

# JOBS IN SPACE

Every crew member does an important task to help the team! If you went on a mission to Mars, which job would you want to do?



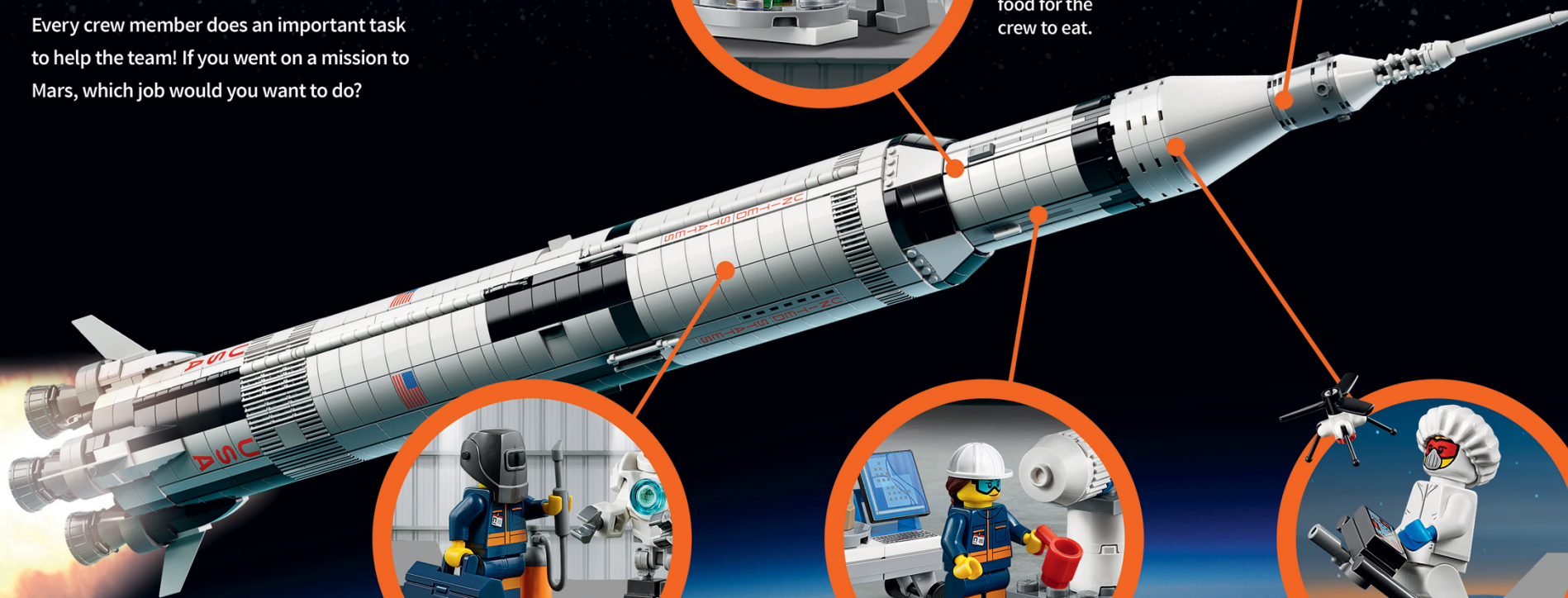
## SCIENTIST

This scientist is a plant expert who grows food for the crew to eat.



## ASTRONAUT

Astronauts fly the spaceship and explore other planets. They train for many years to do this important job.



## WELDER

A welder uses a special torch to repair broken parts on robots and the spaceship.



## ROCKET ENGINEER

These workers make sure that the rocket engine keeps running.



## DRONE PILOT

On Mars, a machine called a drone can see areas that humans can't reach. A pilot operates it with a controller.

## A JOB FOR EVERYONE!

There are lots of other jobs for people who travel to Mars in the future. You could be a doctor, farmer, engineer, teacher, or surveyor in space!



# PASSPORT TO SPACE

## Space Adventurers

Teach students about jobs in space—and let them imagine their own out-of-this-world career.



### Objective

Students will read nonfiction text about space careers and answer questions using evidence from the text.

### Time

40 minutes

### Materials

Super Space Careers  
reading passage  
What's Your Space Job?  
activity sheet

### Directions

- 1 Project (or print and distribute) image of an astronaut-controlled robotic arm found at [go.nasa.gov/2Zovt1M](http://go.nasa.gov/2Zovt1M).
- 2 Ask: *Can you guess where this picture was taken?* (From the International Space Station [ISS] in orbit.) Ask how they think the spacecraft got into orbit. Explain that the parts or modules of the ISS were sent up on rockets and assembled in space.
- 3 Initiate a class discussion about who might be inside the ISS operating the equipment (a team of astronauts).
- 4 Point out the robotic arm. Explain that the cargo craft was sent into space to bring supplies. The robotic arm was used to capture the cargo craft and keep it near the ISS. Ask: *Why do you think the crew didn't go outside to capture the craft?* (Spacewalks are dangerous and it's safer to use the robotic arm.)
- 5 Tell students they're going to read a passage to learn about careers in space. Distribute the passage and activity sheet to the class.
- 6 After students have finished, review answers as a class. Then provide time for students to make their own ISS ID cards. They should draw themselves on the front, label the ID with their job, and describe their skills and tasks on the back of the card. **Then, check out our other space-inspired lessons online!**

## CHANCE TO SEND A KID TO SPACE CAMP®!

As part of its Let's Go initiative, LEGO is sending 50 kids from



Title I schools to Space Camp® in summer 2020! Nominate your students for this amazing experience at [scholastic.com/explorespace](http://scholastic.com/explorespace).

**Nominating teachers of the 50 winners receive \$200!**



CONTEST: NO PURCHASE NECESSARY TO ENTER OR WIN. Void where prohibited. Open only to teachers in a Title I public school in the 50 United States (or the District of Columbia), who are 18+ and who teach students ages 6–11 who are enrolled as of the time of the teacher's entry. The teachers and students must be residents of the United States. Deadline: Entries must be submitted between 12:01 a.m. ET on August 30, 2019, and 11:59 p.m. ET on October 18, 2019. Winning students and at least one accompanying parent/legal guardian will receive a trip to Space Camp in Huntsville, Alabama. Students must be at least 7 years old to attend Space Camp. Approximate retail value of each winning prize package shall not exceed \$5,500. Nominating teachers of winning students will each receive \$200. Visit [scholastic.com/explorespace/officialrules](http://scholastic.com/explorespace/officialrules) for complete Official Rules and restrictions.

# Super Space Careers

Do you think it would be awesome to work in outer space someday? By the time you're grown up, there will be missions to space stations, the moon, and Mars. Read on to learn about the real-life skills you might need for a job in space!

**ROCKET ENGINEERS** design rockets and other spacecraft.

**Science they use:** Rocket engineers create rockets that can escape Earth's gravity (that's the force that pulls objects down). Rockets work using a process called **propulsion** to fly into outer space. If you've ever let go of a balloon you've blown up, you've seen propulsion at work. Air escaping from the end of the balloon moves it forward in the opposite direction. A rocket basically does the same thing to fly into space.

**Problems they solve:** Rocket engineers have to design spacecraft that doesn't carry extra weight or air resistance and is safe and effective.

**Skills:** Working with advanced computers; coding; writing reports; geometry and physics; teamwork.

**ASTRONAUTS** travel into space to complete missions.

**Science they use:** Astronauts use science and engineering skills



to conduct experiments while they're in space. But they spend most of their time on Earth, training or helping

other astronauts from the ground.

**Problems they solve:** During training, they must learn how to survive and work in space. They use special equipment called **simulators** that make it feel like they're in space.

**Skills:** Engineering and operating spacecraft; calculus and algebra; physical fitness; collaboration.

**ROBOTICS ENGINEERS** design, test, and build robots.

**Science they use:**

These engineers create robots (machines

that do dangerous or hard jobs) and computer software to perform important tasks in outer space.

**Problems they solve:** Robotics engineers make it easier for astronauts to explore parts of space that aren't safe for humans. They also solve other space challenges, like creating a robotic arm to help an astronaut lift heavy equipment.

**Skills:** Working with computer design programs; coding; algebra and calculus; critical thinking; problem-solving.



Name \_\_\_\_\_

# What's Your Space Job?

Read "Super Space Careers," then use information from the text to fill in the chart below.

## Define these jobs

## Problems they solve

### Rocket Engineer



### Robotics Engineer



### Astronaut



Write answers to these questions on the back of this page.

1. Which job interests you the most? Why?
2. What skills will you need?
3. What could you do to start practicing those skills?



# Out-of-This-World Informational Texts

Introduce your students to the future of space travel as they analyze reading passages and space vocabulary.



## Objective

Students use text features and visual information to learn about a spaceship's interior, and infer the meaning of space-related vocabulary words.

## Standards (CCSS)

**Gr. 2–4: RI.7:** Use diagrams to explain text

**Gr. 2–5: RI.1:** Use text details to answer questions

**RI.5:** Use text features and/or structure

**L.4:** Determine the meaning of unknown words

## Time

**Part A:** 40 minutes

**Part B:** 40 minutes

## Materials

Take a Tour of a Spaceship reading passage

► Passage A: Gr. 2–3

► Passage B: Gr. 4–5

What's in a Spaceship activity sheet (Gr. 2–3)

Use Diagrams to Explore Space activity sheet (Gr. 4–5)

Exploring Mars reading passage

► Passage A: Gr. 2–3

► Passage B: Gr. 4–5



## Part A

### Exploring the Inside of a Spaceship

**1** Hook students by asking how they would survive if they were able to travel to space. Where would they sleep? How would they stay clean in space?

**2** Explain that students will read an informational article about the interior of a spaceship.

**3** Distribute the Take a Tour of a Spaceship reading passage for students' grade level and preview its structure.

#### **4** Grades 2–3:

- Review the text features that help students understand informational texts, including headings, bold words, and captions.
- Have students act out different text features as a class (e.g., jumping and waving to represent the prominence of a heading).

#### **Grades 4–5:**

- Describe in words a device with many parts, like a washing machine or a hairdryer. Ask students if they understand what you're describing. Show a picture and ask again. Emphasize that visuals and diagrams can be important for comprehension.

**5** Distribute the activity sheet for students' grade level.

**6** Have students read the article and complete the activity sheet to guide their analysis of the text.

## Part B

### Building Vocabulary on Mars

**1** Ask students to imagine they have landed on Mars. What do they think they'll see? How will they feel? What would they need to survive? Explain that they will be investigating facts about Mars and learning new vocabulary.

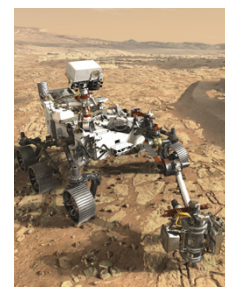
**2** Distribute the Exploring Mars reading passage for students' grade level. Read the article as a class, stopping to infer the meaning of the space vocabulary words.

**3** Discuss what students learned about life on Mars from reading the article. Ask: *Would you want to visit Mars? Why or why not?*

**4** Guide students in creating a vocabulary graphic organizer for a selection of the bold words in the passage. Include the definition, an example, a non-example, and a drawing (Frayer model organizer). If you have time, challenge students to find creative ways to act out the words.

**5** Ask questions using the space-related vocabulary words (e.g., When would you use a sensor?).

**6** Have students select two space vocabulary words from the list and write a sentence using both. You can challenge students to include a certain mood in their space sentence: exciting, silly, scary, etc.



## EXTENSION

**SPACE FICTION** Challenge students to use what they learned to write a story featuring at least two space vocabulary words, two parts of a spaceship, and two space careers!

**PASSPORT TO  
SPACE**

# Take a Tour of a Spaceship

What's it like to live inside a rocket that is zooming high above the Earth?  
Read on to find out!

**R**ockets once took astronauts to the moon. Now the U.S. is preparing to go back to the moon, and even to Mars. While traveling through space, the astronauts will need to work, eat, and sleep in tight quarters. The high-tech spacecraft that blasts them into space is specially built to keep them safe as they complete their mission and return home.

## Inside a spacecraft, you might see:

**FOLDAWAY SEATS** There are four seats in the spaceship: the commander and pilot sit in the front row facing a control panel. Two more astronauts sit directly behind them. They are strapped in on their backs for blastoff, and the seats fold away once they're in orbit so they have more room.

**CONTROL PANEL** How do astronauts drive the spaceship? By computer, mostly. With the help of touch-screen monitors, they direct the ship, monitor its electrical systems, and communicate with Earth.

**DOCKING HATCH** Astronauts wiggle into the spaceship through an opening at the top, the same hatch they use to let robot landers out to explore the moon or Mars. The hatch also helps the ship dock onto a larger space station.

**HAND CONTROLLERS** The crew uses these to pilot the ship once they're in space.

**SLEEPING BAGS** Astronauts sleep inside sleeping bags, which they attach to the wall to keep themselves from floating into each other while they snooze! In



Astronauts working in an Orion test module.

space, they can sleep straight up or upside down—because they are floating in almost no gravity (called microgravity).

**PERSONAL HYGIENE KIT** It includes a hairbrush (even though your hair will stick straight up in microgravity) and a toothbrush. Toothpaste is so thick that it sticks to a toothbrush in space, but water comes out of a hose in bubbles that astronauts catch with their mouths!

**SPACE TOILET** The toilet is a small camping-style unit with a privacy curtain. At its side is a hose with a funnel at the end for collecting urine. Both have suction to move the waste away.

**TRASH CANS** Astronauts have chores in space, and that includes taking out the garbage. They use a lot of wet wipes to clean both themselves and the spaceship.

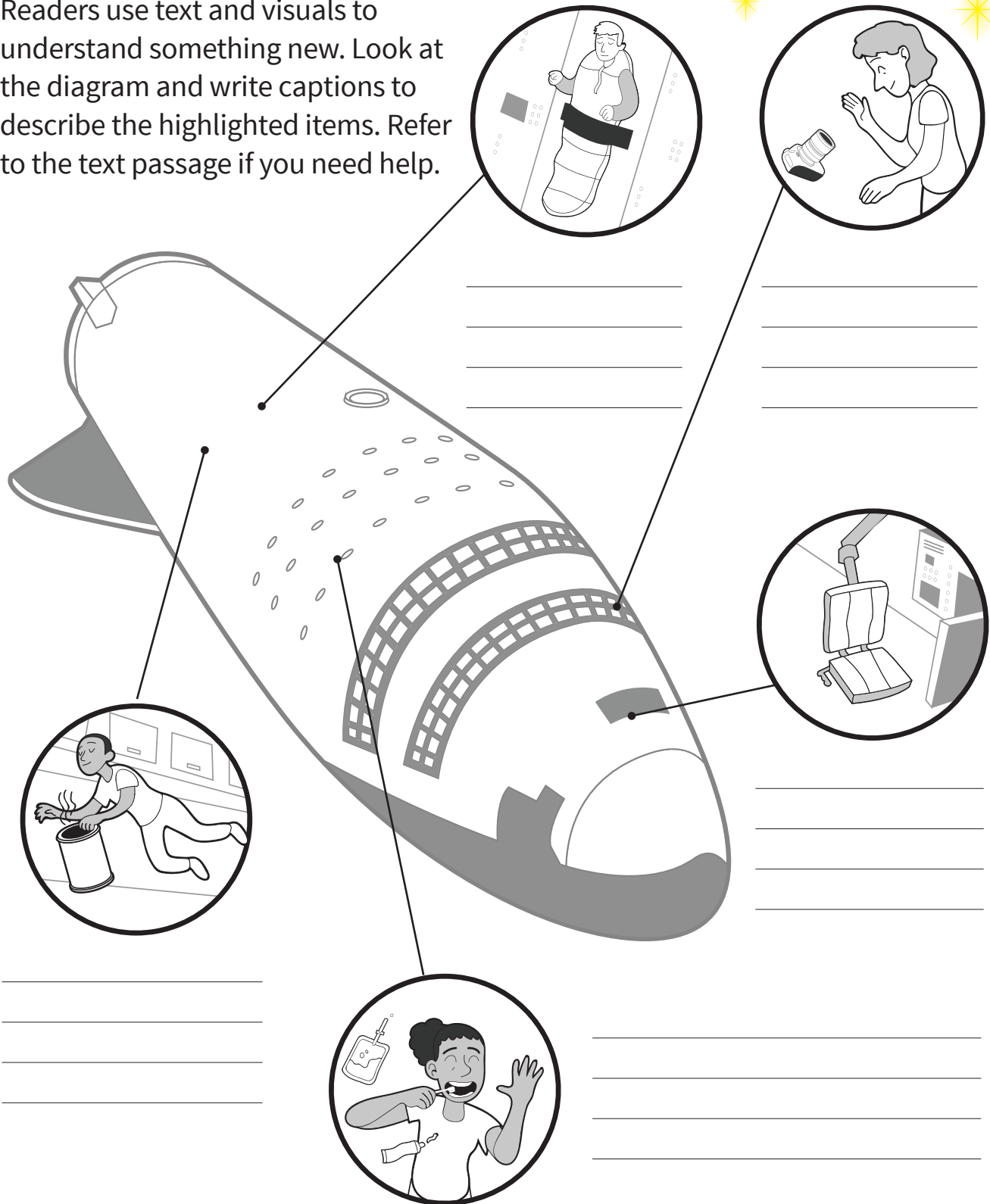
**VIDEO CAMERA** It lets astronauts chat with people back on Earth, including their family and friends!



Name \_\_\_\_\_

# Use Diagrams to Explore Space

Readers use text and visuals to understand something new. Look at the diagram and write captions to describe the highlighted items. Refer to the text passage if you need help.



# Exploring Mars

What's it really like on the red planet? With the help of cutting-edge robots, we'll find out soon!

Is there life on Mars? Could people actually live there one day? These are questions that America's space program, called NASA, wants to answer. It's been 50 years since an astronaut walked on the moon. Now NASA is eager to get back there, and to send robots all the way to Mars to explore.

In 2020, Mars and Earth will be **orbiting** close to one another, like they do every couple of years, and several countries are planning to send **rovers** to find out more about the Red Planet, named for the rusty red dust on its surface. (Sometimes the dust blows into the planet's **atmosphere**, making the sky look pink!) It's a big trip: The U.S. rover, called Mars 2020, will **launch** in July 2020, but won't land on Mars until February 2021!

## What A Rover Looks Like

Mars 2020 is about the size of a car at 10 feet long, nine feet wide, and seven feet tall. This rover is tough, which is important. (An older spacecraft got its **probe** stuck while trying to burrow into Martian soil for samples.) It has six rugged wheels, each with its own motor, to take it over Mars's rough, dry surface, which is covered with craters and old volcanoes. It also has the most powerful **robotic arm** ever built for a rover. This adaptable arm can withstand the extreme temperature changes and heavy dust on Mars.



The Mars 2020 rover has a powerful robotic arm.

The rover's assortment of instruments includes a drill at the end of its robotic arm to dig for soil samples that astronauts will collect and bring back to Earth; an advanced camera system; **sensors** to test temperature, wind speed, and direction; and a high-tech X ray tool to analyze the chemical makeup of rocks at a fine scale.

## What's Next?

While NASA is getting ready to launch Mars 2020, it is also testing and preparing its newest spacecraft, called Orion, to take humans to the moon and to Mars. But that won't happen until sometime in the 2030s. First, we need to learn much more about this mysterious planet. If its **hostile** environment can support people, maybe one day when you're older you'll be able to visit Mars!