



Edible DNA



Dear Parent/Guardian:

Thank you for your interest in MI Kids!

These activities are a great way to encourage your child's curiosity and interest in science.

In the upcoming MI Kids event, your child will learn about the structure of the DNA molecule by doing a hands-on activity.

Your child will build a molecule of DNA using edible components. The DNA "ladders" can even be twisted in order to represent the three-dimensional structure of the DNA double helix! This fun activity helps your child learn about the structure of the ultra-microscopic DNA molecule and how it is used to store information in the DNA sequence. Your child can enjoy constructing their own DNA molecule and also delight in the sweet treats both during and after!

Looking forward to seeing you soon!

-The MI Kids Team



MI Connection: Since DNA codes for the information that makes each organism unique, we can use it to identify small differences between closely related organisms. For microorganisms that we cannot even see with the naked eye, such as bacteria, we can tell them apart from the differences in their DNA--even if the bacteria look similar under the microscope! Microbial Insights uses the DNA sequences from bacteria found in the environment to identify both helpful and harmful microorganisms. While some bacteria can make us sick, others can be used to break down pollutants in our water supply and we want to be sure to keep them happy!



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DNA stands for **deoxyribonucleic acid** and it contains all of the information that makes you, you! We're made of trillions of cells, which individually, are too small to see with just our eyes. These cells have lots of different and important jobs and DNA is basically the boss that tells these cells what they have to do. DNA does this using a special alphabet, called bases, that's only 4 letters long! These bases are combined to form a structure called a double helix that looks very much like a spiral staircase. Each rung of this staircase is generally referred to by the first letter of their name, like a nickname, and the letters are A, T, C, and G. A and T are best friends and always hang out together, while G and C prefer to hang out with each other. In this activity we will build a model that represents a tiny molecule of DNA—as it is found in every living thing!

Activity: Build your edible DNA

1. Choose one of the sequences below.

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

or

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

2. Begin by assembling one side of your DNA molecule. The piece of licorice will form the DNA backbone and the marshmallows will be the bases.
3. Select the corresponding color marshmallow for the first base in your sequence. Push the marshmallow onto the end of a toothpick so that the toothpick goes all the way through.
4. Anchor the toothpick into the licorice backbone. Continue adding marshmallows and toothpicks that represent the bases in the sequence that you chose.



Materials for Each Student

- 2 licorice sticks
- Colored marshmallows:
 - 9 green
 - 9 pink
 - 9 yellow
 - 9 orange
- Tip: slightly dry ones work a little better
- 12 toothpicks

Adenine (A) = Orange



Thymine (T) = Pink



Cytosine (C) = Green

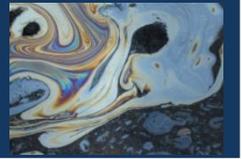


Guanine (G) = Yellow





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- Once the sequence is complete with one set of marshmallows, return to one end of the DNA and begin adding the matching set of bases on each toothpick. Remember that C always pairs with G and T always pairs with A.



- Complete your DNA molecule by attaching the other backbone. The shape of the resulting DNA molecule is **two-dimensional** and looks like a ladder.



- Use both hands to pick up each end of the DNA molecule and gently twist it. The shape of the twisted DNA molecule is **three-dimensional** and looks like a **double helix**. This is the natural shape of DNA inside of all cells.

