

Names: \_\_\_\_\_ & \_\_\_\_\_

## Making and Reading DNA Lab

### Introduction:

A molecule of DNA (Deoxyribonucleic Acid) is composed of nucleotides. Each nucleotide is made of a phosphate, a deoxyribose sugar and a nitrogenous base. These nucleotides bond together to create the double stranded DNA. You will build 10 nucleotides and then use these to create a short strand of DNA. You and your partner will need to preplan your nucleotides so they will pair up correctly making two backbones with 5 base pairs in between.

### Materials:

**Red Licorice – Deoxyribose sugars**

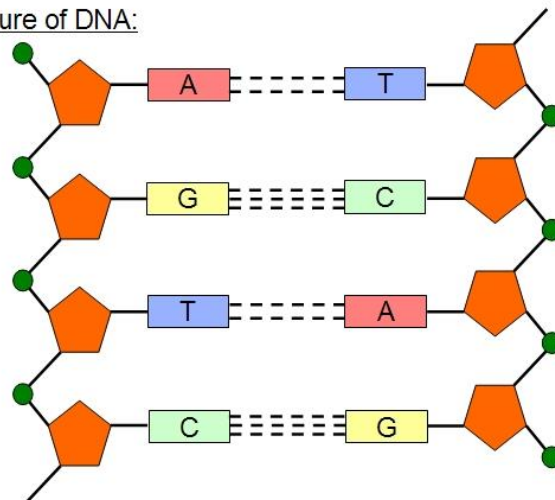
**Black Licorice – Phosphates**

**Gummy Bears – Nitrogenous Bases**

**Toothpicks – used to build your nucleotides**

**Paper Plate – platform for building model**

Structure of DNA:



### DNA Replication

Create a key before building nucleotides:

**Sugar** – red licorice (10 pieces)

**Phosphate** – black licorice (10 pieces cut into ½ inch pieces)

**Adenine** – \_\_\_\_\_ gummy bear

**Thymine** – \_\_\_\_\_ gummy bear

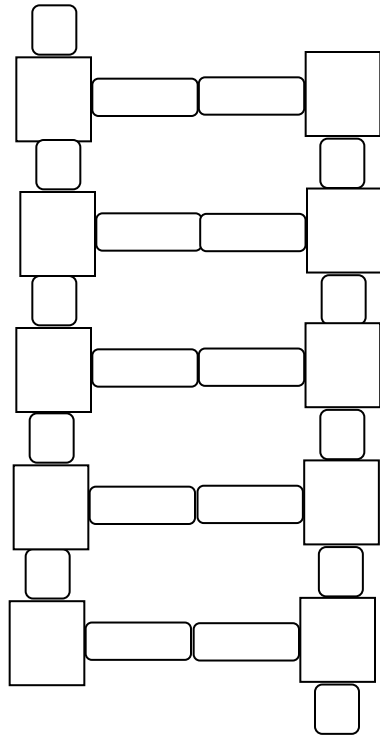
**Guanine** – \_\_\_\_\_ gummy bear

**Cytosine** – \_\_\_\_\_ gummy bear

Fill in the color  
you will use  
for each base.

(You will have to decide how many of each color of gummy bears you need)

1. Assemble your 10 nucleotides. Do NOT connect the nucleotides to each other yet. Use the toothpicks (you may break them) to hold the 3 parts together. Lay them on your paper plate. Have your teacher check them.
2. Use more toothpicks (breaking them if necessary) to connect your nucleotides together to make your double stranded DNA. Make ONE STRAND of five nucleotides FIRST as your template strand. Then add your complimentary nucleotides one at a time to form the other strand. Have your teacher check it when you are finished.
3. Fill in the diagram below with the order of the bases YOUR DNA strand has. Use S for sugar, P for phosphate and A, T, C & G for your bases.



4. Label the **3' end** and the **5' end** on both sides.
5. STOP and have your teacher check your work BEFORE moving on! Answer the questions on the next page while you wait.

**Clean-up:** You may eat your models after you finish your questions. Throw all uneaten candy and used materials in the trash. Wet Ones are available to clean your hands.

## Questions for Candy DNA Lab

**You and your partner are to answer these TOGETHER. Do not split them up. Read and answer each question after you discuss it.**

1. Your original DNA sequence (the template strand): \_\_\_\_\_
2. The red Twizzlers in this experiment represent \_\_\_\_\_
3. The colored gummy bears represent \_\_\_\_\_
4. In a DNA strand, what holds the bases together? \_\_\_\_\_
5. What structure on the backbone are bases connected to? \_\_\_\_\_
6. Name the 3 parts of a nucleotide
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
7. Which two bases are purines? \_\_\_\_\_ & \_\_\_\_\_
8. How many rings are on purines? \_\_\_\_\_
9. Which two bases are pyrimidines? \_\_\_\_\_ & \_\_\_\_\_
10. How many rings are on pyrimidines? \_\_\_\_\_
11. What is meant by “anti-parallel”? \_\_\_\_\_  
\_\_\_\_\_
12. On a nucleotide, is the phosphate bonded to the 5' Carbon or the 3' Carbon? \_\_\_\_\_
13. What is meant by “semi-conservative” DNA replication? \_\_\_\_\_  
\_\_\_\_\_
14. What process is DNA preparing for when replication occurs? \_\_\_\_\_