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in partnership with AUTODESK

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MOON CAMP
EXPLORERS

GUIDELINES

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→ INTRODUCTION

Moon Camp is an education project run in collaboration between ESA and the Airbus Foundation, in partnership with Autodesk. It uses innovative learning technologies to challenge students to design their own Moon settlement with a 3D modelling tool. It features preparatory classroom activities that focus on learning-by-design and science experimentation.

Teams will develop a number of scientific interdisciplinary experiments to explore the extreme environment of space and understand how astronauts could live on the Moon. Afterwards they should 3D design their Moon Camp using Tinkercad and write a report explaining their project. Their design should be adapted to the Moon environment and make use of local resources and provide protection and/or living and working facilities for the astronauts. **Participating teams will compete for the Moon Camp Explorers Prize for best project.**

The Moon Camp Challenge is divided in three separate categories featuring different levels of complexity: **Moon Camp Discovery (beginners), Moon Camp Explorers (intermediate) and Moon Camp Pioneers (advanced).**

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→ Overview

In the future, to enable astronauts to stay on the Moon for long periods of time, new infrastructures must be developed to overcome important challenges. Such challenges include protection from radiation and meteorites, energy production, the extraction and recycling of water, food production and much more. The Moon Camp Challenge invites students to become Moon explorers and decode some of the complexities future astronauts may face.

In Moon Camp Explorers each team's mission is to design a 3D Moon Camp able to sustain at least 2 astronauts and keep them safe from the hazards and vacuum of space. Teams will also have to submit a report about their project.

The Moon Camp should include:

- Use of local resources (e.g. lunar soil, water ice)
- Technological solutions (e.g. power source, recycling system, food growth chamber)
- Protection (from meteorites and radiation)
- Living and working facilities for the astronauts.

→ Timeline

Registrations are open from 6 January 2020 to 25 March 2020.

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→ How to submit the project?

1. The team's 3D model must be created exclusively using Autodesk® Tinkercad™. Submissions created in other software programs will not be accepted.

2. Projects must be submitted to the Moon Camp online platform: **www.mooncampchallenge.org.** The deadline is 25 March 2020.

3. Submissions must include:
- the team's report explaining the project and design, written in English. The report should follow the online template.
- at least one screen capture of the team's 3D model as a .JPG or .PNG;
- the Tinkercad project must be submitted as one .obj file (maximum file size 50 Mb).
- the public link to the Tinkercad project should also be provided.

4. Each team must model all individual components of the design. It is not permitted to import existing CAD data into the design, with the exception of any files provided by Autodesk, ESA, or Airbus Foundation.

5. The team must be the sole author/owner of the project and all materials submitted to the Moon Camp Challenge. Projects sponsored or funded by third parties may not be used. No third party (including your school or project sponsors) should have any rights to materials you submit.

→ Evaluation

A Jury composed of ESA, Airbus Foundation and Autodesk experts will select the finalist teams and winners based on the following criteria:

Innovation, creativity and inventiveness (25%): How well does this new design "push the envelope" and enhance user experience?

Software skills (25%): How well does the student design demonstrate technical skills and quality of design based on technical requirements?

Suitability to purpose (25%): How well does the design prove useful and suited to serving its purpose of providing a functional Moon Camp?

Online Form (25%): How well does the report explain the reasoning for design choices and overall habitability of the Moon camp?

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→ Who can participate?

Participation is open worldwide. Moon Camp Explorers is open to teams of students aged up to (and including) 14 years old.

Teams must be comprised of a minimum of 2 up to a maximum of 6 students and must be supported by a teacher or educator.

The teacher/educator is responsible for monitoring the team's technical progress, offering help and advice and acting as the team's point of contact with the ESA's Education Office/Airbus Foundation through the Moon Camp online platform or through email: **moon.camp@esa.int**. The teacher/educator is responsible for submitting the team's entry.

Teams that participated in Moon Camp Discovery are also allowed to submit a project to Moon Camp Explorers.

There is no limit to the number of teams a school or club can enter, but each student can only enter one team, and each team can submit one entry only.

Additional eligibility conditions apply for teams from ESA Member States*, Slovenia or Canada.

In the framework of the current collaboration agreement between ESA and Airbus Foundation on the Moon Camp challenge, teams from an ESA Member State, Slovenia or Canada that want to participate in Moon Camp Explorers will have to fulfil the following extra conditions:

- At least 50% of team members must be citizens of an ESA Member State, Slovenia or Canada.
- Each team member must be:
  - Enrolled in a full time primary or secondary school located in an ESA Member State, Slovenia or Canada
  - or, be home-schooled (certified by the National Ministry of Education or delegated authority in an ESA Member State, Slovenia or Canada)
  - or, be a member of a club or after-school group, such as Science Club, Scouts or the like.

* ESA Member States in 2019: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland and the United Kingdom.

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→ Project requirements and constraints

By entering the Moon Camp Challenge, the team agrees to the Moon Camp Challenge Official Rules:

1. The team acknowledges that their members have read and agree with the guidelines.

2. The team agrees that their project will be shared on the Moon Camp platform.

3. The team accepts that ESA Education and partners have the right to use the entirety or parts of the project for outreach and education purposes.

4. The team accepts that each entry must be entirely the original work of the team members indicated in the entry.

5. The team acknowledges that entries must not contain anything that is or may be (as determined in the sole discretion of ESA Education and Airbus Foundation): (i) threatening, harassing, degrading, stalking or hateful; (ii) defamatory; (iii) fraudulent or tortious; (iv) obscene, indecent or otherwise objectionable; (v) protected by copyright, trademark, patents, utility models, design patents or other proprietary right without the express prior written consent of the owner of such right; (vi) dangerous or potentially dangerous; or (vii) contrary to governmental policies of any country whose residents are eligible to enter the competition.

6. The team acknowledges that the entries must not promote drugs, alcohol, cigarettes, guns, or violence in any manner.

7. The team acknowledges that the entries must not contain any material that would give rise to criminal or civil liability or that encourages conduct that constitutes a criminal offense.

8. The team acknowledges that the entries may not violate any third party's publicity or privacy rights. If any entry contains the name, voice, likeness, image or written or spoken words of any third party, the entrant must obtain the third party's written consent to include such materials prior to submitting the entry.

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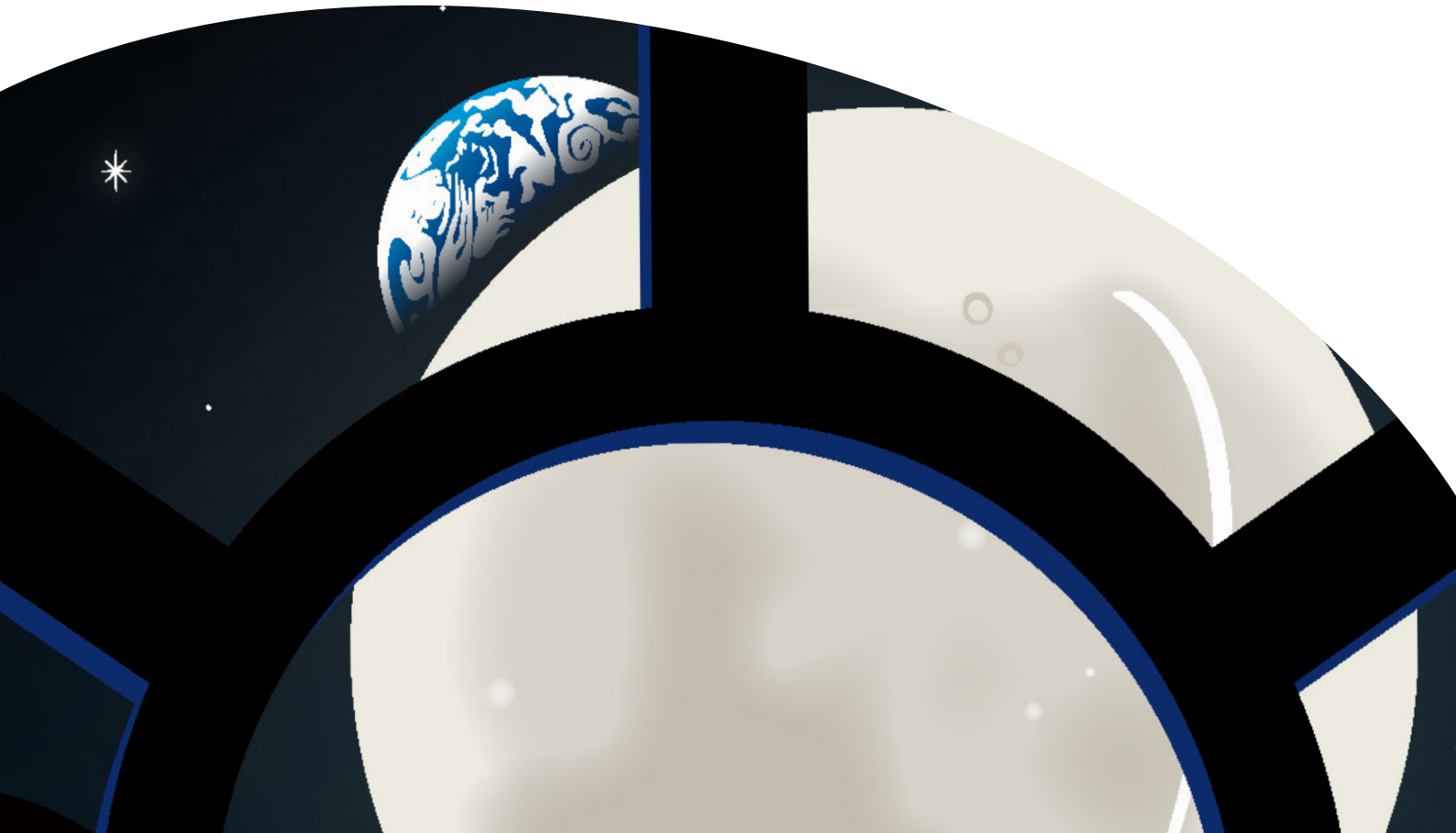
→ Supporting resources and tools

ESA provides a set of resources for primary and secondary school teachers:

- **Classroom resources:** Moon Camp features preparatory classroom activities that focus on learning-by-design and science experimentation. Here teachers will find inspirational resources to develop curricular scientific experiments related to the Moon. The classroom resources can be combined to develop interdisciplinary projects. **https://mooncampchallenge.org/classroom-resources/**

- **Moon Animations:** This set of animations presents information about the Moon and the challenges that astronauts may face on their expedition to the Moon.
https://mooncampchallenge.org/video-gallery/

- **Tinkercad:** This tool is a free, easy-to-use web-based app for 3D design. You can put your design skills into action with our Moon Camp tutorials. **https://mooncampchallenge.org/tinkercad/**



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→ Questions

For any questions, consult the Moon Camp Challenge website **mooncampchallenge.org** or send an email to **moon.camp@esa.int**.

→ Useful links

Moon Camp Challenge platform
https://mooncampchallenge.org/

Tinkercad – 3D Design tool
https://www.tinkercad.com/