“Can We Survive On Mars?”

Kindergarten Category

Diligence: Christina Tzoumerkioti

Mars, beyond a red planet, is a "cluster of challenges": a world full of inhospitable terrain, interrupted by deep valleys and plateaus, and surrounded by vast expanses of frozen desert. Life on Mars cannot exist without the technology and ingenuity that humanity brings with it; Our survival there will be more of a story of adaptation and perseverance, where scientists become farmers and explorers become engineers.

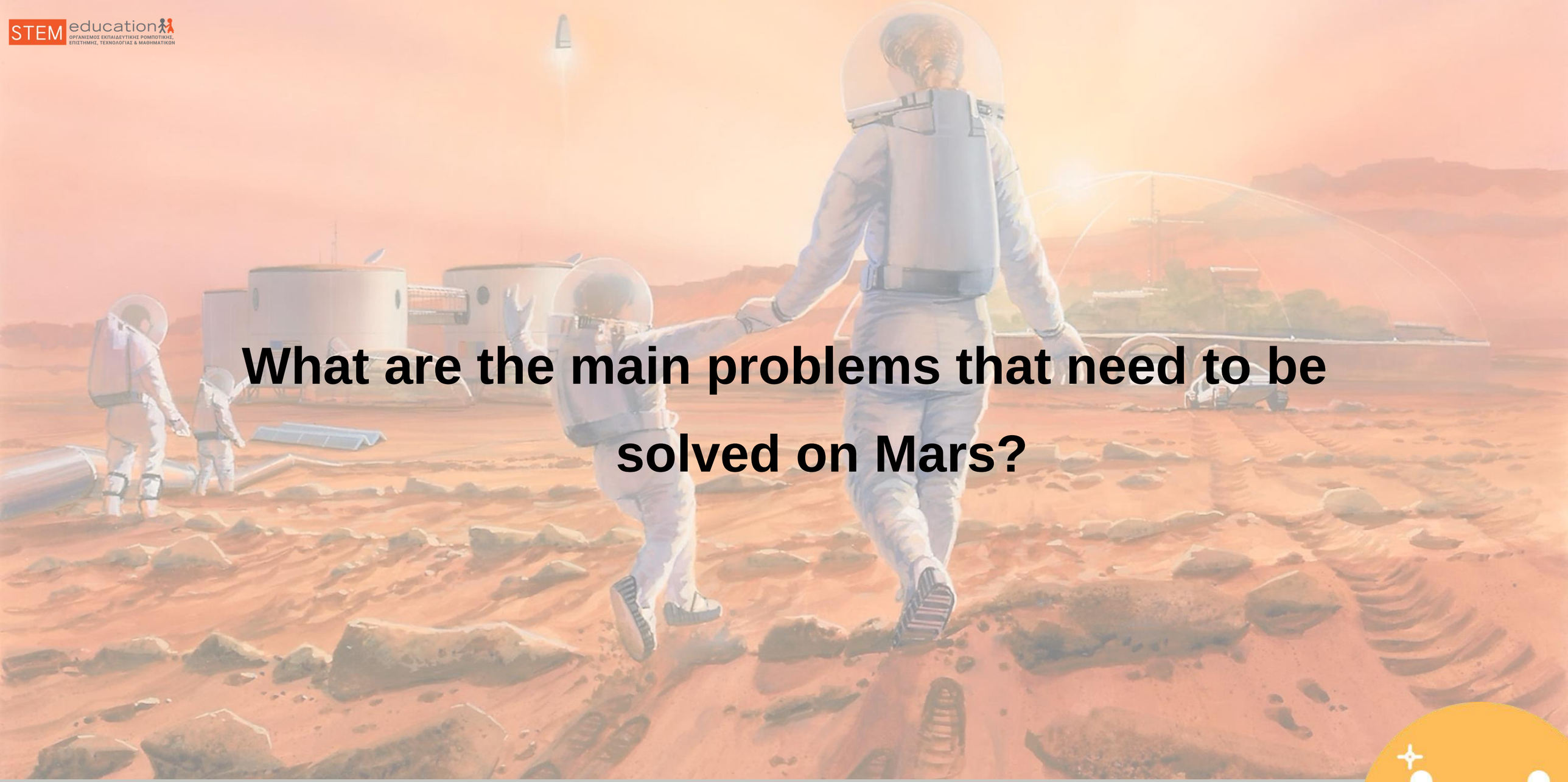
Mars is the planet of science and innovation, but also of the need for self-sufficiency and perseverance. As an ancient saying goes, "Nulla terra aliena est homini parato" ("No land is foreign to prepared man"). The quest for survival on Mars is not just a journey to a new world, but a test of human nature itself.

The planet Mars resembles Earth

The desire to explore is inherent in man, it is characteristic of human nature. Since ancient times, people began to explore the Earth and at the same time turned their gaze towards the sky. The search for other habitable planets is the natural extension of this desire.

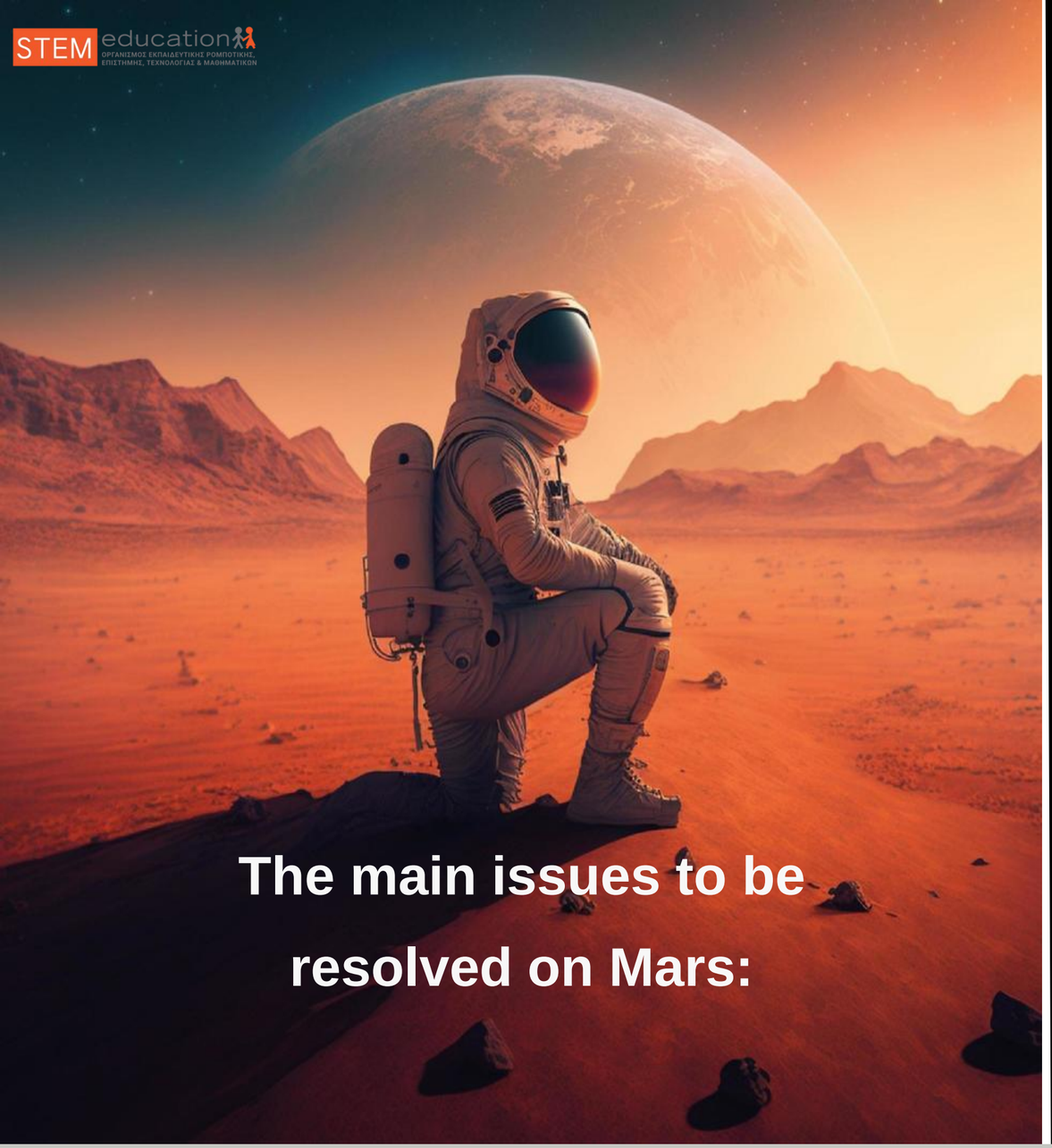
Mars is the most Earth-like planet in our solar system. Studying it may provide a unique opportunity to understand the evolution of planets and the possibility of life.

The colonization of Mars is an ambitious effort that faces many challenges and requires solutions to various problems. While technology continues to advance, humans will have to resolve many critical issues before they can establish viable colonies on Mars.



What are the main problems that need to be solved on Mars?

Kindergarten Category “Can We Survive On Mars?”

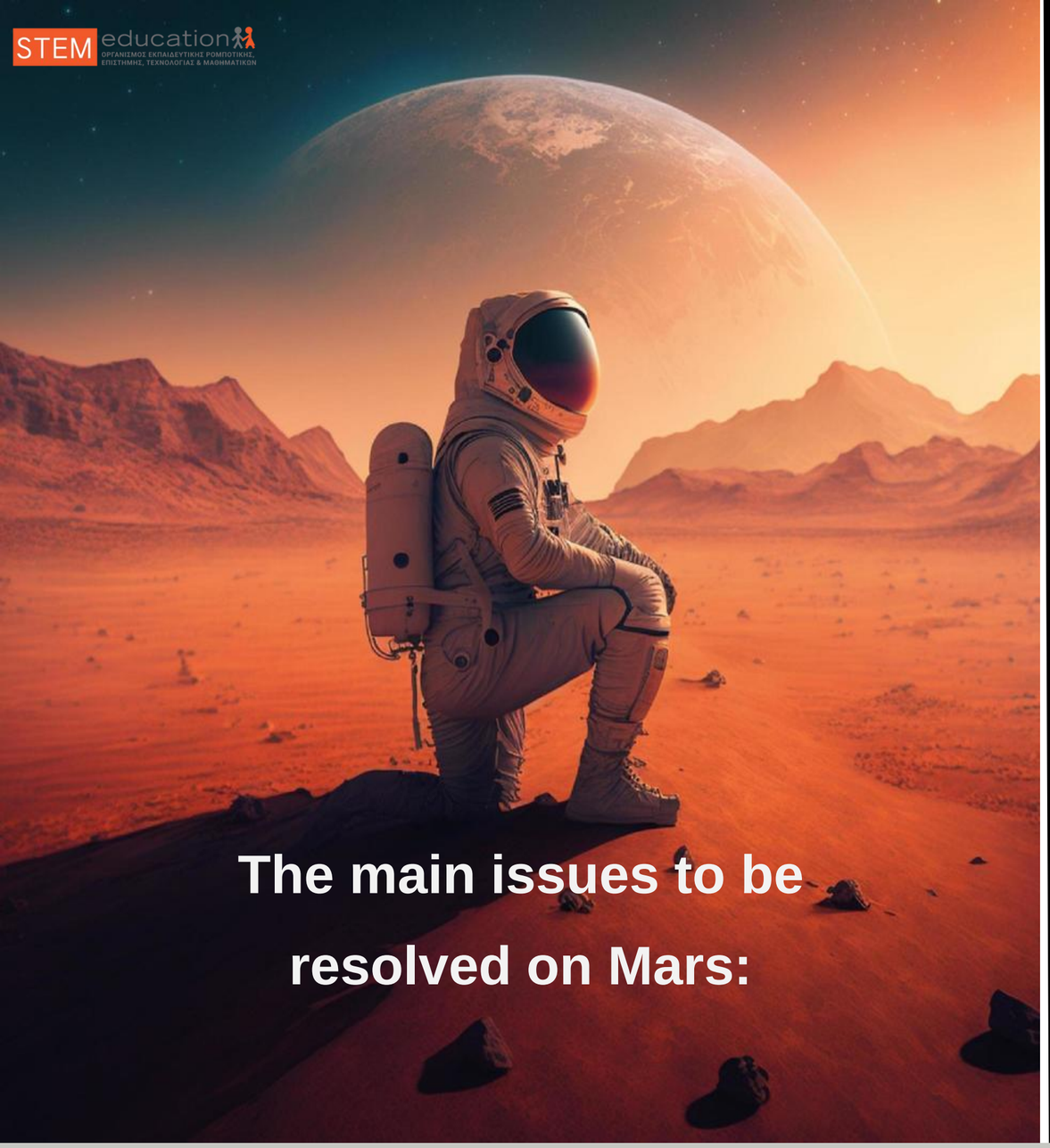


Transition and Landing

- Travel Interval: The trip to Mars can take from 6 to 9 months. We need spaceships that protect us from dangers such as radiation.
- Landing: Landing on Mars is difficult because the atmosphere is thin and doesn't help spacecraft stop easily.

Air and Water Supply

- Oxygen Production: On Mars there is not enough air to breathe as on Earth. We need to build special machines that will convert the Martian air into oxygen.
- Water Supply: On Mars there is no easy water. We will have to find water under the ground or build machines that will purify the water we use again.

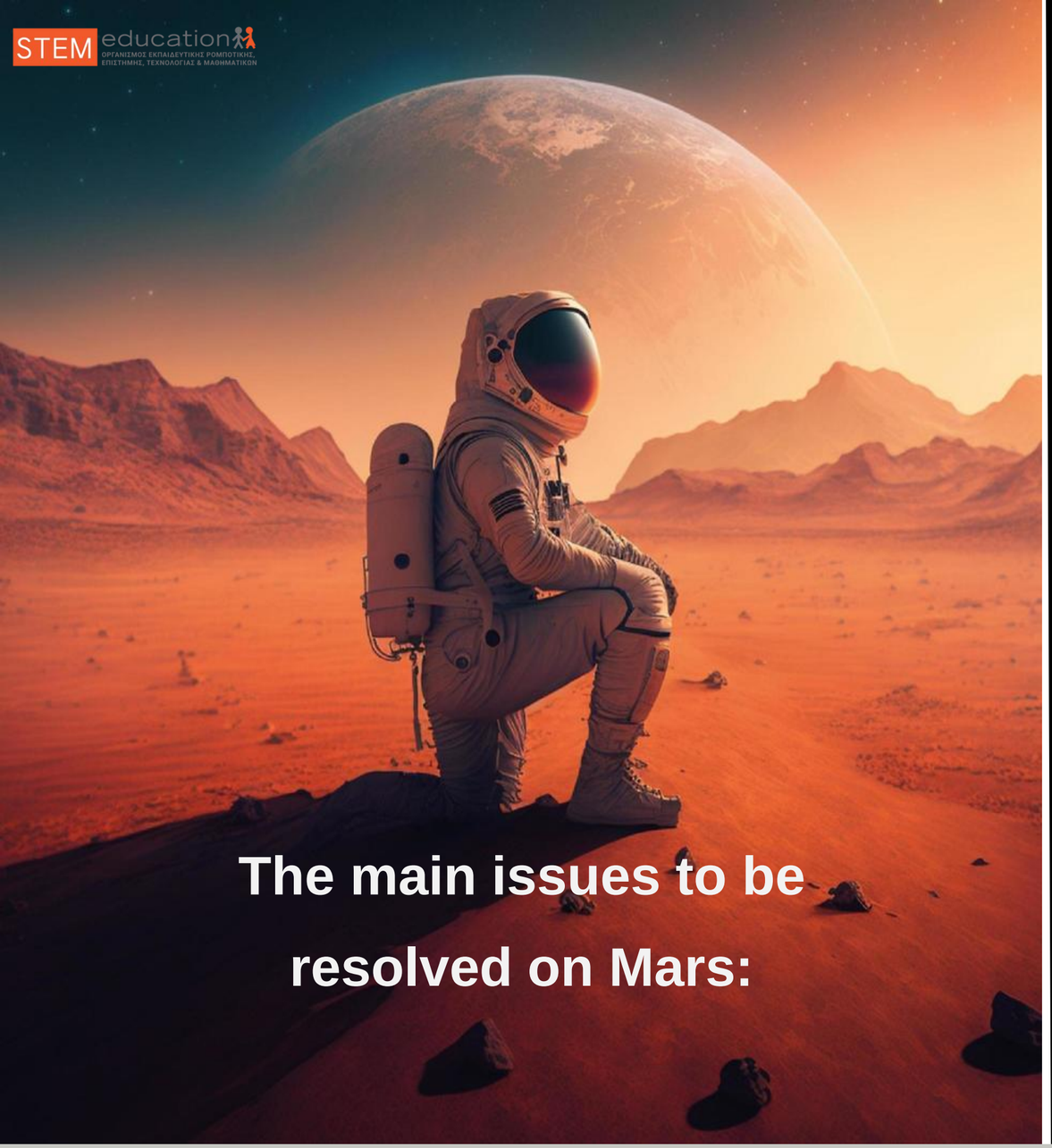


Nutrition

- Food Cultivation: Growing food in a hostile environment with low gravity and limited resources is a big challenge.
- Food Storage and Transportation: Food must be kept fresh and nutritious during travel and stay.

Communication

- It will be difficult to talk to Earth because Mars is far away. We need special equipment to send messages.



Housing and Infrastructure

- Radiation protection: On Mars there is a lot of radiation that is harmful to humans. We will need homes and clothes that protect us.
- Infrastructure Construction and Maintenance: On Mars it is very cold at night and hot during the day. We need to build warm houses that protect us. In order to build these, we need to use materials found on Mars and robots.

Mars is a distant planet that needs a lot of attention! If we want to live there, we need to take care of him and protect him from all the problems he has and find smart ways to solve them.
All people who will go to Mars must work together to create a safe and sustainable environment. They will need to design systems that ensure survival, such as clean air, water and food, as well as protect themselves from the harsh conditions of the planet.
So let's build a Mars that will be friendly to life, with the same responsibility, love and care that we built our Earth!

Capture on a path of your robot

"the 5 most important **YES! WE CAN**..." - from the following list - that humans must implement compulsorily so that they can survive on Mars and make the Red Planet viable for future generations. These solutions are vital for adapting to the extreme conditions of Mars and ensuring human presence there.

Can we survive on Mars?
The list of **"YES! WE CAN..."**

YES! We CAN build sustainable structures from materials found on Mars.

YES! We CAN make roads out of Martian materials to move easily.

YES! We CAN create underground houses to be safe from dust and cold.

YES! We CAN recycle our waste to keep Mars clean.

Can we survive on Mars?
The list of **"YES! WE CAN..."**

YES! WE CAN use special filters to purify the air and breathe.

YES! We CAN build robots that will search for water deep in the ground.

YES! We CAN create special suits that protect us from the radiation of Mars.

YES! We CAN build small, portable greenhouses to have food everywhere.

YES! We CAN store solar energy to use at night and use it to meet our energy needs on Mars in general.

Can we survive on Mars?
The list of **"YES! WE CAN..."**

YES! We CAN grow our own food in closed farming systems.

YES! We CAN create small parks with plants that will give us fresh air and space to play.

YES! We CAN live in domes with adjustable temperature and atmosphere.

YES! We CAN use robots to help explore and expand the human presence.

General Instructions

Kindergarten students will build their first algorithm, using their imagination on the general theme of life on Mars. They will create relevant projects that integrate the motion space of their floor-standing robots and the surrounding space surrounding the subject in order to propose fantastic ideas on how we could survive on Mars.

Through play and exploration, they will think about how we can build houses, how we grow food, and how robots can help us live on this distant planet. We want them to imagine a Mars full of adventures, where anything is possible with the power of creativity and cooperation!

General Instructions

In the Kindergarten category, groups of 6-10 children (4-6 years old) are created. Each team, under the guidance of the kindergarten teacher, constructs a floor track from materials of their choice. On it they will place small models that will be characterized by 1-2 words and will depict in a three-dimensional way (painting or collage)...

The work can contain both static and moving materials. The choice of materials is free**. For the first time this year, the competition is also requested to include in the project at least one moving structure that incorporates one of the simple machines (wheel, shaft, gear, pulley, etc.).** The movement of the structure can come from the child's hand, through a battery and switch, or through a remote control. Recommended materials related to this age category are

General Instructions

On it they will place small models that will be characterized by 1-2 words and will depict in a three-dimensional way (painting or collage):

- which they see as the most important problems for human survival on Mars, such as lack of water, fresh air and protection from severe dust storms.
- what they consider to be the most important solutions to these problems, such as special shelters to live safely, robots that help us with difficult tasks, and the use of solar energy for light and heating.

Ready-made plastic toys are not allowed

Each creation should be made by children, with simple materials of their choice and depict three-dimensional!

Detailed Description

The Kindergarten game aims to help young children think, for the first time, in an **algorithmic** way and develop basic **engineering knowledge.**

The game is designed to meet their specific age needs and specifically helps them: To represent their ideas and knowledge through problem solving,

- Familiarize themselves with the basic concepts of algorithm creation, control.
- the execution of this
- its debugging.
- To utilize concepts of direction and orientation in space (right, left...).
- Practice their motor skills, as assembling the pieces helps children develop fine motor skills and hand-eye coordination.
- Understand basic mechanical principles: Children come into contact with basic engineering concepts and materials, such as balance, connection, levers and gears.

Detailed Description

- Learn by doing and receive real-time feedback on how the commands they create guide a robot and help develop a story.
- Engage in an activity that involves the whole body.
- Communicate and collaborate with their peers, as well as with adults.

Labelling:

Participation in "Can We survive On Mars?" is not competition.
Time, moreover, is an abstract concept, and temporal concepts are particularly difficult for preschoolers and toddlers. Too often they confuse today with yesterday and tomorrow, now with before.

Detailed Description

All this is involved in conquering the temporal sequence, the process of placing ideas and events in a logical order in order to divide our time, that is, what we should do first, second... Last.

Complementary to the above, this game aims to be a tool for modern Kindergarten and to help teachers in their teaching work.

APPROACH TO THE ISSUE

Engaging children with Mars, the planet we are trying to explore, will allow them to get to know the problems we face in creating conditions for life there, as well as the challenges that need to be overcome.

Children will collect all this information, learn about the difficulties that man is trying to overcome and will have the opportunity to imagine creative ways to make Mars friendlier to life, making their dream of colonizing other planets more feasible.

For the purposes of the presentation, the teams will have to create and tell a story, which will be consistent with the path of the robot through the space they will build. The story and route of the robot can have any structure the teams wish, provided that it includes the narration - guided tour, by the children, in 4-5 points stations.

CONSTRUCTION OF TRACK AND MODEL

The teams:

They will create 4-5 three-dimensional models from the milestones in history they have prepared, in size 15x15cm or 30x30cm. The models should be painted by the children themselves and can include 1-2 words.

They will create a floor track (e.g. on canvas or durable cardboard), on which they will draw squares measuring 15x15cm.

They will place the models on the track and specifically on the designed squares, as well as the moving structure that will incorporate **one of the simple machines (wheel, axle, gear, pulley, etc.).**

Then:

- They will draw a route on the track, which will connect these points in the order decided by the children, according to the story they themselves will have thought of.

CONSTRUCTION OF TRACK AND MODEL

The track:

- Its minimum area can be 90x90cm (6x6 squares) and its maximum area can be 1.5x1.5m (10x10squares).
- A square on the track should mark the "Start" of the route.
- Another square on the track should mark the "End" of the route.
- The rest of the squares can be decorated, as the children wish, according to the story they have prepared, including **in the project at least one moving structure incorporating one of the simple machines (wheel, axle, gear, pulley, etc.).**
- The "entrance" to each point - station of the story takes place when the robot stops at the specific square chosen by each group (the square should be tangent to the point, ie next to the point).

PRESENTATION

On the day of the presentation, the teams will be invited to demonstrate the route they have prepared, combining planning with imagination. On the spot, children will program a robot and use the code capture cards to follow the selected path.

Every time the robot reaches a stop/point -depending on what it corresponds to- a happy sound or a sound of "disapproval" should be heard and the students should present its main elements following the development of the story, as it has been formed.

At this point, children are invited to use their creativity and make their presentation as imaginative as possible.

How to evaluate - Criteria

The event is non-competitive. Therefore, no winning teams will emerge. The teams will be evaluated by an interdisciplinary committee consisting of a representative of WRO Hellas, a kindergarten teacher and a representative of the artistic field (visual arts), who will evaluate the constructions of the groups.

The criteria to be taken into account by the Committee are:

The participation of each child of the group in the whole process (individually and in groups). The integrity of the constructions and their aesthetic result.

The imaginative way of presentation with proper speech.

The correct programming of the robot and its faithful response to the commands given.

The inclusion of at least one **at least moving construction, incorporating one of the simple machines (wheel, axle, gear, pulley, etc.).**

So, we know the challenges that Mars hides, we learn about the conditions there and we prepare to face the obstacles, looking for solutions to create life on the Red Planet. We start the journey... Our own unique and special journey... to discover new technologies, innovative ideas and scientific discoveries, aiming to turn Mars into a hospitable planet, ready to welcome life!"