

Co-funded by the Erasmus+ Programme of the European Union



DEMETER

DEveloping interdisciplinary Methodologies in Education Through Enhanced Relationships between schools and farms

Interdisciplinary Methodology





Objectives



The project stems from the aim of supporting teachers and farmers in adopting innovative and collaborative practices between schools and farms, to be developed in an interdisciplinary way, in order to define disciplinary and transversal learning objectives and link them with educational activities on farms. The international comparison, the dialogue between teachers, researchers, farmers and institutions, the training provided within the project also represented an opportunity for professional development, in the perspective of lifelong learning, for all the actors involved.

Activities

Literature review

The first output of the project was a literature review in order to investigate how previous research has approached the relationship between primary schools and farms from different perspectives such as educational partnership, teaching strategies adopted and learning outcomes promoted.

Collecting and analysing good practices

The first activity foreseen by the project was the collection of good practices representing examples of fruitful collaboration between schools and farms. They were then shared and analysed by the project team.

Testing (2 phases)

Each partner tested the practices of the other partners, in their own schools, to assess how they could be adapted to specific contexts. The results of this phase made it possible to implement the practices and test them in a second phase of experimentation involving teachers from outside the partnership.

Training

The training, offered at the end of the first experimentation phase, was aimed at illustrating the activities carried out, the results of the research and the development of the interdisciplinary methodology. The training focused in particular on explaining how to implement teaching practices, how to link them to the learning objectives of the various national curricula and how to organise learning activities and contexts.

Verifying the effectiveness of the implemented practices

Indicators and their levels have been defined to monitor the practices in progress, used by the experimenting teachers to identify the level reached and motivate them by highlighting strengths and weaknesses.

Toolkit development

The toolkit is intended as an easy tool for teachers and educators to design interdisciplinary school-tofarm learning paths linked to the transversal goals of the 2030 Agenda and to disciplinary learning objectives.

Structuring the Literature Review

The first output of the DEMETER project is the current literature review, which was conducted between September 2018 and March 2019 by the Milano Bicocca University Research Unit, in order to investigate how previous research have addressed the relationship between primary schools and farms from different perspectives such as educational partnership, teaching strategies adopted and learning outcomes promoted.

The teaching-learning methodologies specifically targeted for implementation in DEMETER are pedagogically grounded in the Reggio Emilia approach (Gandini, 1998; Ceppi & Zini, 2011), which assumes the environment as a "third educator" with the power to convey and catalyse the educational messages underlying school planning and expects learning to be enhanced by student observation and inquiry.

The purpose of the literature review was to theoretically underpin the rationale for the DEMETER project by identifying effective teaching and learning methodologies for the development of key competencies in primary school children through farm-based education, as a specific approach to outdoor education.

Several areas of research focused on the learning outcomes promoted in the various approaches of outdoor education, both academic and transversal skills, and most of them show a positive impact on both (Williams & Dixon, 2013). Also, regarding the outcomes emerged the need to implement the research to better measure and understand the effects.

Another topic are the teaching methods, indicated as few addressed by research in biology education and environmental education including outdoor education (Jeronen et al., 2017), this also to a lack of teachers' confidence with the outdoor settings that can be reduced by promoting teacher training in this field (Blair, 2009; Dillon et al., 2003).

We built up our search by entering a selection of keywords and combinations of keywords into multiple online search engines and databases including Google Scholar, SpringerLink and Elsevier.

Keywords combinations	Google Scholar	Springer Link *	Elsevier
"Farm + School"	8300	481	270
"Farm + Learning Outcomes"	4	204	520
"Farm + Teaching"	346	237	18
"Farm + school + children"	96	390	3

* Discipline: Education; subdiscipline: Learning and Instruction

Table 1. Outcomes of scoping

¹ In collaboration with two teacher-researchers: Doris Valente and Chiara Gianotti.



Figure 1. Tree summarizing inclusion/exclusion criteria

The huge number of results (table 1) was drastically reduced by excluding literature, based on the paper titles alone, all publications dealing with agricultural schools and institutes, universities, preschool and higher education, and following the criteria illustrated in Figure 1.

This overview led us to divide the remaining 121 papers – based on the abstracts – into three main categories, even with multiple overlapping themes.²

- school-farm partnership (18)
- learning outcomes (55)
- teaching strategies (48).

²We used Mendeley library, a web tool for creating shared archives, to organize the research papers identified via these searches and make them accessible to the entire research team.



Figure 2. Breakdown of the reviewed papers by key category.



COUNTRY OF ORIGIN

Figure 3 Breakdown of the reviewed papers by country where the research was undertaken



YEAR OF PUBLICATION

Figure 4. Breakdown of the reviewed papers by year of publication

The pedagogical role of the farm

The topic of the farm as a learning environment is rooted in the field of outdoor education and opens up various connections with education for sustainable development, nutrition, good health and wellbeing education. As noted in the goals outlined in the Global Sustainable Development Report 2019³(Agenda 2030), Education for Sustainable Development (henceforth ESD) and outdoor education need to be enhanced by strengthening the co-operation among schools, local area partners, and civil society in order to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (SDG 4).⁴

Following this view, the school-farm co-operation can be based on several guiding principles like locality, continuity and active participation (Risku-Norja & Korpela, 2010).

As educational agencies embedded in natural and anthropized settings (Torquati & Ernst, 2013), schools play an active part in their broader environment; hence, when a working alliance is formed among all the actors in a local area, especially via ad hoc networks such as ENSI and GEEP⁵, this enhances teachers' professional development, fostering innovative teaching practices in the field of ESD (Smith, 2018, p. 282).

Numerous studies show that outdoor education settings and the opportunity to interact with the environment via natural materials can facilitate more complex learning in children: such approaches create a continuum with the external environment, of which young learners may have little prior experience, especially in heavily urbanized contexts (Scott et al., 2012; Fägerstam & Blom, 2013; Selmer et al., 2014).

Educational experiences in outdoor settings and engagement with outdoor environments have proved to have a positive impact on psychological and physical wellbeing (Grey et al. 2015; Roberts et al., 2019) and to yield enhanced learning outcomes in students both when the setting is highly structured and when it is more loosely structured (Dhanapal et al., 2013; O'Brien & Murray, 2007).

³Independent Group of Scientists appointed by the Secretary-General, Global Sustainable Development Report 2019: The Future is Now – Science for Achieving Sustainable Development (United Nations, New York, 2019).

⁴<u>https://sdgs.un.org/goals/goal4</u> 5<u>https://www.ensi.org</u> <u>https://thegeep.org/</u> However, as observed by 'Skamp and Bergmann' (2001), teachers are little inclined to deliver learning experiences that include or are based on the natural environment, with the result that they forgo both meaningful learning opportunities for their students and the opportunity to design educational offerings with other local actors.

Building a Farm-School Partnership

Substantially research on this theme has been conducted within the framework of the Norwegian movement The Farm as a Pedagogical Resource, founded in 2002 (Jolly & Krogh, 2010; Krogh & Jolly, 2011). In their work, Linda Jolly and her research group describe the core principles informing the design of courses that initially saw farms and schools working together to jointly implement the pioneering "Living School" project.

This body of work, combined with practical online tools⁶ and grey literature (Harris, 2009), enabled us to identify a set of key actions that must be undertaken for the farm-school partnership to flourish. Specifically, these literature sources suggest the importance of:

- offering joint training to teachers and farmers,
- ensuring that any program of educational activities is co-designed by farmers and teachers,
- developing a shared vision and mediating between the farmers' and teachers' needs.

The need to establish a two-way dialogue between the outdoor learning setting (farm) and the school forced teachers out of their comfort zone and also fostered mutual learning by researchers and local actors (farmers), helping them to acquire a more in-depth understanding of the situation in which the educational action takes place (Hazard et al., 2018).

The need to design professional development programmes to equip teachers to facilitate learning in natural environments is also underlined in an Australian farm-school program (Ballantyne & Packer, 2009). This program also shows the key role that having access to dedicated centres, such as Queensland's Outdoor and Environmental Education Centres, could play in building the partnership by giving it an institutional support.

The importance of an institutional umbrella emerges also from the US Farm-to-School project, which has been focused more narrowly on food education, which is aligned with federal and state legislation such as No Child Left Behind, and has been documented as enhancing children's agri-food knowledge, nutritional awareness, and behaviours (Joshi et al., 2008).

A second topic in shaping the characteristics of an effective partnership is the need of a farm-school codesign of the activities, that presumes a mutual recognition of skills and knowledge and as states the already mentioned research carried on by Linda Jolly that encouraged "close contact" between farmers and teachers so that the activities on the farm could become a part of the regular curriculum (Jolly et al., 2004, p. 3). The flip side of this closeness could be that farmers, with long-term links with a particular school sometimes, felt that it was based on personal relationships with a specific teacher and if that teacher moved on, the link with the school often collapsed (Jolly & Krogh, 2010).

If there are also logistic difficulties to consider, as co-design takes a long time, however, the Risku-Norja and Korpela (2010) research highlighted that the teachers reported that it was worth it for the opportunity to offer children experiences in continuity with the curriculum in a new authentic learning environment, and the farmers for the development of an effective way of dealing with the public resulting from cooperation with the schools.

⁶ <u>www.visitmyfarm.org</u> <u>https://leafuk.org/farmertime/resources</u> https://www.foodforlife.org.uk/schools/what-can-you-do/visit-a-farm Another key issue implicated in the farm-school co-design, is the pedagogical role of the farmer who has to also deal with the children's and teacher's representations of farmers and farm life, which were often stereotypical. Similarly, we have also noticed recurrent prejudices, in several educational programs conducted in Italian farms (Nigris et al., 2014), such as the idea that all farmers are male, wear straw hats, and do not avail of modern technologies.

From the Norwegian studies it also emerged that the greater effectiveness of projects is guaranteed by a continuity in the relationship; the results of the three cases analyzed show that a project in which contact with the farmer is direct and well-integrated into the curriculum is more effective for the students (Jolly & Krogh, 2010).

Encouraging regular farm visits during which children enjoy the opportunity to directly participate in everyday farm tasks could also "breaks down social barriers to age segregation and provides opportunities for children and adults to meet and talk about real life issues and life experiences" (Mayer-Smith et al., 2009, p.119).

t is worth mentioning that, although it is not part of the scientific literature, the project Visit my Farm has⁷ produced a list of detailed guidelines for making farm learning experiences meaningful. These recommendations include:

- choosing a farm park vs an "authentic" farm as appropriate (the author suggests the former, for younger children or those with special needs),
- the visit should be led by the farmer,
- teachers should visit a farm during their initial Teacher Education or, at least, before planning a class project.
- there is a need to raise awareness, among teachers and farmers, of the organizations that can help them to plan farm visits,
- intermediary organizations should support existing farmer networks and inform farmers about the requirements for hosting school visits.

INSTITUTIONAL	TRAINING	CO-DESIGN	SOCIAL AND ECONOMIC	OBSTACLES
UMBRELLA			SPILLOVER	
Queensland's Outdoor and	"The Farm as a Pedagogical	Activities carried out both at	Local products in school meals,	Stereotypical representations of
Environmental Education Centres	Resource" course led by	school and on the farm (Ballantyne	farms hosting community events	farm life (Mayer-Smith et al. 2009
(Ballantyne & Packer, 2009)	Norwegian University of Life	& Packer, 2009; Krogh & Jolly,	(Botkins & Roe, 2008)	Nigris et a1, 2014, Risku-Norja &
	Sciences. One year course for	2011; Mayer-Smith et al., 2009;		Korpela, 2010)
	teachers and farmers (Krogh et al.,	Risku-Norja & Korpela, 2010;		
	2011)	Selmeret al. 2014; Smeds et al.		
		2015)		
Nationalpioneer project 'Living	A training day at the farm	Interaction with the farmer	Steady market for local producers	Farmers refers difficulty in finding
School" (Krogh & Jotty, 2011)	recommended (Harris, 2009)	prepared beforehand at school	(Atlen & Guthman, 2006)	schools cooperation (Harris,
		(Jothy & K.rogh, 2010)		2009)
Nationa1FTS Network (Botkins	Need of design professional	Two-way dialogue (Hazard et al.,	Opportunity for farmers to	Move out from teaching comfort
& Roe, 200)	de ve lopment programme s	2018)	develop public relationship (Risku-	zone (Hazard et al., 2018)
	(Batlantyne & Packer, 2009)		Norja & Korpela, 2010)	
	Pedagogical enforcement of the	Link with the curriculum (Jolly,	Parents involvement (Selmer et al.	Co-design takes a long time
	farmer's role (Risku-Norja &	2004; Risku-Norja & Korpela,	2014)	(Risku-Norja & Korpela, 2010)
	Korpela, 2010)	2010; Seimeretal. 2014)		
	Fostered mutual learning (Hazard	Specific codesigned and evaluated	Intergenerational dialogue (Mayer-	Fund & seasonality (Botk ins &
	et al., 2018)	project required (Krogh & Jolly,	Smith et al. 2009)	Roe, 2008)
		2011)		

Figure 5 Summary table of the main issues involved in building the school-farm partnership

⁷ <u>https://www.visitmyfarm.org/preparing-for-your-farm-visit#guide-resources</u>

Learning Outcomes

Learning outcomes can be divided into two sub-themes: more purely academic outcomes, in terms of subject-specific learning, and broader outcomes such as transversal skills, attitudes, and behaviours.

Two previous literature reviews have addressed this theme, among others, offering us a valuable initial guide to the key issues surrounding the impact on student learning outcomes of outdoor and non-formal learning settings such as farms.

The more recent of these two reviews, conducted by Williams and Dixon (2013) at Portland State University, examined the 'Impact of Garden-Based Learning on Academic Outcomes in Schools: Synthesis of Research Between 1990 and 2010' and pointed out key gaps in the existing research and the fact that studies up to that point had rarely succeeded in identifying what aspects of a particular programme had helped to yield positive impacts. The authors concluded that investment in outdoor education had not been accompanied by a "parallel focus on rigorous research to understand the academic learning outcomes in a systematic manner" (ibid, p. 226). Nevertheless, they also pointed out "a preponderance of positive academic outcomes especially in science, maths, and language arts, giving credence to gardens serving as instructional and curricular means for covering academic content" (ibidem).

A detailed analysis and assessment of the learning outcomes has been carried out by Finnish researchers (Smeds et al., 2015b) examining the role of the farm as learning environments in light of the drastic decrease in the number of active farms in Finland. The test results indicated that, at the five-month follow-up stage, low academic performers who had been exposed to the authentic learning environment of the farm obtained higher mean test results than did high academic achievers who had received their intervention in the classroom setting only. This finding bears out not only the effectiveness of on-farm activity but also its significant potential to boost inclusivity.

These outcomes are in keeping with a broader framework that defines educationally effective programmes as those that do not lay a strong emphasis on the products of learning, but rather stimulate processes of inquiry, generate open-ended questions, and generally foster active participation and engagement by the students. The wide-ranging cognitive, affective, physical, and behavioural impacts of outdoor educational experience are well illustrated in several studies like the Forest School project by O'Brien and Murray (2007).

The positive impact of outdoor activities on students' soft skills include attitudinal behavioural chances (Ballantyne & Packer, 2009; Blair, 2009), problem solving and peer cooperation (Fägerstam, 2014; Kangas et al., 2017), motivation, concentration and confidence (O'Brian & Murray, 2007) and self assessment skills (Nuutinen, 2018).

Within Nuutinen empirical study, 'The Encounters Project in Finland', children used the KLW grid (what they already Knew, what they had Learnt and what they Want to know further) to self-assess their learning. The same grid was used in the Demeter practices.

Two PhD theses have also offered in-depth investigations of outdoor learning outcomes: the work of Pia Smeds (2017) and 'Farm Visit: Interdisciplinary outdoor learning for Primary School Pupils and Scotland's Curriculum for Excellence' (McIver Mattu, 2016). The latter explored the use of educational farm visits as an example of outdoor learning, in the⁸ context of the Scottish Curriculum for Excellence through Outdoor Learning (Scottish Government, 2010). The author's starting assumption was that the new curriculum is lacking, insofar as it offers no evidence of broader connections between outdoor learning formats and curricular contents.

⁸ <u>https://education.gov.scot/Documents/cfe-through-outdoor-learning.pdf</u>

McIver Mattu observed that the teachers in her case study were able to link their farm visits to a wide range of curricular areas, such as Art, Music, Drama, Numeracy and Science, and pointed out that the children experiences at the farm, like touching, feeding, and seeing animals, produce long-lasting and emotionally charged knowledge (McIver Mattu, 2016, p. 150)

SCIENCE	матн	OTHER SCHOOL SUBJECT	SOFT SKILLS AND ATTITUDE	NUTRITIONAL KNOWLED GE AND BEHAVIOUR S	LONG-TERM IM PACT
Effectiveness of outdoor context in science a ores (Fågerstam & Blom, 2013; Smeds et al., 2015; McIver Mattu, 2016)	Higher math scores for students who followed traditional barning programme (Pigg et al., 2006)	Art, music, drama (McIver Mattu, 2016)	Problem solving and peer collaboration (Fägerstam, 2014, Fägerstam & Blom, 2013; Kangas et al., 2017, Murray & O'Brien, 2005)	Fruit and vegetables consumption increased among those with the lowest intakes (Bontrager Yoder et al., 2014)	Long term persistance of concepts and process (Smeds, et al., 2015b)
Effectiveness of garden based curriculum in a ience scores (Klemmer et al., 2005)	Long-term better results in math tests for students engaged in outdoor activities (Fågerstam & Blom, 2013)	Literacy: outdoor exploration activities enhanced children's writing ab Hity (Scott et a1, 2012)	Confidence, social skills, language and communication, motivation and concentration, knowledge and understanding (O'Brien & Murray, 2007)	Fruit and vegetables consumption increased (Kropp, 2018)	Long-lasting and emotionally charged knowledge (McIver Mattu, 2016)
The potential for indoor and outdoor learning to complement each other (Dhanapal & Lim, 2013)	Numeracy (McIver Mattu, 2016)	Language improvement (Murray & O'Brien, 2005)	Attitudinal and behavioural changes related to environment (Ballantyne & Packer, 2009, Blair, 2010; Murray & O'Brien, 2005)	Awareness of the food (milk) chain (Smedset al., 2015b)	Higher degree of long-term knowledge retention (Fågerstam& Blom, 2013)
			Seff-assessment skills (Nuutinen, 2018)	Higher veg intakes with long- term effect (Kropp, 2018)	

Figure 6 Summary table of the main Learning Outcomes

Teaching strategies and teachers' competences

Several studies have identified teacher-reported obstacles to conducting farm/outdoor learning activities. One issue raised by multiple authors, that we have already addressed in the school-farm partnership paragraph, is that effective farm-school educational projects require ad hoc training for teachers, who perceive themselves as poorly informed about farming topics and are not confident in their ability to teach them well (Bowker, 2002; Knobloch et al., 2007; Tal & Morag, 2009). A key to the effectiveness of training is the teachers "openness to find value in training related to field-based teaching and individual's predisposition to being out of doors" (Scott et al., 2015, p. 177).

A recently published report on the Erasmus Plus project, A Rounder Sense of Purpose (Vare et al., 2019), offered a practical accreditation model for ESD educators, suggesting that they require 12 competences, each of which breaks down into three learning outcomes with multiple underlying components.

The four rows of the RSP competence table suggest a process that the educator might follow: (a) integration–using knowledge from different dimensions, looking at interconnections and cause-effect

relationships

(b) involvement—building this understanding into their personal sense of commitment

(c) practice—combining the two stages above in their practical work as an educator

(d) reflection—evaluating the process and results of their work, assuming responsibility, and taking decisions before repeating the process in an iterative learning loop. (ibid. p. 9)

Lack of time is a frequently reported obstacle (Harris, 2009). Already emerged in the process of partnership building: teachers have little time to engage in additional planning, whether at school or onsite at the farm and also may fail to initiate collaboration with farmers due to a lack of awareness about the presence and activity of local environmental organizations (Marcombe, 2013). In addition, the number of months during which it is feasible to spend time outdoors is limited by seasonal weather patterns (Trexler et al., 2000).

Cooperation with an expert may also help teachers to overcome concerns about threats to child safety: in one study on student teachers' perceptions of outdoor learning settings (Torquati & Ernst, 2013), the main reason that certain sites were viewed as less suitable for educational activities were safety hazards, which typically require the presence of additional adults in order to guide and supervise the children.

Basic and in-service teacher training can thus play a crucial role (Smeds et al., 2015b) in helping teachers to develop key competences needed to offer children learning experiences in natural settings: teachers require technical knowledge about how to provide appropriate supervision, but also the capacity to design structured and unstructured learning experiences in natural setting. In the same way, teachers' prior knowledge and hands-on experience in outdoor learning are influenced by, and include, their preconceptions and representations of education in natural settings, benefits (Anderson et al., 2006), potentially setting off a virtuous cycle of educational offerings, combining outdoor and indoor experiences (Norðdahl & Jóhannesson, 2016).

Other studies confirm that teaching confidence in promoting this holistic perspective and experiencebased strategies are increased by training (Anderson et al. 2006, Zhai. 2012).

As observed by Angelotti et al., stimulating future teachers to get involved in and reflect on their process of knowledge acquisition has further value because it provides them with an educational model that they can reproduce in schools. It is of great value for teachers to have a systemic overview of the connection between food products and primary sources and the ability to guide their students to acquire this concept.

Furthermore, when teachers have training opportunities or a personal interest in farming/nature, they are more inclined to invite questions, both open and focused, from their students and to help the children to develop more complex answers (Bowker, 2002). Nevertheless, research shows that teachers' interest in, and knowledge about, farming and nature is not enough to produce an effective learning environment, just as visits to outdoor settings do not guarantee, by themselves, that learning will take place (Smeds et al., 2015a).

The literature furnishes some guidelines for teachers on how to make their outdoor/school education programs effective. The most successful outdoor learning projects are those in which learning products are not heavily emphasized, inductive teaching methods are used, an inquiring approach is stimulated (Bowker, 2002), open-ended questions are generated, and students actively participate and appear involved (Ballantyne & Packer, 2009, Jeronen et al., 2017; Kangas et. al 2017; Zhai, 2012). Inquiry-based learning is encouraged in the first hand by taking into account childrens prior knowledge (Zhai, 2012), irrational conceptions (Smeds et al., 2015b) and misconceptions (Bowker, 2002).

TEACHING METHODOLOGIES	TEACHERS' TRAINING	TEACHERS' COMPETENCES and ATTITUDES	CURRICULAR LINKS	CONCERNS AND BARRIERS
Inquiry based learning (Bowker, 2002)	Agricultural training for teachers is recommended (Knobloch et al. 2007)	Teachers' preconceptions and beliefs influence the success of outdoor learning experiences (Harris, 2009; Knobloch et al., 2007)	TEKS objectives and School gardening curriculum content (Klemmer at a1, 2005)	Teachers perceive themselves as poorly informed about faming topics/environmental issues (Bowker, 2002; Knobloch et al., 2007; Marcombe, 2013; Tal & Morag, 2009)
Experience based learning	Teaching confidence, holistic and	Teachers prior knowledge influences	C coperation with	Teacher' lack of knowledge about local
(Ballantyne & Packer, 2009;	experienced strategies increased by	preconception of outdoor learning	agricultura l'environ ental experts	organizations, lack of equipment (Scott et
Zhai, 2012)	training (Anderson et a1, 2006; Angelotti et a1, 2009;Blair, 2010)	benefits (Anderson et al., 2006)	facilita te the integration of outdoor learning activities with the school curriculum (Affolter & Varga, 2018; Trexter et al., 2000)	a1, 2015; Marcombe, 2013; Trexler et a1, 2000)
Work in groups (Jeronen et	Training courses help teachers	Teachers' personal is veis of nature	Field trips, as complex learning	Children health and safe ty (Scott et al.,
a1, 2016)	designing outdoor/classroom	relatedness predicted intention to	settings, link the environment to the	2015; Marcombe, 2013; Trexler et al,
	(Norðdahl & Jóhannesson, 2016; Tal	outdoor teaching (Fägerstam, 2014;	science curriculum (Tal & Morag,	2000)
	& Morag, 2009, Smeds et al 2015b)	Torquati& Ernst, 2013)	2009)	
Multi-sensory learning	Teachers asked for specific training	Educators need to integrate students'		Cost and travel time (Harris, 2009;
(Smeds et al., 2015a)	(Trexler et al, 2000)	botanic garden experience with school		Marcombe, 2013; Scott et a1, 2015;
		subject knowledge (Zhai, 2012)		Trexier et al., 2000)
Pupils actively partecipation	Courses recommended in order to	Reflection and assuming responsibility:		
and agency (Jeronen et a1,	provide appropriate supervision in	evaluating the process and results of their		
2016;Kangaseta1, 2017)	natural environments (Torquati &	work (Vare et al., 2019)		
	Emst, 2013)			
Interdiscipfinarity (Vare et al.,	Individua l's predisposition to being			
2019)	outdoor influence openness to find			
	value in training (Scott et al, 2015)			

Figure 7 Summary table of the teaching strategies and teachers' competences

Conclusions

The present literature review has pointed out advantages and challenges associated with education experiences carried out in partnership between schools and farms, including both broader educational principles that refers to outdoor education and ESD and topics that are specific to the farm environment. The topic of farm-school relationship has led us to examine, on the one hand, a number of issues that have implications for a broader range of learning environments, including other outdoor settings such as gardens and forests; and on the other hand, learning goals and learning outcomes that are both subject-specific and more generally transversal to environmental and sustainable education. The third key factor we address is related to teachers' competences and teacher education in promoting outdoor education.

Some of the weaknesses and gaps that we have identified had been already pointed out by previous literature reviews and advocate the need to focus future research on the following questions:

- How should teachers and farmers be trained to allow a meaningful and effective learning experience?
- How to consistently incorporate farm experience into school curricula?
- How to detect and assess academic and transversal learning outcomes in a systematic manner?

The present literature review has helped us to define some of the key factors underpinning strong farm/school partnerships and effective outdoor education experiences. These will provide the scaffolding for designing the next steps in the DEMETER project and they include both broader educational principles that apply to outdoor education and ESD in general, and items that are specific to the farm/school partnership.

1. The farm-school partnership could be strengthened by:

- organizing training sessions with both teachers and farmers in order to develop a common language and shared educational goals,
- addressing logistical issues such as time, funds, and seasonality,
- promoting the pedagogical role of the farmer in co-designing the activities.

2. When taking into account the expected learning outcomes, attention should be given to:

- both academic and transversal skills,
- the role played by classroom-based and outdoor experience,
- coherent assessment tools.

3. An effective school-farm co-designed teaching strategy should include:

- well-structured curricular links,
- consideration for students' and teachers' pre and misconceptions, expectations and fears,
- time for hands-on experience, explanation, reconstruction, reflection, and consolidation,
- design and settings to promote inquiry-based learning.

These key points will guide us through the project implementation phase, and especially during our monitoring of teaching practices, and collection of evidence and documentation. This approach will be crucial to training teachers and farmers in designing learning experiences at farms that are meaningful and effective for all the actors involved.

The good practices

The collection of good practices identified in the framework of the DEMETER project is an example of fruitful collaborations between schools and farms. The practices were identified, shared and analyzed by the project team following the definition of a common template. Altogether 15 practices were identified only 11 were chosen as they met the quality criteria identified by the partnership. The first part of the description of each practice is dedicated to its content and how it was planned and implemented. The second part focuses on describing the context and shows why the practice was chosen as an effective example of collaboration between school and farm.

LET'S GO TO THE FARM!

PRIMARY SCHOOL DON BOSCO, MONCUCCO DI VERNATE - IT

TEACHERS: PAOLA CAPITANIO, PAOLA PERETTI FARMS: CAIELLA (CLASSI 1-2), CAMISANI (CLASSE 3), FIORENTINA (CLASSE 4), ACCADÌ (CLASSE 5)

What? Specific theme-oriented activities

Goal of the activity

To be able to discover, directly on the field, the origin and the production of the products and to get to know from close up experience of rural life.



Description of the type of activity

Incipit: Each class had received a mystery box containing some farm products (flour, honey, jam, rice) and then children were asked some questions in order to discover what they already knew about the origin and the productive process behind the final products.

Introduction: before these activities, more linked to farm, the teachers asked the pupils who is a farmer and what he/she does in order to collect mis-conceptions. From this first inquiry emerged an idealized character, with straw hat and overalls, busy from dawn to dusk working in the fields with low-tech tools.

Let's make jam (first class - 7 years old): Children went to the farm and pick up strawberries in order to transform them in jam and discover the steps of the process.

What is the origin of rice? (third class - 9 y. old): Children went to the farmhouse and discovered, with the help of the farmer, the production process from rice plants to our tables, meeting some discoveries such as types of cultivation, water channels and use of renewable energy.

The teacher's role

The teachers guided the children by flexibly planning what inputs to provide to activate the curiosity and questions of the children, who were then stimulated to look for answers in the field. They have previously established a collaboration with the factors in order to organize the activity and share the objectives.

🚑 The children's role

The children have played an active role before going to the farm, during the visit and also on the return, where they reworked the experience.



Farmer/grower/producer's role

The farmers welcomed the classes as privileged witnesses of the children's active search process, answering their questions and guiding their discovery.

Documentation or output to be produced by teachers and children before, during or at the end of the practice.

- First: starting questions that would contain the children's main curiosities about the mysterious objects received and what they knew about it.
- During: active questions, experiments
- Next: verbal and graphic reworking of the themes, discussed in subjects other than science.





Process (step-by-step activities to implement the practice), tools (microscope, ipad, worksheets etc.) and didactic approach (discussion, experiments, problem based questions, brainstorming, role playing etc.).

Let's make jam (first class - 7 years old): 1- startup questions: We think that the farmer: -first he/she picks up the fruit in the field -He/she washes it -afterwards, they press it with a spoon. -finally they puts it in the jar. Is it going to be like that? To verify our hypotheses, we just have to go to the farmhouse Caiella

2- Experience in the farm: Phase One: Collect the strawberries in the field. Step two: wash then and pull the strawberries Step three: Put the strawberries in a pun and add sugar phase four: cooking Step five: transfer to the jars stage six: taste test

The origin if rice? (third class - 9 y. old):

1- Startup questions:

Children received a packet of rice and a letter.

Dear children, in your opinion, what journey did the product take before it arrived in your hands?

-Please describe it

-Try to draw it.

The children send an email to the farmer asking if their assumptions were right (sowing, growing, harvesting with machinery, processing of rice on the farm and packaging)

2- Experience in the farm:

The children visited the rice fields observing and listening to the different methods of cultivation and learning the great importance of water, channelled into the fields. The class then went to the production area to watch the process of cleaning and packaging

Difficulties (possible weak points, obstacles)

There are not always partners willing to promote challenging learning and teaching processes, either among the factors or among colleagues. Farm visits were just one for each class.

Potential and Possibilities (follow-up activities)

- Interdisciplinarity (from science and geography to grammar and drama).
- Children also collaborated with all the school's classes in the creation of a year-end theatre show in which they each recounted their own experience. The classes worked on writing a script, screenplay and acting

How? Description of the practice's context



Why is this a good practice?

We think that this is a good practice because it brings out the active role of children in creating a relationship of curiosity and discovery towards the farm and the farmer. A farmer who shows children the commitment and importance of their work by accepting questions and structuring the visit in relation to a project agreed with the teacher.



The practices



Where Pavia (Lombardia region, Italy) countryside



When (in which period of the school year) April-May



People involved Teachers, farmers

Timeframe (how many activities/lessons and duration)

- 4 main phases: 1-Startup questions: 2 activities 2-Farm visit: one full day 3-Follow up activities: 2 hours
- 4-Show realization: 2 weeks

Learning objectives linked with the national curriculum

- Enhance the experience and knowledge of the students, to anchor new content. In the process of learning the pupil brings a great wealth of experience and knowledge acquired outside the school and through the different media available today and puts into play expectations and emotions, This comes with wealth of information, skills, methods of learning that the didactic action will have to properly recall, explore, and problematize. In this way the student can give meaning to what he is learning.
- The child captures in the world's landscapes of history the progressive transformations made by man on the natural landscape. They realizes that geographical space is a territorial system, consisting of physical elements and anthropogenic relationships linked by connection and / or interdependence.
- The pupil develops attitudes of curiosity and ways of looking at the world that stimulate them to seek out explanations of what they sees happening. Explore the phenomena with a scientific approach. With the help of the teacher, their peers, in autonomous way, observes and describes the course of events, formulates questions, also on the basis of and carry out simple experiments.
- The child clearly explains what they have experienced, using appropriate language. Find information and explanations on problems from various sources (books, internet, adult speeches, etc.) that interest them.

Group and classroom

If it's possible, all classes involved. In each class ensuring that there are one to one and small group work included.



Why did you choose this School–external actors collaboration?



Why have you chosen that farm?

We had chosen some farms in our area, with some we had already collaborated by participating in their workshops, for example the farmhouse Caiella. Others we contacted because we didn't know the owners of the area, apart from one, it happened, that we knew the owners and we involved them in the process, accompanying them in the organization of a visit of a class at their farm.



How did you established contact with the farmer/grower/producer/?

We presented the route to the various farmsteads and involved them. We found that all the owners were keen to support the project.

How did you co-design the activities with the farmer/grower/produce (planning visit, evaluation meeting, etc.)

We proposed the type of collaboration to the various farmhouse, asking them to let us have their products to be discovered by the students before visiting their farm. The material produced by the various classes was then sent to them by the teachers by e-mail before making the visit, so that the pupils' previous and naive knowledge was already clearer to the various factors. After having agreed on a theme, the row of the product analyzed, the content of the activity was managed by the various farmers. The teachers were more involved in the organization of the visit to the young company Accadi, where we had never met with schools.



RASPBERRY JAM FOR BREAKFAST SCUOLA CARDUCCI, REGGIO EMILIA - IT



What? Specific theme-oriented activities

Goal of the activity

Learn about growing raspberries and make it into jam. Engage children to taste raspberries and handmade raspberry jam, and think about their nutrition habits, especially about the importance of having breakfast.



Description of the type of activity

Farmer will explain how he grows raspberries on his farm, how they're collected, preserved and used; children will collect raspberries (if possible) and make them into raspberry jam.

The teacher's role

- Mediator between farmer and children;
- Provider of technology and supplies needed;
- Motivator, encouraging positive attitudes and holistic approach to knowledge

The children's role

- Observe and understand the process of growing raspberries
- Collect fruits (if conditions will allow it)
- Cooperation in making jam out of raspberries



Farmer/grower/producer's role

- Provide all the necessary information about raspberry growth and raspberry jam
- Host children in small groups to enable them to see the plantation and collect raspberries (if it is possible)

Documentation or output to be produced by teachers and children before, during or at the end of the practice.

- Scheme explaining how to grow raspberries
- List of questions for the farmer
- Raspberry jam recipe

Process (step-by-step activities to implement the practice), tools (microscope, ipad, worksheets etc.) and didactic approach (discussion, experiments, problem based questions, brainstorming, role playing etc.).

APRIL:

-Presentation about the farm, the planting process, general information about growing raspberries (farmer visit, virtual through video)

-Group discussion and collection of questions

-The Flowering: farm visit (virtual or real, depending on restrictions)

MAY/JUNE:

-The Harvest: farm visit (virtual or real, depending on restrictions)

- JUNE:
- Make Raspberry jam and taste it.





Difficulties (possible weak points, obstacles)

- May not be permitted children to visit the farm.
- Some children may refuse to collect raspberries or to work in small groups.

Potential and Possibilities (follow-up activities)

- Interesting topics that can provide useful context for discussion (veganism; organic v intensive; climate change)
- Science, technology and maths involved in farming can provide a real-world context for classroom activities
- There are opportunities to trace the journey made by food from field to fork, and think about the food we eat and where it comes from. This can relate to food miles, climate and seasonality to topics such as maths, science and geography

How? Description of the practice's context



- Real-world learning experiences such as cooking provide inspiring educational experiences for children
- It may help encourage children to be more adventurous in their food choices
- The activity will be remembered by children for a long time after the event, thus enabling further post-visit learning
- The children can take the recipe and complete it at home



E

Where

Fattoria didattica La Meridiana; Scuola Carducci.

When (in which period of the school year) APRIL:

-Presentation of the farm, the field, general information about growing raspberries (farmer visit, virtual through video)

-Group discussion and collection of questions

-The Flowering: farm visit (virtual or real, depending on restrictions)

MAY/JUNE:

-The Harvest: farm visit (virtual or real, depending on restrictions) JUNE:

- Make Raspberry jam and taste it.

People involved

- Farmer
- Teachers
- Children
- Parents

Timeframe (how many activities/lessons and duration)

Beginning: APRIL End: June

-About 15 hours of classroom work (video viewing, discussion, production)

- -Two Farm visits
- -Making Raspberry jam (one full morning activity)





Learning objectives linked with the national curriculum

- Use the five senses to know the world
- Observe meaningful events concerning the life of animals and plants
- Observe and understand the natural environmental modifications
- Identify in other living organisms basic needs, similar to those of the human beings
- Know numbers and quantities and use them for concrete purposes
- Describe simple events of the daily life about food, heat, motion, forces
- Recognize sequences in real life experiences
- Tell phases of a real life experience
- Understand and write texts containing instructions for practical purposes



Why did you choose this School-external actors collaboration?



Why have you chosen that farm?

- Proximity
- The farmer is expert in hosting children and these kind of activities
- The place is suitable for our classes (number of kids, safety, sort of activities)



How did you established contact with the farmer/grower/producer/? We worked with the same farmer two years ago.



We met with the farmer on the site, view the fields and discussed activities together.

The practices

ANIMAL FARM PRESCHOOL CUCCIOLO - IT

What? Specific theme-oriented activities

Goal of the activity

Knowing the animals and the environments where they live.



Description of the type of activity

- Visit to the stables: watching and feeding the animals, e.g. cows etc.;
- Observation of farm's spaces
- Workshops with herbs: rosemary and salt.



The teacher's role

Accompanying, control and stimulus of observation



The children's role

Observing, feeding the animals, playing with the items found in the farm, eg. grains



Farmer/grower/producer's role

The farmers led the group both in the workshops and in the approach with the animals.



- Before: reading stories about the farm topic;
- During: workshops and observation at the farm;
- End: bringing home the jar made in the laboratory with salt and rosemary.
- Photo billboard to document the parents' experience on the bulletin board at the entrance of the school.

Process (step-by-step activities to implement the practice), tools (microscope, ipad, worksheets etc.) and didactic approach (discussion, experiments, problem based questions, brainstorming, role playing games etc.).

During the meeting, discussions with the group

Difficulties (possible weaknesses, obstacles)

Financial issues: the bus and the entrance ticket to the farm have a cost ... therefore, it is possible to go there just once a year



Potential and Possibilities (follow-up activities)

At the "Bertozzi" farm there are many animals you can do different activities with: riding horses, taking care of and petting animals, helping in the cultivation of the field. A real environment that children should experience more often. From once a year time to several times during the year, to see the changes.



How? Description of the practice's context



Why is this a good practice? Because children are unfamiliar with livestock.



Where At "Bertozzi" farm.



When (in which period of the school year)? Autumn and spring.



People involved? Teachers, farmers, parents, cooks



Timeframe (how many activities/lessons and duration) A morning or afternoon activity.



Group and classroom Maximum 28 children per section.

Why did you choose this School–external actors collaboration?



Why have you chosen this farm?

- To understand the real context where the animals live.
- Because it is a big farm with a variety of animals.



How did you established contact with the farmer/grower/producer/?

By phone and visited in person the farm.



- Making agreements and defining timetables and what to propose to children.
- Evaluation in the teaching team and then returned to the farmer



ANIMAL FARM PRESCHOOL "NADIANI PARITARIA"- IT



What? Specific theme-oriented activities

Goal of the activity

- Coming familiar with the animals and the real environments where they live
- Developing a sense of respect for time: care, patience, linked to the activity of the factor.



Description of the type of activity

- Grape harvest with scissors and buckets;
- Crushing;
- Filtering and bottling the juice



The teacher's role

Accompanying, controlling, stimulating observation



Farmer/grower/producer's roles

Grape harvesters for one day.

The farmer who has led the group the entire day in every single step, both with words and actions.

Documentation or output to be produced by teachers and children before, during or at the end of the practice.

- Before: the project starts with the visit;
- During: workshops and observations in the farm;
- Fine: taking home the grape juice bottle.
- Drawing and verbalisation in class.

Process (step-by-step activities to implement the practice), tools (microscope, ipad, worksheets etc.) and didactic approach (discussion, experiments, problem based questions, brainstorming, role playing etc.).

Discussion within the group: metacognition.

Difficulties (possible weak points, obstacles)

- Going once: all the day .
- Financial issues: the bus and the entrance into the farm have a cost. Therefore, it is possible to go there just once a year.



Potential and Possibilities (follow-up activities)

It is possible to do several activities at "Fantini" farm : riding a horse, taking care and petting animals, helping to cultivate the fields.

A real environment that children should experience more often. Once or more in a year to see the changes.





How? Description of the practice's context



Why is this a good practice?

Because children see the process in areal life context and have a way of seeing how grapes are grown and the entire production process.



Where At the farm



When (in which period of the school year)? October to follow the product seasonality



People involved? Teachers, farmers, parents, cooks



Timeframe (how many activities/lessons and duration) One whole day

Group and classroom. Maximum 28 children

Why did you choose this School-external actors collaboration?



Why have you chosen that farm?

- To respond children's need to experience the farm and where the animals live.
- I personally know the farm and that the farmer is available.



How did you established contact with the farmer/grower/producer/?

By phone. The farm is inside the Municipality of Bertinoro



How did you co-design activities with the farmer/grower/producer (planning visit, evaluation meeting, etc.)

I personally went to plan in detail the times of the day and the workshops. Verbal return of positive and negative aspects.

TASTED

WASHINGBOROUGH ACADEMY - UK

What? Specific theme-oriented activities

Goal of the activity

- To extend children's palates and confidence in trying fruit and vegetables.
- Linking up schools with the fresh produce from Farms.

Description of the type of activity

TastEd is a way to teach children about new foods (especially fruits and vegetables) and their own senses and it is also a way to raise attainment in literacy. It is relatively new to the UK (having been piloted at Washingborough Academy in Lincolnshire as well as St Matthews in Cambridge since 2017). It has, however, been tried and tested in Scandinavian countries such as Sweden and Finland (where it is called Sapere) for several decades.

The idea of TastEd is to prevent and alleviate childhood obesity in the U.K. by equipping children with the opportunity to develop a taste for a wide variety of vegetables and fruits. These are lessons in eating, not lessons in cooking. Children learn about new foods and healthy eating in a very fun, non-judgmental environment. Rather than lecturing children about food, as some healthy eating schemes have done in the past, TastEd is founded on the idea that children learn best through actually experiencing the joys of fresh food.

The early signs are that TastEd is a very effective intervention for changing children's tastes. In a recent lesson in Cambridge, 7 children out of a class of 30 tried raw tomato for the first time in their lives – and most of them liked it and said they would try it again. At Washingborough in Lincolnshire, teachers have observed that children who once said they didn't like eating fresh fruits and vegetables are now much more willing to choose vegetables and salad in the canteen.

Studies from Finland suggest that this method is highly effective at increasing a child's liking of fresh fruit and vegetables, particularly for children whose parents have low educational background. It is thus a tool for reducing social inequality around food.

A secondary benefit is that TastEd is a highly effective way to get children to engage with the primary Literacy curriculum. We have found is especially powerful for teaching speaking and communication during Reception year as when children are engaged by food, it tends to inspire them to speak.Food places everyone in the class on the same page and engages even those who feel under-confident in literacy'.

In a recent lesson on different coloured tomatoes with a Reception class, children made comments such as 'the little orange tomato looks like an ant's egg' or 'the yellow one looks like a lantern' or 'the big red one is like a football'. They also used adjectives such as 'bumpy', 'stripy', 'shiny' smooth'.

The teacher's role

The teacher is responsible for:

- Delivering the lessons that have been pre-produced
- Engaging the children in using their senses to explore the food
- Ensuring that children are aware that they 'Do not have to like or do not have to taste'
- Along with the 'TastEd Toolbox' ensuring the there is good quality fruit and vegetables (not many, only examples) to deliver the lessons



Each the children's role

The children will take part in the session to:

- Using their senses to become more familiar with fresh fruit and vegetables
- Taking part in discussions about how their senses work in relation to food
- Documenting their thoughts and experiences
- Being open to exploring new foods

Farmer/grower/producer's role

- Supplying high quality produce
- Supplying information/provenance of the produce
- Further background information and interesting facts about the produce

Documentation or output to be produced by teachers and children before, during or at the end of the practice.

- Writing about the experiences that they have had
- Using similes and metaphors to describe how their senses have been engaged
- Poetry around the fruit and vegetables from their observations
- How many children experienced a food stuff for the first time

Process (step-by-step activities to implement the practice), tools (microscope, ipad, worksheets etc.) and didactic approach (discussion, experiments, problem based questions, brainstorming, role playing etc.).

- Whole class and small group activities
- Discussion work
- Creation of word banks
- General interesting facts/information about the produce to elicit interest
- Questioning/vocabulary gathering

Difficulties (possible weak points, obstacles)

- Access to fruit and vegetables
- Teachers' knowledge
- Neophobia
- Parents perceptions of what their children dislike

Potential and Possibilities (follow-up activities)

- Tiered lesson throughout primary school
- Themed lessons on history topics
- Children cooking with the ingredients
- Making a 'feast' for their peers and parents

How? Description of the practice's context

Why is this a good practice?

TastEd lessons encourage children to talk about their likes and dislikes adding explanations of why they do or don't like a certain food. The lessons help them to fulfil the Communication and Language requirement to answer 'how' and 'why' questions.

The aim of the project is to support schools with developing children's vocabulary through a multisensory approach to tasting and interacting with food stuffs – fruit and vegetables. Children's well-being would also be developed, understanding where their food comes from and understanding that to keep our bodies healthy we need to eat a wide range of foods.



The practices

The long term aim is to help children develop a taste for a range of fruits and vegetables as well as building up their vocabulary and self-expression around food.

TastEd equips children with new sensory tools for trying foods that they do not like. Children who are reluctant to try new foods are told that they can smell or lick them instead.

A further aim is that TastEd supports the national curriculum in PSHE/PSED as children are encouraged to understand that not everyone likes the same foods, but we can all respect each other's different tastes



Where

In the school's classroom



People involved

- Children
 - Teachers
 - Learning Support Assistants
 - Parents
 - Farmers
 - School cooks

Timeframe (how many activities/lessons and duration)

- 12 week programme.
- Can be extended for one session every week of the academic year

Learning objectives linked with the national curriculum

Links to a variety of Language and Literacy objectives as well as PSHE and Early Learning Goals:

30-50 months:

- Knows some of the things that make them unique, and can talk about some of the similarities and differences in relation to friends or family.
- Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world.
- Can talk about some of the things they have observed such as plants, animals, natural and found objects.
- Shows care and concern for living things and the environment.
- Engages in imaginative role-play based on own first-hand experiences.
- Builds stories around toys, e.g. farm animals needing rescue from an armchair 'cliff'.
- Uses available resources to create props to support roleplay

40-60 months:

- Extends vocabulary, especially by grouping and naming, exploring the meaning and sounds of new words
- Links statements and sticks to a main theme or intention.
- Uses talk to organise, sequence and clarify thinking, ideas, feelings and events.
- Confident to speak to others about own needs, wants, interests and opinions.
- Explains own knowledge and understanding, and asks appropriate questions of others.
- Begins to read words and simple sentences
- Attempts to write short sentences in meaningful contexts.
- Looks closely at similarities, differences, patterns and change.





Group and classroom

Whole class activities as well as small group

Why did you choose this School–external actors collaboration?



Why have you chosen that farm?

- Needs to be carried out with either a fruit farm or vegetable producer.
- Not as effective with cereal/livestock farm

SCHOOL VISIT TO A FARM

SOIL ASSOCIATION - UK



What? Specific theme-oriented activities

Goal of the activity

To understand more about how food is produced through a visit to a working farm

Description of the type of activity

The activity will involve a group of school children visiting a farm and finding out more about how they produce the food we eat. The visit will be led by the farmer or a member of farm staff who can interpret the farming activities for the pupils to understand. The day is likely to include a walk or trailer ride to see different elements of the farming system, including crops, livestock, machinery, buildings and wildlife (dependant on the type of farm visited). This will provide the basis for questions and discussion. Ideally some pre-visit and post visit activities in the classroom will help prepare for the visit, and extend the learning afterwards.

The teacher's role

The teacher is responsible for:

- Ensuring that the children are briefed and prepared for their visit. This may include thinking about what their preconceptions are about farming; what they may expect to see on the farm; where they think food comes from; how to stay safe on the visit.
- Ensuring that the day is planned with the farmer and that he/she is aware of the sort of topics the children should learn about. A pre-visit meeting or phone call can help plan this
- Ensuring that parents know what the visit entails with respect to clothing, footwear and visit times.
- Ensuring that the children are safe and well behaved on the visit. The farmer may not be experienced in controlling a large group of children
- Helping interpret what the farmer is saying to ensure that children understand, and prompting questions and discussion as required
- Thinking about what activities undertaken on the farm can provide the basis for future project work and discussion in the classroom, meeting curriculum needs

Example 7 The children's role

The children will take part in the session to:

- Learn more about how farmers produce the food we eat, and gain more -understanding about seasonality, the journey food takes from field to fork, and the environment
- Take part in discussion and ask questions to deepen their understanding
- Where possible, take part in a practical activity to enable them to embed the learning and perhaps give them new skills and experiences
- Use the opportunity to develop interpersonal skills, teamwork, confidence, communication and health benefits through exercise and access to green spaces
- Collect knowledge and information that can be reflected on at a future date in the classroom
- Follow instruction and stay safe on the visit, but also have a great time on the farm!





Farmer/grower/producer's role

The farmer will:

- Liaise with the teacher to plan the session and ensure that he/she is aware of what to cover on the visit
- Ensure that the farm is a safe environment to visit, with appropriate facilities, handwashing and risk assessment in place
- Introduce the farm and what is produced, and describe the farming activities in a way that is clear to understand for the age group
- Take the children on a tour to see perhaps four or five key points of interest/discussion
- Provide opportunities for handwashing, toilet visits and refreshment breaks

Documentation or output to be produced by teachers and children before, during or at the end of the practice.

Before the visit:

- Teacher: Pre-visit and any booking forms completed with the farmer
- Teacher: Risk assessment completed for the school
- Children: Discussion or written/artwork on what to expect on the farm visit

During the visit:

- Teacher: Collect/note topics and activities that could be followed up in the classroom
- Teacher: Help interpret any difficult topic for pupils, and ensure a balanced viewpoint is being portrayed on sensitive or contentious subjects
- Children: Have the opportunity to experience the farm without too much data collection/note taking to distract them.

After the visit:

- Teacher: Plan a range of opportunities to follow up the visit in appropriate lessons to build on the learning
- Teacher: ensure that pupils have a balanced view of different types of farming if the visit raises issues to be discussed
- Teacher: Explore practical growing and other food projects that can be conducted in the school grounds
- Children: Reflect on the farm visit experience and what they have learnt and how they view the farm compared with the pre-visit discussion.

Process (step-by-step activities to implement the practice), tools (microscope, ipad, worksheets etc.) and didactic approach (discussion, experiments, problem based questions, brainstorming, role playing etc.).

1.Search for a suitable farm and make a booking

2.Communicate with the farmer to plan what will be covered

3.Complete necessary paperwork (booking and risk assessments etc), book transport and obtain parental consents

4.Prepare children for the visit with discussion and questions

5.Ensure children and parents are given guidance on clothing and footwear and health and safety procedures

6.Arrange the day to include a number of stops for discussion and encourage questioning, discussion and brainstorming

7.Include some practical activities where possible to engage the children and avoid too much talking/listening



8. Emphasise topics or themes that will be built on back in the classroom

9. Develop a plan for post-visits development (eg written work, artwork, maths, role-play activities and discussion)

10. Integrate farm visit related topics into the lesson plans over the following weeks and months



- Finding a suitable farm within easy reach can be difficult
- Funding the cost of the transport and any fees to visit the farm
- Justifying the visit in terms of curriculum and time
- Having time to create the links with the curriculum and future learning opportunities
- Bad weather can have an impact of the enjoyment and success of the day, it is worth considering a wet weather plan
- It is difficult to gain a wide perspective of different types of farming from the visit, so incorporate this in pre and post-visit activities to give children a balanced view



Potential and Possibilities (follow-up activities)

- The farm visit will provide a 'Wow day' experience that can provide a reference and springboard for future learning. Food and farming topics are relevant to everyone and can cover almost all areas of the curriculum
- There are many interesting and sometimes contentious topics that can provide useful context for discussion (meat eating v vegetarianism; organic v intensive; climate change; environmental issues)
- The science, technology and maths involved in farming can provide a real-world context for classroom activity
- There are opportunities to trace the journeys made by food from field to fork, and think about the food we eat and where it comes from. This can relate to food miles, climate and seasonality to topics such as maths, science and geography
- Creative writing and artwork can be produced from the farm experience

How? Description of the practice's context



Why is this a good practice?

- Real-world learning experiences such as a farm visit provide inspiring educational experiences for children
- The visit will be remembered by children for a long time after the event, thus enabling further postvisit learning
- There are further wellbeing and health benefits to being outside and engaging young people with the environment



- On a working farm that is experienced in hosting school visits (play-farms or theme park farms should be avoided)
- Usually with 45 mins/1hour from the school to ensure that the children have enough time on the farm





When (in which period of the school year)

- Most farm visits will happen during the spring, summer and autumn when the weather is better for being outside
- The temptation to organise the visit as a summer trip should be avoided if the class is to get the most out of follow up learning activities

People involved

- Teacher
 - Farmer
 - Parents/helpers to provide enough adults to support the day and break the class into smaller groups where required

Timeframe (how many activities/lessons and duration)

- Generally arrive at the farm around 10am and leave around 2pm to fit in with the school day
- Split the day into 4 or 5 sessions to look at different topics or locations of the farm
- Allow plenty of time for lunch and handwashing (which can take a lot of time with a big group)



Learning objectives linked with the national curriculum

Almost all areas of the national curriculum can be covered if the teacher and farmer are creative in their plans for the day. The key is to discuss and plan the objectives beforehand and work this into the pre and post-visit activities.

Group and classroom

- The outdoor classroom provides the location for the activity, and where possible children should experience this and the weather.
- Facilities on each farm will vary, but most will have an indoor space to have lunch or work in bad weather
- Class sizes vary, but it is worth splitting a big group to enable learning and discussion. This can be done with parent/teacher helpers, with 6-10 children forming a good sized group to enable input and concentration.



SOFT CHEESE MADE SIMPLE SOIL ASSOCIATION - UK

What? Specific theme-oriented activities

Goal of the activity

To understand more about the journey food makes from farm to fork

Description of the type of activity

The activity will best involve a group of school children visiting a dairy farm and then following it up with a cheese making activity, either at the farm or back in the classroom

The teacher's role The teacher is responsible for:

- Ensuring that the children are briefed and prepared for their activity. This may include thinking about what is made from milk (butter, cream cheese, different types of milk, packaging); what the cows eat to make the milk; how the milk travels to the shops etc.
- Preparing the ingredients for the activity, together with the basic equipment required
- Thinking about what other activities can provide the basis for future project work and discussion in the classroom to meet curriculum needs.

The children's role

The children will take part in the session to:

- Learn more about how farmers produce the food we eat, and gain more understanding about seasonality, the journey food takes from field to fork, and the environment
- Take part in discussion and ask questions to deepen their understanding
- Take part in a practical activity to enable them to embed the learning and perhaps give them new skills and experiences
- Use the opportunity to develop interpersonal skills, teamwork, confidence, and communication



Farmer/grower/producer's role

The farmer will:

- Liaise with the teacher to plan the session and ensure that he/she is aware of what to cover on the visit
- Ensure that the farm is a safe environment to visit, with appropriate facilities, handwashing and risk assessment in place

Documentation or output to be produced by teachers and children before, during or at the end of the practice

Before the activity:

- Teacher: Risk assessment completed for the school and check on any lactose allergies
- Split the children into small groups (4 pupils?) so that they all get the opportunity to play a role
- Children: Discussion on milk production and milk products

During the activity:

- Teacher: Help develop teamwork, following instruction and discuss the cheesemaking process
- Children: Have the opportunity to undertake a practical activity and taste the results



After the visit:

- Teacher: Plan a range of opportunities to follow up the activity in appropriate lessons to build on the learning
- Children: Reflect on the experience and what they have learnt and how they view the food they eat.

Process (step-by-step activities to implement the practice), tools (microscope, ipad, worksheets etc.) and didactic approach (discussion, experiments, problem based questions, brainstorming, role playing etc.).

- 1. Collect a range of milk product packaging to discuss with the children. Think about what additives they have, and how the milk has been treated (homogenised, UHT, pasteurised etc)
- 2.Collect equipment: electric/gas hob, large saucepan, stirring spoon, teaspoon, sharp knife, lemon squeezer, thermometer, sieve, muslin cloth.
- 3. Collect the ingredients: 4 litres of milk, a handful of lemons, salt, fresh or dried herbs
- 4. Heat the milk slowly in the pan until the temperature reaches around 75 degrees. Stir to prevent it burning at the base
- 5. Juice the lemon and add to the milk in small quantities to enable the proteins to separate
- 6.Keep the milk warm and stir to help separate the curds from the whey. Add salt to taste
- 7. Strain the whey through a muslin cloth and sieve
- 8. Cut fresh herbs or add dried herbs to the cheese
- 9. Press into shape and decorate
- 10. Taste the cheese (and also taste the whey if you like!)

Difficulties (possible weak points, obstacles)

- Having the suitable equipment to hand for the small groups
- It can take a while for the cheese to separate so be patient, keep it warm and stirred and add more lemon juice
- Keep a few discussion point going through the activity so children don't get bored or distracted. Let them experiment and taste as they go.



Potential and Possibilities (follow-up activities)

- There are many interesting and sometimes contentious topics that can provide useful context for discussion (veganism; organic v intensive; climate change and methane; environmental issues)
- The science, technology and maths involved in farming can provide a real-world context for classroom activity
- There are opportunities to trace the journeys made by food from field to fork, and think about the food we eat and where it comes from. This can relate to food miles, climate and seasonality to topics such as maths, science and geography

How? Description of the practice's context



Why is this a good practice?

- Real-world learning experiences such as cooking provide inspiring educational experiences for children
- It may help encourage children to be more adventurous in their food choices
- The activity will be remembered by children for a long time after the event, thus enabling further post-visit learning
- The children can take the recipe and complete it at home



- Where
 - On a working farm that has the appropriate classroom space for running the activity
 - In the classroom as a follow-up activity to seeing the milking cows



When (in which period of the school year)

Any time of the year

People involved

- Teacher
- Farmer (if there is a visit involved)
- Parents/helpers to provide enough adults to support the day and break the class into smaller groups where required



Timeframe (how many activities/lessons and duration)

It will take up to an hour to run the activity, depending on discussion



Learning objectives linked with the national curriculum

Almost all areas of the national curriculum can be covered if the teacher and farmer are creative in their plans for the day. The key is to discuss and plan the objectives beforehand and work this into the pre and post-visit activities.



Group and classroom

- The farm classroom provides the best location for the activity if the resources and materials are suitable. However, it is easier to do this back in school (especially if you have a good cooking facility)
- Class sizes vary, but it is worth splitting a big group to enable learning and discussion. This can be done with parent/teacher helpers, with 4-6 children forming a good sized group to enable input and concentration.

SCENT OF BREAD

CARDUCCI PRIMARY SCHOOL, REGGIO EMILIA - IT

What? Specific theme-oriented activities

Goal of the activity

To understand how bread is made.



Description of the type of activity

Visit to a farm, where children can see wheat fields and experience the process of making bread.



The teacher's role

- Stimulate children curiosity during the days before the visit;
- Inform children about farms and countryside (Our school is in the city centre and many children have never been in the countryside);
- Stimulate conversations about food and bread in particular
- Organize the trip and choose a farm
- Get in touch with the farmer and define the activities
- Encourage communication between the farmer and the children
- Re-elaborate the experience with children

The children's role

- Get ready to observe a new place and learn about farming
- Take part in discussions with the teacher, friends and the farmer
- Take part in practical activities (making bread) and working in team with classmates
- Memorise and retell a procedure



Farmer/grower/producer's role

The farmer shows children their wheat fields, and explains the process of breadmaking and provides them with tools and equipment. During the visit they provide information about the environment, seasonality, farming, and taking care of animals.

Documentation or output to be produced by teachers and children before, during or at the end of the practice.

Before the visit:

• Conversations about bread; where do you think bread comes from? How do you think bread is made?

During the visit:

Making the bread

After the visit:

• Make a list of the ingredients needed to make bread, complete with drawings







Process (step-by-step activities to implement the practice), tools (microscope, ipad, worksheets etc.) and didactic approach (discussion, experiments, problem based questions, brainstorming, role playing etc.).

PROCESS

- Conversation about bread before the visit
- Visit wheat fields; observation;
- Explanation of the process of making bread
- Collect grain
- Grind grains to obtain wheat flour
- Mix flour with salt, water and yeast
- Shape bread
- Observe how the oven works and wait for the bread to be ready
- Smell and taste bread
- Conversation after the visit
- Make a list of ingredients
- Make biscuits and cakes at school

Difficulties (possible weak points, obstacles)

- Finding a suitable farm
- Finding a cheap way to travel
- Uncertainty of weather

Potential and Possibilities (follow-up activities)

- Make biscuits and cakes at school
- Collect the excess bread from the school canteen and donate it to charity organizations in town

How? Description of the practice's context

Why is this a good practice?

Because it's centred on a real task and children learn mostly by doing.



Where

In a farm 5 km from the school (La Meridiana farm in Gavasseto)



When (in which period of the school year) May



• Teachers

TOOLS

- grindstone
- mixer
- oven

DIDACTIC APPROACH

- learning by doing
- discussion
- brainstorming
- teamwork





Timeframe (how many activities/lessons and duration)

- One lesson (2 hours time)before the visit (conversation)
- One day for the visit
- One lesson (2,3 hours time) after the visit
- One school day to make biscuits (in groups)

💫 Learning objectives linked with the national curriculum

- Use the five senses to know the world
- Observe meaningful events concerning the life on animals and plants
- Observe and understand natural environmental modifications
- Be familiar with the territory
- Identify anthropic and natural landscape elements
- Know numbers and quantities and use them for concrete purposes
- Describe simple events of the daily life about food, heat, motion, forces
- Recognize sequences and contemporaneity in real life experiences
- Tell phases of a real life experience
- Understand and write texts containing instructions for practical purposes

Group and classroom

1°A e 1°B.

Why did you choose this School–external actors collaboration?



Why have you chosen that farm?

- Proximity
- The farmer is expert in dealing with children and this kind of activities
- The place is suitable for our classes (number of kids, safety, sort of activities)

How did you established contact with the farmer/grower/producer/?

- Colleagues's advice
- Website
- Phone calls
- Evaluation meeting

How did you co-design the activities with the farmer/grower/produce (planning visit, evaluation meeting, etc.)

The farmer explained his farm's main activities by phone. The teachers team chose to focus on the process of making bread because it involved many natural and anthropic events: seeding, growing, collecting plants, and making bread.

The teachers then visited the farm and had a meeting with the farmer to plan activities during the visit.



PUMPKIN'S PARTY colégio do sardão - pt

What? Specific theme-oriented activities

Goal of the activity

- To promote healthy lifestyles;
- To raise levels of health-related physical aptness;
- To promote cultural enrichment of the pupils, through the established routes;
- To promote learning skills by exploring the world that surrounds the pupils;
- To promote the interconnection of learning in the external environment;
- To promote the consolidation of contents in the external environment through the development of formal / non-formal activities.
- To interact with tolerance, empathy and responsibility and argue, negotiate and accept different points of view, developing new ways of being, looking at and participating in society.
- To adapt behaviors in contexts of cooperation, sharing, collaboration and competition.
- To work as a team and use different means to communicate in person and in a network.



Description of the type of activity

Project – The life cycle of a pumpkin!



The teacher's role

The teacher assumes a role of guiding / mediating pupil's learning process.

The children's role

The pupils assume the role of main actor in his / her development and learning.



Farmer/grower/producer's role

The farmer assumes a role of teacher's partner in guiding / mediating pupil's learning process.

Documentation or output to be produced by teachers and children before, during or at the end of the practice.

- Research related to factors essential for good plant growth specifically, pumpkins.
- Self-regulation learning grids.
- Growth monitoring and plant development grids.
- Recipes

Process (step-by-step activities to implement the practice), tools (microscope, iPad, worksheets etc.) and didactic approach (discussion, experiments, problem based questions, brainstorming, role playing etc.).

- Sowing activities;
- Watering;
- Research related to factors essential for good plant growth specifically, pumpkins.
- Sharing of information on topics of interest to the student or related to the subjects being studied.
- Free oral presentations, followed by questioning by the class.
- Schematic presentation of the information, with the support of the teacher.
- Selective registration of previous ideas, planning of activities to be carried out, data collected and conclusions built from the data.



- Comparison of results obtained with predictions made.
- Weekly group follow-up of plant growth.
- Weekly reports on monitoring plant growth.
- Harvesting activities.
- Cooking Classes Pumpkin Jam.
- Cooking Classes Pumpkin Pie.
- Pumpkin Decoration for Halloween.



Difficulties (possible weak points, obstacles)

Adverse environmental factors

Potential and Possibilities (follow-up activities)

- Pumpkin Jam & Pumpkin Pie sale.
- Halloween party.

How? Description of the practice's context

Why is this a good practice?

Pupils who participate in decision-making enjoy enhanced self-esteem and motivation, gain important personal, social and organisational skills, and become familiar with group and democratic processes. At the organisational level, pupil involvement in decision-making leads to better relationships, more relevant and effective policies, and better learning. In the best scenarios, pupils and adults work together as partners to ensure that their school provides the best possible learning environment for all.

Pupils have an important part to play in helping their school to improve in every aspect of school life, and that's why we understand that these kind of activities contribute to the development of attitudes and values that determine the behaviors of the individuals, and promotes learning itself by the unformal tasks, based on contents and general curricula. This particular project was developed and created based on the interests, motivations and needs of the students, as well as their suggestions gathered in class assembly.

Atthis level of education, it is desirable that the children acquires attitudes, as curiosity, the requirement of justification, the need for proof for judgment, persistence.

It is intended that in the development of his socialization process, the children values cooperation and consideration from the point of view of others.

It is necessary for the new generations to have a highly developed critical logical reasoning. That is, to create autonomous citizens morally and intellectually.

In this sense, these outside activities plays a very important role. Promotes orientation for citizenship, with a view to the development of individuals as citizens consumers; assets and responsible users of the instruments and means that the outside environment provides.

Where

In our outer environment - Colégio do Sardão.

When (in which period of the school year)

From May (sowing) to October (harvesting)



People involved

- Pupils
- Parents
- Teachers
- Farmer



Timeframe (how many activities/lessons and duration)

During this activity, one hour per week will be assigned to outdoor activities.

🚰 Learning objectives linked with the national curriculum

- To formulate questions, requests and answers regarding the activity.
- To represent different communicative roles in simulation games.
- To recognize the importance of dialogue, negotiation and commitment in the peaceful resolution of conflict situations.
- To verify morphological changes that are going on throughout the stages of life, comparing aspects resulting from parameters .
- To reflect on behaviors and attitudes, experienced or observed, that compete for the physical and psychological well-being, individual and collective.
- To identify situations and risk behaviors for individual and collective health and safety in various contexts home, street, school and to propose appropriate protective measures.
- To characterize the typical weather conditions of the seasons in Portugal and their variability.
- To categorize living beings according to similarities and observable differences.
- To relate the characteristics of living beings (plants) with their habitat.
- To recognize the existence of diversity among living beings from different groups and distinguish. them from non-living forms.
- To recognize that living beings have basic, distinct needs at different stages of their development.
- To relate threats to the biodiversity of living beings with the need to develop responsible attitudes towards Nature.
- To conduct experiments in safe conditions, following the experimental procedures.
- To know how to handle everyday materials and objects safely by exploring logical relationships of form and function (scissors, staplers, punchers, juicers, cutlery, etc.).
- To identify the properties of different materials (eg shape, texture, colour, taste, smell, gloss, buoyancy, solubility), grouping them according to their characteristics, and relating them to their applications.
- To identify human activities involving technological change in the world around him.
- To relate spaces of their experience with different functions, establishing relationships of identity with space.
- To elaborate daily itineraries, in simplified plants of its environment, signaling different natural and human elements.
- To describe natural and human elements of the place where they live.
- To communicate knowledge about places, regions and events.
- To know how to put questions, raise hypotheses, make inferences, prove results and know how to communicate, recognizing how knowledge is built.
- To represent real places that are close to you in time and space.
- To ask questions about environmental problems in the locality where they live, namely related to water, energy, waste, air, soil and proposals for intervention.
- To express attitudes of respect, solidarity, cooperation, responsibility in relation to those who are close to it.
- To demonstrate positive attitudes conducive to the preservation of the surrounding environment, being able to present proposals for intervention.

Group and classroom 1st, 2nd, 3rd and 4th grade

MEASURING QUEST

COLÉGIO DO SARDÃO - PT

What? Specific theme-oriented activities

Goal of the activity

- To promote healthy lifestyles;
- To raise levels of health-related physical issues;
- To promote cultural enrichment of the pupils, through the established routes;
- To promote learning skills by exploring the world that surrounds the pupils;
- To promote the interconnection of learning in the external environment;
- To promote the consolidation of contents in the external environment through the development of formal / non-formal activities.
- To interact with tolerance, empathy and responsibility and debate, negotiate and accept different points of view, developing new ways of being, looking at and participating in society.
- To adapt behaviors in contexts of cooperation, sharing, collaboration and competition.
- To work as a team and use different means to communicate in person and in a group.



Description of the type of activity

Project - Units of measure (length, mass, capacity, money and volume).

The teacher's role

The teacher assumes a role of guiding / mediating pupil's learning process.

The children's role

The pupils assume the role of main actor in his / her development and learning.



Farmer/grower/producer's role

The farmer assumes a role of teacher's partner in guiding / mediating pupil's learning process.



Documentation or output to be produced by teachers and children before, during or at the end of the practice.

- Research related to factors essential for measure units.
- Family /classroom measuring activities worksheets.
- Self-regulation learning grids.
- Peddy-paper passport.

Process (step-by-step activities to implement the practice), tools (microscope, ipad, worksheets etc.) and didactic approach (discussion, experiments, problem based questions, brainstorming, role playing etc.).

- Measuring activities (work in the classroom, at home and on the farm, individually and in groups);
- Sharing of information on topics of interest to the student or related to the subjects being studied.
- Free oral presentations, followed by questioning by the class.
- Schematic presentation of the information, with the support of the teacher.
- Selective registration of previous ideas, planning of activities to be carried out, data collected and conclusions built from the data.
- Comparison of results obtained with predictions made.
- Peddy paper;





- Cooking Classes;
- Cakes sale;
- Lemonade sale;
- Cakes sale;
- Fair.

Difficulties (possible weak points, obstacles) Adverse environmental factors.

Potential and Possibilities (follow-up activities)

Treasure hunt

How? Description of the practice's context



Why is this a good practice?

We understand that this kind of activities contribute to the development of attitudes and values that determine the behaviors of the individual, and promotes learning itself by the unformal tasks, based on contents and general curricula. On this level education, it is desirable that the children acquires attitudes, such as curiosity, the requirement of justification, the need for proof for judgment, persistence etc..

It is intended that in the development of his socialization process, the children values cooperation and consideration from the point of view of others, for example.

It is necessary for the new generations to have a highly developed critical logical reasoning. That is, to create autonomous citizens morally and intellectually.

In this sense, these outside activities play a very important role. Promotes orientation for citizenship, with a view to the development of individuals as citizen consumers; assets and responsible users of the instruments and means that the outside environment provides.

Where

In our outdoor environment – Colégio do Sardão.

When (in which period of the school year)

3° period – between April and June

People involved

- Students,
- Parents
- Teachers
- Farmer

Timeframe (how many activities/lessons and duration)

During the 3rd period, a class per content will be assigned to outdoor activities.

Learning objectives linked with the national curriculum

- To formulate questions, requests and answers to questions regarding the activity.
- To represent different communicative roles in simulation games.
- To compare and sorts objects according to different quantities (length, mass, capacity and area), identifying and using conventional and unconventional units of measurement.
- To recognize and relate to each other the value of coins and notes, and use them in different contexts.
- To recognize and relate to each other time intervals (time, day, week, month and year).

- To design and apply strategies to solve problems involving visualization and measurement in mathematical and non-mathematical contexts, and evaluate the plausibility of the results.
- To express, orally and in writing, mathematical ideas, and explains reasoning, procedures, and conclusions.
- To develop interest in mathematics and value its role in the development of other sciences and domains of human and social activity.
- To develop confidence in their mathematical skills and knowledge, and the ability to analyze their work and regulate their learning.
- To develop persistence, autonomy and willingness to deal with situations that involve mathematics in their school career and life in society.
- To collect, organise and represent discrete qualitative and quantitative data using different representations and interprets the information represented.
- To recognize the importance of dialogue, negotiation and commitment in the peaceful resolution of conflict situations.
- To verify morphological changes that are going on throughout the stages of human life, comparing aspects resulting from parameters such as: sex, age, dentition, etc.
- To reflect on behaviors and attitudes, experienced or observed, that compete for the physical and psychological well-being, individual and collective.
- To identify situations and risk behaviours for individual and collective health and safety in various contexts home, street, school and propose appropriate protective measures.
- To characterize the typical weather conditions of the seasons in Portugal and their variability.
- To categorize living beings according to similarities and observable differences.
- To relate the characteristics of living beings (animals and plants) with their habitat.
- To recognize the existence of diversity among living beings from different groups and distinguishes them from non-living forms.
- To recognize that living beings have basic, distinct needs at different stages of their development.
- Relates threats to the biodiversity of living beings with the need to develop responsible attitudes towards Nature.
- To conduct experiments in safe conditions, following the experimental procedures.
- To know how to handle everyday materials and objects safely by exploring logical relationships of form and function (scissors, staplers, punchers, juicers, cutlery, etc.).
- To identify the properties of different materials (eg shape, texture, colour, taste, smell, gloss, buoyancy, solubility), grouping them according to their characteristics, and relating them to their applications.
- To identify human activities involving technological change in the world around him.
- Relate spaces of their experience with different functions, establishing relationships of identity with space.
- To describe natural and human elements of the place where you live.
- To communicate knowledge about places, regions and events.
- To know how to put questions, raise hypotheses, make inferences, prove results and know how to communicate, recognizing how knowledge is built.
- To ask questions about environmental problems in the locality where they live, namely related to water, energy, waste, air, soil and proposals for intervention.
- To expresses attitudes of respect, solidarity, cooperation, responsibility in relation to those who are close to it.
- To demonstrates positive attitudes conducive to the preservation of the surrounding environment, being able to present proposals for intervention.

Gruppo e classe

Second grade

MATHEMATICS ON THE FARM

VÄNERSBORG MUNICIPALITY, BRÅLANDA SKERRUDS SCHOOLS AND HUSHÅLLNINGSSÄLLSKAPET VÄST

What? Specific theme-oriented activities

Goal of the activity

- The students should gain increased knowledge about different aspects of agriculture through mathematics.
- The students should gain increased knowledge about sustainability and food.
- The students will have the opportunity to experience in reality the agricultural world related to mathematics through different senses.
- The students can follow the farmer's job under the whole year and participate in it through mathematics.



Description of the type of activity

- Regularly (ex. once in a month) visiting a farm nearby, or just at school, taking part in different activities with a farmer.
- Using digital instruments during the activities. The students have different mathematical problems to solve when they visit the farm and also when they work in the classroom. Problems that the teacher and the farmer plan before the activities.

The teachers' role

- To plan and evaluate each farm visit basing on the mathematics syllabus of the year.
- To keep in touch with the farmer / farm and to plan and evaluate the activities.
- To participate in the farm visits.



The children's role

Participation, coming up with their own suggestions/proposals about what they would like to learn/know.



Farmer/grower/producer's role

To keep in touch with teachers, and to participate in planning and carrying out activities together with the students.

Documentation or output to be produced by teachers and children before, during or at the end of the practice.

The students will report their activities through a "logbook", wall journal and digital instruments. The teachers and the students will follow up what has been done through conversations, discussions, and various written tasks that will form the basis of the entire planning phase.

The work will be presented to parents and others through exhibition, homeworks etc..

These activities could include parents and other family members finding out different things at home that relate to the task / work area, for example: How much milk do you drink in a week at home?





Process (step-by-step activities to implement the practice), tools (microscope, ipad, worksheets etc.) and didactic approach (discussion, experiments, problem based questions, brainstorming, role playing etc.).

- -Step by step from planning to implementation phase.
- -School material to prepare or to to have at disposal.
- -Pedagogical aspects: students' preparation, discussions, questions..)

Workflow:

- A: Preparation/comprehension;
- B: FarmerTime
- C: Study visit at the farm;
- D: Feedback, follow-up and evaluation

Pedagogical aspects:

1) Starting by finding out the students' knowledge before a work session by asking questions, which the pupils should answer individually, in couples or in groups. Examples of questions: What do you know about...? When I say what do you think? What would you like to know about...? Is there anything you would like to ask...?

2) Planning and implementation of the lessons/work. Planning phase takes place on the basis of the curriculum's content, but also includes the students' questions and comments.

3) Finishing by asking the same or new questions that the students should answer individually, in couples or in groups. They can be written as a text, sample or report (Padlet, Forms, PowerPoint, poster, newspaper etc.) Some questions as in the point n.1.

4) In order to measure the quality and the level of the learning process, the "exit tickets" are a good way for students to answer any questions at the end of each work session. The answers will be submitted to the teacher who will see what the students have learned and what not. Good also for the planning of further / future lessons.

Other aspects:

- -To decide the way to reach the farm (by bus, by walk or by bicycle..)
- -To inform the farmer about the classroom's visit in the farm.
- -To take with you some material for the documentation (pens, crayons, paper, camera..)
- -To do a risk assessment;
- -How many teachers or educators or school staff members do we need during the visit?
- -Eventually, to split the students in any groups.



Difficulties (possible weak points, obstacles)

To find a suitable farm. To get there, both from time and economic issues.

Potential and Possibilities (follow-up activities)

To create a higher interest in agriculture and understanding of sustainability, environment and health related issues.

How? Description of the practice's context



Why is this a good practice?

- To use mathematics in a practical way and to develop/reinforce knowledge in mathematics.
- Everyone in the classroom will practice the same experience.
- Getting practical learning about agriculture linked to theory.
- To be outdoors and to move around.
- To learn about the main issues that are important to our lives and our society.



In the farmer, on site.



When (in which period of the school year)

During the whole year.



People involved

Parents and grandparents.



Timeframe (how many activities/lessons and duration)

It is very important that these visits in the farm will be repeated in a regular way (for example once per month).



Learning objectives linked with the national curriculum

- Grade 1- Numbers: Natural numbers and their properties, as well as how the numbers can be divided and how they can be used. Natural numbers and simple numbers in fractions and their use in everyday contexts.
- Grade 2- Problem solving: Mathematical questions based on simple everyday life
- Grade 3- Measurement of length, volume, mass and time with ordinary contemporary and older units of measurement.
- Grade 4- Multiplication and division; Area and perimeter; Fraction; Geometry; Programming; Equations; Measurement units (length) conversions; Problem solving.
- Grade 5- Fractions, percentage, decimal numbers, Circumference and area; Symmetry; Programming: Equations; Measurement Units Conversion (Weight); Problem solving
- Grade 6- Fraction, percentage, decimal numbers; Circumference and area; Statistics; Programming; Equations and expressions; Measurement Units Conversions (Volume); Problem solving



Group and classroom Any group or class.

Analysis of the main strengths and difficulties identified

Strengths (opportunities and future possibilities)

- Authentic learning environment;
- Ability to address topical issues such as attention and care of the environment, food education, education to sustainable (Goals of the 2030 Agenda);
- Interdisciplinarity: the themes of food and agriculture are relevant for everyone and can cover almost all areas of the curriculum;
- Direct Interaction with the farmer and his knowledge;
- Farmer as a privileged witness of the process of active research of children answering their questions and guiding their discoveries;
- Sharing of planning and objectives between teachers and farmers;
- Possibility of proposing authentic tasks (formative evaluation);
- Role of the teacher as a mediator between farmer and children, motivator, encouraging a positive attitude and a holistic approach to knowledge;
- Active role of children before, during the visit and also after the visit when they re-elaborate the experience.

Difficulties (possible weaknesses, obstacles)

- Times and spaces: visits are occasional, availability of farms to welcome classes with large groups of pupils, activities conditioned by the weather situation, risks evaluation;
- Financial issues: high transport costs, difficulties in raising funds;
- Distrust of some children towards the natural environment (getting dirty, tasting fruit and vegetables, neophobia, fear of animals ...);
- Parental apprehension and teachers' resistance to take children outside of school, in open spaces where 'control' is more difficult;
- Training of teachers on the agro-food theme;
- Difficulty in finding partners willing to promote processes challenging learning and teaching, both among farmers and among teachers;
- Need to create links with curriculum design.







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The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by the Erasmus+ Programme of the European Union



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