












It's Berry **DNA!** the Extraction Experiment

You've probably heard about DNA, but have you ever seen it? In this activity you'll make your own DNA extraction using common household supplies so you can have a look at it!

But first: What is DNA?

Whether you're a human, a cat or a bacterium, each of your cells will have DNA inside of it. Even a strawberry. DNA stands for deoxyribonucleic acid – you're right, that's a long word – no wonder that they shorten it into DNA! DNA is the material that carries all the information about how a living thing will function and look. Pretty crazy! It looks like a funny ladder that's been turned and twisted many times into a spiral. Each piece of information is carried on a different section of the DNA. These sections are called genes. The genes in DNA pass along physical traits from parents to children.

What you need:

- 1 zip-top bag 
- 2 strawberries (fresh or frozen) 
- Liquid handwashing dish detergent 
- 1/2 cup water 
- Salt 
- Two liquid measuring cups 
- Coffee filter or strainer 
- Coffee stirrer 
- Briefly frozen rubbing alcohol 

Why use strawberries?

Human cells have two copies of our DNA while strawberry cells have eight copies! This makes it easier for us to separate enough strawberry DNA to be able to see it with the naked eye. And of course, strawberries are soft and easy to crush.



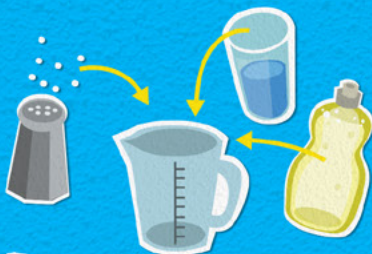
What to do:



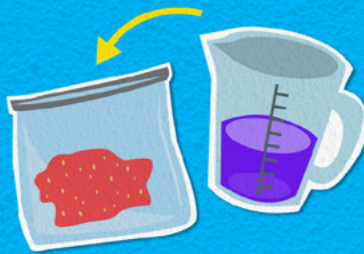
- 1** Wash the strawberries and remove any green leaves.



- 2** Place the strawberries in a zip-top bag. Make sure it is tightly sealed and then smash the berries with your fingers. This breaks open many of the strawberries' cells, which is where the DNA is.



- 3** In a liquid measuring cup make your DNA extraction liquid: mix together $\frac{1}{2}$ cup of water, 2 teaspoons of dish detergent and 1 teaspoon of salt.



- 4** Add 2 teaspoons of the DNA extraction liquid into the bag with the strawberries. This will further break open the cells.



- 5** Reseal the bag and continue mashing the strawberries inside of the bag. You don't want any large pieces remaining.



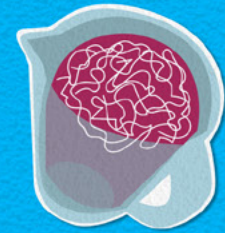
- 6** Place the coffee filter or the strainer on the other liquid measuring cup.



- 7** Pour the strawberry liquid into the filter or through a strainer. Use a spoon to press against it to better mix it.



- 8** Next, pour down the side of the cup an equal amount of cold rubbing alcohol as there is strawberry liquid and hold the mixture at eye level. Do not mix!



- 9** You are looking for a separation of a white cloudy substance in the top layer. That is the strawberry DNA!



- 10** Use the coffee stirrer to gently remove the DNA from the solution and have a look at it. Isn't it fascinating to see the DNA strands in person? (Bonus: If you happen to have a microscope kit at home, put some of the DNA on a slide and observe even more closely – just like a real scientist!)



What just happened?

Smashing the strawberries breaks open many of the strawberries' cells, where the DNA is. The dishwashing liquid helps to bust open any cells that are still intact, releasing the DNA. Salt is added to ensure that the proteins in the cells are kept separate from the DNA. When the alcohol is added to the measuring cup, it makes the DNA clump together. DNA is not soluble in alcohol, which is why the strands become visible.

