

Mission to Mars!



This series of lessons was designed to meet the needs of gifted children for extension beyond the standard curriculum with the greatest ease of use for the educator. The lessons may be given to the students for individual self-guided work, or they may be taught in a classroom or a home-school setting.

Introduction

Did you know the first people to live on Mars have already been born? There are many organizations throughout the world working hard to plan a Mars colonization. But there is a lot of work to be done to make this a reality. Maybe by the time humans first set foot on Mars, you will be among them!

Learning Objectives

After completing the lessons in this unit, students will be able to:

- Explain the [risks/rewards](#) of a Mars colonization
- Examine personality traits required of the first Martian explorers
- Identify the [physical characteristics of Mars](#) including the [location, climate, geographical features, atmosphere, and surface](#)
- Discuss the [spacecraft that have explored Mars](#) and what information we learned about Mars from them
- Identify and understand [what a new Martian colony would need](#) for human survival
- Generate high-quality questions requiring high-level thinking and skills in order to answer questions
- Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue
- Conduct short, as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation
- Draw evidence from literary or informational texts to support analysis, reflection, and research
- Design and create ideas based on research
- Write a well-developed paragraph

Lesson 1: Why Mars?

Humans have an unlimited capacity for curiosity. We are always looking for a new place to explore. Since the dawn of time, people have looked up at the sky and wondered what was out there. Today, as our natural curiosity continues to persist, humans are looking for the next great adventure. Why would we choose Mars? Are you ready to venture together into the next great unknown territory?

TO DO:

- Brainstorm these questions together:
 - Why would people want to go to Mars?
 - What are [some challenges](#) we will face?
- Create a three-column table. In the first column, list everything you know about Mars. In the second column, list everything you'd like to learn about Mars. And in the third column, list the new things you learn throughout this unit.
- Research time! Using websites, books, and videos, find out why Mars would be a good choice for a human colony. Make sure you also research some of the dangers involved.
- Create an advertisement to persuade volunteers to join the Mars Colonization movement. Include the risks they may face. Your ad may be formatted for a magazine or it may be a television commercial.

Lesson 2: What it takes



The global search has begun for the first humans to set foot on Mars and make it their home. It will be important these first settlers have the qualities that will set them up for a successful colony on Mars. What character traits do you think would be essential for this endeavor? How would you [build a community of settlers](#) who could work together to create a viable Martian colony?

TO DO:

- List some qualities you think would be important for these astronauts to possess in order to have a successful mission. Why are they important?
- What types of professionals would need to be on your team? Doctors? Scientists? What other professions would you need? Why?
- What does it mean to be a pioneer? Research eras in history when people explored and settled a new territory. Compare the qualities, strengths, and

talents of these pioneers to those of future Martian explorers.

- Using websites, books, articles, and/or videos, research how astronauts train for missions.
- Draw on paper (or using a drawing app) a cartoon character of yourself on Mars. In the representation, indicate which traits and strengths you have that will help you succeed. Do you have the qualities necessary to be a pioneer on Mars? Why or why not?

Lesson 3: Are you curious?

People have been curious about Mars for many years — so curious, in fact, that NASA has [sent many spacecraft](#) to Mars to find out more about it! Each spacecraft has had a different job, and each one has its own unique personality. NASA is preparing to send a new rover to explore the possibility of life on Mars, both past and future. This rover doesn't have a name yet. What would you name the new spacecraft?



TO DO:

- Think of 3 unanswered questions you have about Mars. List the questions.
- Create a spacecraft whose purpose is to answer your 3 questions using only foil, three pipe cleaners, a styrofoam ball, two paperclips, a paper plate, a marker, two mailing labels, two rubber bands, and 10 toothpicks.
- Present the craft to your classmates. In your presentation, include a hook, a description of each of the three parts and how they will answer your questions, and a closing statement that leaves your classmates inspired.
- Watch videos of various spacecraft landings on Mars and look for their Twitter accounts ([NASA New Horizons](#), [NASA Juno](#), [Curiosity Rover](#), [Cassini Saturn](#), [NASA Dawn](#)).

Lesson 4: Mars 101

If you are planning to colonize Mars, you probably need to know all about your new home. In this part of the unit, you will be a research scientist. Start a research notebook and learn all you can about your new home.

TO DO:

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| <ul style="list-style-type: none"> ● Where is Mars in the universe? ● Why is Mars red? ● Describe the moons of Mars. ● What is the Martian atmosphere like? | <ul style="list-style-type: none"> ● What landforms are found on Mars? Do they have names? ● What makes up the soil on Mars? ● What is the climate like on Mars? | <ul style="list-style-type: none"> ● How long is a day? A year? ● Add any other information that you think is important to a Mars researcher. |
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Lesson 5: Mars or bust!

Since you are now an expert on Mars, it's time to plan your colony! You must decide what your colony will need and then create a blueprint for the colony. You never know, maybe NASA will use your blueprint when it is finally ready to blast off to Mars.



TO DO:

- First, you must decide where on Mars you will build your colony. Using what you know about Mars, [choose the perfect spot](#). Why is your location the most advantageous for your colony?
- Brainstorm what your colony will need. Consider an [energy source](#), [living space](#), [food](#), [water](#), [breathing](#), communication, and transportation. Can you think of anything else you'll need? Who will make the rules in your colony? How will the children be educated?
- Choose one of your items from the above list to explore. List the questions you have about that item.

For example, if you are researching food, you may ask: How can we grow food on Mars or what types of food are necessary to be healthy?

- Now research the best way to develop the area that you are responsible for in your colony.
- Once you've chosen your idea, for example, hydroponics, you can sketch and label your design. You will collaborate with others to combine your areas so your colony is in good working order.
- Now ... build your colony! Using recycled materials such as plastic containers and paper towel rolls, build a model of your Martian colony. Don't forget to give it a name!

Can't get enough of Mars?

EXTENSION ACTIVITIES:

- Calculate the cost of a Mars colonization
- Design a system of government for this new colony
- Write a science fiction story about your journey to Mars or what (or who) you found when you arrived
- Write a persuasive letter to the president about why we should colonize Mars
- Sketch a Martian home (transportation system, bridge, recreation area, etc.) to scale
- Create a new language that everyone on Mars can use
- Make a travel guide/brochure/map to assist visitors to your colony
- Create a commercial or poster to advertise your colony