

Teachers' Notes

Suggested project: Planting our own apple-tree

Subject matter:

The class are introduced first to the apple-tree as a member of the rose family, and to its fruit. General considerations: why the apple is a healthy fruit and how it forms an important element in the ecosystems of certain cultivated landscapes. The final topics are breeding and cultivation of apple-trees and the most important things to be observed in connection with planting and care. The main emphasis of the subject matter will naturally depend on the pupils' particular interests and on the time available for the project. If plenty of time is available because the project is integrated into regular active learning rather than simply part of a short project week, the apple themes "Planting our own apple tree" and "From apple to juice" could also be run together, see below.

Teaching objectives:

Active learning should be practised as far as possible since this enables the pupils to obtain practical experience in many areas (see Suggested Classroom Procedure). In this way they gain performance skills, and the ability to gather information for a particular purpose, record it and put it into practice. They will make closer acquaintance with an everyday fruit and perhaps also come to appreciate it better.

Suggested classroom procedure

As a start, everybody should bring their own apple. Free narration and brainstorming, everybody saying what occurs to them in relation to apples and apple-trees (whole class, or individual clustering, see Background Text).

Phase: Overview / Various aspects of the apple	
Activity	Subject matter
Collecting and ordering existing knowledge about the apple in the form of a structural diagram ("Mind Mapping"). This will probably reveal the first gaps in the pupils' knowledge. The diagram will be kept - perhaps transferred to an acetate or large sheet of paper - and expanded later	Creativity methods
Filling in the Worksheet: doing the apple quiz, literature search	The many different aspects of the apple: botanical classification, codling moth as pest, apple juice production, health value of the apple
Studying an apple blossom, if available, and preparing an assembled illustration	Structure of the blossom, studying original specimens, handling a forceps, assembled blossom illustrations, correct drawing
Drawing a blossom and the cross-section of an apple, legends based on information from the literature	Structure of the blossom and (aggregate) fruit
Phase: Apple production	
Repeated brainstorming, followed by expansion of the structural diagram: the aim is now to find persons to contact* (Experts) and preliminary questions	Creativity methods, the whole range of apple producers
First compilation of information: free reporting on the experts and analysis by the class	
Drawing up suitable question lists for in-depth information, drafting headings for interviews, perhaps arranging a day for photos	Systematic work
Questions / interview / taking photographs / email questions to Foodstudents Experts, etc.	Verbal expression, communication pathways
Obtaining tree and materials**	Systematic work
Planting tree**	
Drawing up records: presentation, ordering and sorting of information, e.g. as wall newspaper	Who supply us with apples and how are apples produced? (Cultivation: where and how, etc.); e.g. map showing principal cultivation areas, photos/drawings of pests***, plant protection, grafting of fruit-trees, apple cultivars and their harvesting times, etc., etc

* Apple producers: leisure-time gardeners, fruit-growers, relatives or acquaintances; additional experts would be the Foodstudents Experts, farmers' associations, etc. Information on breeding and grafting techniques with fruit-trees could be obtained from tree nurseries.

** Arrange permission and financing of tree and materials beforehand: Friends? Donations from parents? Class fund?

*** In Fach-Lexika (Biologie) lassen sich leicht einige Apfelschädlinge finden, da ihr deutscher Name mit „Apfel-“, beginnt. **Dies gilt nicht so oft für die englischen Bezeichnungen. In Übersetzung weglassen!**

If plenty of time is available because the project is integrated into regular active learning rather than simply part of a short project week, the apple themes “Planting our own apple tree” and “From apple to juice” could also be run together. The lessons could proceed on the following lines:

Phase: Overview / Various aspects of the apple	
Activity	Subject matter
Collecting and ordering existing knowledge about the apple in the form of a structural diagram (“Mind Mapping”). This will probably reveal the first gaps in the pupils’ knowledge. The diagram will be kept - perhaps transferred to an acetate or large sheet of paper - and expanded later	Creativity methods
Filling in the Worksheet: doing the apple quiz, literature search	The many different aspects of the apple: botanical classification, codling moth as pest, apple juice production, health value of the apple
Studying an apple blossom, if available, and preparing an assembled illustration	Structure of the blossom, studying original specimens, handling a forceps, assembled blossom illustration, correct drawing
Drawing a blossom and the cross-section of an apple, legends based on information from the literature	Structure of the blossom and (aggregate) fruit
Phase: Production of the “raw material” apple	
Repeated brainstorming, followed by expansion of the structural diagram: the aim is now to find persons to contact* (Experts) and preliminary questions	Creativity methods, the whole range of apple producers
First compilation of information: free reporting on the experts and analysis by the class	
Drawing up suitable question lists for in-depth information, drafting headings for interviews, perhaps arranging a day for photos	Systematic work
Questions / interview / taking photographs / email questions to Foodstudents Experts, etc.	Verbal expression, communication pathways
Obtaining tree and materials**	Systematic work
Planting tree**	
Drawing up records: presentation, ordering and sorting of information, e.g. as wall newspaper	Who supply us with apples and how are apples produced? (Cultivation: where and how, etc.); e.g. map showing principal cultivation areas, photos/drawings of pests, plant protection, grafting of fruit-trees, apple cultivars and their harvesting times, etc., etc.
Phase: Producing (our own) apple juice (cf. suggestion “From apple to juice”)	
Defining work stages and drawing up a work schedule	Systematic work, production stages, comparison with industrial production
Allotting tasks: Who supplies what?	Systematic work in sub-project groups
Distributing separate tasks, practical work	Systematic work in sub-project groups
Labours rewarded: apple juice straight or in non-alcoholic cocktails	Tasty recipes with the “everyday” product apple juice
Supplementing or preparing overall documentation	Documentation method

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Points to note

Junior classes will spend more time on the first phase and not go as deeply into the material as senior ones. The themes offering themselves for more advanced study in senior classes are the irregular apple-tree meadow (and possibly also the apple plantation) as an ecosystem, pests, beneficials and plant protection, or occupational profiles for tree nurseries or in agriculture.

For the first phase:

See "The Quiz"

For the second phase:

The search for information takes place in two stages, because a base has to be created for more specifically directed questions. For this purpose, contacts will have to be found: tree nurseries, farmers (particularly fruit-growers), friends and acquaintances, associations ...

A search for possible contacts will be carried out, where necessary with help from the teacher, and the first telephone calls made. The contact persons must be free to say what they feel to be of interest and importance for the class project. An internet search would also be useful (e.g. with www.google.de) if the school is suitably equipped. The information obtained in this way would be evaluated and used to formulate cues for interviews on still open questions and to develop ideas for graphic or photographic motifs. Cf. below, "The Experts".

Possible questions: Planting, cultivation method, what pests occur and how are they controlled? What organisms are beneficial? What animals are to be found on the trees? What are the ripening times for various cultivars, who do fruit-growers sell their product to? Why do the trees grow at a particular distance from one another? What does the fruit-grower do with his trees over the course of the year - in spring, summer, etc.? What are the differences between a plantation and irregular meadow cultivation? Local fruit-growers or their associations will certainly be willing to give information on plantations; for meadow cultivation, it would be best to approach either fruit-growers (especially those growing apples for must or cider) or environmentalist groups, who might even be prepared to lead an excursion.

Pupils who have received detailed information from a tree nursery on planting and care will certainly be in a position to plant a apple-tree of their own in the school garden. Perhaps a tree-nursery might be willing to sponsor a small tree!

Foodstudents in the classroom: The Quiz and the Experts

Foodstudents offers apples, potatoes and bread as quiz themes. The suggested theme "Planting our own apple tree" integrates the Apple Quiz (jointly with the Lexicon), where all aspects of the apple are highlighted. The pupils learn more about the subject matter in the form of questions and answers, thus combining enjoyable activity, the reinforcement of new knowledge, and an interest in the many varied aspects of a particular foodstuff.

Foodstudents also offers an opportunity to get in touch with experts - mostly scientists - by email. All of them are genuine specialists in their own particular areas. Email contacts are a good means for young people to get used to addressing questions to experts and help them lose their shyness towards persons they may think to be "above their heads" or "unreachable". It also gives them practice in social and political participation as future responsible citizens. All of the experts will do their best to reply within one week at the latest. Should one of the experts be absent for a longer period, a substitute will be organised.

The Quiz:

The worksheet "Planting our own apple-tree" is filled in with the Apple Quiz, the Foodstudents Lexicon, a field guide to species identification, and an apple. (A specimen for labelling the parts of the apple will be found, e.g., at the internet site www.wegerer.at/apfel/spur/teile1.htm, created by Austrian primary school teachers.) If a real blossom is not available, a good illustration must be obtained, e.g. from a book or as a slide.

The Apple Quiz and the Lexicon together will provide the answers to all the blanks in the worksheet. It is important that all questions should be tackled and the Lexicon really used, since more detailed information on the codling moth is only to be found in the Lexicon.

Questions to the Experts:

Other questions will certainly arise, depending on the central subject matter of the unit. Here are a few suggestions and examples as to which might be the right expert to approach:

What aims are breeders trying to reach at present with apple-trees, and how successful have their efforts been (person to contact, e.g. Prof. Klaus-Dieter Jany)?

Are there any genetically modified apple-trees in Europe and any genetically modified apples in the supermarket, for example with resistance to the codling moth (person to contact, e.g. Prof. Hans-Jörg Buhk)?

How does molecular diagnosis work with apples and what methods are used for genetic modification of apples (person to contact, e.g. Dr. Christian Unger)?

Who supervises whether new apple cultivars are good to eat and are safe for health (persons to contact, e.g. Prof. Hans-Jörg Buhk or Dr. Oliver Mellenthin)?