



The Mini Page

Betty Debnam, Founding Editor and Editor at Large



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Launching a New Age of Exploration

What's Up in Space?

The residents of Earth share a dream of exploring the lands and skies far from our home planet. Government groups and private industries are joining forces to launch a new chapter in the Space Age.

More than 100 countries have some type of space program. The world has come together in space.

To learn more about current and future missions, The Mini Page talked with experts from NASA.

NASA tests the engine of a new Space Launch System, or SLS, for sending Orion into deep space. Its first flight test will be about 2018. In 2021, the SLS will launch Orion with a crew on board.



photo courtesy NASA

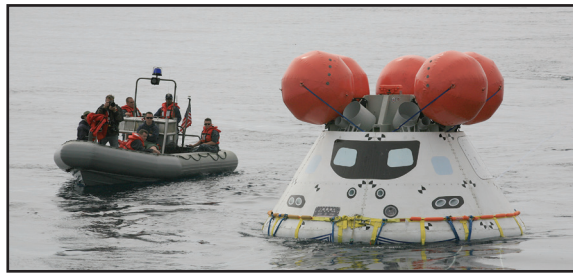


photo by Kim Shifflett, courtesy NASA

U.S. Navy personnel approach an Orion test module to practice Orion recovery.

Beyond Earth orbit

For the first time since the last Apollo missions in the 1970s, people are preparing to leave low-Earth orbit. This December, NASA will launch the first test flight of Orion, its first human spacecraft since the space shuttle.

Orion is designed to eventually carry people into deep space, to an asteroid and maybe to Mars.

People have been flying to the International Space Station, or ISS, but that is in low-Earth orbit, about 220 miles above the planet. Orion's first test flight will launch it to about 3,600 miles above Earth. An older rocket model will launch Orion's first test because SLS will not be ready.

The December Orion flight will test the heat shields as it streaks back to Earth at 20,000 miles per hour. No crew members will be on board this first flight.

Orion upgrades

Orion was built with major upgrades and new technology. Designed for a crew of at least four, it will be the safest, most advanced spacecraft ever built.

Orion's new computer system will be 25 times faster than the computers on the ISS and 4,000 times faster than Apollo's.

The most important new addition to Orion is the launch abort system. If something goes wrong, it will be able to pull the crew away to safety immediately. No other spacecraft has had this safety feature.



art courtesy NASA

This art shows the launch abort system (far right) still attached.

Destination: Deep space

Orion's first mission will be to capture a small asteroid and deliver it to lunar orbit. The asteroid will orbit the moon until NASA can send humans to explore it.

The asteroid trips will help NASA test people's ability to perform jobs needed for travel in deep space.

Getting Ready for Deep Space

Twins in space

In March 2015, NASA will begin a year-long study of identical twin astronauts. Scott Kelly will spend a year on the ISS. His brother Mark Kelly will stay on the ground.

Comparing test results from the twins will teach scientists more about how spending a long time in space affects the body. A Russian cosmonaut will join Scott in this first year-long study on the ISS. In the 1990s, cosmonauts stayed a year on the earlier Russian space station MIR.

Opening a new chapter

Since the U.S. ended the shuttle program, the Russians, Europeans and Japanese have been responsible for delivering supplies to the ISS. Now two private American companies are also delivering cargo and will begin transporting astronauts.

Buying routine services such as cargo and crew flights from private companies frees NASA to focus on deeper space missions.



art courtesy ESA

Since the cargo crafts usually burn up when they re-enter Earth's atmosphere, astronauts load their trash on board the crafts before returning them to Earth. The trash is incinerated, or burned, in re-entry.

This fall, the private company SpaceX's Dragon cargo spacecraft will bring back parts and experiments, such as the space-grown lettuce. It has been designed to return to Earth safely, without burning up.

Space lettuce

ISS crews have been learning how to deal with the challenges of long-term space missions. One of the challenges is to find food that will stay fresh and tasty for long periods.

Crews have taken the first steps by growing lettuce on board the ISS. But astronauts won't get to eat the first crops. They are sending the lettuce back to Earth to make sure it's safe to eat after growing in space.

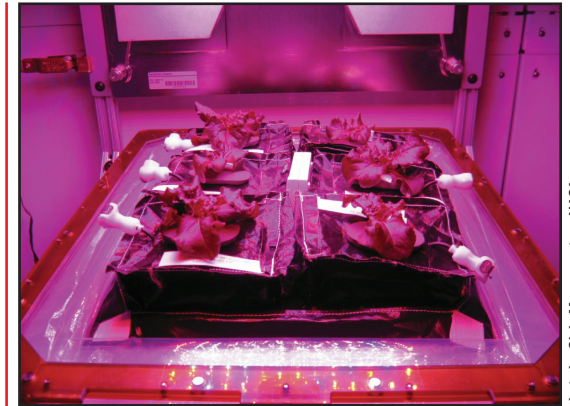


photo by Gicla Mass, courtesy NASA

Lettuce grows in an ISS capsule called Veggie. Special grow lights make the capsule glow purple.

Ready Resources

The Mini Page provides ideas for websites, books or other resources that will help you learn more about this week's topics.



On the Web:

- nasa.gov
- bit.ly/XKKxaB
- mars.jpl.nasa.gov/participate/funzone
- 1.usa.gov/1tuFwyn

At the library:

- "Smithsonian Discover: Space" by Denise Baggett
- "DK Eyewitness Books: Space Exploration" by Carole Stott



Try
'n'
Find

Space

O	C	D	M	N	O	I	T	A	R	O	L	P	X	E
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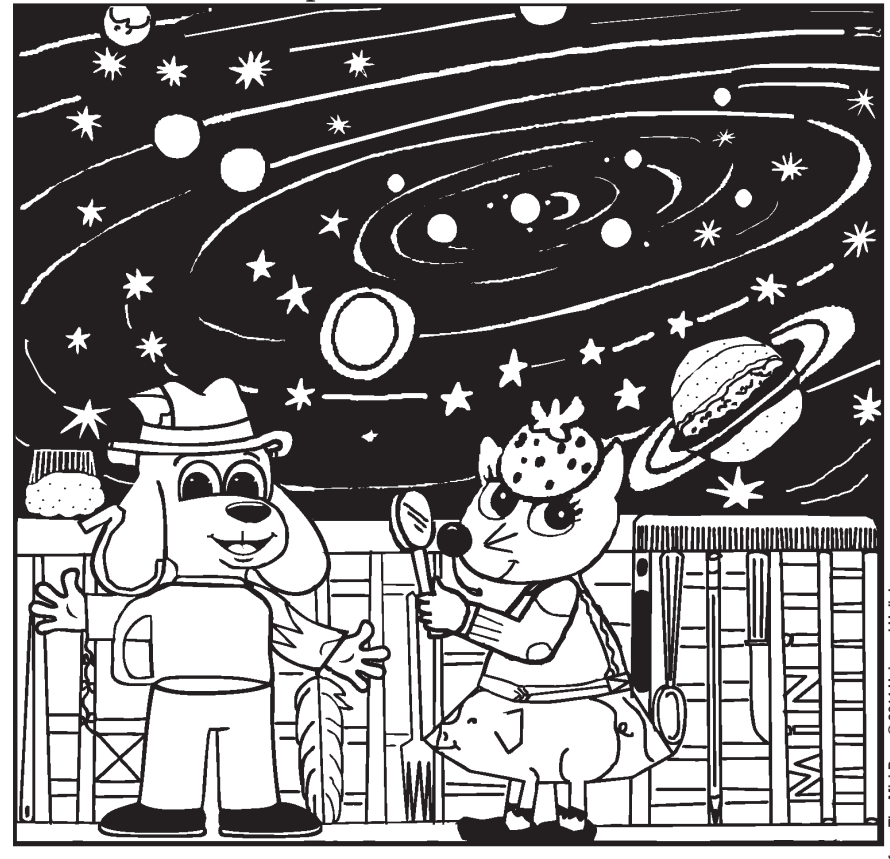
Words that remind us of space exploration are hidden in the block below. Some words are hidden backward or diagonally. See if you can find: ASTEROID, ATMOSPHERE, CARGO, COMET, CREW, DEEP, EARTH, EXPLORATION, FLY, GAS, JUPITER, LOW, MARS, MISSION, ORBIT, ORION, ROCKET, SPACE, SPACECRAFT, STATION, TESTS, WATER.



Mini Spy

Mini Spy and Basset Brown are enjoying a visit to a space museum. See if you can find: exclamation mark

- ladder fork hamburger sock pencil
- feather needle strawberry kite cherry
- knife tooth word MINI comb heart
- pig letter O number 2 spoon arrow
- muffin teacup man in the moon



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Rookie Cookie's Recipe Sweet Baked Tortilla Chips

Astronauts eat tortillas instead of bread in space!

You'll need:

- Cooking spray (butter-flavored works best)
- 8 (6-inch) corn tortillas, cut into 8 wedges each
- 1 1/2 to 2 tablespoons sugar
- 1/2 teaspoon ground cinnamon

What to do:

1. Preheat oven to 400 degrees. Coat a large baking sheet with cooking spray.
2. Arrange the tortillas on baking sheet and spray surface of them with cooking spray. Sprinkle the sugar and cinnamon over the tortillas.
3. Bake for 8 to 10 minutes, until the tortilla chips are golden brown and crispy. Serves 4.

You will need an adult's help with this recipe.

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Meet Meryl Streep



photo by David Bloomer, (c) 2014 The Weinstein Company. All Rights Reserved

Meryl Streep stars as Chief Elder in the movie "The Giver." She has starred in many movies, including "Mamma Mia," "Lemony Snicket's A Series of Unfortunate Events" and "Music of the Heart." She has the voice of Mrs. Fox in the animated movie "Fantastic Mr. Fox" and the voice of Queen in "The Ant Bully."

Meryl, 65, was born in Summit, New Jersey. When she was 12, she began studying to be an opera singer. She was a cheerleader in high school. In college, she studied acting and received an advanced degree in drama from Yale University. She then began acting in plays in New York.

She has earned 18 Academy Award nominations and won an Oscar three times. She was awarded the National Medal of the Arts.

Meryl co-founded the charity Mothers and Others that works to protect the environment. She also supports international women's rights organizations.

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Gus Goodsport's Supersport



Height:
5-4
Age:
13
Hometown:
Philadelphia

Mo'ne Davis

from The Mini Page © 2014 Universal Uclick

For more than 65 years, young baseball players have stepped onto the national stage at the Little League World Series, which is held each August in Williamsport, Pennsylvania.

This year, 13-year-old Mo'ne Davis captured the attention of the nation as she helped lead her Taney Dragons Little League team of Philadelphia to the World Series. Mo'ne, who can throw a 70-mile-per-hour fastball, pitched a three-hit shutout in the Mid-Atlantic regional final to advance Taney to Williamsport. Once there, she became the first female pitcher to earn a win — another shutout, of course.

Millions of Americans watched her games on TV. Quiet confidence and historic accomplishments ultimately led to Mo'ne becoming the first Little Leaguer — male or female — to appear on the cover of Sports Illustrated magazine. It may not be her last, since Mo'ne and others say she's an even better basketball player.

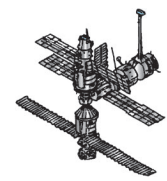


Mighty Funny's Mini Jokes

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All the following jokes have something in common. Can you guess the common theme or category?

Stan: How do astronaut lambs travel?
Stuart: In spacesheeps!



Sally: How do you park at the space station?
Steve: At a parking meteor!

Sid: How do you organize a flight to the space station?
Scott: You need to plan-et carefully!



To Mars and Beyond

Martian history mysteries

In the last year, the Mars rover Curiosity accomplished its top goal, to gain proof that Mars was once **habitable**, or able to support life.

More than 3 ½ billion years ago, liquid water was on Mars. Certain chemicals necessary for life were also present. Experts believe conditions would have been right for life to develop.

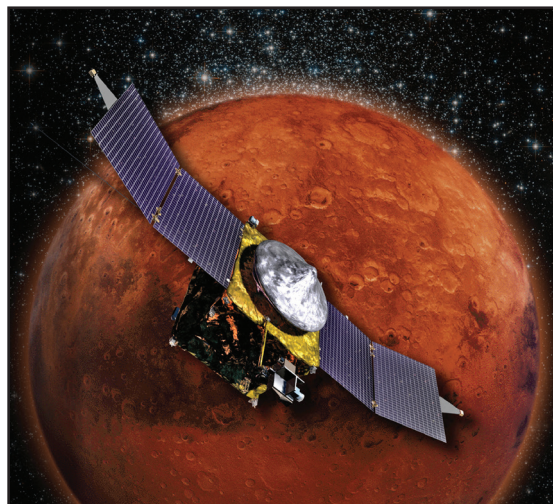
Curiosity is now traveling toward Mount Sharp, a mound of sedimentary (seh-duh-MEN-tuh-ree) rock. **Sedimentary rock** has been formed from layers of **sediment**, or particles carried by wind or water and deposited on land. Because each layer was deposited at a different time, sedimentary rock forms a kind of time capsule.

As Curiosity drives up the side of Mount Sharp, it will take samples of the different layers. The first region it samples will have the oldest rock. As it rises up the side, it will open up newer and newer chapters in Martian history.



photo courtesy NASA/JPL-Caltech

This photo from Curiosity shows its tracks as it heads toward Mount Sharp.



art courtesy NASA

This art shows MAVEN orbiting Mars. MAVEN stands for Mars Atmosphere and Volatile Evolution.

A growing neighborhood

Two new missions reached Mars this September, the U.S. MAVEN and the Indian Mangalyaan orbiters. They joined three other craft already orbiting Mars.

MAVEN will look at how the atmosphere has changed over time, which will give more clues about whether Mars was once habitable. Experts would also like to learn why Mars seems to have lost most of its atmosphere.

Some Earth-based telescopes have seen what looks like methane gas in the Martian atmosphere. This surprised scientists.

Mangalyaan will be discovering if methane really is present. Methane is a sign that there may have been life, but it can also be formed from underground processes.

Exploring planets and moons

NASA's JUNO mission is on the way to Jupiter to study its interior. The Cassini spacecraft regularly flies by Saturn's moon Titan, studying its atmosphere and its lakes of methane and ethane.

The Kepler mission has confirmed there is one rocky planet in a habitable zone outside our solar system. Experts believe there are at least 17 billion Earth-size rocky planets in the Milky Way galaxy.

Moon missions

China landed a craft on the moon in 2013 and its rover, Yutu (Jade Rabbit), is collecting lunar dust. It is also planning a 2016 mission to the moon. Four privately funded moon missions are scheduled for 2015.



photo courtesy ESA/Rosetta/MPS for OSIRIS Team MPS/UPD/LAM/IAA/SSO/INTA/UPM/DASP/IDA

Rosetta, a European Space Agency mission, entered orbit around a comet in August. Experts were surprised to see that it looked as if two objects had come together to form the comet. In November, Rosetta will be the first mission to land on a comet's surface.

Next week, The Mini Page presents a good-character checkup.

Look through your newspaper for stories about space exploration.

The Mini Page thanks Dr. Dan McCleese, chief scientist for NASA's Jet Propulsion Laboratory, and Stephanie Schierholz, NASA Human Exploration and Operations, for help with this issue.

The Mini Page Staff

Betty Debnam - Founding Editor and Editor at Large Lisa Tarry - Managing Editor Lucy Lien - Associate Editor Wendy Daley - Artist