



LESSON PLAN "Me a scientist"
" Doing an experiment extracting DNA from fruits and vegetables"

PROCEDURE


Goal : understand what DNA looks like

• **Materials (for 2 students):**

- 1 test tube
- 1 test tube rack
- 1 funnel
- 1 paper filter
- 1 beaker
- 1 container of table salt
- 1 wooden applicator stick
- 1 container of alcohol
- 1 container of dis-washing detergent
- cold water
- 1 container of Schiff solution
- 1 mortar and 1 pestle
- 1 watch glass
- ¼ of banana.

Need some help ?

- *to mash* = to crush something semi-solid into something nearly liquid (« the birds mash the food before giving it to their babies »).

- *a drop* = 

- *to homogenize* = to mix perfectly two or more different liquids.

- *to pour* = to transfer a liquid from a container into another container .

• **Procedure:**

Cell lysis

- 1) **Mash** the banana with the mortar and pestle with all the table salt, then you will get a **mashed solution** ;
(*Cells will be broken by both mechanical and chemical means : action of the mortar and the salt.*)
- 2) Take 50 ml of cold water with the beaker, add this water to the mash (banana+salt).
- 3) Add 30 **drops** of dis-washing detergent (the dis-washing detergent will destroy the cell membrane).
- 4) **Homogenize** the mash+ water+ dis washing solution, then you get an **homogenate**.
- 5) Slowly **pour** * the homogenate through a paper filter+ funnel into the beaker. This liquid is now **filtrate**.
- 6) Then put only 1,5cm of the filtrate in the test tube.

Self-assessment : ù
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***Purification of the
DNA***

- 7) Slowly pour 3cm of alcohol on the top of the filtrate, the two liquids should not mix together (alcohol should form a layer on the top of the filtrate) , put the test tube back on its rack. (Alcohol will help to separate the DNA from all the cells pieces)

WARNING: THE 2 LIQUIDS SHOULD NOT MIX.

- 8) Wait for 5min without disturbing the test tube : bubbles will form and the DNA will precipitate. Start answering the questions.

Self assessment :
Ù Ì

DNA coloration

- 9) Gently take the DNA with the wooden applicator stick. Put the DNA on the glass.
- 10) Add 1 drop of Schiff solution (Feulgen coloration) on the DNA fibers , this solution colorates only DNA.

self-assessment : Ù
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***Cleaning
and storage***

- 11) Do the student work sheet ;
- 12) Wash, dry and store the materials back as they were at the beginning of the experiment;
- 13) Clean the table.

self-assessment : Ù
Ì

Experiment assessment

Procedure followed carefully :	/ 2
Autonomy :	/ 1
Cleaning and storage:	/ 1
Experiment done quietly :	/ 1



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Student work sheet

Family name : first name :

1) Describe the mass that you extracted (obtained at step n° 7), describe its shape and color
(you can also use the book) /1

2) Why did you mash the banana with salt ? /1

3) What function does have the detergent in this experiment ? /1

4) Look at the color of the mass after the coloration (you can also use the book)
a) describe the color of the mass ? /1

b) Knowing that Schiff solution colorates specifcly DNA, which conclusion can you make ?
/ 0,5

4) What is the link between chromosomes and DNA? / 0,5



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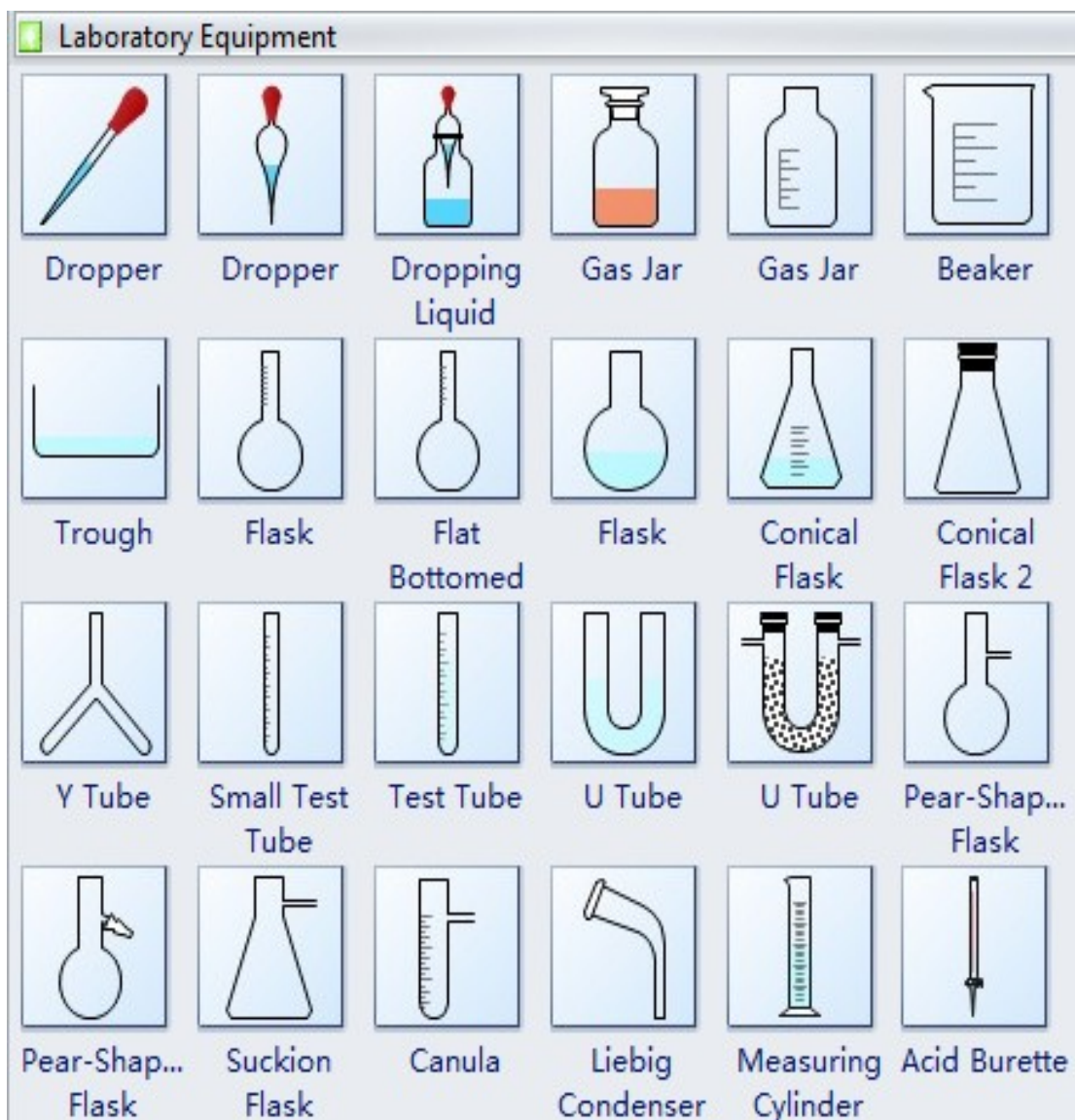


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VocabularyTool box

COMMON LABORATORY EQUIPMENT



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