

ACTIVITY: Kids extract DNA from a strawberry

GRADE LEVEL(S): K to 12th



15 minutes

OVERVIEW: For this lab, students put themselves in the shoes of DEEPEND scientists to extract real DNA from a strawberry

DISCIPLINES: Science, genetics

OBJECTIVES: Students will be able to:

- recognize that DNA is the blueprint of living things
- discuss how and why scientists extract and map DNA
- discuss how mapping DNA helps with population studies

NOTE: This easy, popular lab activity lets kids actually extract DNA from a strawberry. It is an excellent way to introduce DNA, discuss how and why scientists extract DNA and lets kids become the scientist. Since the scientists at the National Human Genome Research Institute ([genome.gov](http://genome.gov)) created an excellent simple set of instructions and a YouTube video (for you), we decided not to reinvent the wheel. We have included some suggestions to keep in mind while planning your lab.

MATERIALS:

Copy of “How to Extract DNA from a Strawberry” instructions from National Human Genome Research Institute ([www.genome.gov/pages/education/modules/strawberryextractioninstructions.pdf](http://www.genome.gov/pages/education/modules/strawberryextractioninstructions.pdf))

Per learning group:

- 2-3 Frozen strawberries **THAWED**
- 1 plastic (resealable/zip type) sandwich bag
- 2 teaspoon baby shampoo
- 1/2 teaspoon salt
- 1/2 cup water
- 1/2 COLD rubbing alcohol (for younger students, adult should measure and pour)
- coffee filter
- clear plastic cups (2)
- popsicle sticks
- measuring utensils (optional: if students measuring)
- \*safety goggles (optional)

**\*THOUGH THE INSTRUCTIONS DO NOT INCLUDE THEM, WE SUGGEST YOUNGER STUDENTS WEAR SAFETY GLASSES**

We have some preparation and “day of” tips to help...

WHAT TO DO:

Preparation:

1. Watch Drs. Eric Green and Carla Easter from the National Human Genome Research Institute of the National Institutes of Health (NIH) demonstrate how to extract DNA from strawberries in this YouTube video: [www.youtube.com/watch?v=hOpu4iN5Bh4](http://www.youtube.com/watch?v=hOpu4iN5Bh4)
2. Take a moment to review the DNA and DEEPEND background information to see how and why the Science Team uses DNA studies to enhance the research.

## Preparation (continued):

3. Refrigerate rubbing alcohol.
4. Place 2-3 strawberries in each sandwich bag. Allow strawberries to thaw completely.
5. If you have younger students or limited time, pre-measure solution (shampoo, salt, water) in clear plastic cup for each group.
6. Set up lab space for each group. Each group needs thawed strawberries in bag, solution or ingredients for solution, (if students measuring their own, they'll also need measuring utensils), popsicle sticks, clear plastic cup, coffee filter, safety glasses (one pair per student).

## Day of:

Follow "How to Extract DNA from a Strawberry" instructions.

## Possible discussion questions:

- *What is DNA?*
- *Do dogs have DNA? Fish? Bacteria? (Yes)*
- *What can we learn from DNA?*
- *How would you use DNA to study the deep?*
- *How do you think the DEEPEND Scientists use DNA?*
- *How can identifying and tracking deep-sea animals DNA help DEEPEND scientists?*
- *Do you know how do scientists get the DNA from a plant or animal? Let's find out...*

*What do scientists do after the DNA is extracted?*

Once the DNA is extracted, each base (A, G, C, T) is marked with a special compound that lights up a different color. This specially marked sequence is put into a sequence analyzer, a machine that makes the bases light up one at a time. Let's say A lights up green, G lights up white, C lights up blue, and T lights up red. If the machine makes the bases light up and sees white, white, blue, green, red, green, it saves the sequence: GGCATA. Usually, the DNA sequences we use are hundreds of bases long so the machine reads those four colors many times and records the each base. Then, we can look at the DNA sequence the machine has read.

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