).

Your task is to use the following materials and procedure to construct an edible model of DNA. When you are finished, use toothpicks and tape to label one of each of the chemical bases.



You will need:

2 pieces of licorice
12 toothpicks
9 pink marshmallows
9 yellow marshmallows
9 green marshmallows
9 orange marshmallows
5 paperclips
Masking Tape

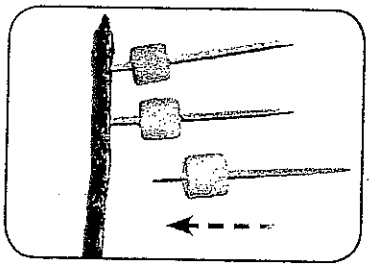
Step 1: Choose one of the sequences below.

Sequence 1: ~~T A C G T A T G A A A C~~

-or-

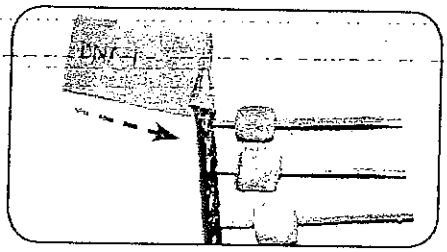
Sequence 2: T G G T T T A G A A T T

Adenine (A) = Green	
Thymine (T) = Pink	
Cytosine (C) = Yellow	
Guanine (G) = Orange	

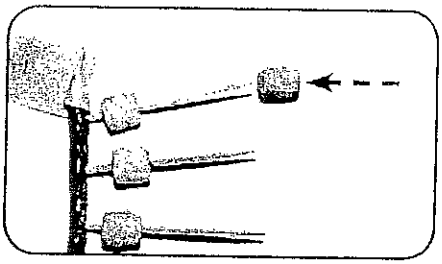


Step 2: Assemble one side of your DNA molecule. A piece of licorice will form the backbone and marshmallows will be the chemical bases. Place a marshmallow on the end of a toothpick so that the point of the toothpick goes all the way through. Anchor the toothpick into the licorice backbone. Refer to the table above to choose the correct color marshmallow to represent the chemical bases in your sequence.

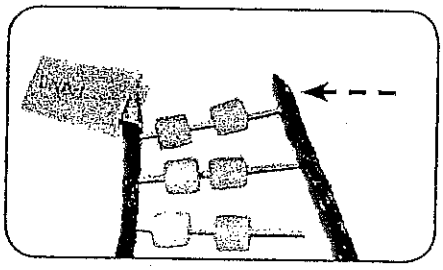
Have Your DNA and Eat It Too! continued...



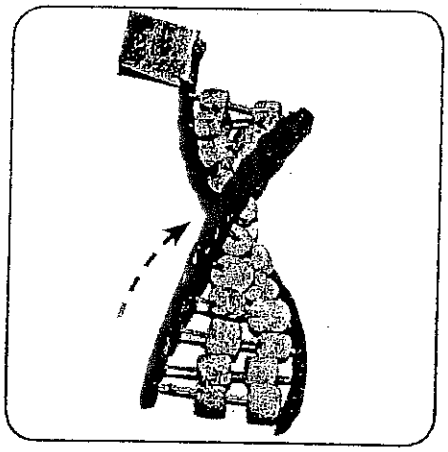
Step 3: Label the backbone. With a marker or pen and masking tape, label your licorice backbone "DNA- 1" or "DNA-2" depending on which sequence you used. Write the label on the left end of the licorice.



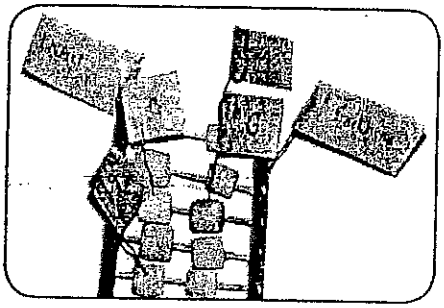
Step 4: Match the chemical base pairs. Place the color marshmallow for the matching chemical base on the other end of each toothpick. Remember that A always pairs with T and C always pairs with G!



Step 5: Complete your DNA model. Attach the other backbone so your model looks like a ladder.



Step 6: Twist your DNA model. Carefully twist your DNA molecule so that it looks like a double helix.



Step 7: Label your model. Make flags to label the parts of your DNA out of paper clips and tape. Label one of each of the following: Adenine, Thymine, Cytosine, Guanine, and Backbone. **Make sure your chemical base pairs are correct!**