



Genetics

If you participated in our Fall enrichment classes, you likely researched and discovered your family genealogy (the study of family history and lineage). This month we are going to focus on your genetics, which you also get from your family. Let's get learning about what makes you, YOU.

Vocabulary:

Allele - a variant form of a gene.

Cells - the smallest unit of life. All living things are made up of cells.

Chromosomes - are located inside the nucleus. They carry genetic information. Each chromosome can contain many genes. Each cell, in humans, contain 23 pairs or 46 chromosomes.

Deoxyribonucleic Acid (DNA) - The genetic code that determines all the characteristics of a living thing. It is made of molecules called nucleotides.

Gene - a unit of heredity which is made up of DNA.

Nucleus - the control center of a cell. The nucleus contains chromosomes.

Resources

<https://history.nih.gov/exhibits/genetics/kids.htm> - Just for Kids! A cartoon guide to genetics.

<https://www.amnh.org/explore/ology/genetics> - American Museum of Natural History - Genetics for kids - The Gene Scene - a fantastic site with games, stories, videos, and hands on activities all about genetics.

<https://kidsbiology.com/biology-basics/dna/> - Another interactive website with explanations and videos to help us understand the science of DNA.

<https://kids.kiddle.co/DNA#Nucleotides> - Facts and awesome kid friendly images all about DNA.

Activities

Make a 3D DNA Model - adapted from the American History of Natural History. Keep in mind DNA is shaped like a twisted ladder which we call a double helix.

1. First, make the sides of the ladder. To do this, cut two strips of colored paper that are at least two feet long and about one inch wide. (If your paper is not long enough, tape a couple of strips together.)
2. Use a pencil and a ruler to mark each inch along one strip.
3. Next, make the steps of the rungs of the ladder. In DNA, these steps are made of four bases: adenine (A), thymine (T), cytosine (C), and guanine (G). Choose four colors from your markers to represent the four bases. Write the colors you choose for each base here:

A: _____ T: _____
C: _____ G: _____



4. Take 10 toothpicks. For each one, color half the toothpick the color you chose for A. Color the other half the color you chose for T. Take ten more toothpicks and do the same thing with the colors you chose for C and G. **It's important that A is always paired with T and C is always paired with G.
5. Now construct your double helix! Grab both strips of paper, put one on top of the other, and tape them together at each end.
6. Using the pencil marks as a guide, poke a toothpick through the middle of the strips at every inch. You can add toothpicks in any order you want.
7. Keep going until your strips are filled up. Be sure to leave some room at the ends of the strips. Make sure all the toothpicks are pushed halfway through the holes.
8. Gently spread the two strips apart until your model looks like a ladder. This is what DNA would look like if it weren't twisted. (Hint: If any toothpicks fall out, put a drop of glue on the hole, stick the toothpick back in, and let the glue dry. You could also wrap a piece of tape around the toothpick.)
9. Now for the twist: Tape one end of your model to a wall or wherever you want to hang your DNA model. (Make sure the place you choose is okay with your parents.)
10. Then, carefully holding the DNA model, twist it at least once around until it looks like a double spiral. Tape the other end to a flat surface. Congratulations - you've done the DNA twist!

Build and Draw a Monster

1. Find the Monster Maker sheet in your bin.
2. Use the key on the bottom to decode the characteristics.
3. Draw your monster according to the genome decoded.
4. Share with Mrs. Jennings or your CVHS Teacher