

ACTIVITY 3: DNA EXTRACTION FROM STRAWBERRIES



Image Credit: Science U

Background:

So much is known about DNA that we can alter the genetic makeup of organisms, such as the sea lamprey. As Activity 2 discusses, genetic engineering is being used as a possible solution to controlling the sea lamprey population and reducing the threat they pose to the Great Lakes ecosystem by altering lamprey genes.

This takes advantage of what's known as the **central dogma of molecular biology**: DNA, a molecule that contains the code of all the proteins necessary to make an organism, gets transcribed into RNA—a similar molecule that contains the same code in a different language, so to speak—and the RNA gets translated into proteins that do everything an organism needs to do at the molecular level.

In order to learn about DNA and develop technologies with it, scientists first need to be able to get DNA out of an organism in the first place to study it and work with it. So, how does that happen? Using a lab technique called DNA extraction.

Pre-Lab:

First, ask students to raise their hand if they have ever eaten DNA before. Some students may look around and hesitate, but after you allow for some awkward time, inform them that every hand should be raised, because any living organism (plant or animal) contains DNA.

Next, brief students about the notes from the background section above in this activity and let them know that today they will be extracting DNA from an organism—strawberries—using a variation of the technique scientists use to do this.

Then, show this Science U **video from PBS LearningMedia** about extracting DNA from strawberries to give them an overview of what they will be doing. Check for understanding with a few comprehension questions about the video.

Last, provide the materials needed and give students a copy of the DNA Extraction Student Handout to allow them time to conduct the investigation.

Have all groups list their calculated average mass of DNA in one strawberry on the board. Part of the analysis will be for groups to calculate a class average for the amount of DNA in one strawberry and determine a percent difference from their group compared to the class average.

Discuss with the class why the class average number might be different than an individual group's calculated value for the mass of DNA in one strawberry and what it means if a group calculated a negative versus positive value for the percent difference.

Teaching Tip: If you have students who are allergic to strawberries, consider using another fruit like bananas or raspberries instead.