

## Banana DNA

What do you have in common with an octopus, flamingo and banana? It may seem like this is a crazy question, but the simple answer is: You are all living! That means you all have **DNA**!



DNA stands for deoxyribonucleic acid. It is the genetic material that's found in humans, along with every other living or once living organism. Scientists are able to extract DNA from living and once living organisms...like bananas! DNA stores information in the form of a code. The code is made up of **four** different chemical bases: adenine (A), guanine (G), cytosine (C) and thymine (T).



The four bases team up with each other to form base pairs, where they also attach to other sugar they make a **nucleotide**. Nucleotides are arranged in two long spiral strands that form a double **helix**. This looks something like a curvy **ladder**.

One important thing to know about DNA is that it can **replicate** and make copies of itself. This is needed so that when our cells divide and multiply as we grow, the new cells have an exact copy of the old information that makes up who we are! The DNA in our genes is what determines a lot of our characteristics, like height and hair and eye color. Every single human has unique genes, except for **identical** twins.

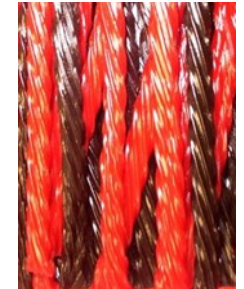


### *Build Your Own Model*

What's a better way to learn about DNA than to build it yourself? (Not to mention you can eat it later too!)

#### **Materials needed:**

- Red and black licorice sticks
- Colored marshmallows or gummy bears
- Toothpicks
- Needle
- String
- Scissors



#### **Steps:**

1. Assign the colored marshmallows or gummy bears to represent the four nucleotide bases: adenine, cytosine, guanine and thymine (a different color for each one).
2. Assign the colored licorice pieces to be either the sugar molecule or the phosphate molecule.
3. Cut the licorice into 1 in. pieces
4. String half of the licorice pieces together lengthwise, alternating every other black and red using the needle and string.
5. Do the same thing with the other half of licorice so you have two strands that are the same length.
6. Connect two different colored marshmallows or gummy bears using the toothpicks.
7. Connect the toothpicks with the candy to either the red licorice pieces only or the black ones only, so that the candy is between the two strands.
8. Holding the ends of the licorice sticks, twist the structure slightly.



# Career Corner

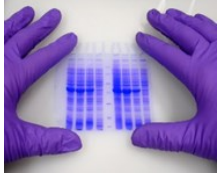
**Geneticist** - Geneticists work to modify plants and animals so that they produce more nutrients for feeding people. In addition, they can study the DNA of pests to help create effective pesticides without harming other organisms.

### How Geneticists Benefit Agriculture:

- Improve crop traits such as yield, pest resistance and environmental stress.

### Geneticists Study:

- Chemistry
- Biology

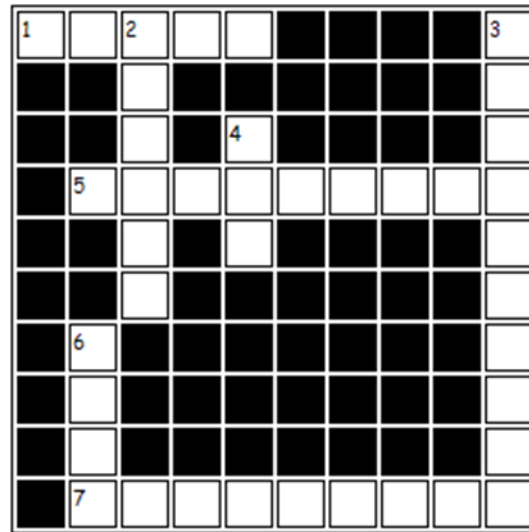


SCAN ME



# Farm Facts

- The average American consumes 28 pounds of bananas per year.
- Every living or once living organism has DNA.
- India is the number one banana producer in the world.
- Goldfish have more genes than humans do.
- Bananas are the fourth largest crop worldwide.



### Across

- The two long spiral strands form a double \_\_\_\_\_
- Everyone has unique genes except for \_\_\_\_\_ twins.
- DNA can \_\_\_\_\_, or make copies of itself.



### Down

- A double helix looks like a spiral \_\_\_\_\_
- A base pair + a sugar molecule + a phosphate molecule makes a \_\_\_\_\_
- Every living thing has \_\_\_\_\_
- There are \_\_\_\_\_ chemical bases that make up DNA.

## Thank you to our major sponsors

- |   |  |
|---|--|
| ◇ Clemens Family Foundation                           | ◇ Nationwide                                   |
| ◇ Corteva Agriscience                                 | ◇ Northeast Agricultural Education Foundation  |
| ◇ Dick & Shelva Mains Fund                            | ◇ Nicholas Meat LLC                            |
| ◇ Farm Credit Foundation for Agricultural Advancement | ◇ Pennian Bank                                 |
| ◇ First Citizens Community Bank                       | ◇ Pennsylvania Dairymen's Association          |
| ◇ Glatfelter Family Foundation                        | ◇ Pennsylvania Farm Bureau                     |
| ◇ Horizon Farm Credit                                 | ◇ PA Pork Producers Council                    |
| ◇ J. William Warehime Foundation                      | ◇ PA Soybean Board                             |
| ◇ Kathy Berry Agency                                  | ◇ The Hershey Company                          |
| ◇ Land O' Lakes                                       | ◇ The Donald B. & Dorthy L. Stabler Foundation |
| ◇ McCormick Family Foundation                         |  |

