

6. The diet study of Venus Flytrap



Title	Project “The diet study of Venus Flytrap (lat. Dioneaea muscipula)” (The importance of research for motivating students while examining the topic "Healthy Eating")
Summary / subjects (<i>contest theme / topic</i>)	I want to share my experience as an example - the idea of research activities, while teaching a theme of "Healthy Lifestyle" in the lessons of World cognition and includes several subtopics. One of them - "healthy diet". In order to engage students in the subtopic of “healthy diet” and to explain the benefits of protein for a growing organism, I suggested researching a carnivorous plant. <u>The aim was for children to study the benefits of protein for a growing organism in an engaging form of learning – practical research (with elements of a game) and communication (in groups).</u> Embedded subjects: mathematics, arts and technology.
Target group: age range and size of the group	Target group: 3rd A grade pupil; Pupils ‘ages: 9-10 years; Group size: 20 pupils.
Learning objectives / competences	<u>Teaching (learning) objectives / competences:</u> <ul style="list-style-type: none"> • Learn the scientific research method. • Form the skills of scientific literacy. • Promote cooperation. • Develop environmental knowledge and communication competencies.
Description of activities	Activities: <ul style="list-style-type: none"> • <u>Collecting information</u> about Venus Flytrap online (Work in pairs, cooperation while completing the questionnaire). • Hypothesis. • Research (group work, cooperation while "nourishing", monitoring the plant). • Recording facts during the research (teamwork, cooperation by completing the "observation sheets"). • Conclusions. • Preparation for the educational video „Venus Flytrap diet study“ creating scenes and illustrations for the video (cooperation on the division of roles in groups). • Educational video. • Project presentation for parents and lower grades’ pupils. (Pupils learn to share information, summarize, interpret the conclusions – these are the elements of critical-logical thinking, necessary for the development of the modern student).
Process stages (Tools, methods, training)	The aim of the research: to find out what food does the Venus Flytrap (lot. Dioneaea muscipula) digest. To water the plant with distilled or rain water during the study, to record all the findings.

(learning)
strategy / what,
how, in what
order)

Hypothesis: Venus Flytrap only digests foods that contain animal protein.

Necessary measures:

- the carnivorous plant "Venus Flytrap" (this plant can be purchased at flower shops);
- rain or distilled water;
- foods: curd, fresh chicken, cottage cheese, hardboiled egg, fresh fish, fresh beef, walnuts, white bread, boiled beef dumpling;
- tweezers;
- Flag-Tabs;
- Observation sheets – to record the findings.

Time period: September-October.

Process of the research:

The plant was introduced before the start of the research: what it looks like, what is the structure of the leaves, why are these leaves special, why does the instructions says to only water the plant with rain or distilled water (see. 1 photo).



Magnifying lip alone was not enough for students to understand the insectivorous plant characteristics. Some of the students found out for the first time that there are plants that are capable of catching insects and digesting them! After a closer visual examination of a Venus Flytrap growing on classroom windowsill, students raised questions: „Why does it catch insects? Why does it need them? What are we going to feed it? How many times can the same leaf close and open? Can this plant catch a butterfly or a larger fly?” Preliminary information given by the teacher, led to even more questions. So, we had to look for more information online (see. Photo 2).

1 photo. Venus Flytrap watered with distilled water.



Photo 2. Students looking for information online.

The students understood the importance of information– „After all, you cannot do research without getting to know the details of the research object“. In order to ensure that pupils did not get lost searching for information, I presented ten key things they should know about the Venus Flytrap, before carrying out the research. Working in pairs, pupils had to find answers to the questions in the table (see. Table 1) online.

Table 1. **Information about Venus Flytrap** (*Dionaea muscipula*)

Who gathered the information:.....

No.	Questions	Answers
1.	What is the kingdom of Venus Flytrap?	
2.	What is the family of Venus Flytrap?	
3.	In which continent can you find Venus Flytrap?	
4.	Which countries is the Venus Flytrap spread in?	
5.	Where can you find the Venus Flytrap (soil, meadow, water, etc.)?	
6.	What makes the leaves of this plant exceptional?	
7.	What do the glands of the leaf emits when the insect lands on it?	
8.	What does the Venus Flytrap use to attract insects?	
9.	Why does the Venus Flytrap catch insects?	
10.	Which “relatives” of Venus Flytrap grow in Lithuania?	

After the information was gathered and the hypothesis was made, we began the most interesting stage of the research – the experiment. We discussed how to carry out the experiment, what kind of food to give to the plant (see. Photo 3), what kind of results we can expect.



Photo 3. **Children feeding fresh chicken to the Venus Flytrap.**

Within two months of the survey we planned to feed the Venus Flytrap with 9 different food products and we prepared for monitoring of the digestion process: the speed at which the plant will close its leaves, how many days it takes for them to reopen, will there be any food left inside. Students performed daily monitoring and wrote notes in the "Observation Sheet" (see table 2). Pupils worked in three groups.

Table 2. Observation of **Venus Flytrap** (*Dionaea muscipula*) duration of digestion.

No.	Food type	Start of digestion	End of digestion	Duration (days) of digestion	Remarks	Notes done by (name of pupil)
.....						
.....						

The leaves, which digested food, were marked with flag-tabs (see. Photo 4).



Photo 4. **The leaves, which digested food, labeled with flag-tabs.**

The results:

Curd digested - 3 days, Fresh chicken - 10 days, Cottage cheese - 5 days, boiled egg - 9 days., Fresh fish - 6 days, Fresh beef - 3 days, boiled beef dumpling - 9 days, did not digest walnut and white bread.

Conclusions:

The longest period (10 days) of digestion - fresh chicken, the shortest - (3 days) fresh beef and curd. Did not digest walnut and white bread.

Hypothesis confirmed: Venus Flytrap digest food, which had animal protein.

After a successful study, we summarized the activities and acquired skills by creating an educational video. The aim was to show the sequence of the research, to present the results and explain the importance of protein to the insectivorous plant and to do that in an interesting way.

We made a scene where a Health show host asks a dietitian for advice on which protein containing foods are best for the plant (see. 5 photos).



5 photo. **Scene: show host interviews the dietitian.**

Children hear the names of foods that contain protein. While playing a game, children learn new concepts - "dietitian", "food ration", "healthy eating", "animal protein". During the discussion of the results children naturally raised the question of whether proteins are also important to the human body. Children reasoned as follows: "If the carnivorous plant receives protein, it successfully grows. That means the children grow successfully if they eat protein food as well!". Children became interested in the topic "healthy diet", they learned and stayed motivated during all the lessons. I believe, that the reason for their motivation and eagerness was the research of carnivorous plant.

Evaluation
(types and
methods)

During the project students' achievements were assessed by **forming a grade:**

6. constantly praising for their activities, for example: "It's great that you could coherently explain how to water the plant," "I'm glad that you've worked very carefully with the tweezers", "You didn't make mistakes listing the products of animal origin, however you should revise the meaning of the word "diet", "I am glad you came to an agreement about the process of presentation," etc.
 7. The results were evaluated according to what was expected, and the progress made.
 8. Formative evaluation **helped students** to successfully carry out practical work, to learn and improve.
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<p>Educational material used in the process and Information and Communication Technology tools / programs</p>	<p>Sources:</p> <ul style="list-style-type: none"> • Jonynienė V. (2006). <i>World cognitive textbook "Our World" 3rd class.1st. Book</i>. Kaunas: Šviesa. • Primary and basic education Framework Programme. Order of Lithuanian Republic Minister of Education 2008. 26 August. no. ISAK-2433. Online: <https://www.smm.lt/.../pradinis_ugdymas/>. • The world of plants. <i>Venus flytrap. Dionaea muscipula. Carnivorous plants</i>. Online: <http://www.walnuts.lt/augalai.php?lt=musekautas>. • Baltokienė. R. (2010-05-20). <i>Venus flytrap cultivation and reproduction</i>. Online: <http://www.musekautas.lt/?p=251>. • Wikipedia the Free Encyclopedia. Venus flytrap. Online: <https://lt.wikipedia.org/wiki/Jautrusis_mus%C4%97kautas>. • Urbonienė L. <i>Healthy way of life, or what we know about healthy lifestyle</i>. Online: <http://www.aidas.lt/lt/sveikata/article/10874-06-06-sveikos-gyvensenos-pagrindai-arba-ka-mes-zinome-apie-sveika-gyvensena>.
<p>Time (duration) and training (learning) environment</p>	<p>Duration: September - October. Learning environment: classroom, computer class.</p>
<p>Conclusions / Innovativeness of the training (learning) activities, annexes (video material, handout material and (or) any other material)</p>	<p>Conclusions:</p> <ul style="list-style-type: none"> • Motivational environment has been created in preparation to analyze the topic of “Healthy eating”. • Educational video "<u>Venus Flytrap diet study</u>" has been made. • During the research: <ul style="list-style-type: none"> ➤ Found out the importance of protein to the carnivore plant. ➤ Learned to apply the scientific research method. ➤ Formed the skills of scientific literacy. ➤ Developed environmental knowledge competencies. ➤ Carried out all tasks in cooperation with others. <p>Learning activities are innovative, because pupils performed research themselves: hypothesized, followed the research process and recorded changes, came to conclusions, created an educational video (https://www.youtube.com/watch?v=4f4vMpSwD9c), were able to convey the received information to their classmates.</p>
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