

INTELLECTUAL OUTPUT 03

SCIENTIFIC CREATIVITY

4 Creativities Project

№2019-1-BG01-KA201-062354





INTRODUCTION

The aim of FCREATIVITIES project is to improve the teachers' abilities to generate a creative education, leading to the creation of students who are able to think, analyze and solve daily problems. We *will develop new scientific skills* and competencies through the incorporation of new proposals, spaces, methodologies, and resources that will increase the students' ability, creativity and the skills for innovation. These activities will be used *with 10 to 12 years old students*, promoting their motivation and creativity. With the **scientific creativity** promotion we will improve the thinking capacity of our students and the ability to go from basic notions to more complex ones; they will learn to resolve problems in a real situation; they will practice the construction of their own learning; they will train their **deductive capacity** and this will take them to create strategies and solutions of their own and they will get better with their physical environment and their appreciation from different spaces, shapes, parts and the group in general. Scientific creativity will take place inside the classroom through scientific experiments workshops.

Scientific activity will be **boosted through observation, manipulation and research**. That will lead students to discover their immediate environment. Experimental and research activities will offer students the opportunity for learning in an independent and significant way.



Title of the experiment

Cells

Description and application in everyday life



The method of modeling is a classical method of teaching, which is extremely suitable for studying difficult and abstract learning content in natural sciences. The development of a model is a complex and lengthy process that requires prior in-depth study and understanding of different aspects of the modeled object.

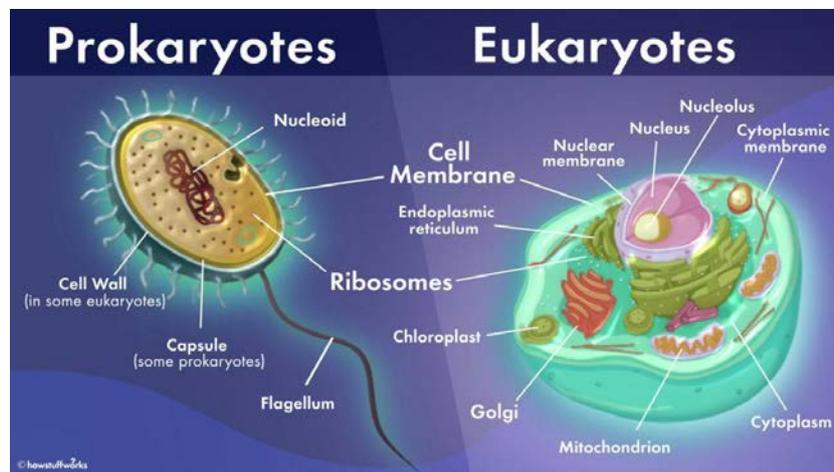
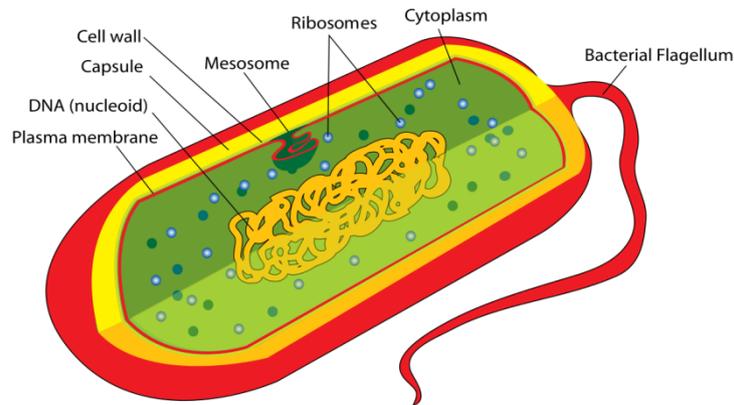
Through the models one can understand the essence of the studied objects, the learners to express their understanding of what they have learned, to explore and create. Modeling affects the motivation and activity of students and increases their independence.

The activity consists of various models of the cells:

prokaryotic and eukaryotic cells,



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plant and animal cells.



The student creates and follows a plan, models scientifically, faithfully and accurately, uses appropriate materials, presents the model attractively, supporting his work with knowledge.

The students know that the cell is the smallest building block of organisms.



The cell type determines the course of life processes in organisms and their role in the cycle of substances.

Materials are used for this purpose (paper, rubber, styrofoam, cardboard, plastic, nylon, textiles, etc.)

Appendix №1: **Worksheet: Making a cell model**



Aims

Please list the objectives you want to achieve...

1. Knowledge of the cell, cell types and the relationship between cell type and life processes of organisms.
2. Development of creativity and precise thinking.
3. Creative expression of the students.
4. Develop problem-solving skills.
5. Individual presentation and teamwork.



Steps we must follow

The task will be to make a model of different type of cells(*prokaryotic and eukaryotic, animal and plant cells.*)

Preliminary preparation is required, which includes:

1. Construction of an image of the object: (through a diagram, drawing and other symbols)
2. Choosing suitable materials for the model.(at home)

Then follows:

3. Making the model following the blueprint. Here you can be an artist.
4. To find out if the model is successful, answer the following questions:
Did they like our idea? Did you learn anything new from the model? Is it well made?
What is applied in everyday life?



Materials needed

In order for the teacher to be prepared for the proper implementation make a list of all needed materials and resources needed.

The materials that can be used to create the model are:

paper, plastic, nylon, textile, rubber, styrofoam, sponge, cardboard, polymer clay and others.

You will need scissors, glue, needles, threads and other tools of your choice to assemble the model.





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Tips

If you have any recommendations for the teachers, please share them here. Please include any measures that must be taken to carry out the experiment safely!

1. The teacher could set the modeling for homework and the presentation should be at school.
2. The students can also work independently.
3. The activity is recommended for students aged 11-12.
4. When using materials and tools (such as scissors, needles, etc.) to observe the measures for safe work.
5. Students draw conclusions by filling out a worksheet.

Worksheet Making a cell model

Preliminary preparation:

I collected information about:

1. Structure and functions of the cells.
2. The similarities and differences in the structure of the cells of organisms
3. The relationship between cell type and the vital processes of different organisms.



I used the following sources:

1. Tips for making a successful model by the teacher.
2. Schemes, drawings of the object on the Internet, popular science literature, etc.
3. Information on materials that are suitable for the development of the model.

Objects on which models can be made	Materials for making the model	Practical application of the Cells model
<i>prokaryotic and eukaryotic, animal and plant cells.</i>		

CONCLUSIONS:

1. **What is the smallest building block and functional unit of living organisms?**

The answer:

2. **What is the relationship between cell type and the vital processes of organisms?**

The answer:

3. **What do you think about the role of organisms in nature?**

The answer:

Test your skills by placing ✓ in the appropriate place in the table.

I can now			
to study information from various sources			
to use the most important of the collected information			
to model cells as the smallest building blocks of organisms and to use models to explain their structure and functions.			
to understand the role and meaning of each organism in nature			