

Bramble – ripening of blackberries, and understanding why!

This resource will try to exploit the excitement/motivation of observing one of the colorful :), sweet and eatable well-known phenomena in nature ... with the aim of doing IBSE, asking “scientific” questions about why ... how ... and what has influence on ... the ripeness of blackberries, eventually focusing on big ideas in science about adaptation, ecology, evolution, climate change, food web/reproduction, systematic observations over long periods of time, collaborating with peers to deepen our (the science community) understand of a phenomenon not well understood ...



Background

In Denmark we will have a transition when students go from primary to lower secondary where they meet biology for the first time as a separate subject. Many teachers will start introducing students to field studies focusing on understanding basic ecology concepts and different methods of observations. Specifically designing the ripening-of-blackberries-resource to focus on classical field observation, collecting high-quality data on biotic and abiotic factors with easy data-storage for later use will make the resource useful to many danish teaches.

Target group

	Denmark	Lithuania	UK	Spain
Stage/age	7 (age 13)		Key stage 3	

ACT	Activities	Objectives	Transversal skills (21st century skills?)	Students' activities	Teacher's Activities	Tools	Results
1	Observe bramble in late summer/early fall	the pupil can make observations in nature	Information and Communications Technology (ICT) Literacy	Students locate bramble with app in different locations . Observe degree of ripeness	Planning fieldwork: before - under - after-activities Introducing the app/devices helping the pupils collecting reliable data	PhenoloGIT app Smart device (phone or tablet)	Dataset with field observations of brambles. Share with others on platform.
2	Inquiry/problem based. Making hypothesis/formulation own problems to explore.	The pupils can formulate relevant hypotheses based on observations from nature	Critical thinking and creative problem solving	Student own inquiry based on observations. E.g. "Why some locations have more ripe berries than others", "Why does bramble have	Asking "good" questions that stimulate the pupils curiosity. Assist students in using data on the GEO-serve in the inquiry process.	GEO-server/GIT Open Learning Social Network Internet Books	Hypothesis and problem based questions

				berries?"			
3	Knowledge building/exploring with offset in theory and phenoloGIT-data collected by others	The students can explain the connections between phenology and the collected data	Information Literacy	The pupils get knowledge about bramble lifecycle and ecological issues and compare their own collected data with others data	helping the pupils to collect and choose relevant data from other biotopes	PhenoloGIT app GEO-server Internet Pages about phenology	Knowledge about phenology and brambles lifecycle and place in a food web
4	Observing bramble in spring with focus on flowering and pollination	The students can collect data in nature	Information and Communications Technology (ICT) Literacy	Using the PhenoloGIT app and collect relevant data	Planning the field trip	PhenoloGIT app Smart device (phone or tablet)	Dataset from spring
5	Observing bramble in fall and compare with last year's results to falsify/ verify hypothesis	The students can compare data from different data sets and discuss the implications of the dataset	Information and Communications Technology (ICT) Literacy	Using the phenoloGIT app and collect relevant data	Planning the field trip Helping the pupils with comparing the data in different years	PhenoloGIT app Smart device (phone or tablet)	Dataset from fall
6	Presentation of the results	The pupils can communicate and discuss	Communication	Presenting the work and discussing the data	Feedback and discussing the work with own students.	GIT Open Learning Social Network	Presentation of findings in online forum/ online conference paper/presentation

		scientific issues with others			Facilitate/or ganize peer review process with other schools working with bramble	k	ntation as part of the <i>GIT Open Learning Social Network</i> Peer r reviewed by other students
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Big ideas in focus

Big ideas relating to the bramble-resource:

- Classification of living organisms: organisms can be grouped into species that are very similar in appearance based on a classification. A classification system is a framework created by scientists for describing the vast diversity of organisms, indicating the degree of relatedness between organisms, and framing research questions.
- Adaptation; Plant species have adaptations to obtain the water, light, minerals and space they need to grow and reproduce in particular locations characterised by climatic, geological and hydrological conditions. If conditions change, the plant populations may change, resulting in changes to animal populations.
- Evolution: Evolution is the process of change in a population of organisms that occurs over a long period of time. An evolution can happen because every organism varies in their genes and the survival of the fittest organism is due to the characters that fits the environment in the best way. The selections parametres are both due to the environment - who will produce the fittest offsprings due to the environmental conditions- and the seksual selection.
- Biodiversity: Biodiversity is the variability among living organisms in all habitats.
- Seasonal changes: the changes in the abiotic factors like temperature and solar radiation affects the living organisms. When the temperature declines in the fall the defoliation begins and some animals begin to collect stores. Phenology is made by the seasonal changes that appears because of the changes in the abiotic factors.

Inquiry based science education

The bramble-resource focus on student-centred inquiry processes where students observe, raise questions, reason, discuss results with pairs and communicating their new understanding. The resource follows the BSCS 5Es Instructional Model with Engaging Learners (activity 1 - picking blackberries); Exploring Phenomena (activity 2) ; Explaining Phenomena (activity 3); Elaborating Scientific Concepts and Abilities (activity); Evaluating Learners (activity 6).