

Try extracting DNA from fruit with this hands on activity.

**Age:** 7 - 14

**Time:** 30 min

**Topics:** DNA, Living things

**Learning objectives:**

- DNA is found in the cells of all living things.
- DNA can be extracted from cells.

## BACKGROUND

A bit like a recipe book, all the biological instructions for making an organism are contained in a long molecule called DNA (deoxyribonucleic acid). All living things, from humans and mice to plants and bacteria, have a unique set of instructions written in the four chemical letters of DNA: A, C, G, and T.

Although it's not visible to the human eye we know that DNA has a unique shape. It is a double helix, and looks a bit like a twisted ladder. Each strand of the ladder is made of a long string of four DNA letters: A, C, G, and T.

These DNA letters known as bases always pair up in same way:

- **A** always pairs with **T**
- **C** always pairs with **G**

So we know when we have a T on one strand of the ladder, the other side will always be A, and if we have a G, the letter opposite it will be a C.

This activity will enable participants to extract DNA from fruit using basic household ingredients.

### Find out more

Read this fact page to find out more about DNA: [www.yourgenome.org/facts/what-is-dna](http://www.yourgenome.org/facts/what-is-dna)

## ACTIVITY PREPARATION

### Materials

- ☐ Fruit such as strawberries, bananas, blueberries, etc
- ☐ Table salt
- ☐ Washing up liquid
- ☐ Water
- ☐ Vodka (chilled)
- ☐ Cocktail sticks
- ☐ Disposable cups
- ☐ Disposable shot glasses
- ☐ Sealable plastic bag
- ☐ Jug
- ☐ Sieve
- ☐ Spoon
- ☐ Measuring cylinder (up to 100 ml)
- ☐ Instruction sheet

### Set up

To set up for this activity carry out the steps below:

1. Put the vodka in the freezer overnight. It works best if it is really cold.
2. To speed things up you can premeasure out the salt, water and washing up liquid. This is optional.
3. Follow the instructions and do a practice run the day before to make sure you are clear on how the process works.
4. Set up each group (or table) with:
  - Fruit
  - 10 ml of vodka (put it in a different container if possible and label with alcohol)
  - 5 g of salt in a shot glass
  - 5 ml of washing up liquid in a cup
  - 50 ml of water in a bottle
  - Measuring cylinder
  - Jug

- Sieve
- A bowl of cocktail sticks
- Sealable plastic bags
- Cups for mixing water, salt and washing up liquid.
- Shot glasses
- Instruction sheet

## ACTIVITY GUIDANCE

### Warm up

Start with a quick discussion:

1. Using the PowerPoint slides provided show the students the image of DNA. Ask the students if they know what this is. Ask them to describe its shape.
2. Using the next slide, explain that DNA is made up of 4 letters ATCG and the letters pair up in a particular way: A with T and C with G.
3. Using the next slide, explain that DNA is found in all living things. Ask if they can name a living thing that has DNA? Can they name any of the organisms on the slide?

### Run the activity

Get going with the activity by following these steps:

1. Now the group is familiar with DNA explain, using the final PowerPoint slide, that they are going to extract DNA from a fruit.
2. Show them the instruction sheet to follow.
3. Demonstrating from the front, walk the students through the extraction process step by step.
4. Key points to highlight during the activity are outlined below:
  - The washing up liquid helps to break down the cells and the salt helps to pull out the DNA.
  - Mashing up the strawberries physically breaks open the cells.
  - Sieving the mixture separates all the lumps from the liquid in the jug which contains the DNA.
  - The alcohol makes the DNA bunch up so it is visible.

## TAKE IT FURTHER

Did you get DNA from the strawberry? Why don't you take it further and see if you get as much DNA from another fruit? What about a blackberry (one of the 25 species being sequenced by the Wellcome Sanger Institute)? Or how about a banana or apple? What other fruit could you try?

Do you want to explore the topic of DNA further? Why not try making an edible DNA model with our **Delicious DNA** activity or make a **Sequence Bracelet**.

You could also find out more about the 25 species being sequenced by the Wellcome Sanger Institute with our **Creature Report** activity.

## SHARE IT

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**[engage@wellcomegenomecampus.org](mailto:engage@wellcomegenomecampus.org)**

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