

DNA Extraction

This activity takes about 10 mins plus an introduction

Intro:

This activity introduces a younger audience to deoxyribonucleic acid, or DNA. DNA is present in every cell of all plants and animals (contained within the cell nucleus) and determines the genetic traits of the individual organism. It is what makes us who we are.

The Science:

This experiment demonstrates DNA extracted from a strawberry; the long thick fibres you can see and even pull out of the extraction mixture are real strands of strawberry DNA (strawberries are great for this activity because they contain 8 DNA strands per cell, rather than the usual 4).

DNA is a chemical made out of two long molecules coiled up tightly into the classic "double helix" pattern. In humans, it is organised into structures called chromosomes, with every human cell containing 46 pairs. It contains all of the instructions within each cell to tell it to grow, reproduce and function. Our DNA is inherited from our parents (half from mum and half from dad), and the DNA of every human is different except for identical twins (who have identical DNA).

Each component of the extraction mixture plays a role in the DNA extraction: Soap helps to dissolve the cell membranes, salt is added to release the DNA strands by breaking up protein chains which hold the nucleic acids together and, finally, DNA is not soluble in isopropyl alcohol, especially when it is ice cold.

What you will need:

Coffee filter papers/Sieve
Pipette
Test tube/beaker
Strawberries
Washing up liquid
Salt
Zip Lock/sealable plastic bags
Isopropyl alcohol

Instructions:

Chill the alcohol in the freezer. Pour 90ml water into a test tube/beaker and then add 2 tsp washing up liquid. Stir in 1/4 tsp salt and mix until this is fully dissolved. This is your extraction mixture. Place a strawberry in a sealable plastic bag and add the extraction mixture. Remove as much of the remaining air from the bag and seal tight. Thoroughly mash the strawberry using fingers/hands. Pour the mix through the sieve/coffee filter into a test tube/beaker. Add 1tsp of chilled alcohol to the solution and watch at eye level looking for the separation of material that is viewed as a white area on top. This is your strawberry DNA.

