

## Strawberry DNA Extraction: Modifications and notes. 6/10/16 Hive13

### Supplies:

- Put paper towels and kid-sized gloves on the table(s).
- **1 strawberry can be used instead of 2** if there are not enough. The protocol still works fine, just less DNA will be collected
- **Replace the coffee filters with an ~8" square of cheesecloth** (the coffee filters break too easily)
- The rubbing alcohol should be kept on ice in the cooler until it is time to use.
- We are providing small plastic jars for kids to take DNA home. There are also markers to write names.

### Steps:

1. [Removing leaves]--Put a container on the table to collect the leaves.
2. [Smashing strawberries]—Younger kids may need help to completely smash the berries.
3. [Mixing DNA extraction liquid]—1/2 cup of extraction liquid is enough for 20+ kids. You can mix this beforehand to save time, but it's more fun for the kids to mix it themselves.
4. [Adding extraction liquid to strawberries]—adult help is good
5. [Smashing again]—Soap bubbles are not a huge problem but make it harder to get all the mush out of the bag.
6. (Filtering into a cup)—We are using cheesecloth, not coffee filter. Squeezing all the juice out gets messy and **kids may want gloves**. If some strawberry chunks and seeds get through, they will probably get stuck in the final DNA, but won't ruin the experiment.
7. *Continuation of 6*
8. [Pouring Rubbing Alcohol]—This should be done by adults. The exact amount doesn't matter, just use enough to create a visible clear layer above the red juice. Make sure to tell the kids **DO NOT STIR**, this will mix the alcohol into the juice before DNA can form. Also **DO NOT DRINK OR INHALE**.
9. [Wait for DNA to form]—This can be seen most easily by looking from the side. Should be complete in 30 seconds.
10. [Collect DNA]—The snotty DNA can be scraped off the stirring stick into a small jar.

**Cleanup**—Be ready with a trash bag and waste jug for the juice/alcohol.

### Presentation tips:

Before starting the procedure, there are some pictures and props you can use to talk about DNA. You can use your own creativity here, but here's one way to go:

- DNA is present in every living cell and encodes the instructions that tell it what to do. You have DNA, and strawberries have DNA. (show the picture)
- DNA is a polymer made up of 4 different subunits that create the coded message (show the picture)
- Inside the cell, DNA is usually coiled up in a neat, organized manner. Big coiled up pieces of DNA are called chromosomes. You can see chromosomes inside cells using a microscope (Show the picture, and show the ball of yarn)
- However, DNA can also get tangled up into a big sticky mess. One time this can happen is when you get an infection. Immune cells inside your body spew out their DNA to create a net that traps and kills the germs. It's kind of gross and it kills the immune cell too, but it helps protect you from disease. This is called a Neutrophil Extracellular Trap and the process is called NETosis (show pictures, and show yarn that's all tangled up)
- Today we are extracting DNA from strawberries. This will result in tangled up, sticky DNA that you can take home.