

Comparing leaves

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Subject: Botany, Biology.

Country of creation: Belgium.

Countries of testing: Austria, Czech Republic, Portugal and Slovenia.



Aims of the GP

Students will be able to determine differences in trees by their leaves, seeds and flowers.

Students will compare trees by studying leaves.

Necessary Teaching Material

Paint, markers, pencils, butcher paper, drawing paper, glue, chart, documents about leaves and trees.

Age of the students

12-13

Preparation and teaching time

Preparation: 60 min. Class time: 2 x 60 min periods.

Lesson Plan

Activity	Procedure	Time
Outside	Students collect 2-3 leaves from different trees.	20 min
In class	1) Students examine their leaves and find answers to the following questions: What are the differences? What are the similarities? Do you see teeth? Do you see hair? Do they feel rough or smooth? 2) Students compare their leaves with images and find out the name of the trees. 3) Each student swaps a leaf with a colleague.	20 min
Outside	1) Students find the trees matching their leaf and examine: What colour the leaves are. How big the tree is. If the tree has many or few leaves. Whether the leaves grow far apart or close together. What colour the bark is. How the bark feels. What the flowers or nuts look like.	20 min

Activity	Procedure	Time
	2) Draw their tree/leaf. 3) Collect a fruit or flower from the tree.	
In class	1) Students split in groups according to their trees (one group per type of tree). 2) Students make a reproduction of the real tree (take the leaf rubbings and cut them out; draw the nuts and flowers and glue all these to create a tree). 3) Teacher hangs up the trees in the classroom. 4) Each group will present their tree to the class.	60 min

Extracts from worksheets

A typical leaf of a *dicotyledonous* plant consists of two main parts: the blade and the petiole. The blade is thin and expanded and is supported by a network of veins while the petiole is slender and connects the leaf to the stem. The leaf blade varies greatly in shape and there are numerous terms to describe its general shape. The following terms describe the parts of a leaf: Apex, Base, Margin and Veins.

Images of the parts of a leaf can be found at:

<http://www.botany.uwc.ac.za/ecotree/leaves/LeaftypeA.htm>

The leaf blade has two types of configurations. It may be in one unit, in which case the leaf is called a *simple leaf*, or it may be divided into numerous small parts that look like individual leaves and which form a *compound leaf*. It may be difficult to tell whether one is looking at a simple leaf or at the leaflet (pinna) of a compound leaf. The distinction can be made by the fact that a leaf (simple or compound) has an axial bud between the petiole and the stem.

For more information see <http://www.botany.uwc.ac.za>

Questionnaire

Do you think that the presence of trees is important for humankind?

1 2 3 4

Not at all Very much

Trees that lose all their leaves once a year are called:

Evergreen.

Never green.

Deciduous.

Trees which lose their leaves continuously and not at all once are called

Evergreen.

Never green.

Deciduous.

Always green.

What is the stalk that joins the leaf to the stem called?

The phyllode.

The petiole.

The axil.

The node.

The leaves perform two major functions for the tree

Transpiration and circulation

Photosynthesis and circulation

Photosynthesis and transpiration

What may be the reasons why an increased surface area provided by the leaves is important to a tree? Mark all those you think are correct.

It provides a large area for the absorption of carbon dioxide.

It provides a large area for the absorption of light.

It helps the tree to shape its roots.

It increases the area for storage of photosynthetic products.

The terms that describe the leaf's general shape are.

Node, sheath, petiole, stem.

Shape, apex, margin, base, veins.

Shape, petiole, margin, root.

Teacher reviews

According to most of the teachers who implemented this GP, its success lies in its simple hands-on approach and its basic, but very important topic. Students enjoyed being given the freedom to use their creativity and resources in order to record the life cycle of plants. The success of this GP can be seen by the example of one of the Portuguese teachers who said that although the topic "leaves of plants" is not included in the national curricula, due to its importance in raising awareness with the students and seeing how the students enjoyed the observations of nature, the school will introduce this topic into their biology curriculum and they will continue using this GP.

The SPICE project

SPICE was a two-year project (December 2009 – November 2011) carried out by **European Schoolnet** (<http://europeanschoonet.org>) together with **Direção Geral de Inovação e Desenvolvimento Curricular** (<http://sitio.dgicd.min-edu.pt/Paginas/default.aspx>) from Portugal and **Dum Zahranicnich Sluzeb MSMT** (<http://www.dzs.cz/>) from the Czech Republic.

The primary objective of the SPICE project was to collect, analyse, validate and share innovative pedagogical practices, particularly those using inquiry-based learning, whilst enhancing pupils' interest in the sciences. SPICE supported this objective by singling out, analysing and validating good practice pedagogies and practices in maths, science and technology (mostly ICT-based) and disseminating them across Europe. SPICE involved 24 teachers from 16 different educational systems (from 15 different countries). This teachers' panel helped the SPICE partners in defining good practices that were then tested in classes by 41 teachers during the school year 2010-2011.

For more information see: <http://spice.eun.org>



Lifelong Learning Programme



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