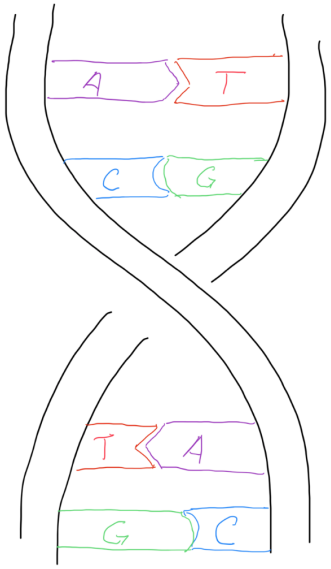
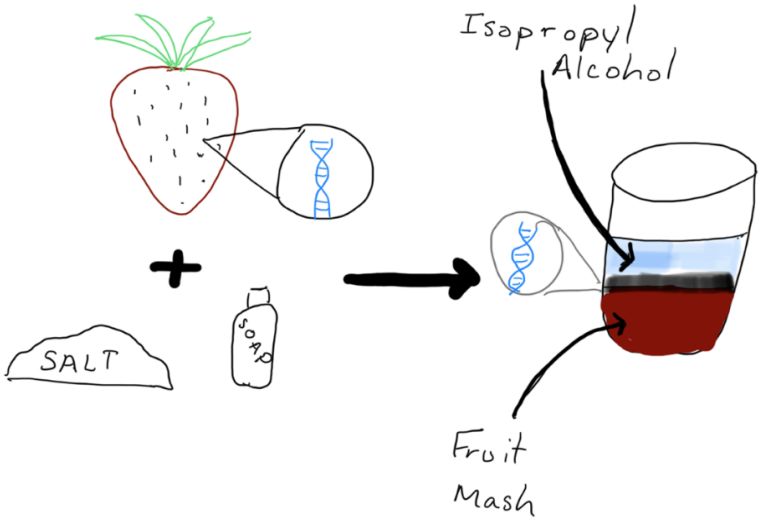
**Husky @ Home Science: Fruit DNA**

**Pre-Activity Note to Kids:**




- DNA is a polymer! A strand of DNA is composed of 2 polymer strands that become cross linked together with hydrogen bonding, creating a ladder like structure.
- Hydrogen bonding occurs between a hydrogen of one monomer and a nitrogen of a different monomer.
- In DNA the monomers are “nucleotides”. There are 4 types of nucleotides in all DNA. The common names for them are A, T, C, and G.The 4 nucleotide types always pair up such that A bonds with T and C always bonds with G.
- In our experiment today we will be looking at the DNA of some fruit. This is possible by having an isopropyl alcohol layer to extract the DNA from the fruit mix.



**Note to Parents:**

**Important Reminders:**

This experiment requires you to provide a piece of ripe fruit (bananas or strawberries work best) and about ⅓ cup cold isopropyl alcohol (rubbing alcohol) for each experiment. The best way to prepare this is to put a bottle of rubbing alcohol in the freezer a few hours before the experiment. **Please note:** at one point in the procedure we will be using hot water, so please make sure your child doesn't burn themselves.

- Deoxyribonucleic acid (DNA) is composed of two long copolymers made of four different types of monomers. These are known as nucleotides, and are cytosine, guanine, alanine, and thymine. These copolymers are in every living cell, and contain the code for how that thing is assembled.
- The two copolymers are attached to each other via hydrogen bonds, where corresponding nucleotides form bonds between a hydrogen and a nitrogen. Cytosine (C) hydrogen bonds to guanine (G), while thymine (T) bonds to alanine (A).


A simplified example of hydrogen bonding between alanine and thymine.

- Every living thing is made of protein building blocks. What types of proteins are assembled is dependent on the order of A, T, C, and G in its DNA; and every specific sequence of nucleotides in DNA codes for a specific protein. Even small sequence differences can have large impacts—all humans have DNA that is 99.9% similar, yet no two humans look exactly alike.
- In this experiment, we are utilizing salt and dish soap to break open the cell membranes of a piece of fruit and expose the DNA inside and using isopropyl alcohol to separate it from the fruit mix.

**To Google:**
Nucleotides
Hydrogen Bonds
Proteins
Deoxyribonucleic Acid (DNA)
Ribonucleic Acid (RNA)
Watson, Crick, and Rosalind Franklin
Photo 51 (First photo of DNA, not Area 51!)