What are monoecious and dioecious plants?

Biology	Plant Physiology / Botany	Physiology of plants	
Biology	Plant Physiology / Botany	Reproduction in plants	

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

This content can also be found online at:

http://localhost:1337/c/61279a33870bca000351fbae

PHYWE

Teacher information

Application

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Willow catkin (*Salix spec.*)

The dioecious plant families include the willow family (Salicaceae), which includes the willows (*Salix spec.*) among others also the poplars (*Populus spec*). Both the male and female flowers of the willow form inflorescences, which are called catkins. Willows are often found on moist soils. Willows are often planted on hillsides, stream banks, and riverbanks because they fortify the soil with their root systems. Beekeepers also plant willows near their hives.

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Other teacher information (1/4)

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Prior knowledge

Students should be familiar with the structure of plant flowers or buds and the difference between monoecious and dioecious. It is also helpful to be able to identify the main native tree species.

Scientific Principle

The students examine the various kittens of the pasture.

Other teacher information (2/4)

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Learning objective

The pupils should recognise that the willow plants belong to the dioecious plants. They should also be able to describe the different characteristics of dioeciousness.

Tasks

Have students compare the different kittens in the pasture.

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Other teacher information (3/4)

Notes on structure and implementation

- Willows are under nature conservation, complete or large-scale pruning is prohibited in the spring and summer months. Therefore, only as many branches with the flowers of the willow should be picked as needed for the experiment. It is even better if the branches are bought from a flower shop.
- To show the students that the branches with the male catkins (yellowish colored) and the branches with the female catkins (greenish colored) come from different trees, a field trip to the locations of the corresponding trees is recommended.

Male inflorescences

Female inflorescences

Other teacher information (4/4)

Additional information

- Dioeciousness is a form of sex distribution in seed plants. The male and female reproductive organs are located on different, unisexual plants. Dioeciousness occurs in many plant families, but only a few plant families are purely dioecious.
- Early flowering species such as the sal willow are an important food source for bees and moths, which appreciate the nectar of willow flowers. Caterpillars, beetles and game also feed partly on the leaves of the willow.
- The willow also plays an important role as a useful plant: The bark of the willow was used early as a natural medicine, it contains salicin, a compound that is metabolized in the body to salicylic acid, the active ingredient of aspirin. The bark was also used in tanning. Willow twigs can be used to weave baskets and other wickerwork, and in the past they were also an important element in the construction of half-timbered houses.

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Safety instructions

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- Willows are protected, and complete or large-scale pruning is prohibited during the spring and summer months.
- The general instructions for safe experimentation in science lessons to be applied to this experiment.

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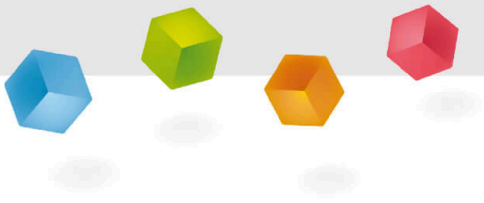

Student Information

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Motivation

Willow catkin (*Salix spec.*)

The dioecious plant family includes the willow family (Salicaceae), to which the poplars (Populus spec.) belong in addition to the willows (Salix spec.). Both the male and female flowers of the willow form inflorescences, which are called catkins. Willows are often found on moist soils. Willows are often planted on slopes, stream banks, and riverbanks because they fortify the soil with their root systems. Beekeepers also plant willows near their hives.

Tasks

Willows belong to the dioecious plants. But what are the actual differences between them and monoecious plants? Take a close look at the catkins of the willow to arrive at an answer.

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Equipment

Position	Material	Item No.	Quantity
1	Tweezers,straight,pointed,120mm	64607-00	1
2	Dissecting needle, pointed	64620-00	1
3	Magnifier, plastic, 5x, d=35mm	88002-01	1

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Procedure

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- Look at the collected branches with the willow flowers. You can see two types of catkins: One is ovoid, roundish and, depending on how wide open they are, golden yellow in color (Fig. 1). The others are elongated, cylindrical and greenish in colour (Fig. 2).
- First examine an egg-shaped kitten as shown in Fig. 1:

  Carefully cut it lengthwise with the razor blade. Look at the cross-section with the magnifying glass.
- Now examine the elongated, greenish catkins (Fig. 2) and also cut one of them lengthwise. Look at the cross-section with the magnifying glass.

1

2

Report

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Task 1

Drag the words to the right place.

Dioeciousness ( ) is a form of sex distribution in . The male and female reproductive organs are located on unisexual plants. occurs in plants in many plant families, but few plant families are purely dioecious. Dioecious plant families include the .

seed plants
different
dioecy
willow family
Dioeciousness

Check

Task 2

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Choose the correct statements.

- [ ] The egg-shaped catkin with the golden yellow colouring is the male flower, the inconspicuous, elongated, greenish catkin is the female flower.
- [ ] The egg-shaped catkin with the golden yellow colouring is the female flower, the inconspicuous, elongated, greenish catkin is the male flower.
- [ ] The willow is dioecious and has separate sexes.
- [ ] The willow is monoecious and has separate sexes.

Check

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Task 3

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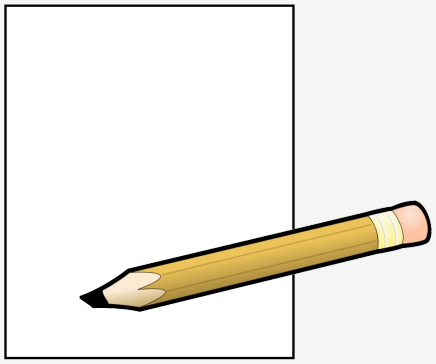
Which statements about pasture are correct?

- [ ] Beekeepers plant willows near their hives. Especially early flowering species form a good nectar source.
- [ ] The bark of the willow contains salicylic acid, an active ingredient found in aspirin, among other things.
- [ ] Poplars also belong to the willow family (Salicaceae).
- [ ] Caterpillars, beetles and game feed partly on the leaves of the willow.

Check

Task 4

Draw a male and a female kitten of the willow and describe the differences.



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Slide	Score / Total
Slide 14: Dioeciousness	0/5
Slide 15: The egg-shaped kitten	0/2
Slide 16: The willow	0/4

Total 0 / 11

Solutions Repeat

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