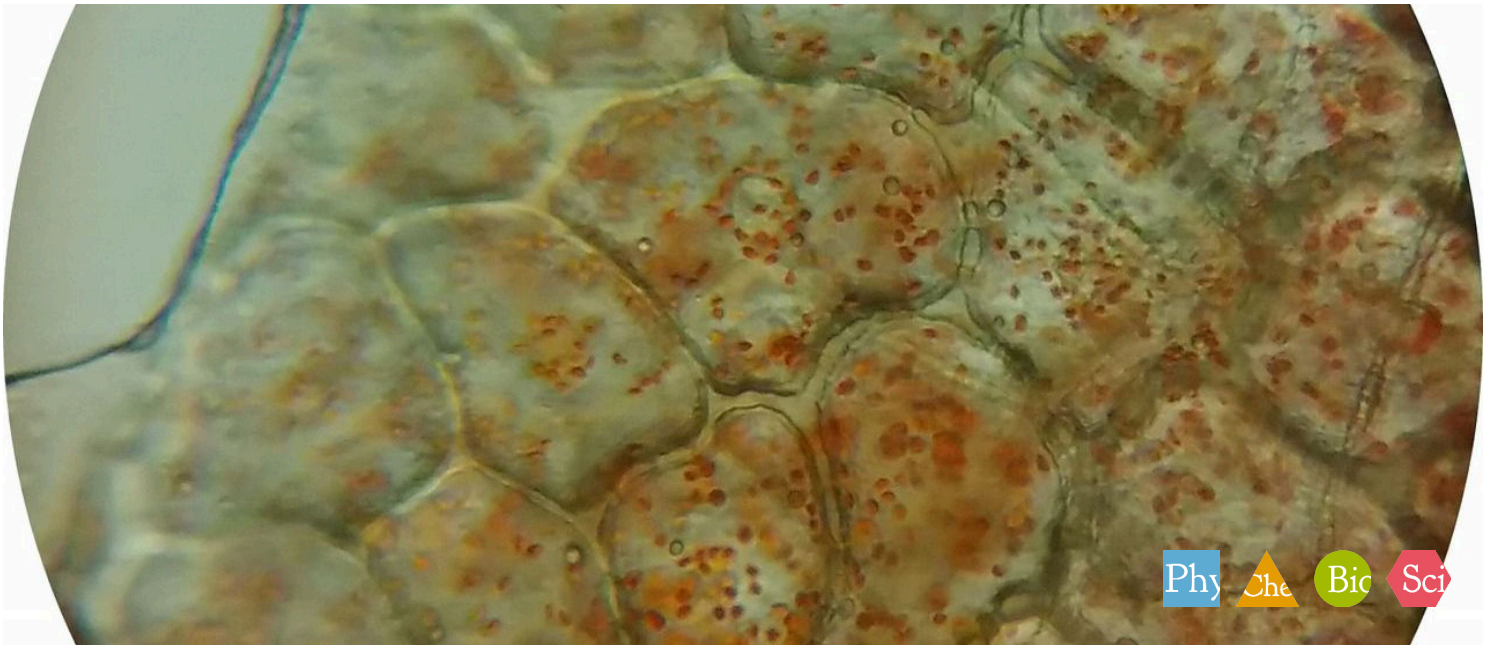
Chromoplasts



Biology	Microscopy / Cell Biology	Basics of Microscopy & Work Technology
Biology	Microscopy / Cell Biology	Plants & Fungi
Biology	Microscopy / Cell Biology	Cell structure
Nature & technology	From the very small & the very big	
Nature & technology	Plants & animals	

Difficulty level	Group size	Preparation time	Execution time
easy	1	10 minutes	30 minutes

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Teacher information

Application

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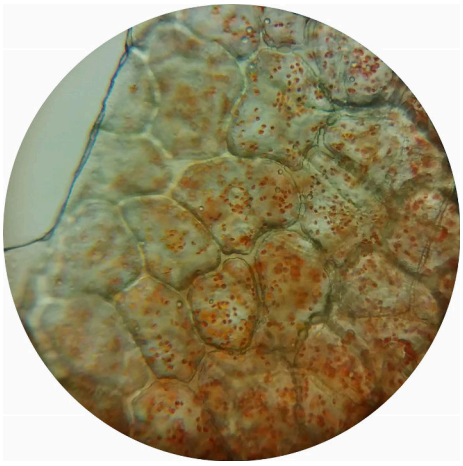

Cells of peppers at low magnification

The fruits and blossoms of many plants have strong, bright colours. The coloured fruits attract animals, are eaten by them and the seeds are excreted elsewhere. This is how the plant is spread. Coloured flowers attract insects, which harvest the nectar from the flowers. In addition, the pollen is transported from plant to plant, thus ensuring fertilization. Yellow and red dyes are usually found in certain cell organelles, the chromoplasts.

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Other teacher information (1/3)

Prior knowledge

The cytoplasm of plant cells contains numerous plastids surrounded by thin membranes. They are usually ovoid in shape and are distinguished by their colour. Due to photosynthesis, the most important group is that of chloroplasts. The chromoplasts contain carotenes or xanthophylls. Some of the colours have a meaning for attracting animals (e.g. flowers - insects, fruits - birds).

Scientific principle

The students should understand the preparation instructions as a stimulus. They can make peel preparations, cut preparations, but also scraping preparations of carrots or squeezing preparations of the soft flesh of tomatoes. It is important to make sure that the preparations become thin, i.e. that they are translucent.

Other teacher information (2/3)

Learning objective

The students learn how chromoplasts are present in form and arrangement in the cell.

Tasks

Making and microscoping the preparation

1. Red pepper - fruit skin
2. Capuchin Cress - Petal
3. Rose - pulp

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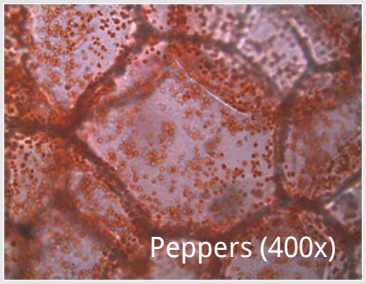
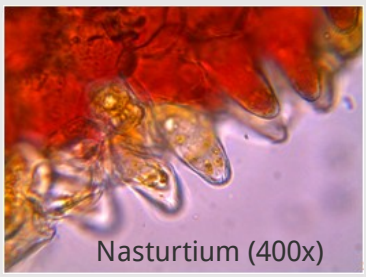
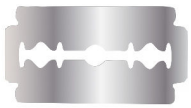
Other teacher information (3/3)


Peppers (400x)


Nasturtium (400x)

Chromoplasts are present in all yellow, red and orange parts of the plant. The preparations suggested on the student worksheet are particularly suitable, but students should be encouraged to examine fruits and flowers that are easily accessible to them. The pupils can bring coloured vegetables from the kitchen at home and flowers from the garden. Blue and purple flowers are not suitable, as the most common dye anthocyanin is dissolved in the vacuoles. Fruits of the rose can be harvested from wild roses or from bed roses.

Safety instructions



- Razor blades are sharp. Extreme caution is advised when handling them.
- Working with microscopes for too long can lead to physical discomfort (fatigue, headaches, nausea), especially when students are inexperienced.
- Microscopes are sensitive. During transport and handling, care should be taken to ensure that everything is done carefully and without rushing.
- The general instructions for safe experimentation in science teaching apply to this experiment.

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Student Information

Motivation

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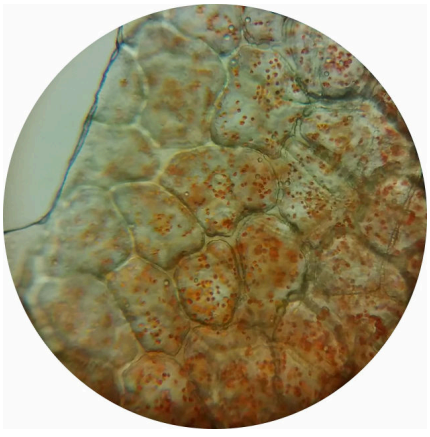

Cells of peppers at low magnification

In this experiment you will learn how to recognize the chromoplasts in different preparations of different plants and fruits and how to describe their shape and arrangement.

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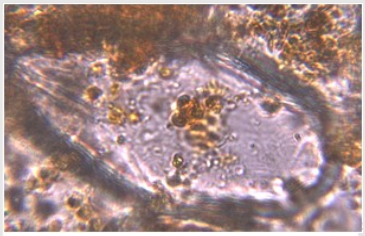
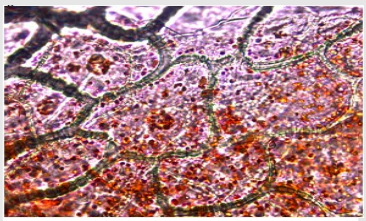
Tasks



Fruits of the rose (400x)



Peppers (400x)

Preparation and microscopy of preparations

1. Red pepper - fruit skin
2. Capuchin Cress - Petal
3. Rose - pulp

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Equipment

Position	Material	Item No.	Quantity
1	PHYWE Binocular student microscope, 1000x, mechanical stage	MIC-129A	1
2	Microscopic slides, 50 pcs	64691-00	1
3	Cover glasses 18x18 mm, 50 pcs	64685-00	1
4	Beaker, 100 ml, plastic (PP)	36011-01	1
5	Dropping pipette with bulb, 10pcs	47131-01	1
6	Tweezers,straight,pointed,120mm	64607-00	1
7	Scalpel holder	64615-00	1
8	Scalpel blades,rounded tip,10 off	64615-02	1

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Procedure (1/3)

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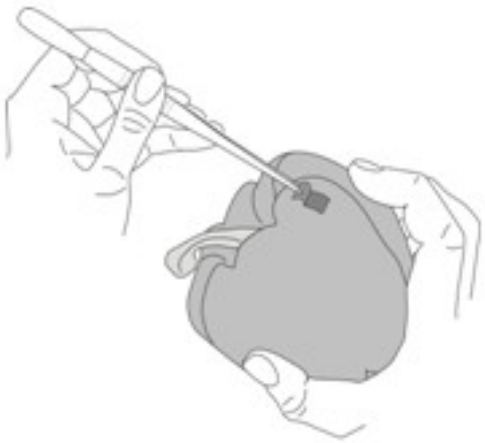


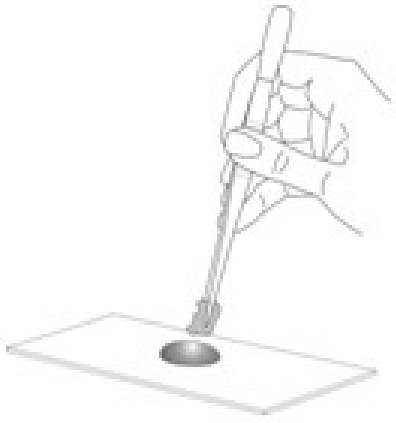
(1) Prepare the sample: Red pepper - fruit skin

- Prepare a slide with a drop of water.
- With the tweezers a piece of the skin of the pepper fruit is peeled off.
- The cuticle is placed directly into the water drop, covered and microscopically examined.

Procedure (2/3)

(2) Prepare the sample: Capuchin cress - petalt

- Prepare a slide with a drop of water.
- A yellow or red petal is placed over the finger and a thin surface incision is made with the scalpel.
- The preparation is placed directly into the water drop, covered and microscopically examined.



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Procedure (3/3)

(3) Prepare the sample: Rose - pulp

- Prepare a slide with a drop of water.
- From the red fruit of a rose (rosehip) a very thin piece of fruit is cut off. The even flesh of the fruit is examined, not the seed.
- The preparation is placed directly into the water drop, covered with a cover glass and microscopically examined.

Report

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Task 1

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In the plant parts with which colours are chromoplasts contained?

- [ ] Greens
- [ ] Oranges
- [ ] Yellow
- [ ] Red

Check

Task 2

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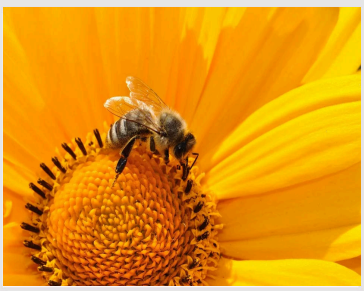

What is a possible meaning of the colours in the chromoplasts?

- Defence
- Attracting animals (e.g. flowers - insects; fruits - birds)
- Sex attractant
- Lights at night

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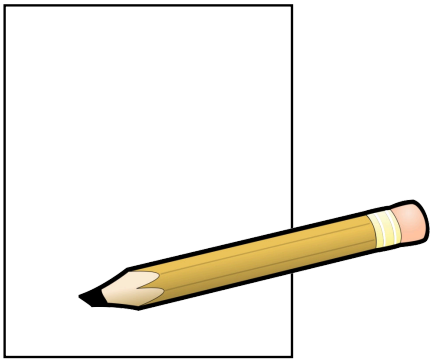
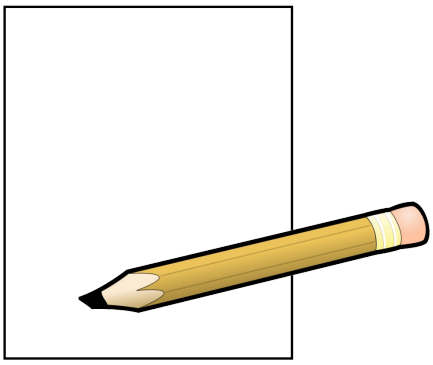
Task 3

Microscopy with increasing magnification. Drawing from the specimen **Red pepper - fruit skin** a cell. Use a coloured pencil to show the location and number of chromoplasts.



Task 4

Microscopy with increasing magnification. Drawing from the specimen **Capuchin Cress - Petal** a cell. Use a coloured pencil to show the location and number of chromoplasts.



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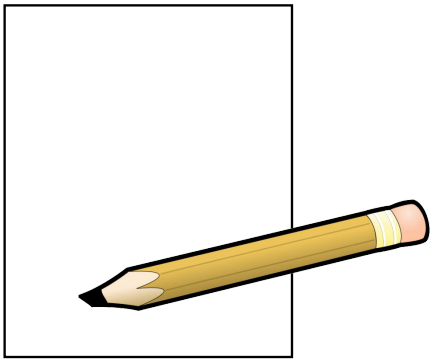
Task 5

Microscopy with increasing magnification. Drawing from the specimen **Rose - pulp** a cell. Use a coloured pencil to show the location and number of chromoplasts.



Slide	Score / Total
Slide 15: Plant parts with chromoplasts	**0/3**
Slide 16: Colours in chromoplastics	**0/1**

Total amount **0/4**

Solutions Repeat

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