

KS3 & 4 Science

Builds on **Unit 8E Atoms and elements**

Supports **Unit 7A Cells**

Unit 9A Inheritance and selection

Unit 7D Variation and classification



The Stuff of Life

Extracting DNA from Strawberries

DNA in a cell is about 100,000 times as long as the cell itself. However, DNA only takes up about 10% of the cell's volume. This is because DNA molecules are full of twists and turns and are packed into chromosomes in the cell's nucleus. This twisting and compression can easily and vividly be experienced by having the students build DNA models with a Molecular Model system.

This activity allows students to easily extract and observe DNA (deoxyribonucleic acid) found in plant cells. They then spool the DNA and are able to visualize its physical properties. They are able to gain an appreciation and first hand experience of the DNA structure.

This activity comes with everything needed to perform the lab except the strawberries and can be completed in about twenty minutes or less.

Strawberries are always readily available in supermarket frozen food sections and available fresh many months of the year as well. Frozen strawberries give better results because the act of freezing breaks the cell membrane and dramatically increases the amount of DNA that is available for extraction. The chromosomes (which are made of DNA) are in the nucleus. This is the only place where DNA is located.

Strawberries are fruits of highly composite flowers. They are "octoploid" which means they have eight of each type of chromosome. Also, ripe strawberries are producing pectinases and cellulases which are already breaking down the cell walls. Most interestingly, strawberries have enormous genomes. These features make frozen strawberries an ideal fruit to use to extract DNA.

This activity is a DNA isolation procedure.

Because DNA is such a long molecule, one of its ends can be "snagged" and, as the DNA is reeled in, it will snag other DNA molecules with it. Soon the rod or splint will have a large spindle of DNA on it. Once isolated, the DNA can be stored in alcohol or dried out. It is then possible for students to hold in their hands the key to an organism's development and structure.

This activity depends on the following fact: DNA is soluble in water, but not in ethanol.

The kit has **all** of the materials needed to perform the activity except for the strawberries. Ideally, students should work in teams sharing the two reagents provided.

This outline activity is reproduced from the kit manual, with permission from Lab-Aids Inc.

The Lab-Aids **Strawberry DNA Extraction Kit** is available from Philip Harris **B8R01751**.