



## Before you start

### Materials to place on the table

Place on the table the following for each group of **four pupils**:

- Extracting DNA instruction sheet
- 3 strawberries (no stalk or leaves)
- A zip-lock sandwich bag or tie-able freezer bag
- 4 small clear disposable glasses (approx. 25-30ml)
- A sieve
- A kitchen jug
- A spoon
- Sheet of kitchen roll
- 4 cocktail sticks

### Materials to be measured

Measure out into separate plastic cups for each group of **four pupils**:

- 90ml of water
- 1 tablespoon of washing up liquid
- ½ teaspoon of table salt

Measure out into separate plastic cups for **each pupil**:

- 10ml cold alcohol (leave in freezer the night before running the practical, and keep cold until required at the end of the experiment)



## Guide

Start off by dividing the class into **groups of four pupils**. Give each group the cups containing the water, washing up liquid and table salt.

- 1 Get the pupils to pour the 90ml of water into the plastic cup containing 1 tablespoon of washing up liquid.
- 2 Then get them to add the  $\frac{1}{2}$  teaspoon of salt to the mixture.
- 3 Using the spoon, they should gently mix everything together until all the salt has dissolved. Make sure they don't mix too hard or it will get very frothy.
- 4 Get the pupils to place the 3 strawberries into the sandwich bag.
- 5 They should then add the water, salt and washing up liquid mixture to the bag.
- 6 Before sealing the bag, get them to squeeze out as much air from the bag as possible.
- 7 Help the pupils to seal or tie a knot in the top of the bag so that no liquid can come out.
- 8 Using their hands and fingers, get the pupils to squash the strawberries in the plastic bag for about 5 minutes until the fruit is all mushed up like a smoothie. Make sure they don't squeeze too hard otherwise the bag may burst!
- 9 Get the pupils to place one sheet of kitchen roll in the sieve and then place the sieve over the jug.
- 10 They should then pour the strawberry mixture through the sieve and kitchen roll to remove any large lumps, collecting the coloured liquid in the jug underneath.
- 11 Leave the mixture for 10 minutes to enable it to pass through the sieve and collect it in the jug.



Now each pupil will work **individually** to get some DNA.

- 12 The strawberry mixture then needs to be poured from the jug into the small glasses so that there is one small glass of mixture per pupil. Only half fill the glasses so that they will have room to add the alcohol in the next step. You may want to do this for your pupils or you may feel they can do this themselves.
- 13 Give each pupil a glass of strawberry mixture and a cup of cold alcohol.
- 14 Get each pupil to slowly pour the cold alcohol into the mixture down one side of the glass. The pupils may need help with this. As they do this, they should see the alcohol forming a clear layer on top of the coloured, strawberry mixture.
- 15 Point out to the pupils that they should be able to see white gooey lumps or threads forming in the layer of alcohol just above the coloured mixture – this is DNA!
- 16 Get the pupils to carefully place one end of a cocktail stick into the clear liquid and use it to pull out some of the DNA.

Well done! Your pupils have successfully extracted DNA from strawberries!

At the end of the activity the DNA mixture and other materials can be disposed of in a regular sink and waste disposal.