SimplyScience Stiftung
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1. DNA Extraction from a tomato

Fig. 1: Tomato

Introduction:

As you know all living organisms consist of cells. In almost every cell information is stored as DNA. Scientists routinely investigate and manipulate DNA in their laboratories. For many years it was unclear if a person's heritage was due to DNA or proteins.

Goal:

In this experiment you will isolate the DNA from a piece of tomato to see what DNA actually looks like. It will also give you an idea of the amount of DNA you eat and of some of its physical properties. The procedure is very simple and does not require any special chemicals or highly sophisticated machines. All you need you can find around the house.

Task 1: Please open the file "Protocol_DNA_Extraction_from_a_tomato.pdf" and follow the protocol carefully. You'll find this protocol on the website just next to this file.

Expected answer: Take a picture of each important step during the experiment. Make sure that you take a picture of the DNA you extracted. Chose 3 pictures (including the picture of the extracted DNA) and describe each of them carefully in your documentation.

Task 2: For the best results, use freezing cold alcohol (-20°C).
Explain why this is true.
Expected answer: 1-3 sentences.

Task 3: A skeptical person could argue that you extracted protein instead of DNA. How would you proceed
a) to prove that your extract contains DNA?
b) to test that proteins are present in your DNA extract as a contaminant?
Expected answer: 2-4 sentences each for task 3a and 3b.

Task 4: One of the first genetically manipulated fruits was a tomato called *'Flavr savr'*. What was the intention of the scientists who developed this special tomato? Find the answer by searching the web.
Expected answer: 3-5 sentences.

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Task 5: You buy a tomato in a supermarket in Switzerland today. How can you know if this fruit is genetically modified?
Expected answer: 2-3 sentences

List the references used according to the guidelines of SCHWEIZER JUGEND FORSCHT, http://www.sjf.ch.

Do not forget to add the activity list to your documentation! Each class needs to report which member was or is responsible for which portion or aspect of the work. Each person in the class must have participated at least once (during the entire competition) in the experimental portion.
Therefore, **take 3 digital photos per experiment showing the class involvement.** Place them next to the activity list in your documentation file.

Expected documentation and further information

- Create **a single** PDF file containing all your solutions, pictures, other documenting material and the activity list and name it, following strictly these conventions:

  1. Number of class
     (find your class number in "Participant" where all the participating classes are presented).
  2. Name of School
  3. Name of class (same as on application form)
  4. Number of experiment
  5. Date (year/month/day)

  → Please use underlines instead of spaces!
  Here is an example: **08_Kantonsschule_Muster_3b_Experiment1_20110222.pdf**

  → The size of the PDF file must not exceed 3 MB (6 pictures: about 400-500 KB per picture)!

- Scores

  A maximum of 10 points is awarded for each experiment. Each question/task (1-5) is rated with a maximum of 2 points.
  If the **references** are listed correctly (according to the guidelines of SCHWEIZER JUGEND FORSCHT) and the **layout** of the whole PDF file is satisfactory, there won't be a penalty on scores. If one of these two aspects is not solved sufficiently, you will receive one point less (for each aspect).

  Example: If you solve the task 1-5 satisfactory (10 points), the layout is good, but the references are not listed correctly, you will only receive 9 points in the end (for one experiment).

Closing date of experiment 1:	**28.03.2011, 18:00**