

Grade Level: Fifth Grade

Time: 20 minutes

Brief Description of Lesson: In this activity, students will learn about DNA and what it consists of by creating their own DNA with the materials given.

*FIU-EOW offers ways to **differentiate** to provide opportunities for all students to access the curriculum or standards. These are being provided as **suggestions**.*

SCIENCE	TECHNOLOGY	ENGINEERING	MATHEMATICS
<p>Standard: SC.5.L.14.1: Identify the organs in the human body and describe their functions, including the skin, brain, heart, lungs, stomach, liver, intestines, pancreas, muscles and skeleton, reproductive organs, kidneys, bladder, and sensory organs.</p>	<p>Standard: ISTE: 2.4.b: Collaborate and co-learn with students to discover and use new digital resources and diagnose and troubleshoot technology issues.</p>	<p>Standard: 3-5-ETS1-3 Engineering Design: Plan and carry out fair tests in which variables are controlled, and failure points are considered to identify aspects of a model or prototype that can be improved.</p>	<p>Standard: MA.5.DP.1.2: Interpret numerical data, with whole-number values, represented with tables or line plots by determining the mean, mode, median or range.</p>
<p>Activity: The mentor will first introduce the experiment and ask the students what prior knowledge they may have relating to the human body organs. The instructor will be able to show the students this video to learn more about DNA and why it matters when it comes to the organs.</p> <p>What is DNA?</p> <p>Make sure to stop and check for comprehension throughout the video: @42 seconds- What did they compare DNA to? @1:10- What do amino acids form? @1:50- Do proteins have to be in a specific form? @2:06- What is the genetic code? @4:00- What does DNA create?</p>	<p>Activity: Students will be able to use technology to keep track of the data they have acquired, such as the amounts of each material they have used.</p> <p>They will also record, on a device, their experiments' results to analyze them after the STEM field day visit and share amongst their classmates. Where students can then provide feedback on each other's results.</p> <p>Supporting Resources/Devices: -A device so that students can record their data</p>	<p>Hook: DNA is the instructions for how to make the body, like the code to a video game or blueprints for a house. If you used a very strong microscope, you would see that DNA looks like a twisting ladder. An important part of your DNA is the Base Pairs. Adenine (A) bonds with Thymine (T), and Cytosine (C) bonds with Guanine (G).</p> <p>Problem: How would you build your DNA based on the materials given and the bonding of the Base Pairs?</p> <p>Measurable Goal: Students will determine if they were successful in their project by making sure that the following Base Pairs are bonded:</p>	<p>Activity: *All candy used is peanut free* As the students make the Edible DNA, they will complete the following worksheet to determine the Mean of the Dots they have been given.</p> <p>Worksheet 1</p> <p>The students will be given the necessary materials and perform the following:</p> <ul style="list-style-type: none"> Separate and Sort <ol style="list-style-type: none"> You'll want to separate your 4 colors of the soft candy into different cups or bowls. Assign each of the colors a specific nucleotide. Construct your Base <ol style="list-style-type: none"> Put the two-colored candy cups or bowls

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<p>What does RNA create?</p> <p>Then, they will teach the vocabulary needed to understand the experiment's components and purpose better. After this step, students should clearly understand how each component affects and its role in the experiment.</p> <p>VOCABULARY</p> <p><u>DNA (deoxyribonucleic acid):</u> the genetic information inside the body's cells that helps make people who they are.</p> <p><u>Genes:</u> are made up of segments of DNA and they determine physical traits, including the color of your eyes and whether your hair is straight or curly.</p> <p><u>Base Pairs:</u> form a code down the length of the DNA. Adenine (A) bonding with Thymine (T), and Cytosine (C) bonding with Guanine (G)</p> <p><u>Components:</u></p> <ul style="list-style-type: none">• Twizzlers Candy• DOTS Candy• Wooden Toothpicks• Cups and Bowls		<ul style="list-style-type: none">• Adenine (Yellow Dots) and Thymine (Green Dots)• Cytosine (Orange Dots) and Guanine (Red Dots) <p><i>*All candy used is peanut free*</i></p>	<p>with their buddy before starting this step.</p> <ol style="list-style-type: none">2. Then choose the order for your base pairs and lay them out onto your workspace in the order you chose.3. Start putting your soft candies on the toothpicks in sets of two, one on each end.4. Continue doing this until you've used all of the nucleotides you set up in your sequence pairs. <ul style="list-style-type: none">• Assembling your 2D DNA Model<ol style="list-style-type: none">1. Once you have the number of desired base pairs for your DNA model constructed, you may want to lay them out in the order you're going to be attaching them to your "backbone pieces".• Turning your Edible DNA Model into a 3D Double Helix<ol style="list-style-type: none">1. Then grab both ends of your model and slightly twist them in opposite directions to create YOUR VERY OWN DNA DOUBLE-HELIX!
Differentiation:	Differentiation:	Differentiation:	Differentiation:

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Students will be given the opportunity to view a video before and after it is presented to the class. Watching the video before or after individually or within a small group will allow the students to pause the video and ask clarifying questions in a small group setting. DIY Edible DNA	Students will be allowed to record their projects and look them over later. This accommodation will elevate any challenges around having to write down and describe the outcomes of their projects during the activity.	When creating the edible DNA, students should be allowed to reference an instruction manual with pictures and descriptions of each step. Worksheet 1	Worksheet with more DNA models to reference when comparing their results. Worksheet 1 Worksheet 2
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