SCRIPT FOR THE ASTRONOMIC GAME

development | Agnieszka Jaworska (Primary School No. 1 in Bytów)
in cooperation with the Experyment Science Center in Gdynia

INTRODUCTION

age of participants	13 - 18 years
form of classes	moderated discussion, student project, public presentation
duration	45 (60) minutes + 90 minutes

SUBJECT

During the game at the exhibition at the Experyment Science Center in Gdynia, the students played the role of future astronauts who as first humans land on Mars. They underwent a training program during which they acquiring key skills that would allow them to survive and complete planned tasks during their missions to Mars.

The "Colonization of Mars" classes are a continuation of educational activities undertaken during the participation of students in the gamified astronomy path at CNE. They broaden the knowledge of students from various fields, present still unsolved problems of world scientists and force them to think of hypothetical solution. A student in the role of a scientist or astronaut is forced to think creatively. All actions taken by the student must be conscious and responsible, because the result of his work will be "the colonization of Mars".

GENERAL GOALS

- students' interest in astronomy
- enabling students to aquire knowledge about the universe in a non-standard way
- learning more about NASA's work and missions
- conducting thought experiments regarding the future of mankind
- encouraging young people to learn STEM

SPECIFIC GOALS

- attractive and creative learning about other planets and their conditions
- enriching knowledge from specific thematic circles in physics, astronomy, chemistry, biology and geography
- working with the problem methology
- improving skills of searching, selecting and using information from various sources, as well as applying it in new practical or theoretical tasks
- comprehensive activation of students in the learning process
- acquiring team work skills
- shaping social competences

DESCRIPTION AND COURSE OF CLASSES

PART I

(proposed duration: 45 - 60 minutes)

1. INTRODUCTION

During the short introduction, students learn that, using the knowledge acquired during the game at the Experyment Science Center, need to be used in developing a plan to colonize Mars. They will be divided into groups, each of which will deal with a separate issue.

2. SUMMARY OF THE NEWS GAINED DURING THE GAME

The teacher begins a discussion on the eternal dreams and plans of scientists regarding the colonization of Mars and refers to the current missions and work of NASA on the exploration of this planet. He asks students what problems we have to deal with in order to establish a human colony on the Red Planet.

Students list the obstacles and challenges in colonizing Mars. The teacher must ensure that all main aspects are covered, i.e .:

- parameters of the planet's environment (temperature, composition of the atmosphere and soil, pressure, lack of liquid water)
- reduced gravity
- restoring the atmosphere
- no magnetosphere
- energy sources (colony electrification)
- food (crops, breeding)
- health problems of astronauts (also psychological)
- Mars-Earth communication problem (long distance)

3. ASSIGNMENT OF TASKS AND PLANNING

The teacher divides the students into groups (3-5 people). It should be noted that each student has a different amount of knowledge and interests, that may be the starting point in selecting issues for a given group. The teacher then assigns each group the task of creating a design for part of the Mars colony. Each team works on a hypothetical solution to a thematically different problem. The starting question for each group is, "What do we need to do to colonize Mars?"

Students in designated groups jointly formulate the problem in terms of the received (selected) problem and ideas for its solution.

The teacher sets a deadline for the project. It is advisable to encourage students to be inventive, unconventional and creative in interpreting the topic.

PART II

1. STUDENTS WORK BY DESIGN METHOD

The follow-up of the students is a long-term undertaking of working with the project method. Students in a given team share responsibilities, plan and organize their work. Using information acquired at the CNE and from various other sources, they perform the task together.

The end result is to be finished visualized design of the idea of colonizing Mars - work of any form (mockup, poster, device prototype, multimedia presentation, animation, etc.).

2. PRESENTATION OF WORK EFFECTS - SUMMARY

(proposed duration: 90 minutes)

The final stage is the public presentation of all groups work. If more than one class has taken part in the astronomy pathway, eventually all of them will join their respective parts of the colony and invite other classes to explore them.
It is suggested to organize an interactive exhibition for the wider school community. Each team will have a stand on which they will explain to visitors their idea for solving given problem of Mars colonization.

The scenario was developed as part of the "Science Inspired" project carried out by the Experyment Science Center in Gdynia in cooperation with Agora Science Center (Hungary), VIDA! Science Center (Czech Republic) and Noesis Science Center and Technology Museum (Greece). The project is co-financed by the Erasmus + program of the European Union, Action 2: Strategic Partnerships for Youth.