**DNA Candy Lab: Eat Your Genes**

**Student Handout**

**Procedure**

1. Wash your hands and table.
2. Get a paper plate/paper towel.
3. Pick a DNA strand from the pile.

**Chargaff’s Base-Pairing Rules**

Adenine **(A)** bonds with\_\_\_\_\_\_\_\_\_**(\_\_)** Guanine **(G)** bonds with \_\_\_\_\_\_\_\_\_**(\_\_)**

**Tape your DNA strand card here and draw the complementary strand to match DNA using Chargaff Base-Pairing Rules.**

1. Determine how many of each color gummy bear you will need to make BOTH sides of your DNA molecule.

|  |
| --- |
| Adenine = Yellow |
| Thymine = Red |
| Guanine = Green |
| Cytosine = Orange |

Yellow \_\_\_ Red \_\_\_ Green \_\_\_ Orange \_\_\_

Get the gummy bear colors you need, 2 Twizzlers, and a few toothpicks.

1. Assemble your DNA using ½ a toothpick to attach the gummy bears to the Twizzlers and a whole toothpick to connect the gummy bears to each other.



**Example** A T

A T

A T

1. After you get yours assembled, fill in the bases on the picture below.



**DNA Replication**

When DNA replicates, it “unzips” and each side is used as a template to make a new side of the DNA (following base-pairing rules).

1. If you were to replicate this DNA molecule, what would each new DNA molecule look like. Fill in the picture below with the 2 new DNA molecules.

*Old DNA New DNA New DNA Old DNA*



Congratulations! You have successfully replicated DNA! Please clean up your work area and answer the following questions.

**Review Questions**

1. Use the following sequence to replicate DNA.

ATT CGC GCA TCA

\_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_

1. Why must DNA replication happen in the nucleus of the cell?

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1. The 1st step of DNA replication is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the DNA.
2. We just finished modeling DNA replication, in what part of the cell cycle

does this process occur? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What type of bond is found between the nitrogen bases of DNA?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonds. What molecules have we

previously discussed that is also held together by those types of bonds?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Explain why DNA replication is referred to as a semi-conservative process.

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1. During DNA replication two identical DNA molecules are produced from one original molecule. Which statement below explains why the newly formed molecules are identical to the original?
2. The original DNA molecule breaks down into nucleotides that are reassembled by DNA polymerase into two new molecules.
3. The nitrogen base adenine can only pair with cytosine and thiamine.
4. Each strand of the original molecule serves as a template for the two new stands, and new nucleotides are added to the template according to the pairing rule.
5. The nitrogen base adenine can only pair with guanine and phosphate groups.