

Making and Reading DNA Lab

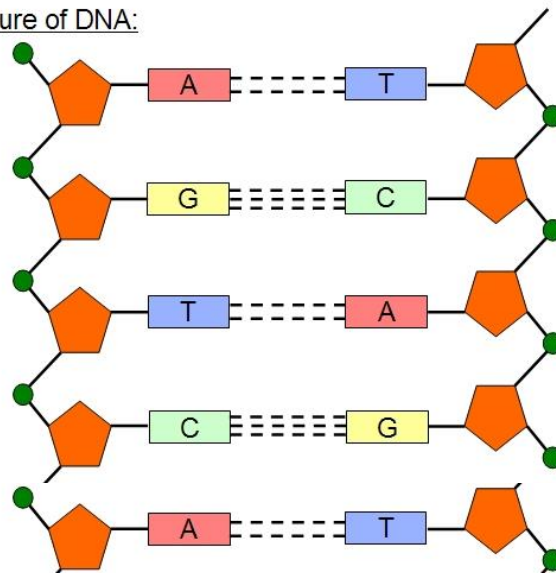
Introduction:

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 Twizzler – Deoxyribose sugars**
- Black Licorice – Phosphates**
- Gummy Bears – Nitrogenous Bases**
- Paper clips – used to build your nucleotides**
- Toothpicks – Hydrogen bonds**
- Paper Plate – platform for building model (nucleus)**

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

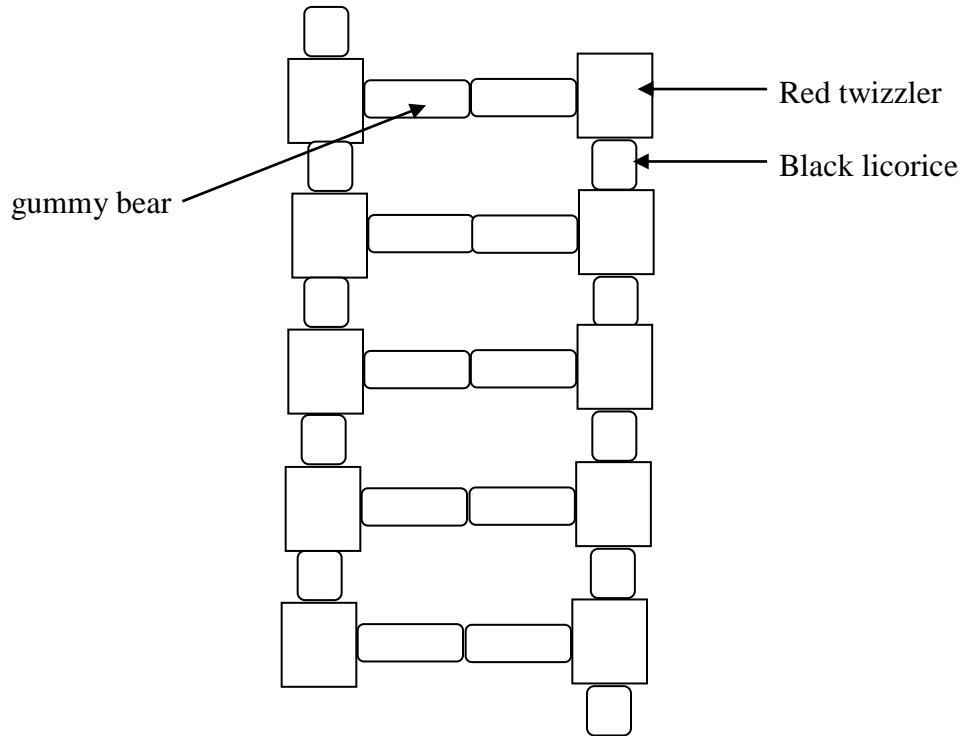
Guanine – _____ gummy bear

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 paperclips to hold the 3 parts together. Lay them on your paper plate. Have your teacher check them.
2. Use 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.

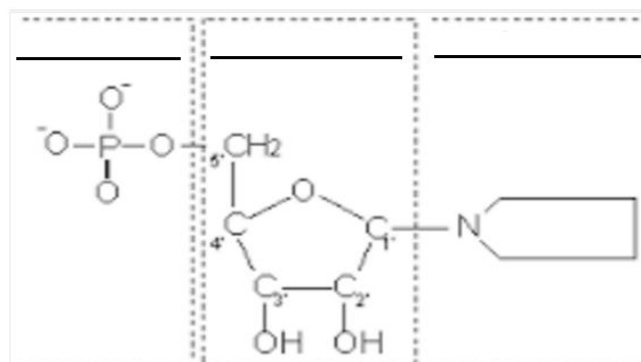


4. Label the **3' end** and the **5' end** on both sides.
5. STOP and have your teacher check your work BEFORE moving on! Answer the questions on the next page while you wait.

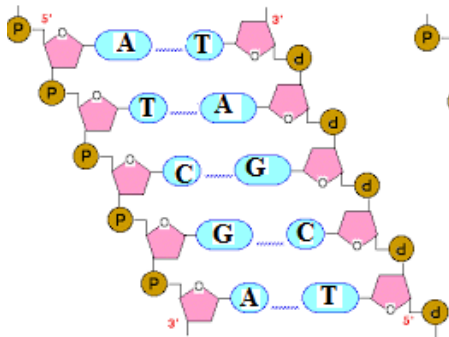
Clean-up: You may eat your models after you finish your questions. Throw all uneaten candy and used materials in the trash. Wet Ones are available to clean your hands.

DNA Candy Lab CONCLUSION QUESTIONS

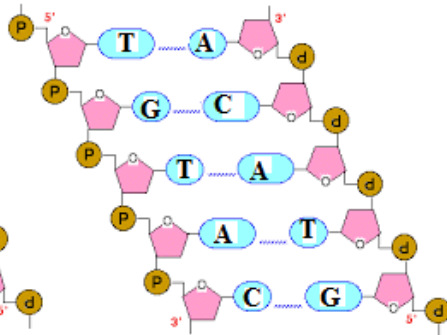
1. A nucleotide is shown below. On the lines, label the three parts.



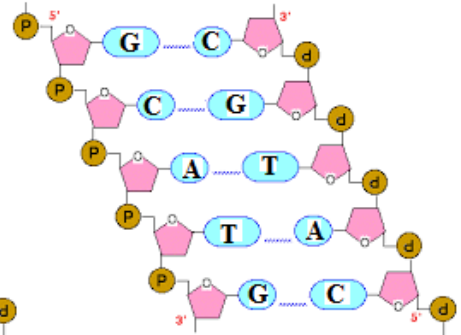
- In a DNA strand, what type of bond holds the bases together? _____
- What structure on the backbone are bases connected to? _____



**Guinea Pig DNA sequence
for protein that
produces white coat**



**Bacteria DNA sequence
for protein that
breaks down lactose**



**Rose Bush DNA sequence
for protein that produces
red flowers**

Examine the DNA sequences shown above to answer the following questions.

- Describe four similarities between the DNA sequences of a Guinea Pig, Bacteria, and a Rose Bush.

Similarity ONE- _____

Similarity TWO - _____

Similarity THREE - _____

- Describe a difference in the DNA of a Guinea Pig, Bacteria, and a Rose Bush.

- You have heard the saying that “DNA determines your traits,” but based on the figures above what part of the DNA determines your trait? _____ Circle this part on the image below.

