

# SUMMER OF MARS

## Dear Educator,

The first person who will set foot on Mars has already been born. Will it be one of your students?

Beginning this summer, your students can become Future Space Explorers at the *Summer of Mars* celebration at Kennedy Space Center Visitor Complex. There, they and their families can launch themselves into the excitement of visiting an active spaceport where immersive experiences get you closer to NASA and space exploration than anywhere else on the planet.

Best of all, for incoming fifth-grade students, admission is free!

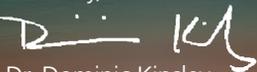
You can ready your students for this once-in-a-lifetime adventure with the activities in this free program created by the curriculum experts at Young Minds Inspired (YMI). Aligned with Next Generation Science Standards, these NASA-approved activities are designed to seamlessly integrate with and enhance your science curriculum, supporting deeper-level thinking skills and stimulating discussion about real-world issues and the future of space exploration.

This adventure, however, is not just for incoming fifth-grade students and their families. During National Teacher Appreciation Week, May 1-5, all teachers can request free Educator Study Passes at [KennedySpaceCenter.com/SummerOfMars](http://KennedySpaceCenter.com/SummerOfMars), as well as enter for a chance to win an astronaut to visit your school!

So join the journey at the gateway to NASA's past, present, and bold future by sharing this program with other teachers in your school.

Please comment online at [ymiclassroom.com/feedback-SummerOfMars](http://ymiclassroom.com/feedback-SummerOfMars) to let us know your thoughts on this program. We look forward to hearing from you.

Sincerely,



Dr. Dominic Kinsley  
Editor in Chief  
Young Minds Inspired



## TARGET AUDIENCE

Incoming fifth-grade students and their families.

## OBJECTIVES

- Stimulate student interest in science and space exploration.
- Promote interest in attending the *Summer of Mars* at Kennedy Space Center Visitor Complex.
- Integrate STEM-based activities into real-world experiences that lay the groundwork for students' future life experiences.

## PROGRAM COMPONENTS

- This two-page teacher's guide.
- Two reproducible activity sheets and a take-home letter.
- Dedicated microsite at [ymiclassroom.com/SummerOfMars](http://ymiclassroom.com/SummerOfMars) with standards alignment and links to free NASA resources.

## HOW TO USE THIS PROGRAM

Download and photocopy this teacher's guide and the reproducible activities, and have students share the take-home letter with their families. Prepare the materials for each activity in advance.

TEACHERS, RECEIVE FREE ADMISSION DURING NATIONAL TEACHER APPRECIATION WEEK, MAY 1-5, AND ENTER FOR THE CHANCE TO WIN AN ASTRONAUT VISIT TO YOUR SCHOOL!

## ACTIVITY 1

### JOURNEY TO MARS: EXPLORERS WANTED

**Materials needed:** Pencils, activity sheets. For the Mars habitats, materials may vary. Cardboard, cardstock, masking tape, plastic drinking straws, coffee filters, aluminum foil, empty egg cartons, empty milk cartons, fabric scraps, dried pasta, marshmallows, and other similar materials could be used. Plan on two classroom sessions for this activity.

Introduce students to the concept of exploration by asking them to share places they would like to explore and careers that rely on exploration. Prompt them to name being an astronaut as one option and the Moon, space, and other planets as places that astronauts explore.

Now tell students that NASA is planning on exploring Mars and that the first person to step on the red planet has already been born; maybe it will be one of them! Use a computer and projector to show the posters featured on <http://mars.nasa.gov/multimedia/resources/mars-posters-explorers-wanted/>, or print them out and share them with students.

Explain that NASA has been studying Mars for over 50 years, and that it will take several more years before we can send humans to Mars. Show students the video at [www.nasa.gov/mission\\_pages/mars/videos/index.html](http://www.nasa.gov/mission_pages/mars/videos/index.html) and point out that Mars exploration has progressed from flybys, to orbiting probes, to landers, to rovers. The next step is to send humans, which is planned for the 2030s. Ask students how old they will be then and have them raise their hands if they think they would like to be a Mars explorer.

Distribute the activity sheets and read the introduction about life on Mars together. Ask students to write about the challenges they think they would face if they were astronauts living on Mars and share some of their answers.

Use your projector to show students the PowerPoint at [http://mars.nasa.gov/participate/marsforeducators/soi/resources/MarsSOI2012\\_Lesson4\\_pres1.ppt](http://mars.nasa.gov/participate/marsforeducators/soi/resources/MarsSOI2012_Lesson4_pres1.ppt), and discuss each slide as you show it. Then divide students into groups of 3 or 4. Using the materials suggested above, challenge students to create a model of a "Mars habitat" suitable for two people that meets the requirements listed on the activity sheet. Encourage creativity and allow them to "invent" technology that perhaps doesn't exist yet. Students should also write about each Mars habitat requirement on the back of the sheet. Then, have them share their habitats with the rest of the class.

**Extension activity:** Challenge students to design and draw spacesuits that would protect them from the Martian atmosphere.

## ACTIVITY 2

### EXPLORING MARS

**Materials needed:** Pencils, activity sheets. For the model rovers, give each group 6 donut-shaped candies (such as Life Savers®), 6 plastic drinking straws, 2 pieces of cardboard about 8.5" x 11", a roll of masking tape, scissors, a small paper cup, and 6 mini marshmallows, or about enough to almost fill the cup. You will also need a long piece of cardboard or plywood for the ramp, and textbooks to lift it.

Ask students to think back to the video they saw in the first lesson and share some of the ways the probes and rovers landed on Mars (cushioned by balloons and bouncing, landing via parachute, slowed down by jets, lowered gently to the ground). Tell students that this year is the 20th anniversary of the rovers and remind them that in 20 more years, humans themselves might be "roving" around Mars!

But what exactly is a rover? Tell students that a rover is a moving robot designed to explore and learn. Use a computer and projector to view these sites for information about the Mars rovers:

- <https://spaceplace.nasa.gov/mars-sojourner/en/>
- <https://spaceplace.nasa.gov/mars-spirit-opportunity/en/>
- <https://spaceplace.nasa.gov/mars-curiosity/en/>

After viewing each, ask students to share what they learned. Point out that one common denominator is water. Thinking back to their last lesson, why do students think scientists are so interested in water on Mars? Tell them that a new, more advanced rover will launch in 2020. Go to <https://spaceplace.nasa.gov/mars-2020/en/> and discuss how this rover will be different from the previous rovers.

Distribute the activity sheets and read the description of the Curiosity together. Ask students to look at the drawing and write what they think each numbered part does on the lines provided. Then, have students work in groups of 3 or 4 to build their own Mars rovers. The rover must roll down a cardboard ramp and across a line on the floor (or table) without spilling its important scientific equipment (the mini marshmallows). Students can build it anyway they want, but they cannot cover the cup; the rover must roll smoothly enough not to spill the marshmallows. Once all of the rovers are built, test them out on the ramp.

## TAKE-HOME LETTER

Distribute copies of the take-home letter and tell students that this can be their own invitation to their parents or guardians to visit Kennedy Space Center Visitor Complex as a fun family *Summer of Mars* experience. Have students sign the letter and take it home. Be sure students are aware of the opportunity to win a trip there to enjoy the new Astronaut Training Experience and Mars Base 1, opening this fall.



Questions?  
Contact YMI toll-free at 1-800-859-8005 or by  
email at [feedback@ymiclassroom.com](mailto:feedback@ymiclassroom.com)

# JOURNEY TO MARS: EXPLORERS WANTED

Would you like to be one of the first people on Mars? NASA plans to send humans to Mars in your lifetime! Mars is Earth's neighbor and is habitable—with limits. First of all, the temperature on Mars fluctuates between  $-195^{\circ}\text{F}$  at its coldest to about  $70^{\circ}\text{F}$  at its warmest. The air contains only trace amounts of oxygen. The soil is toxic, and the planet is very dusty—so dusty and windy, in fact, that giant dust storms can block out the sun for months! Although water has not been discovered on the surface of Mars, scientists are pretty sure frozen water exists below the surface, perhaps very far below.

One thing is for sure—life on Mars would be a challenging adventure! If you get a chance to visit during the *Summer of Mars* at Kennedy Space Center Visitor Complex this summer, you could become one of the Future Space Explorers destined to explore and discover this fascinating planet.

What are some of the problems humans have to solve before we can live on Mars?

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Now, listen carefully to your teacher's presentation and to the instructions for your group project to design a Mars habitat that should include the following:

- A place to live
- Two ways to collect energy
- A place where you collect water
- A place where you grow food

On the back of this sheet, give your Mars habitat a name and write about how you would power it, how you would collect water, and how you would grow food.



Explore more! Visit [KennedySpaceCenter.com/SummerOfMars](http://KennedySpaceCenter.com/SummerOfMars) to learn more about the *Summer of Mars* and enter to win a family trip to Kennedy Space Center Visitor Complex to experience the new Astronaut Training Experience and Mars Base 1 opening this fall!

**Share the take-home letter with your family.**

# EXPLORING MARS

Curiosity is NASA's newest Mars rover, launched in 2011. Take a look at the picture of Curiosity below. Using the word bank, label the parts of the rover, and then write what you think each part does, based on what you learned from the video.

**Word Bank**  
 arm  
 body  
 neck/head  
 wheels  
 hand

Now follow your teacher's instructions to build a model Mars rover. The rover should be able to roll down a slope without dislodging its valuable scientific equipment, represented by mini marshmallows. You may only use the items given to you to build the rover.



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**Share the take-home letter with your family.**

# SUMMER OF MARS

**Dear Family,**

The beach is nice, and camping is always fun, but let's go on a REAL adventure this summer! How about a free trip to Mars?

Let's go to Kennedy Space Center Visitor Complex, where I can experience the opportunity to be a Future Space Explorer! I can come face-to-face with veteran astronauts and better understand space through their eyes and their true-life experiences.



Take me to where I can get an up-close look at the spacecraft that took us to new frontiers. Show me a real space shuttle, and let me learn about the story of our country's history of space exploration: How the Mercury and Gemini missions blazed a trail for American space travel, and how the Apollo missions inspired a generation. Let me gaze upon the mighty rocket that won the race to the moon—fulfilling the dreams and imagination of humankind.

Then, let's take the next giant leap together and explore the future of interplanetary space travel! Show me all the engaging, exciting, and educational activities the *Summer of Mars* has to offer.

**Let's go to Kennedy Space Center Visitor Complex in Florida and get my free ticket to Mars!**

Signed \_\_\_\_\_

# SUMMER OF MARS

**Parents:** Remember when Mars was a mystery? In one lifetime, we've gone from gazing at our mysterious neighbor to guiding rovers across its surface—and next, we will send humans to Mars! At the *Summer of Mars*, you can explore Mars with your family and even see what it might be like to live on Mars! Visit [KennedySpaceCenter.com/SummerOfMars](http://KennedySpaceCenter.com/SummerOfMars) to register for a free pass for your child, and enter to win a trip to Kennedy Space Center Visitor Complex to experience the new Astronaut Training Experience and Mars Base 1 opening this fall!

**MARS NEEDS YOU!**

**YOUR TICKET TO ADVENTURE AWAITS! DON'T MISS OUT ON THIS CHANCE OF A LIFETIME!**

ADMIT ONE

NASA | Kennedy Space Center VISITOR COMPLEX

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Not an actual ticket. Register in advance at [KennedySpaceCenter.com/SummerOfMars](http://KennedySpaceCenter.com/SummerOfMars) to download your free ticket.