



SATISFACTION OF PRIMARY SCHOOL STUDENTS IN OBSERVATION ACTIVITIES

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ABSTRACT

This interpretive study explores the level of satisfaction of primary school students in relation to an observation activity of environmental components (natural plant materials and their representations in photographs and drawings), conducted in a school setting. The research employed a quantitative approach, applying a quasi-experimental research design. A specific questionnaire, composed of ten items, was developed to evaluate different dimensions of satisfaction with the learning activity. Participants were 153 second-grade students (aged 8-9), equally distributed into three experimental groups. Each student was tasked with observing a coniferous tree (spruce), using different materials: natural plant materials (experimental group A), photographs (experimental group B), and drawings of the plant (experimental group C). Results indicate that the use of natural plant materials generated the highest level of satisfaction, highlighting their attractiveness and clarity, as well as increased personal involvement from the students. Additionally, activities based on photographs and drawings were appreciated, but recorded lower scores and a greater variation in students' perceptions, suggesting that these types of materials may require additional adaptations to improve clarity and attractiveness. The study underscores the importance of using natural materials in observation activities of environmental components, as these have a significant impact on student engagement and perception of the activity's usefulness. It also highlights the need to optimize static representations to stimulate students' interest and understanding in the learning process.

Keywords: student satisfaction, observational learning, spruce tree, static visuals, elementary education

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INTRODUCTION

In Romanian primary education, numerous direct observation activities in the environment are organized (Dulamă, 2010a, b; 2011), where students observe and explore nature (Deac et al., 2019; Pahome, 2024), bodies of water (Dulamă & Buda, 2014). In many teaching activities, children have the opportunity to observe environmental components in photographs (Antal et al., 2020a, b; Dulamă, 2001), on maps (Bogdan, 2024), in schematic drawings (Dulamă, 1996) or detailed reproductions of real-life landscapes (Drăghici et al., 2020). Comparative observation of deciduous forests in reality, in photographs, and in drawings allows for a deeper understanding of this topic among students (Pahome, 2023), developing their capacity (Dulamă, 2000), competence, or ability to observe (Dulamă, 2010b) and analyze (Cîineanu et al., 2024), thus contributing to forest education (Dulamă et al., 2016; Dulamă et al., 2017).

At the primary education level, studies have been conducted where students observe forest animals in documentary films (Ilie et al., 2020b), take virtual tours of rural settlements through videos (Ilie et al., 2020a), and through watching animated films, have the opportunity to observe and form visual representations of natural phenomena (Vereș et al., 2020), the water cycle in nature (Vereș et al., 2021), and the planets in the solar system (Vereș & Magdaș, 2020).



Digital school textbooks in Romania include interactive multimedia activities (Buzilă et al., 2017; Ilovan et al., 2018) that facilitate visual learning, offer illustrative materials, and propose activities that facilitate discovery learning of energy sources (Buda et al., 2020) and other topics. In authentic learning activities through observation, students adopt an active role (Dulamă, 2006, 2008a), and the teacher acts as a guide who organizes and monitors the process carried out by students, as a whole (Dulamă & Roșcovan, 2007; Pahome, 2023).

A key condition for the success of an activity and learning is for students to feel satisfied at the end of the learning activity in which they have participated (Martín-Rodríguez et al., 2015; Teo, 2010). Satisfaction is the ultimate goal that any product or service should aim to achieve (Lin et al., 2008). The term is used as an indicator of the gap between a standard of comparison (such as one's expectations or desires) and the perceived performance regarding the good or service in question (Oliver, 1980).

Satisfaction is the most accepted measure of the quality and effectiveness of teaching and learning (Wu et al., 2010), a multidimensional concept with a complex structure, consisting of several affective components (Lindgaard & Dudek, 2003), grouped into dimensions: student, teacher, course, technology, design, and course context (Chen & Bagakas, 2003).

School satisfaction arises from the cognitive interpretation of the fulfillment of essential psychological needs for child development (Verkuyten & Thijs, 2002). Student satisfaction in the learning process is a positive attitude that develops when individual expectations and needs are in line with learning experiences (Sopiatin, 2010).

Learning satisfaction is the result of a comparison between students' expectations of the educational process and the real experiences they live (Rorimpandey, 2022). Satisfaction occurs when expectations are met or exceeded. Each student has a different level of satisfaction in the learning process, influenced by factors such as personal learning style, results obtained, feeling of safety in the classroom, study conditions, development opportunities, and interpersonal relationships (Surya, 2004).

Satisfaction with learning has been examined in studies focused on students' perceptions of the relevance of the content (Kim & Lee, 2011), interaction with the teacher or with the resource material (Kuo et al., 2013). Satisfaction in learning is influenced by: collaborative learning (Gray & DiLoreto, 2016; Lin et al., 2008; Sorden & Munene, 2013), degree of participation (Ünal & Çakir, 2017), ability for self-learning (Eom & Ashill, 2016), ease of learning, and information flow (Bradford & Wyatt, 2010). The quality of teaching, reflected in the teacher's expertise, has a significant impact on students' satisfaction in the learning process (Butt & Rehman, 2010; Kahu, 2013).

Student feedback on their level of satisfaction is very important for improving teachers' activities, the efficiency of their lessons, and the overall quality of educational programs (Bradford & Wyatt, 2010). The level of school satisfaction is important because it influences motivation and academic performance (Wu et al., 2010), facilitates the theoretical or practical understanding of a subject (Lo, 2010) and affects psychological well-being (Baker, 1999), absenteeism rate, school dropout (Ali & Ahmad, 2011) and behavioral problems (Reyes & Jason, 1993). Satisfaction can be diminished by external factors, such as parents' and peers' expectations, as well as non-school experiences (Huebner et al., 2001). Such information should support teachers in striving for high-quality teaching and in shaping contexts of satisfactory learning experiences (Lu & Chiou, 2010).

An analysis of the literature shows that in primary education in Romania, students' satisfaction with learning activities in a formal context has not been investigated. Given the importance of satisfaction in learning, the aim of this study is to measure, using a self-designed satisfaction questionnaire, the level of satisfaction of students after participating in a direct observation activity of the components of a coniferous tree (spruce), compared to the satisfaction obtained when observing the plant in photographs and drawings.

The following hypotheses were formulated for this study:

- Hypothesis 1: Students' satisfaction level is higher when observing natural materials than when observing them in photographs or drawings

- Hypothesis 2: Students' satisfaction level is influenced by the characteristics of the observed material, study conditions, teacher expertise, and the significance attributed to the activity by the student



METHODOLOGY

Participants. A total of 153 second-grade students (aged 8-9) enrolled in three schools in the city of Târgoviște, considered representative of the county's educational community, participated in the study. The researcher contacted primary school teachers in Dâmbovița County with over 15 years of experience to participate in the research with their students. Before the research began, parents were informed about the purpose of the study, and the necessary consents were obtained.

The classes were equally divided into three experimental groups, each group consisting of two classes, as follows: experimental group A [EGA] - 51 students from the "Constantin Cantacuzino" National Pedagogical College, experimental group B [EGB] - 51 students from the "Coresi" Primary School, and experimental group C [EGC] - 51 students from the "Mihai Viteazul" Primary School.

Procedure. This study employed a quasi-experimental design with three groups, using a pre-test (Monday, 10 minutes), formative intervention (Tuesday, 50 minutes), a questionnaire (Tuesday, 10 minutes), and a post-test (Wednesday, 10 minutes) (Pahome, 2023).

At the end of the observation activity, each group was administered a questionnaire to determine the level of student satisfaction with the observation-based learning activity. The questionnaire was completed on paper, after the formative intervention, before the post-test, in the participants' classroom. Students were informed that their responses would remain anonymous and that the data would be used only in aggregate form. The completion time was 5 minutes.

Procedure of the didactic activity. During the formative intervention, participants worked in small groups of 4-5 students in the classroom, based on an observation sheet. They solved the tasks by cooperating in a group, being constantly monitored by the researcher-teacher. Participants in each group individually used a variety of materials. Students in EGA observed natural plant materials: a spruce seedling, a spruce cone, a scale detached from the cone, and spruce seeds. Students in EGB observed photographs of the spruce seedling, mature trees, cone, and spruce seeds. Students in EGC observed drawings of the spruce seedling, mature trees, cone, and spruce seeds (Pahome, 2023) (Appendix B).

Instrument. The questionnaire used to evaluate students' satisfaction following participation in an observation activity of environmental components (Appendix A) was developed after a comprehensive literature review. Before administering the questionnaire, the researcher-teacher conducted a pilot test, in accordance with the recommendations of educational didactics and research specialists.

The 10 items are associated with a Likert scale ranging from 5 to 1, where 5 represents the highest level of satisfaction regarding each evaluated aspect. We have conceptualized "satisfaction" as including multiple aspects: characteristics of the observed material (I1. attractiveness of the material; I5. utility of the material), teacher expertise (I2. clarity of instructions; I8. organization of the activity; I9. clarity of the activity's purpose), study conditions (I3. allocated time; I4. group collaboration; I7. degree of personal involvement), and the significance attributed by the student (I6. relevance of the activity; I10. utility of the activity). The questionnaire focuses exclusively on the activity included in the intervention. The language used is accessible to students, and the questions are formulated clearly and concisely.

RESULTS

A total of 153 valid questionnaires were administered. The results presented in Table 1 indicate a general decreasing trend in mean scores from group GEA to group GEC.

To test whether these differences were statistically significant, a one-way ANOVA was conducted. The results showed that there were significant differences between groups, $F(2, 150) = 5.23$, $p < .01$. Post-hoc Tukey HSD comparisons indicated that group GEA obtained significantly higher scores than groups GEB and GEC.

These results confirm that student satisfaction varies depending on the type of teaching material used in the observation activity (Table 1).



Table 1

The level of student satisfaction with the three activities

Components of satisfaction	Item	GE ^A Natural plant material observation		GE ^B Photograph observation		GE ^C Drawing observation	
		M	DS	M	DS	M	DS
Material characteristics	11 <i>Attractiveness of the material</i>	5.00	0.00	4.78	0.42	4.65	0.66
	15 <i>Usefulness of the material</i>	5.00	0.00	4.78	0.42	4.59	0.57
Teacher proficiency	12 <i>Clarity of instructions</i>	5.00	0.00	4.78	0.42	4.51	0.61
	18 <i>Organization of the activity</i>	4.98	0.14	4.65	0.66	4.63	0.63
	19 <i>Clarity of the activity's purpose</i>	4.96	0.20	4.94	0.31	4.78	0.42
Learning environment	13 <i>Time allocated</i>	4.98	0.14	4.73	0.57	4.51	0.61
	14 <i>Group collaboration</i>	4.98	0.14	4.63	0.53	4.71	0.50
	17 <i>Level of personal involvement</i>	5.00	0.00	4.76	0.55	4.63	0.63
Student-perceived meaning	16 <i>Relevance of the activity</i>	4.98	0.14	4.75	0.48	4.76	0.47
	110 <i>Usefulness of the activity</i>	5.00	0.00	4.94	0.31	4.94	0.24

DISCUSSIONS

Discussions regarding group levels

Table 1 reveals that GEA has extremely high average scores, nearing 5 for all items. These scores suggest a very high level of satisfaction with the materials used and the activities conducted. The consistent mean (M) and low standard deviation (SD) indicate a uniformly positive experience for all students who observed natural materials.

GEB expressed slightly lower satisfaction in the activity of observing photographs compared to GEA, ranging between 4.63 and 4.94. Items I4 (Group collaboration) and I8 (Organization of the activity) obtained lower means, indicating a less positive perception of these aspects. Results show that students in the GEB group encountered difficulties in completing the group task, considered the activity complex, and would have benefited from more guidance from the teacher. Additionally, a higher SD among students in GEB suggests a greater variability in individual levels of satisfaction compared to GEA.

GEC has the lowest average scores (between 4.51 and 4.94) for most items. Students in this group were relatively satisfied, but their perception of the activity and the materials used (drawings) was less favorable. The lower means for items I2 (Clarity of instructions), I3 (Time allocated), and I5 (Usefulness of the material) suggest that the drawings were not clear enough and the allocated time was not optimal.

Discussions regarding material characteristics. The characteristics of materials used in learning activities influence learning satisfaction (Kuo et al., 2013; Dulamă, 2006, 2008). This study aimed to investigate how attractive and useful natural materials, photographs, and drawings were perceived by students in the learning process.

I1-Attractiveness of the material. All students in GEA (M = 5.00, SD = 0.00) rated the material's attractiveness at the maximum level, clearly indicating a preference for using natural plant materials over their representations. In the case of GEB (M = 4.78, SD = 0.42), scores were slightly lower, and the moderate variation suggests that photographs were perceived as attractive but less captivating or engaging compared to natural materials. GEB showed the lowest average score and the highest variation, indicating that drawings generated lower satisfaction compared to the other materials, being considered less attractive by students.

I5-Usefulness of the material. In GEA (M = 5.00, SD = 0.00), students rated the natural materials as extremely useful for completing the tasks, achieving the maximum possible score. In group GEB (M = 4.78, SD = 0.42), photographs were evaluated positively but to a slightly lesser extent than natural materials. The lowest level of usefulness was obtained in group GEC (M = 4.59, SD = 0.57), where drawings were perceived as less suitable for completing the tasks. The results show that natural materials were considered the most



useful for completing the tasks, followed by photographs and drawings, respectively. These results confirm the opinions of educational experts (Dulamă & Roșcovan, 2007)

Discussions concerning teacher expertise. The quality of teaching and the organization of learning activities, resulting from teacher expertise, influence learning satisfaction (Butt & Rehman, 2010; Kahu, 2013). This study aimed to investigate students' perceptions of three factors considered important in learning activities: clarity of instructions, organization of the activity, and clarity of the activity's purpose (Dulamă, 2021a, b; Dulamă & Pahome, 2021)

12-Clarity of instructions. In GEA ($M = 5.00$, $SD = 0.00$), instructions were perceived as extremely clear, with no variation in students' responses. For GEB ($M = 4.78$, $SD = 0.42$), the score was good but with a higher variation compared to GEA, suggesting that observing photographs required additional explanations, guidance, and support from the teacher, as highlighted in the literature (Dulamă, 2021b; Antal et al., 2020a, b). In GEC ($M = 4.51$, $SD = 0.61$), the lowest scores were obtained, indicating that drawings made it more difficult for some students to understand the instructions, a finding also reported in other studies (Pahome, 2023)

18-Organization of the activity. In GEA ($M = 4.98$, $SD = 0.14$), the organization of the activity was perceived as very effective, with high levels of satisfaction and minimal variation. In GEB ($M = 4.65$, $SD = 0.66$), lower scores and higher variation suggest that the organization of activities using photographs encountered challenges that affected some students' perceptions. In GEC ($M = 4.63$, $SD = 0.63$), similar scores and variations to GEB indicate that the organization was perceived less favorably when using drawings. The lower SD in GEC compared to the other groups suggests that perhaps not all students enjoyed working in groups and may have needed more support or guidance from the teacher.

19-Clarity of the activity's purpose. In GEA ($M = 4.96$, $SD = 0.20$), students demonstrated a very good understanding of the activity's purpose, with little variation in responses. In GEB ($M = 4.94$, $SD = 0.31$), the score is close to that of GEA, suggesting that using photographs did not affect the clarity of the activity's purpose. In GEC ($M = 4.78$, $SD = 0.42$), slightly lower scores indicate that using drawings may have diminished the clarity of the activity's purpose for some students. Considering the purpose, although it was the same for all three groups, it was clearer for GEA, probably because they were able to observe the real objects better and complete the task more easily than students who observed photographs and drawings.

Discussions regarding study conditions. Students' satisfaction with learning activities is strongly influenced by study conditions, feelings of safety, and interpersonal relationships (Surya, 2004). This study investigated students' perceptions of three factors considered important for ensuring study conditions in group learning activities organized in the classroom: allocated time, group collaboration, and level of personal involvement (Dulamă, 2008b).

13-Time allocated. In GEA ($M = 4.98$, $SD = 0.14$), almost all participants considered the allocated time to be adequate, reflecting nearly unanimous satisfaction. For GEB ($M = 4.73$, $SD = 0.57$), lower scores and higher variation suggest that photographs generated different time needs among students, possibly due to differences in how they perceived details. In GEC ($M = 4.51$, $SD = 0.61$) this was the lowest score, indicating that the allocated time was perceived as insufficient for observing details in drawings.

14-Group collaboration. In GEA ($M = 4.98$, $SD = 0.14$), scores indicate that students in this group were very satisfied with group collaboration, highlighting a nearly perfect experience. In GEB ($M = 4.63$, $SD = 0.53$), collaboration was less appreciated, with variation indicating different opinions among students. In GEC ($M = 4.71$, $SD = 0.50$), slightly higher scores were recorded compared to GEB, suggesting that drawings facilitated collaboration better than photographs. SD shows a greater diversity in GEB and GEC of opinions regarding the level of satisfaction, probably because some students would have preferred to work with more consistent guidance from the teacher.

17-Level of personal involvement. In GEA ($M = 5.00$, $SD = 0.00$), all students demonstrated a very high level of personal involvement in the activity with natural materials. In GEB ($M = 4.76$, $SD = 0.55$), involvement was lower than in GEA, and the higher variation suggests that photographs did not equally stimulate all students. In GEC ($M = 4.63$, $SD = 0.63$), lower scores and higher variation indicate that drawings were less motivating for some students. Natural materials could be observed directly better by students in GEA, while



to observe a photograph or drawing, it is preferable to observe it alone, in a certain time interval that varies from person to person.

Discussions regarding the perceived meaningfulness of the activity. Student engagement in learning is strongly influenced by their perception of the utility of the learning activity proposed by the teacher in achieving short-, medium-, or long-term goals and objectives, thus activities can be considered more or less relevant (Dulamă, 2008b). This study investigated students' perceptions regarding the utility and relevance of the activity in which they were involved.

16- Relevance of the activity. In GEA ($M = 4.98$, $SD = 0.14$), almost all students appreciated the relevance of the activity, indicating a high level of satisfaction. In GEB ($M = 4.75$, $SD = 0.48$), the score was lower, and the moderate variation suggests slightly different perceptions in this group. In GEC ($M = 4.76$, $SD = 0.47$), scores are similar to those in GEB, with a slightly smaller variation, indicating a uniform perception of the activity's relevance in the case of drawings, as with photographs.

110-Usefulness of the activity. In GEA ($M = 5.00$, $SD = 0.00$), all students considered the activity extremely useful, obtaining the highest possible score. In GEB ($M = 4.94$, $SD = 0.31$), the score is very close to the maximum, showing students' appreciation for the activity carried out using photographs. In GEC ($M = 4.94$, $SD = 0.24$), scores similar to those in GEB indicate that students perceived the activity carried out using drawings as being useful. Students perceived the activities as useful regardless of the type of materials used.

CONCLUSIONS

The results of this study highlight the impact of different types of educational materials on students' satisfaction in the observation and learning process. An analysis of the data collected through the questionnaire administered to the three experimental groups (GEA, GEB, and GEC) allows for the following conclusions:

Natural materials were evaluated as the most attractive (GEA), obtaining maximum scores on this item, while photographs and drawings recorded lower scores and a greater variation in the perception of the level of attractiveness. This underlines students' preference for direct interaction with real materials, which better stimulates visual perception, senses, and interest.

Instructions were considered extremely clear for students who used natural materials (GEA), while their clarity was perceived as being lower in the case of photographs and drawings. This difference suggests that visual materials require additional supplementation and more consistent guidance from the teacher to ensure full understanding. The activity was considered very well organized by students in GEA, while in GEB and GEC greater differences were observed in students' perceptions, which may suggest that visual materials had a slightly negative influence on the perception of organization. All groups perceived the purpose of the activity as clear, with very close scores. However, natural materials had a slight advantage, indicating a more direct link between them and the objectives pursued.

Group collaboration was evaluated positively by all three groups, but the results in GEA were more homogeneous, indicating that natural materials facilitate teamwork better. Students in GEA were the most personally involved in the activity, which reflects an advantage of using natural materials in stimulating curiosity and interest. In the case of GEB and GEC, involvement was lower and more varied, especially in the case of drawings. Students in GEA considered the allocated time to be adequate, while those in GEB and GEC perceived the time as being less sufficient, especially in the case of drawings. This result indicates that the type of material influences the perception of the time needed to complete the activities.

All groups perceived the activity as useful and relevant, with maximum scores in GEA and very close values in GEB and GEC. This aspect underlines the fact that the activity itself was well designed, and the materials used, although different, managed to meet the educational objectives. Thus, natural materials have proven to be the most effective in stimulating students' satisfaction and facilitating learning. Photographs and drawings are valuable alternatives but less captivating, requiring additional explanations to support clarity and engagement. Therefore, for educational activities aimed at developing observation skills, the use of natural materials is recommended, especially for primary school students.



The results of the activity indicate that a practical approach, based on direct observation and the stimulation of all senses, can be particularly satisfying for students. The fact that students, without prior knowledge, were able to understand the characteristics of spruce suggests that this methodology can be adapted to study other aspects of the environment. The success of the activity can serve as a model for the development of new teaching materials and learning strategies.

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Photographs and drawings used in formative assessment

Figure 1

Pahome, D. (2021). *Materiale destinate observării părţilor componente ale molidului* [Learning Materials: Spruce Tree Parts]

Figure 2

2.1: NH State Forest Nursery. (n.d.). *Spruce*. https://www.nh.gov/nhnursery/seedlings/white_spruce.htm.

2.2: Tree Seed Online Ltd. (n.d.). *Spruce*.

https://www.treeseedonline.com/store/p46/Norway_Spruce_%28picea_abies%29.html

2.3: Gardenia.net. (n.d.). *Picea abies*. <https://www.gardenia.net/plant/picea-abies-acrocona>

2.4: Nefronus (2016). *Picea abies*. https://en.wikipedia.org/wiki/File:Picea_abies_cones_-_Czechia.jpg

2.5: Bomengidsn. (n.d.). *Spruces (Picea)*. <https://www.bomengids.nl/uk/spruces.html>

Figure 3

Ivan, A. (2021). *Molidul Părţi componente*. Desene nepublicate, realizate la solicitarea profesorului cercetător [Spruce Tree: Component Parts. Unpublished drawings, made at the request of the professor-researcher].



APPENDIXES

Appendix A

Questionnaire for Students

Educational Institution:

Student's Name and Surname:

Questionnaire for Students

Please rate each aspect of observing the teaching materials (5 points means you liked it very much, and 1 point means you liked it very little).

I enjoyed...	5	4	3	2	1
1. the material I observed					
2. to study the spruce tree using the observation sheet					
3. that the instructions were clear					
4. that I had enough time to observe the materials					
5. that I observed the material with my classmates					
6. that I worked together with my classmates to identify the characteristics of the observed parts					
7. that I participated in drawing conclusions about the characteristics of the spruce tree					
8. the idea that I can repeat the observation activity using a worksheet for other topics					
9. that I can take the observed material home					
10. that I learned new and useful information					



Appendix B

Figure 1

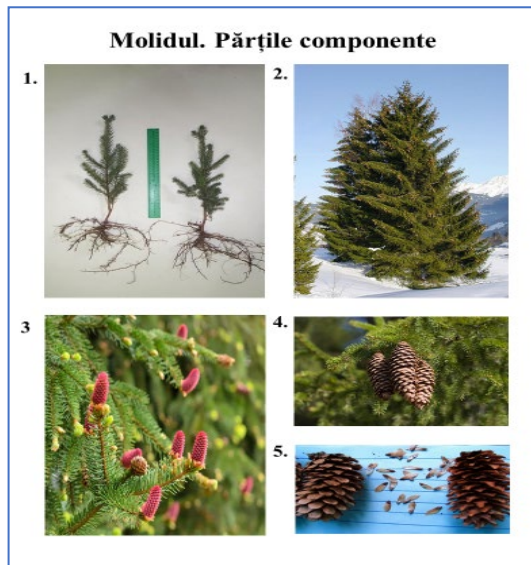
Learning Materials: Spruce Tree Parts



(Source: Pahome, 2021)

Figure 2

Individual Material for Observing Spruce in Photographs

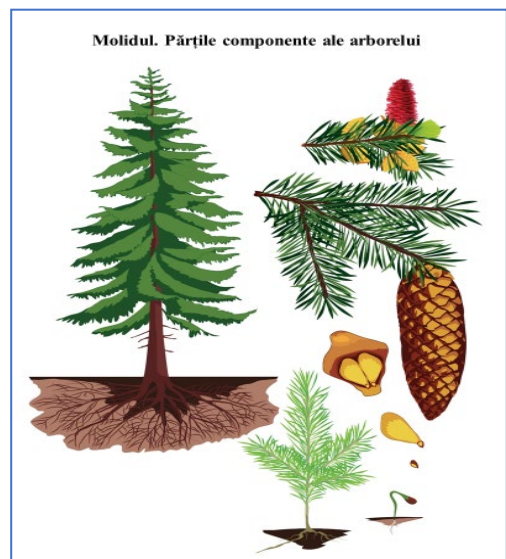


(Source:

1. NH State Forest Nursery, n.d.;
2. Tree Seed Online Ltd, n.d.;
3. Gardenia.net, n.d.;
4. Nefronus, 2016;
5. bomengids.nl, n.d.)

Figure 3

Individual Material for Observing Spruce in Drawing



(Source: Ivan, 2021a)