Didactic unit - Biological macromolecules

Lesson title - DNA extraction

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Level level - classes III scientific high school

Age 16- years

Time required - 2 hours

Short description:

In this unit we will take the DNA, present in all living things, from the banana through a simple procedure, taking into account both its localization within the cell and exploiting the characteristics of this molecule. We will then make an observation under the optical microscope.

Educational learning objectives:

Knowing how to make logical connections;

Knowing how to recognize and establish relationships;

Knowing how to extract and identify DNA.

Current student level:

Prerequisites: the activity is carried out in classes III, therefore students already possess the prerequisites: solutions, extraction techniques, chemical transformations.

Teaching methodologies:

The activity is introduced through a series of questions that lead the pupils to focus attention on DNA and ask where is the DNA? We draw a cell with the nucleus: animal or vegetable? Answer: Both cells have DNA! For practical reasons, a vegetable is chosen …… .. Then the students are asked: If we were to extract it, what should we do? Answer: get it out of the cell. How could we do? Answer: by breaking the cell etc. etc. Thus they come to recognize a series of steps that lead to the isolation of DNA and to recognize it.

Used materials:

Banana;

sodium chloride;

water;

liquid soap;

ethyl alcohol

mortar

beaker

test tubes

microscope

Sequences:

Phase 1) Rupture of cell membranes and release of DNA in a soluble medium;

Phase 2) Dissociation of the DNA protein complex;

Phase 3) Separation of DNA from other soluble cellular components;

Step 4) Staining and observation under the microscope.