

iLEAD Academy 2021 Application Essay Questions

We highly recommend writing a rough draft, proofread, and edit each essay question prior to completing the application.

Question 1: Tell us why you would like to be a student at iLEAD Academy, about your plans and dreams for the future, and why you should be selected to be a part of our community.

Question 2: What do you consider is your greatest strength and why?

Question 3: What do you consider one of your weaknesses and why?

Question 4: Name one thing you have struggled with and how you overcame it.

Mars or Bust Project iLEAD 2021 Application Challenge Due February 15

Challenge

Using your knowledge about Mars and items you have around the house, create a prototype for a structure that will be necessary to support life on the Red Planet. If possible, make a connection between your future pathway at iLEAD Academy and the structure you design. For example, if you are interested in the nursing or biomed pathway, you will want to address the health needs of the new citizens of Mars.

For the purposes of this Challenge, structures include: buildings, transportation systems, and facilities that will need to be specially designed to support human life on Mars.

Time

You will have about 48 hours to complete this challenge, meaning it is due Wednesday, March 25 (submission details below). You should research the Red Planet **using the provided fact sheet**. (You may access other resources but that is optional).

The Scene

NASA is about to send the first human spaceflight to Mars, but the buildings, cars, and other structures here on Earth aren't well suited to the harsh conditions on Mars. Variations in temperature, gravitational pull, atmospheric composition, and terrain all create unique challenges for construction. Your challenge is to create a prototype of a new structure more suitable for the Red Planet.

Possible Materials (*List below is just to provide ideas. We understand you may not have any of these items at your house. Make your creation out of ANYTHING you have. Your goal is to show your understanding of Mars, demonstrate creativity & connect to your pathway*)

- mailing labels
- paper
- pipe cleaners
- popsicle sticks
- straws

Helpful (but optional)resources:

- <https://support.google.com/youtube/answer/161805?co=GENIE.Platform%3DiOS&hl=en&oco=1>
- <https://www.nasa.gov/topics/moon-to-mars>
- https://www.nasa.gov/mission_pages/mars/main/index.html
- There is an article on the last two pages of this document that can be used for research if you do not have access to the internet

Presentation

Choice #1: *(preferred if you have internet access)* Each student will create a video and upload it to YouTube to present the prototype to the judging panel at iLEAD. The video should include an introduction (name, pathway, and county), an explanation of the structure making sure to explain its form and function on Mars, and how it is uniquely suited to help humans sustain life on Mars. Be sure to include information from the research portion of the Challenge and state how it relates to your future pathway at iLEAD Academy.

Choice #2: *(for those without internet)* Each student will take a picture of the prototype and write a “script” for the presentation. The script should include an introduction (name, pathway, and county), an explanation of the structure making sure to explain its form and function on Mars, and how it is uniquely suited to help humans sustain life on Mars. Be sure to include information from the research portion of the Challenge and state how it relates to your future pathway at iLEAD Academy.

Rubric

	1 “Uh, no”	2 “Okay”	3 “Yes!”
Knowledge of Mars	Does not include information about the 4 construction challenges (temperature, gravitational pull, atmospheric composition, terrain).	Includes information about 1 or 2 of the construction challenges	Includes information about 3 or 4 of the construction challenges
Creativity	Idea(s) and use of materials are expected.	Idea(s) or use of materials are unexpected.	Idea(s) and use of materials are unexpected.
Connection to Pathway	Does not address a pathway-related issue or addresses one in a cursory manner.	Clearly identifies a legitimate “life on Mars” issue related to his/her pathway, but does not address it with his/her design.	Clearly identifies a legitimate “life on Mars” issue related to his/her pathway, and addresses it with his/her design
Presentation Skills	Presentation is not well-organized (rambles)	Presentation is organized enough to be coherent	Presentation is well-organized.

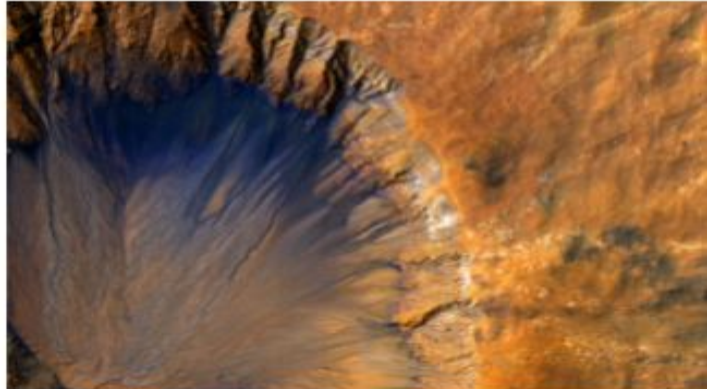
RESEARCH MATERIALS

Since our first close-up picture of Mars in 1965, spacecraft voyages to the Red Planet have revealed a world strangely familiar, yet different enough to challenge our perceptions of what makes a planet work. Every time we feel close to understanding Mars, new discoveries send us straight back to the drawing board to revise existing theories.

You'd think Mars would be easier to understand. Like Earth, Mars has polar ice caps and clouds in its atmosphere, seasonal weather patterns, volcanoes, canyons and other recognizable features. However, conditions on Mars vary wildly from what we know on our own planet.

Over the past three decades, spacecraft have shown us that Mars is rocky, cold, and sterile beneath its hazy, pink sky. We've discovered

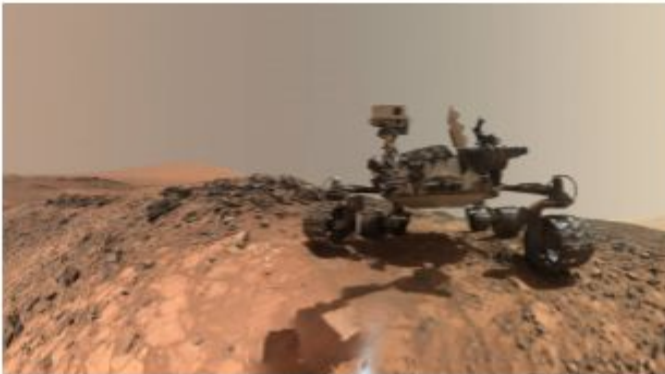
that today's Martian wasteland hints at a formerly volatile world where volcanoes once raged, meteors plowed deep craters, and flash floods rushed over the land. Mars continues to throw out new enticements with each landing or orbital pass made by our spacecraft.



Close-up image of a "fresh" (on a geological scale, though quite old on a human scale) impact crater in the Sirenum Fossae region of Mars on March 30, 2015. This impact crater appears relatively recent as it has a sharp rim and well-preserved ejecta.

Mars is a rich destination for scientific discovery and robotic and human exploration as we expand our presence into the solar system. Its formation and evolution are comparable to Earth, helping us learn more about our own planet's history and future. Mars had conditions suitable for life in its past. Future exploration could uncover evidence of life, answering one of the fundamental mysteries of the cosmos: Does life exist beyond Earth?

While robotic explorers have studied Mars for more than 40 years, NASA's path for the human exploration of



This low-angle self-portrait of NASA's Curiosity Mars rover shows the vehicle at the site from which it reached down to drill into a rock target called "Buckskin" on lower Mount Sharp.

Mars begins in low-Earth orbit aboard the International Space Station. Astronauts on the orbiting laboratory are helping us prove many of the technologies and communications systems needed for human missions to deep space, including Mars. The space station also advances our understanding of how the body changes in space and how to protect astronaut health. Our next step is deep space, where NASA will send a robotic mission to capture and redirect an asteroid to orbit the moon.

Astronauts aboard the Orion spacecraft will explore the asteroid in the 2020s, returning to Earth with samples. The experience in human spaceflight beyond low-Earth orbit will help NASA test new systems and capabilities, such as Solar Electric Propulsion, which we'll need to send cargo as part of human missions to Mars. NASA's powerful Space Launch System rocket will enable these "proving ground" missions to test new capabilities. Human missions to Mars will rely on Orion and an evolved version of SLS that will be the most powerful launch vehicle ever flown.

A fleet of robotic spacecraft and rovers already are on and around Mars, dramatically increasing our knowledge about the Red Planet and paving the way for the future human explorers. The Mars Science Laboratory Curiosity rover measured radiation on the way to Mars and is sending back radiation data from the surface. Future missions like the Mars 2020 rover, seeking signs of past life, also will demonstrate new technologies that could help astronauts survive on Mars.

Engineers and scientists around the country are working hard to develop the technologies astronauts will use to one day live and work on Mars, and safely return home from the next giant leap for humanity. NASA also is a leader in a Global Exploration Roadmap, working with international partners and the US commercial space industry on a coordinated expansion of human presence into the solar system, with human missions to the surface of Mars as the driving goal.



Once you have completed your project and essay questions, you can submit your application using the following link: <https://forms.gle/5RepENXkVTp7art56>