

Raising Stick Insects: Locomotion, Feeding, Life Cycle (ages 5-7)

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Summary: A stick insect colony was set up in the classroom so that the students could study their way of life (locomotion, feeding, growth and reproduction).

The world of living organisms:

forms of life in animals

- developing approaches to observation and experimentation
- integrating special vocabulary

Target Concepts:

- birth, growth, reproduction
- nutrition and diet
- locomotion
- interaction with the environment
- "knowing how to manage a colony"

Duration:

The study took place through extended daily observation periods.

Materials:

- Terrarium (small transparent plastic tank)
- Binocular magnifying glass,
- Rulers

Following up on work carried out on language acquisition through science activity last year, in conjunction with the C.E.F.I.S.E.M. (Training and Information Centre for the Schooling of Migrant Children), a Science and the Environment project focusing on language acquisition was set up this year. (See CD-ROM collection, "Where does the Sorgues Fountain's water go" and "Where Does Water Come From", at Web site <http://sevigne.84700.free.fr>), a stick-insect breeding project was set up, after an outing during which the children gathered insect moults. The sequence provided an opportunity to answer the many questions raised by the children. Work on the stick insects was carried out taking a cross-disciplinary approach, using project-based instruction principles that are very stimulating for struggling children.



Scientific Terms:

Stick insects, life cycle, major functions (locomotion, nutrition, reproduction)





Session Plan

Session 1:

Field outing in order to gather samples of living organisms (plant or animal), including stick insect moults.

Session 2:

Learn about different animals: snails, spiders, wood louses, centipedes

Set up structures to keep the animals alive in the classroom (terrariums) and use a Berlese funnel to observe the animals in the litter

A teacher brings in stick insects in relation with moults found.

Session 3:

Children formulate biological problems

Class divided into four groups: reproduction, locomotion, growth, feeding.

Sessions 4 and 5:

Gather answers suggested by students and engage group discussion.

Session 6:

Certain groups look for information on the Internet.

Continue discussion about experiments to implement and their feasibility.

Session 7:

Plan out experiments on paper.

Issue list of experiment and materials required.

Sessions 8, 9, 10, 11 and 12:

Set up and execute experiments.

Bring out new problems.

Session 13:

Report results using posters put up around the school, on this year's CD-ROM "A Forest of Words", in the CP/CE1 insect-raising section and on the school's Web site (<http://sevine.84700.free.fr>).

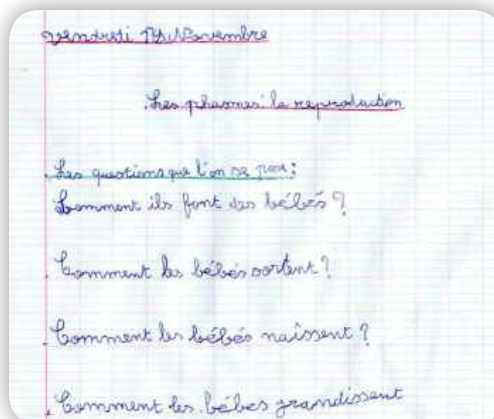
Adjust and modify initial experiments.

The same group works on the same topic.

1. Reproduction Group

Initial questions:

- "How do they make babies?"
- "How do the babies come out?"
- "How are babies born?"
- "How do babies grow?"

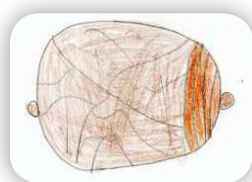
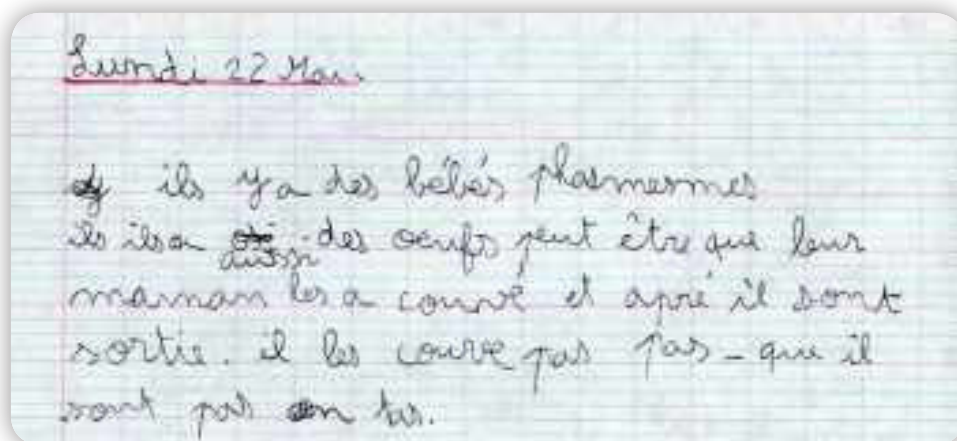


Answers suggested by students:

- "Maybe there has to be a male and a female".
- "Maybe they come together".
- "Maybe the females are green and the males brown".
- "Maybe the babies come out of the female's stomach".

Suggested experiments:

The children suggest counting, every morning, whether there are more or fewer stick insects in the terrarium. They suggest looking at whether there are eggs and looking for the babies.



There are baby stick insects. They also have eggs. Maybe their mommy sits on the eggs and then they came out. He did not sit on them because they are not in a heap.

They note that the number of stick insects remains the same for several months. The issue of differentiating between excrement and eggs (the biological problem that emerged) was solved by using the appropriate observation tools and performing document-based research online.

The students also found information about the sex of the stick insects and their reproduction methods.

The eggs hatched in early June, leaving little time to compare the young insects with the adult ones.

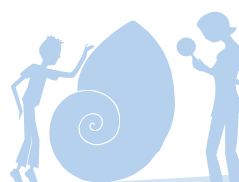
2. Locomotion Group

Initial questions:

- "Do they move around?"
- "How do they walk?"
- "Do they run?"
- "Do they jump?"
- "How do they climb?"

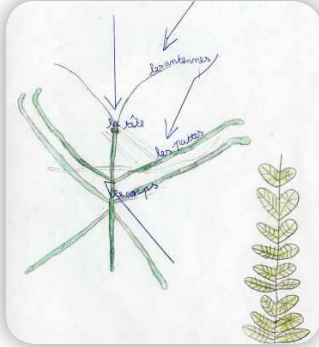
Answers suggested by the students:

- "Maybe because they can't move."
- "Maybe because they walk fast."
- "Maybe because they climb fast."
- "Maybe because they break their leg."



Suggested experiments:

The children suggest studying stick insect anatomy to determine whether they have wings, see if they swim by putting them on the water and see if they fly, by letting them go on a low table.



Antennae / head / legs / body

Following the first experiments, the children suggest colouring the stick insects' legs to observe the path they take over large white leaves. They note that they walk by moving their legs one after the other.

3. Feeding Group

Initial questions:

- "Where is their mouth?"
- "How do they eat?"
- "What do they eat?"
- "How do they bite?"
- "Do they have teeth?"
- "How do they catch their food?"

Answers suggested by the students:

- "Maybe their mouth is below the antennae".
- "Maybe they eat radish, grass, seeds, brambles or bread."
- "Maybe they bite with their teeth".
- "Maybe they grip with their legs".

Suggested experiments:

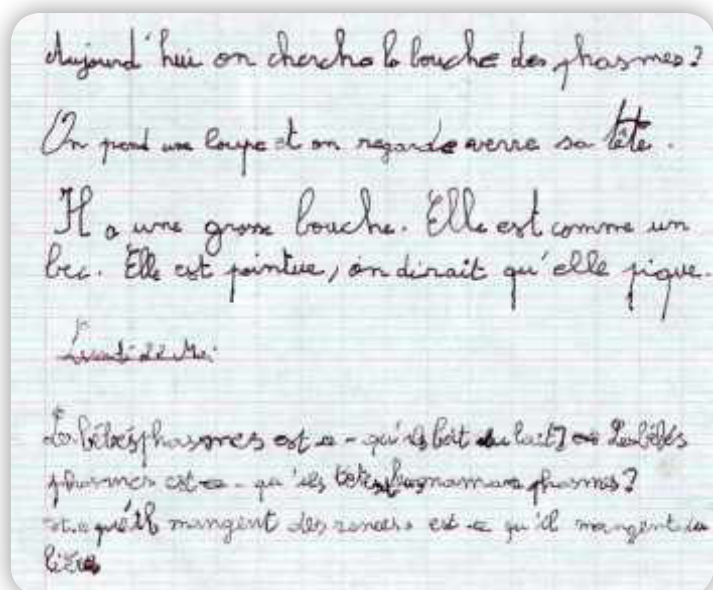
This group suggests a variety of foods to determine their food preferences.

Brambles, the primary component of the stick insect diet, are introduced into the discussion by the teachers.



At the same time, the observations, using magnifying glasses and binoculars, helped better understand the stick insects' mouths. They noticed that the stick insects do not use their legs to eat.





4. Growth Group

Initial Questions:

- "How do they grow?"
- "Do they grow quickly?"
- "Are they all the same size?"
- "How do they get old?"
- "How can you tell if they are dead?"

Answers suggested by students:

- "Maybe they eat at night."
- "Maybe they grow when they eat too much."

The answers do not necessarily come in response to the initial questions.

Suggested experiments:

The group worked from initial questions and left aside all suggestions associating food with growth.

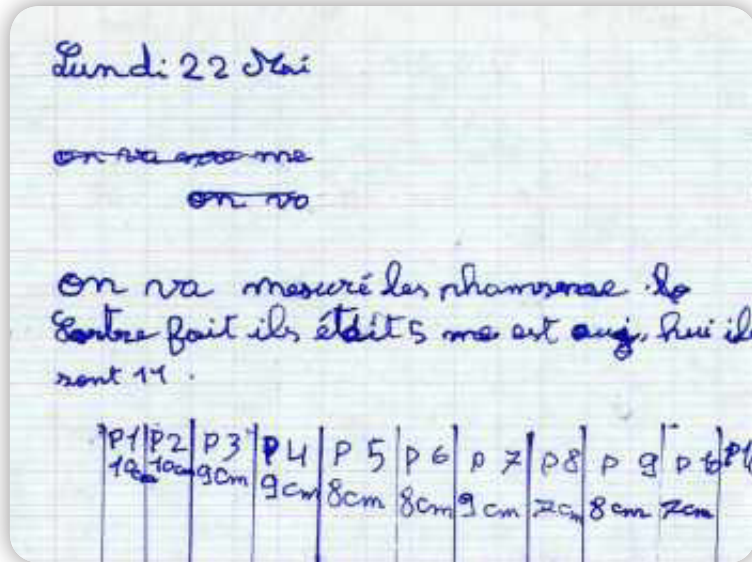
The children suggested measuring the stick insects. However, an additional biological problem emerged very quickly:

How to differentiate between the stick insects to be measured?

The group then suggested either isolating the stick insects in individual terrariums or marking them with food colouring. In the end, they drew a different-coloured dot on their "backs", making it possible to differentiate between them (until the next moult, where the youngest are concerned).

They concluded that: "The stick insects grow up to 11 to 12 cm. Then they lay eggs. To grow, they change skin". (compare with other animals like snakes).





Experiment notebooks

The children were asked how to bring together all of the information regarding the insect colonies.

They suggested a notebook and, starting from that point, the concept of the experiment notebook came into play.

From then on, at every step of the process, the experiment notebooks were used as priority tools.

Assessment

Expanding the children's vocabulary.

Using appropriate vocabulary.

Creating a communications object (le Cd-rom).

Teacher's Comment

The children continued breeding the stick insects at home and thereby gained greater awareness of having respect for animals (respect for ecosystems near the city).

Extensions

Producing a film for training purposes for school teachers (elementary) at the AIX-MARSEILLES IUFM (Avignon site).

PE2-level teachers contributed during Session 7. They observed and filmed the session in the Growth and Reproduction groups.

A CD-Rom and Web site were produced.

The approach was transferred to include other animals.

This year, we are working on organisms that live in the forest bed and the role of decomposers therein (earthworms, ants, wood louses).

La Main à la Pâte comments:

Note: Even though the groups worked separately and on different topics, regular sharing made it possible for each student follow and integrate the work requested of the class as a whole. This enriched the discussion and encouraged the emergence of new suggestions.

