Leaf Decomposition (ages 5-7)

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Summary:

Manifestations of life cycle of leafy trees. Becoming aware of leaf decomposition, as opposed to disappearance and their role in the forest.

Target Concepts:

Environmental education => Ecological approach based on immediate environment.

Role and place of living beings, concept of food chains and networks

Materials:

- Identical recipients (20-L plastic boxes with cover).
- Water spray can or watering can with spout.
- fresh leaves
- decomposing leaves
- forest undergrowth (humus)

Scientific Concepts

The life cycle of leafy trees brings about a number of changes over the course of a single year. In Autumn, the leaves can be observed to fall. With time, they decompose. The decomposition of animal and plant matter on the ground brings about the formation of organic matter known as humus.

Scientific Terms

Decomposition, humus

Instructional Approach

Trigger Situation

The leaves fall to the ground in Autumn. A few months later, they have disappeared.

The park gardener gathers the dead leaves and puts them in a heap in a corner of the garden. By Summer, they are gone.

Student Hypotheses

They fly away or disintegrate.

In the meantime, the gardener has put them in the trash.

They are crushed, ground, cut up into tiny pieces and disintegrate.

They go rotten, become all black and turn into soil.

They get eaten up by the animals.

They are destroyed by the rain.

In the classroom, nothing would happen. They need to be outside.

Student-Suggested Experiments

Put leaves into two closed recipients: one outside the classroom, the other inside. Observe on a regular basis.

Use fresh leaves or leaves that have fallen long ago.

Chop up the leaves, put them in a close recipient and wait. Observe.

Put the leaves in a recipient and mix them up with soil. Observe.

Put the leaves in a recipient and water them frequently. Observe.

Use water, soil and leaves at the same time.

Experiments Performed by Students

For each experiment, two recipients are used, in order to facilitate comparison.

- **Experiment 1:** Two recipients filled with newly-fallen leaves. Put on the covers; one is placed outside, the other inside.
- **Experiment 2:** One recipient filled with newly-fallen leaves, the other with leaves that have begun to turn black. Put on the covers.
- **Experiment 3:** One recipient filled with chopped leaves and the other filled with unchopped leaves.
- **Experiment 4:** One recipient filled with a mixture of leaves and undergrowth and the other is filled only with leaves. Put on covers.
- **Experiment 5:** Two recipients filled with leaves. Water just one of the recipients regularly (always the same).
- **Experiment 6:** One recipient filled with a mixture of leaves and earth, the other only with leaves. Water both recipients regularly but sparingly.
- **Experiment 7:** Two recipients filled with leaves. Heat the content of one of the recipients (and bring to a boil for a few minutes).
- Observations are made regularly on the state of the leaves and the appearance of components not visible at the outset (mould, animals, etc.).

Class Organisation

Depending on what point has been reached in the activities, the students worked either jointly, in a group, or individually.

Experiment Notebook

Information sheets are filled out every day.

The group summary will be made once different stages in plant decomposition can be brought out or mentioned : living decomposers (microfauna, mould, bacteria), plant or animal parasites, the influence of humidity and heat, non-modification of content.

Specify whether the daily information sheets are filled out individually or by the entire group. What kind of group writing is used? Is it written on the blackboard or is it a dictation?

Assessment

Over the course of the experimentation, did you assess the students? By watching how they set up their protocol. Observation of experiment implementation by the students as a form of assessment.

Teacher's Note

Prior experimentation in physics can prove very useful to successfully separate the variables selected.

The experiment can last several months and very few changes will be seen during the first 15 to 20 days.

The heat variable was made a requirement, as was the experiment involving the "sterile" environment, with which the children were unfamiliar.

Attention: humidity and heat do not directly trigger plant decomposition. They enable the development or activity of the parasite plants, animals or bacteria that feed on the plants.

These experiments are an opportunity to broach the concept of decomposition but do not make it possible to perceive the importance of living organisms in decomposition.

Documents Used

- "Jeux et activités nature", (Nature Game and Activity Book, French-language version), Paris.
- Environment, Collection 3 R, Vuibert, Paris, 1993.
- Découverte du vivant et de la terre, Anthelme, Dupont, Maurel, Hachette, Paris, 1995.

Outings, Continuation Activities

This sequence can be rounded out by observing the various components present in undergrowth, in order to show the presence of animal and plant matter in the humus. The concepts of ecosystem will be able to be broached and the construction of a terrarium planned.