

# “Inside” Learning about Nature in the School Classroom



## Introduction

### Mission:

Our goal is to increase food literacy in pre-kindergarten students by introducing garden curriculum in these early years of development. Our hope is that these pedagogical practices (including teaching concepts like ‘closed-loop ecosystems’) will inculcate habits that lead to a healthy body and a sustainable environment. The Edible Campus Program, in partnership with UCSB’s Early Childhood Care and Education Services, is working with seven classrooms of pre-kindergarten students at Orfalea Family Children’s Center to implement said curriculum.

### Theoretical Framework:

The garden curriculum implemented at the Orfalea Family Children’s Center is based on child-driven and play-based theories.

Play-based learning allows the student to learn by interacting with the physical world around them. In order to assimilate new concepts, children must understand how the environment plays a role in this new knowledge. Play-based learning allows children to manipulate their surroundings, by which they can interact and form their own knowledge (Piaget 1952, Dewey 1990, Vygotsky 1967).

Child-driven learning allows the student to take charge of the direction of the content, with which they are interacting. This is typically self-motivated and enjoyable, and relies on adapting to the changing needs of the child (Playwork Principles Scrutiny Group, 2005). The theory of nature placed-based learning, allows the student child to move from inside, outside, and beyond; learning *about*, *in*, and *with* nature (Warden, 2015).

### Important Terms:

- **Food Literacy:** For young individuals, an introduction to food literacy is necessary in understanding the impact of food choices on health and the environment (Food Literacy Center, 2015). Food literacy creates a positive relationship built through social, cultural, and environmental experiences with food, enabling people to make decisions that support health (Food Literacy: Definition and Framework for Action. Tracy Cullen et al., 2015). The emphasis of this curriculum was an early introduction to the components of gardening that familiarizes young students to the processes involved in ecological plant/food production. This includes knowledge of fertile soil, decomposers, and composting. Later curricula may serve to expand on food choice and nutrition in order to further embed food literacy.
- **Closed-Loop Ecosystem:** an ecological system in which matter within is maintained with little loss, as in the case of recycling or composting. Closed-loop ecosystems are self-sustainable, although energy from external sources may flow through (Taub 1974; BBC GCSE Bitesize Science: Ecosystems). Learning about this concept eases students’ understanding of any similar processes in the future.



## Inside Lesson: Settling Soil

Lesson plan modified from: The Editors of Publications International, Ltd. (2007, November 16). Science projects for kids: Soil experiments.

### Learning Objectives:

- Become familiarized with soil and its contents
- Develop vocabulary used for traditional gardening
- Begin to understand what a closed-loop ecosystem means
- Know how to use investigatory tools (hand lens).

### Preschool Learning Foundations fulfilled:

- Socio-emotional development
- Language and literacy
- Mathematics domain
- English-language development domain

### Method:

Step 1: Before the lesson began, volunteers filled mason jars halfway with soil from a plot and sand from the sandbox, as well as pebbles, sticks and flower petals. They shook the jars up so that the different components of the soil were combined together.

Step 2: Once inside the classroom, each volunteer took a small group of students to work with. They asked them what they thought was in soil and explained basic vocabulary terms such as pebbles, sand, silt, and clay. They explained the importance of soil and how it is necessary for all living things to grow. Together with the volunteers, the students pored through the soil and looked for pebbles, bugs, twigs, or anything else that caught their eye.

Step 3: After the students finished examining the soil, the volunteers added water to the mason jars and screwed the lids back on. The students were encouraged to have fun shaking around the mason jars so that the soil was mixed well with water. Then the mason jars were left in the middle of the table.



Students investigating soil together



Examining soil together with volunteer

Step 4: The class came together to listen to either *In the Garden: Who’s Been Here?* or *The Curious Garden* while the jars of soil settled. The volunteers made the book as interactive as possible, frequently asking questions about what the students thought would happen next or what they noticed occurring in the pictures.

Step 5: Once the story was over, students separated back into their groups and looked at the mason jars. The soil had segregated into layers of sand, silt, clay and leftover debris. Students were encouraged to explain what they saw and examine the different colors and layers.

Step 6: The volunteers poured out the water, handed each student hand lenses and a spoon or fork and allowed them to dig out the soil and spread it on the paper sheets. This was to allow students to explore the soil and integrate sensory play so that they would be able to interact with what they had learned. The volunteers also reinforced newly learned vocabulary by asking questions such as “How should the clay feel?” “Do you see any pebbles?” and “Which layer was the sand in?”



## Reflections

The main objective of this lesson was in line with the first stage of place-based learning; that is, for students to learn *about* soil before being immersed in further knowledge. To that effect, the children were able to follow directions, ask questions when given challenging information, and familiarize themselves with the various properties of soil through play. Students applied the new knowledge they had been taught while looking at the separated layers of soil. For example, some students guessed at the components of soil using the vocabulary they had learned, pointing at what they believed to be sand, silt, and clay. Others related the soil to any personal connections they had, pointing out that they also had sand and clay in the sandboxes where they played.

The use of storytelling was a valuable asset in creating an environment that stimulated participation. When the storybooks (chosen due to its introduction to various creatures that rely on soil and plants) were read out loud to the class, interactive questions allowed students to relay their thoughts and pique their interest. Students drew elaborate guesses for what would happen next in the story, or describe the current scene with great detail. Due to its connection to gardening, and the incorporation of group participation, the hope is that this increases the ability to participate in cooperative efforts (Sarver, 1985) in the future.



Listening to a gardening storybook read out loud

Overall, we wanted to see students grasp the important main ideas of soil, such as the benefits it gives to growing plants. When asked, the students reported that they liked learning about soil, and were curious enough to ask about any living organisms that lived in it, or what would happen if there was no soil. This positive reaction may lead to an increase in concern for the environment (Palmer, 1993) and observation and creativity (Crain, 2001).

## What’s Next?

The soil lesson implemented in the classroom was a first step into an environmental pedagogy. To introduce young students to the concept of a sustainable closed-loop ecosystem, using gardening concepts served as an easy, direct connection to the biological processes of the earth (Moore, 1995). However, due to the indoor confines of their classrooms, there was a limiting factor in having students relate to the information taught: for instance, while students were told that plants grew from soil, it was difficult to establish this new framework without a tangible connection. Showing students new saplings (plants that have just started growing), for example, would have been a beneficial way of showing the process of growing plants. Later lessons focusing on education ‘outside’ and ‘beyond’ would remedy this by the use of tools such as worms, bugs, and compost ingredients. However, during the ‘inside’ lesson, being in the context of the classroom provided a place of comfort that effectively allowed the students to be able to play with soil and ask questions without the compromising effects of unfamiliar backgrounds. The use of sensory play amplified the students’ ability to manipulate their surroundings and immerse themselves in newly gained knowledge, which would later provide foundational background for future real-world application.