

2. Investigation of colored petals (*Viola wittrockiana*)



Fig 1: *Viola wittrockiana*

Introduction:

Perhaps you are familiar with the velvet-like impression you get by touching the petals of these well-known flowers called 'Stiefmütterli' (Fig. 1). As well as their soft feel, these flowers have intense and vibrant colors.

Goal:

It's your task to explain these two phenomena (the feel and color of the flowers) by making very thin sections of the petals, and then looking at and photographing the cellular structures under the light microscope. Finally you should interpret and discuss your results.

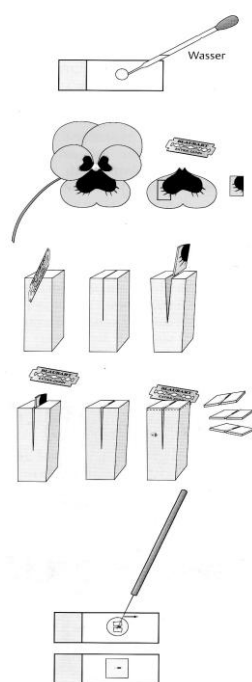


Fig 2: Scheme of the experiment

Task 1:

Find the flowers in a nursery, a flower shop or in a garden. Make sure that they are colored violet, black and yellow (Fig. 1).

Expected answer: Take 1 picture of the whole flowers you have chosen for this experiment. Take 1 picture of the samples of very thin sections you will investigate in task 2 (Fig. 2).

Task 2:

Cut the petal with a new razor blade through the area you would like to analyze (Fig. 2). Make sure that the sections you cut are as thin as possible. Do not only make one section but rather half a dozen of them in a row for further analysis.

Transfer them into a drop of tap water on a slide, cover your sample with a cover slip, and observe the sample under the microscope.

When you find what you are looking for, start to take pictures with your digital camera.

Chose the best picture, label it and describe your observations in detail.

Expected answer: For this task we want to see 1 clear and sharp picture. With this picture you should explain in 2-3 sentences where the velvet effect comes from.

Task 3: Where in the cells of the investigated petals are the pigments stored that are responsible for the vibrant colors of these flowers? It is of special interest to show in which organelles the respective pigments are stored.

Expected answer: 3 sharp and clear pictures which show where in the cells the different colors of the investigated petal-sections are stored. Label the pictures carefully and label the structures you can recognize.

Where (in which organelles) are the yellow and the violet pigments stored? How come some regions of the petals appear black? You may use books you find in your classroom or your reference library for biology at your school to help find the answer.

Task 4: Find some flowers during the winter season in flower shops or in a nursery. Investigate petals from the flowers of 2 other species. Can you detect some obvious similarities or differences?

Expected answer: 2 pictures (one of each species) of the sections through petals of your choice, labeled as in task 3. 3-4 sentences should be added to explain your observations.

Task 5: Read some background information about colors in petals. Give a clear explanation why it is unlikely to find situations where the same pigments are stored in completely different organelles.

Expected answer: 3-5 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 6 MB (11 pictures: about max. 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).

- Special Award

Chose the best and nicest picture you took during the whole experiment 2, label it with your school name, class name and “Miss Viola” and send it as a .jpg file additionally to your documentation file of experiment 2 with the e-mail.

The most beautiful picture will be chosen and will be awarded with the special price “Miss Viola” in the category “Science & Art”.

Closing date of experiment 2:	18.04.2011, 18:00
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