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NON-STANDARD STUDY TASKS USED IN BOTANY TEACHING

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ABOUT ARTICLE

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Abstract: Botany, the scientific study of plants, plays a crucial role in understanding the complexities of the plant kingdom and its significance in various ecological, agricultural, and medicinal contexts. Traditional botany teaching methods often rely on lectures, laboratory experiments, and fieldwork to impart knowledge and skills to students. However, recent pedagogical advancements have emphasized the incorporation of non-standard study tasks to enhance learning outcomes and engage students in novel and interactive ways.

This article provides a comprehensive review of non-standard study tasks used in botany teaching, presenting a range of innovative approaches employed by educators and researchers around the world. The review encompasses both indoor and outdoor activities designed to promote active learning, critical thinking, and a deeper understanding of botanical concepts. Examples of non-standard study tasks include virtual plant simulations, digital herbariums, gamified learning platforms, interactive plant identification apps, and collaborative problem-solving exercises.

The article highlights the benefits of incorporating non-standard study tasks in botany education, such as improved student engagement, enhanced retention of knowledge, and the development of practical skills applicable to real-world scenarios. Additionally, it discusses potential challenges and

limitations associated with implementing these alternative teaching methods, including technological requirements, resource availability, and the need for teacher training and support.

By exploring the diverse range of non-standard study tasks used in botany teaching, this review aims to inspire educators and researchers to adopt innovative approaches and adapt them to their specific educational contexts. It also emphasizes the importance of incorporating technology and hands-on experiences to foster a deeper appreciation and understanding of plants, ultimately nurturing the next generation of botanists, environmentalists, and plant scientists.

INTRODUCTION

Independent study is a form of education offered by many high schools, colleges, and other educational institutions. It is sometimes referred to as directed study, and is an educational activity undertaken by an individual with little to no supervision. Typically a student and professor or teacher agree upon a topic for the student to research with guidance from the instructor for an agreed upon amount of credits. Independent studies provide a way for well-motivated students to pursue a topic of interest that does not necessarily fit into a traditional academic curriculum. They are a way for students to learn specialized material or gain research experience [4]. In the early twenty-first century, many courses delivered within a traditional format are expected to have some component of independent study and to build independent learning skills. The major elements of independent study are the following: individualized teaching and learning takes place through the student's activity; a tutorial relationship exists; learning is made convenient for the student; the learner takes responsibility for progress [5].

A self-taught person may be knowledgeable and able to apply what he or she has learned, but he or she may also be mentally handicapped and unconsciously reworking the traditions of life. Therefore, it is important to know how and in what way to get an independent education. Because the amount of information given to students today is wide, the method of extracting information from them directly to themselves and in the future, my culture is not enough, to develop their logical thinking skills and take it in the right direction. The need for teeth is one of the current problems of our time [1].

Non-standard tasks develop students' ability to think, leads to thinking and increases motivation, interest in accounting. Nonstandard tasks do not allow students to solve problems correctly. Therefore, non-standard tasks are the main means of developing students ' mathematical thinking [3].

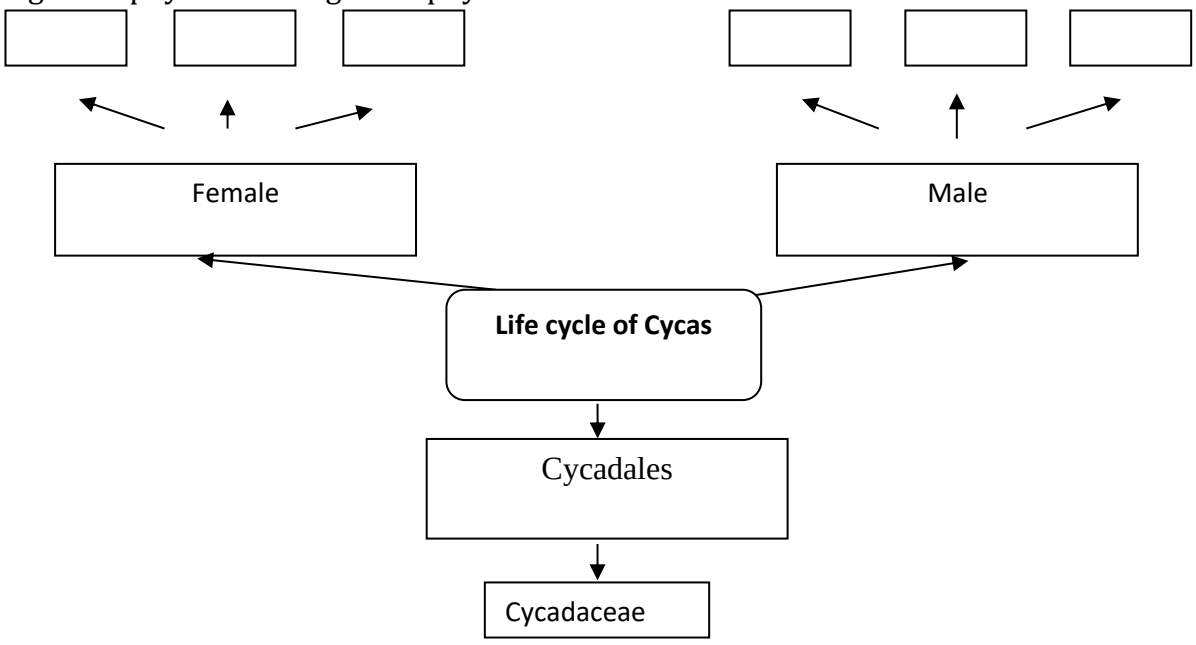
1. Educational tasks for the method of working in small groups of cooperative learning technology

№	Educational tasks related to the materials that students should master	Instructions for completing the task
	Carefully read the text in the textbook, find answers to the following questions and complete the tasks:	Work collaboratively with a group

1.	What do you mean by seed plants?	Actively participate in the question and answer.
2.	What are the representatives of Bryophyta found in deserts?	
3.	Give a botanical description of the Marchantiaceae family?	
4.	Explain life cycle of *Polytrichum commune*?	
5.	Explain the life cycle of sphagnum?	
6.	Explain life cycle of *Andreaea rupestris*?	
7.	Explain the characteristics of the subclass of sphagnum?	
8.	Explain the characteristics of the class of Bryidae?	
9.	Tell me about *Psylophyton princes*?	
10.	Tell me about the class of Lycopodiopsida?	
11.	Explain the characteristics of the order of Lycodophyta?	
12.	Give a botanical description of the Lycopodiaceae family?	
13.	Explain the developmental cycle of Selaginella?	
14.	Explain the life cycle of a Equisetum?	
15.	Salvinia: Explain the development of sporacarp and sporangia?	

2. Cluster-based control

Task-1. Group the life cycle of cycas. 1. Megaspore. 2. Microspore. 3. Archegonium. 4. Female gametophyte. 5. Male gametophyte. 6. Fertilisation.



Cluster answer:

Female – 1, 3, 4.

Male – 2, 5, 6.

3. Control based on different types of tables

Table 1

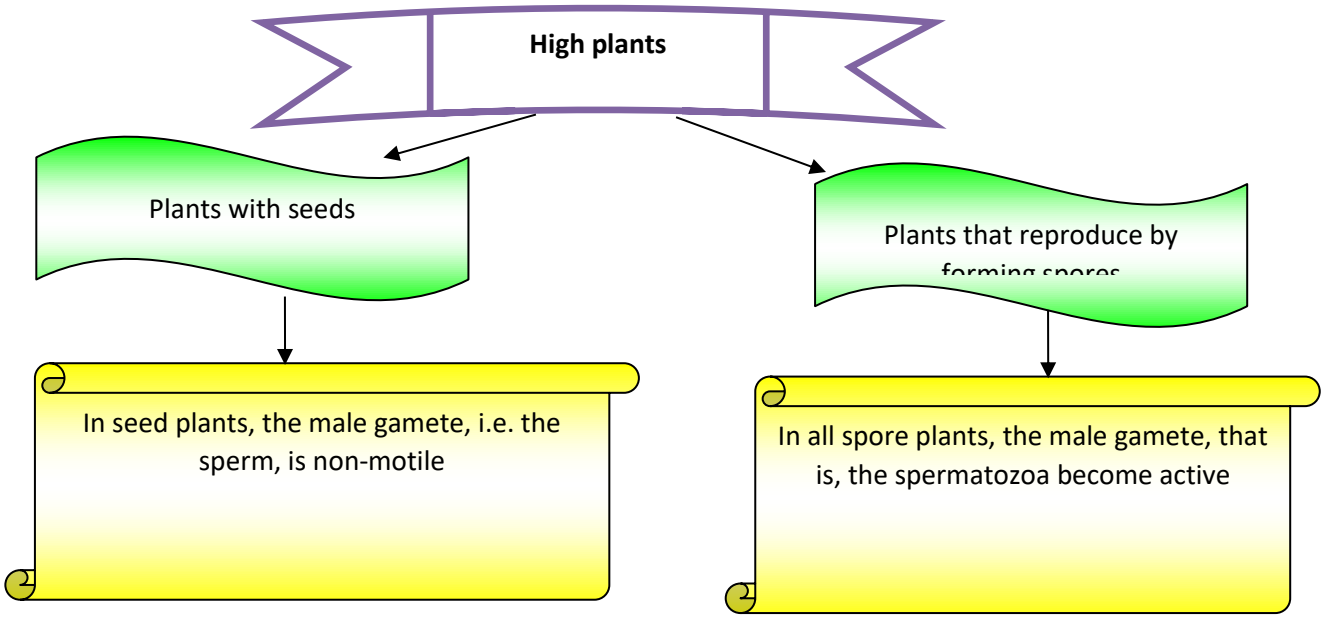
What is the name of a species in the Ginkgoaceae family?	By which scientist was it introduced into the botanical literature?	Japanese translation	Who discovered that among open-seeded plants, ginkgo has motile spermatozoa?

Answers:

Table 1

What is the name of a species in the Ginkgoaceae family?	By which scientist was it introduced into the botanical literature?	Japanese translation	Who discovered that among open-seeded plants, ginkgo has motile spermatozoa?
G. biloba	K. Linney	"silver plum" or "silver fruit"	Japanese scientist S. Hiraze

4. Tasks related to comparison.



5. Assignment. Bio dictation:

1. - sexual reproduction, in which the antheridium and archegonium mature.
2. - is an asexual generation, in which spores mature.
3. - in the further development of the zygote, the formation of the embryo (embryo) and the formation of the sporophyte during its development are observed.
4. Representatives of this section are the oldest ..... plants that have adapted to grow in a dry environment for the first time.
5. Ginkgo means ..... or ..... in Japanese. Ginkgo trees are planted in front of mosques in Japan, China and Korea.

Biological dictation answer: 5) "gray apricot" or "gray fruit"; 4) high; 3) In higher plants; 2) Sporophyte generation; 1) Gametophyte.

CONCLUSION

Sustainable development education in Uzbekistan includes of the education, upbringing, self-development and self-expression, independent and critical thinking, spiritually active, socially active, ethical and ecological norms, and the values of the Uzbek people, based on the interdisciplinary approach to development and the formation of features that concern the state of the environment, and each person can notice new social, economic and environmental problems (Mirziyoyev Sh. M., 2017) [2]. Therefore, independent and critical thinking is an important requirement for students to acquire science-related knowledge, skills and competence. So, using innovative technologies in education, effectively organizing lessons in different ways and increasing the content of science is the demand of the times. On this basis, if the content of the subject is revealed more widely, and the concepts such as working on and thinking for the students are increased.

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