

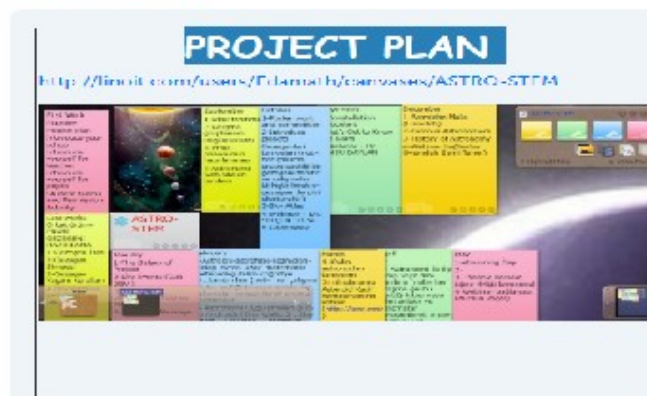
## MaSTEM (Mars Adventure with STEM)- Space home design for those who dream of living on Mars

As a project team, we conducted a project within the scope of 2020 STEM Discovery Campaign Activities. "ASTROSTEM" is an eTwinning project. The Astro-STEM project is designed to raise awareness with accurate information about astronomy and space science in students. It is aimed to discover the depths of the universe with STEM studies by having fun in the democratic learning environments where they can express themselves comfortably. With this project, students learned astronomers, the history of astronomy, constellations and mythological stories, our galaxy, using a sky atlas, keeping telescopes and an astronomy diary.

### ASTRO-STEM



### ASTRO-STEM



Another important part of this project is that it is based on the STEM approach. With the STEM approach, it is thought that students will achieve their project goals. For this purpose, "STEM DISCOVERY WEEK" participation was provided within the scope of "ASTRO-STEM" project. Here, an event is planned with the participation of all project participants. This event is divided into 12 pieces. The reason for being divided into twelve parts is that there are 12 mixed country teams in the project. In these teams, the project from two different schools is mentoring teachers. The students in the teams come from each project school.

<b>3. TEAMS</b>	1-KORAY(BANDIRMA DİSİM / TURKLY)	<b>Nada Sokolovic</b>  <b>Seyide EROĞLU</b>
	2- MUHABBET (Nuh Mehmet Baldöktü A.L./ KAYSERİ/ TURKEY)	
	3-Ceren İsmail Kulak Anadolu Lisesi/ TURKEY	
	4-ATA(EPDOOAL-ESKİŞEHİR/TURKEY)	
	5-İRAMAZAN Şİ L (Şarkıkaraağaç Science High School/TURKEY)	
	6-Güven (EFL/ MERSİN /TURKEY)	
	7-Eriç Mihajlo(Prva tehnička škola /Serbia )	
	8.Berke BRÇAL ( BRÇAL/Eskişehir/Turkey)	
	9-Mustafa ŞAHİN(TGCO.İSTANBUL/TURKEY)	
	10- ARDA UTKU (Nuh Mehmet Baldöktü A L / KAYSERİ/ TURKEY)	
	11) Furkan ( Karaman Science and Art Center KARAMAN/ TURKEY)	
	12)Salim (YKAL/Mersin/TURKEY)	

Each team has about ten students from different schools. The teachers carried out different collaborations with these teams throughout the project. One of the joint works was determined as "STEM DISCOVERY WEEK" participation.

The screenshot shows the eTwinning TwinSpace interface. At the top, there's a navigation bar with 'ANA SAYFA', 'SAYFALAR', 'MATERİYALLER', 'FORUM', 'ÇEVİRİMİÇİ TOPLANTILAR', and 'ÜYELER'. The main content area is divided into two sections:

**4-THE 2020 STEM DISCOVERY CAMPAIGN**

**TASK ABOUT**  
We are participating in the **2020 STEM Discovery Campaign** event with our project's collaborative stem work **"Mars ADVENTURE with STEM"**.

**TASK**  
Review the videos and information documents prepared about the actions to be taken for participation.

**5-MARS ADVENTURE WITH STEM / I**

**TASK ABOUT**  
Astro-stem project stem study.

**TASK**  
You're part of a team commissioned by **NASA** to conduct studies on Mars. Your team is called **Ma-STEM**. You have to do preliminary work and preparation before you go on a Mars mission. Your work, content information, and we tools are included in the table. You can manage your work by communicating with your team leader teachers. This study will be conducted by mixed country teams.

Below the text, there is a map of Kayseri, Turkey, showing various locations like Kayseri Havalimanı, Kayseri Park, and Erciyes Üniversitesi. The map is titled 'is' map' and includes a search bar with 'KAYSERİ' and a URL 'goo.gl/maps/9g8RNIYmVBBJ7Q'.

First, a research problem has been identified. Our research problem is, "How to plan a Mars adventure from start to finish for an astronaut going to Mars?" Different task titles have been created for this research problem. 12 different titles were created for the twelve mixed teams.

A combination of these titles creates a whole. And the resulting common product is also the answer to the research problem.

Problem situation: Due to the rapid increase in the world population and the rapid depletion of natural resources, the search for new resources has become mandatory. Space mining has come to the fore as natural resources in the world are not sufficient for increasing needs. Mining operations based on obtaining minerals from asteroids in space are called space mining. You are in the first team sent to Mars to work on space mining. In this case, you are expected to successfully complete the tasks given to you in Mars in accordance with the following steps.

**A. Firstly, determination of the areas** (Here, different requirements and priority areas are expected to emerge in order to survive in accordance with the living conditions and to conduct mine researches)

**B. Creation of work teams**

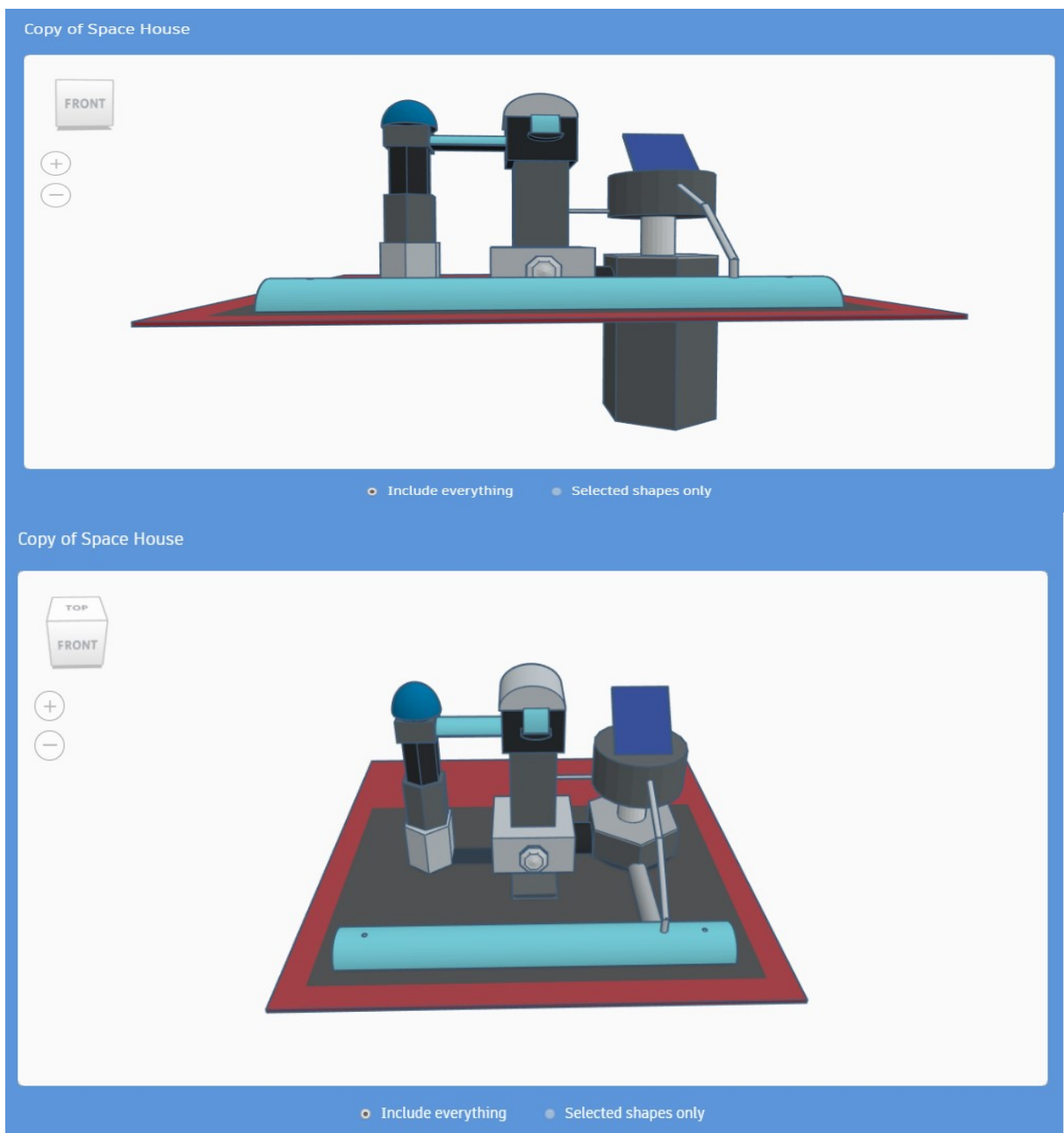
1. How to Prepare for Team Astronaut Space Travel?
2. What are the things you need to take with you on your way to Mars?
3. What are the things that people who will begin to live in should know?
4. What are the features of the Astronaut Suit suitable for Mars conditions?
5. What are the features of the vehicles sent to Space?
6. What are the contributions of Asteroid mining or space mining to the World economy?
7. is a space house design for those who dream of living on Mars.
8. Fixing the food problem in Mars conditions.
9. Eliminating the water problem in Mars conditions.
10. Eliminating the problem of psychological and social adjustment to Mars conditions (creating an inventory of problems).
11. repairing a system damaged by sand storms on Mars.
12. Mars through the eyes of an astronaut. (making the astronaut talk about emotions and thoughts with the web 2 tool)

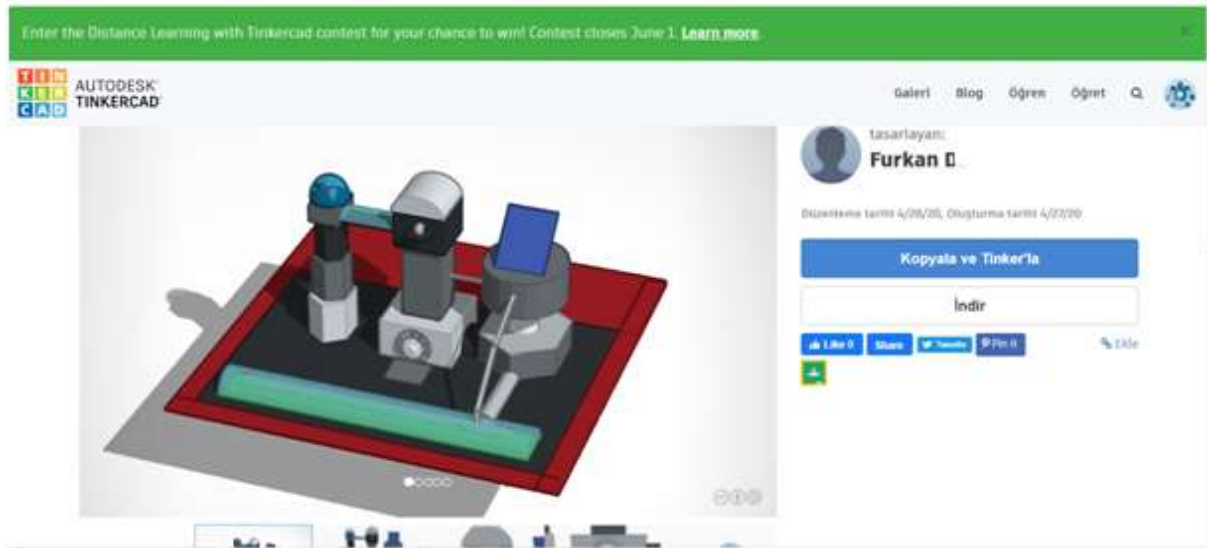
Parts of the research problem have been described above in detail. In addition, an online information meeting was held with the project mentors on the subject. Here, questions from teachers were tried to be answered. In addition, a road map has been set for the event.



1. What are the physical conditions on Mars?
2. What should be considered when designing a house suitable for Mars conditions?
3. What are the design criteria?
4. What should be the human capacity of the house?
5. How should the exterior design of the house be?
6. What materials can be used for home design?
7. Which web tool can be used to create home design?

Discussions were held on online forums regarding the questions listed above. At the end of this, it was decided to create a design with the "tinkercad" tool. The visuals related to the house design created with the students are given below.





The "Mars home design" worksheet link is <https://www.tinkercad.com/things/d1Nr1lQWBSx>.



By conducting teamwork between countries, a common STEM study was tried to be created with a group of students and teachers. Tasks are assigned to each team on a Mars journey. As a team, we will conduct the "space house design" part of this study. Together with my students, we will design a space house using a 3D design tool.

In this study, students conducted teamwork between countries. The students in the team tried to put forward a common STEM study with the teacher. The study sought an answer to a research problem. In this way, students had the opportunity to work like an engineer (E (engineering) of STEM). Also in the study, "What are the physical conditions on Mars?" and "What materials can be used for home design?" Science acquisitions with questions such as were included in the study. The students used their knowledge of "structure of matter" and "chemical change" in science classes (S (science) of STEM). In addition, the quantity calculations used in creating home designs (M (math) of STEM); The disciplines of T (technology) of STEM have been taken into account in the creation of home design with the web 2 tool (tinkercad) and online discussions (T (technology) of STEM). When the whole

study is examined, it is seen that different disciplines are used together. Through STEM strategy, they were provided with meaningful learning and gaining interdisciplinary perspective.

On the other hand, an awareness has been raised on students about "Mars travels and space mining" which is a current subject. This current subject was associated with the course outcomes, enabling students to transfer what they learned in the lessons to daily life.

In addition, students; 21st century skills such as "digital literacy, scientific creativity, research inquiry, teamwork, Critical Thinking and Problem Solving, Communication and Cooperation, Creativity and Innovation" were provided. Finally, with this activity, the students' orientation towards the professions of the future (such as space mining, astreoid mining) was supported. Study activities are shared on the school website.