

Galena Creek Visitor Center  
At-Home Learning Activity Lesson Plan

# Extracting DNA From Strawberries Experiment

via The Homeschool Scientist



This experiment is easier than you would think and will let your kids extract DNA! This is an indoor activity, and it's likely you already have all the materials needed; kids will likely need parental supervision for this activity and is best for grader 4-12. This activity covers science topics like biology and chemistry.

**Objective:** Through this project, kids will learn a simple way of extracting DNA from an organism and will see what DNA looks like.

**Discipline or Subjects Covered:** Science – biology and chemistry

**Grade Level:** This activity is best for grades 4<sup>th</sup>-12<sup>th</sup>

**Materials:**

- 3 strawberries
- measuring spoons
- 2 one or two-cup pyrex measuring cups
- cone-shaped coffee filter
- plastic zip-lock bag
- small clear plastic or glass cups (custard cups work well)
- laundry detergent (liquid or powdered)
- ice cubes
- 2 big bowls
- a timer
- salt
- ice-cold rubbing alcohol

**Procedure:**

*Before beginning, place the alcohol in the freezer. It will need to be cold to precipitate the DNA.*

1. Cut the strawberries into small pieces and put them in a pyrex cup. Mash the strawberries with a fork until the chunks are gone.



2. Add a tsp of liquid detergent to 1/2 cup warm tap water. Stir. Then, stir into the mashed strawberries.



3. Place hot tap water into a large bowl (about 1/3 full) and place the glass containing the mashed strawberry mixture into the water bath to warm for 15 minutes. Next, make an ice bath of water and ice in another bowl (about 1/3 full) and place the glass in the ice bath to cool for 5 minutes.



4. After 5 minutes in the ice bath, pour the mixture into a funnel lined with the coffee filter. Catch the filtered liquid with another clear glass container.



5. When filtering is completed, add 1/4 tsp of salt to the filtered liquid and stir. Now, add the same amount of the cold rubbing alcohol as liquid and wait a few minutes

6. DNA will start to precipitate out of the solution. At first, it will look like white foam and then you will start to see cloudy strands on top of the liquid. This photo is just the beginning stage. The photos with lots of DNA turned out too fuzzy to tell what it was! It's one of the hazards of doing a super fun experiment with the kids. Photos are an afterthought! The strands of DNA can be collected on a plastic fork, toothpick or skewer.



## **Discussion:**

### **Discussion Questions:**

- How do you think the hot and cold water played a role in this process?
- Would this process work with other fruits and vegetables? Give it a try! If it works, compare the DNA size and shape.
- Touch the DNA. What does it feel like? Why does it feel that way?
- What processes are involved to get to seeing the DNA? What did we have to do to the strawberries?
- Why is DNA important and part of every living creature?

DNA is in the nucleus of every living cell. It is the instruction manual for every single cellular process that happens within that organism. While this complex molecule might seem too complicated for us to study without a PhD, the truth is that we can study it in our own kitchen. We can separate it from the other parts of the cell so we can see DNA with our own eyes.

First, the cell walls that hold the DNA must be broken down. The mashing of the strawberries allows us access to all the individual cells of the strawberries. The detergent breaks down the cell membranes by dissolving the lipids (fats) and proteins that make up the membranes. These fats and proteins bind to the detergent and precipitate out of the solution. The warmth of the hot water bath speeds up this reaction and the cold from the ice bath slows the reaction so that the DNA itself is not broken down.

When the mixture is filtered, a solution is collected that contains DNA without the strawberry solids. Since, DNA is soluble in water, alcohol is added to precipitate the DNA. DNA will be drawn into the alcohol layer of the mixture.

### **Other Resources/Further Information:**

Learn more about DNA by watching this short [movie](#)

Want to see what your own DNA looks like? [Extract the DNA from your own saliva!](#)

Learn about the shape of DNA by making [Yummy Gummy DNA](#)

