

National Aeronautics and Space Administration



SPACE TECH FUNPAD

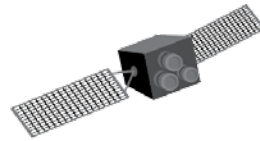


www.nasa.gov



NASA In Your World

NASA develops helpful tools and systems that make it possible for us to learn more about our planet to outer space, but many of NASA's technologies can be found improving your everyday life. Next time you brush your teeth, go skiing, drive on the road, or check the weather forecast, you're using a bit of NASA space technology.



Spacecraft Search

Find the names of these NASA Spacecraft

W A P O L L O T N P Q M W S W E W W I A Q W P T W E Q
\$ S N D S G L G H O A A E D E D E E K S W E O G S R W
P D B F D B M B Y I Z T R G R C R R J D E R R V X T E
A F V G F Y O E B V O Y A G E R T T M F R T I Y E Y R
C G C H G H I E S K E I N S Y G Y O G T Y O H D U T
E H X Z H I U U I T X G P C S F U U P H Y U N B C I Y
S J W X C A S S I N I E O V D Y I I W J A U R U R O U
H Z E C X M T K C E D G I B F H O U S D S J E J F A I
U X R V V O E F F W C U L Y G N D J F F D N W N V S G
T C T P B L G S S D R J K U E J F N G G F Y S E T D E
T V Y A F I X C S F F N J E C I G M H H G H D D G F M
L B U T G J C V V E V P R J V J H N J X H B F S B G I
E N J H S F V J H H N K N H B I J B B C X R G Z F H N
B U H F D A B G J J G G M A I K U G V V C E H Q G J I
K H G I F S Z U B K B L E S K I N H C B V N J W H X A
B B F N G D X I H G Y K U R M E O J V T B I K E J C S
D I D D H F C X J H H M I X U I P G B Y N R L R K V D
F J S E C G V D H J N N H C J J N L N H F A M T U B F
G N A R V H B T A O U B J V H I W Y E J G M N Y J N G
I O X M B J Q W I W J V K B K I S T G R H Y B U O V H
U K C A I U A G I M N W P I Y K X S Y Y J Y V I K I N
Y M F T J I Z R O U I E V I G F A D U H H F C O M V K
Y P G S N E W H O R I Z O N S T A F I N J D X P P B L

APOLLO

KEPLER

PATHFINDER

CASSINI

MARINER

PIONEER

DAWN

MESSENGER

SPACE SHUTTLE

GEMINI

NEW HORIZONS

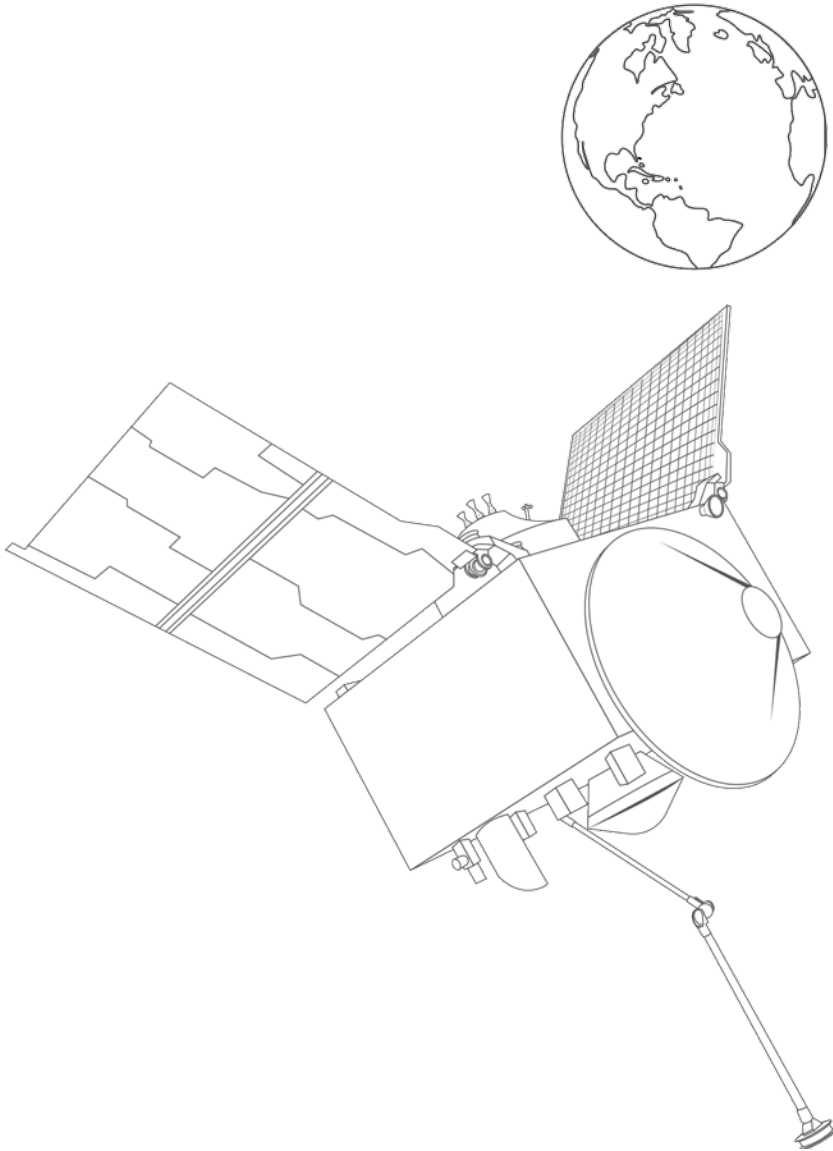
VIKING

JUNO

ORION

VOYAGER

OSIRIS-REX



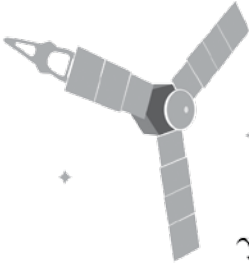
OSIRIS-REX is an unpiloted spacecraft that will travel to the asteroid Bennu and bring samples of it back to Earth. It will use cameras, lasers, spectrometers, and other instruments for viewing different wavelengths of light, to help us learn more about how planets formed and how life began.

Computer Whiz

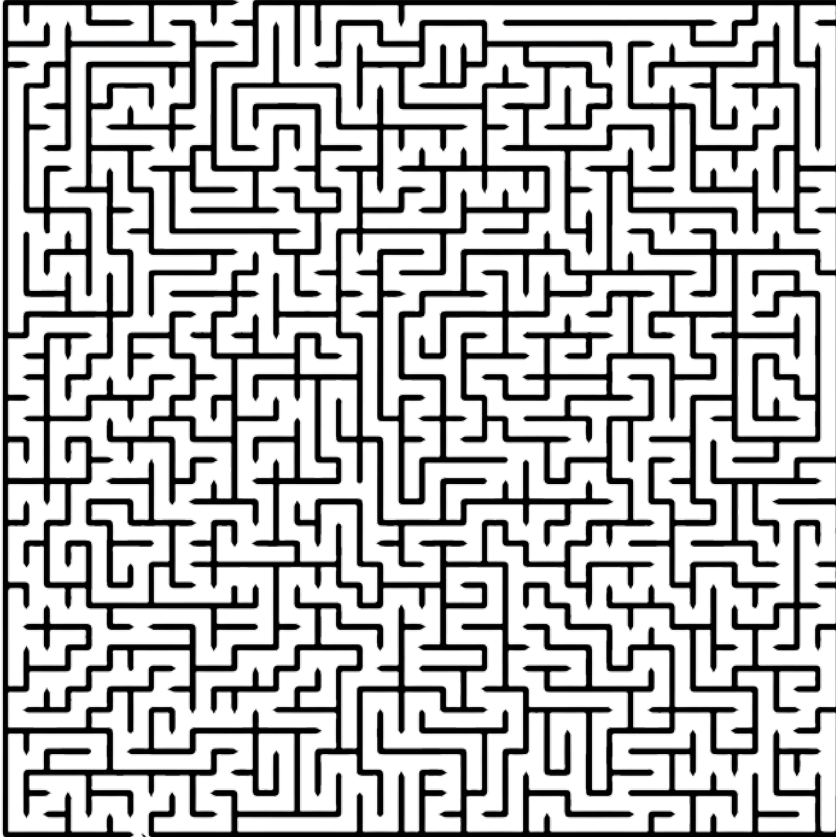
Find and circle these shapes



Lead JUNO



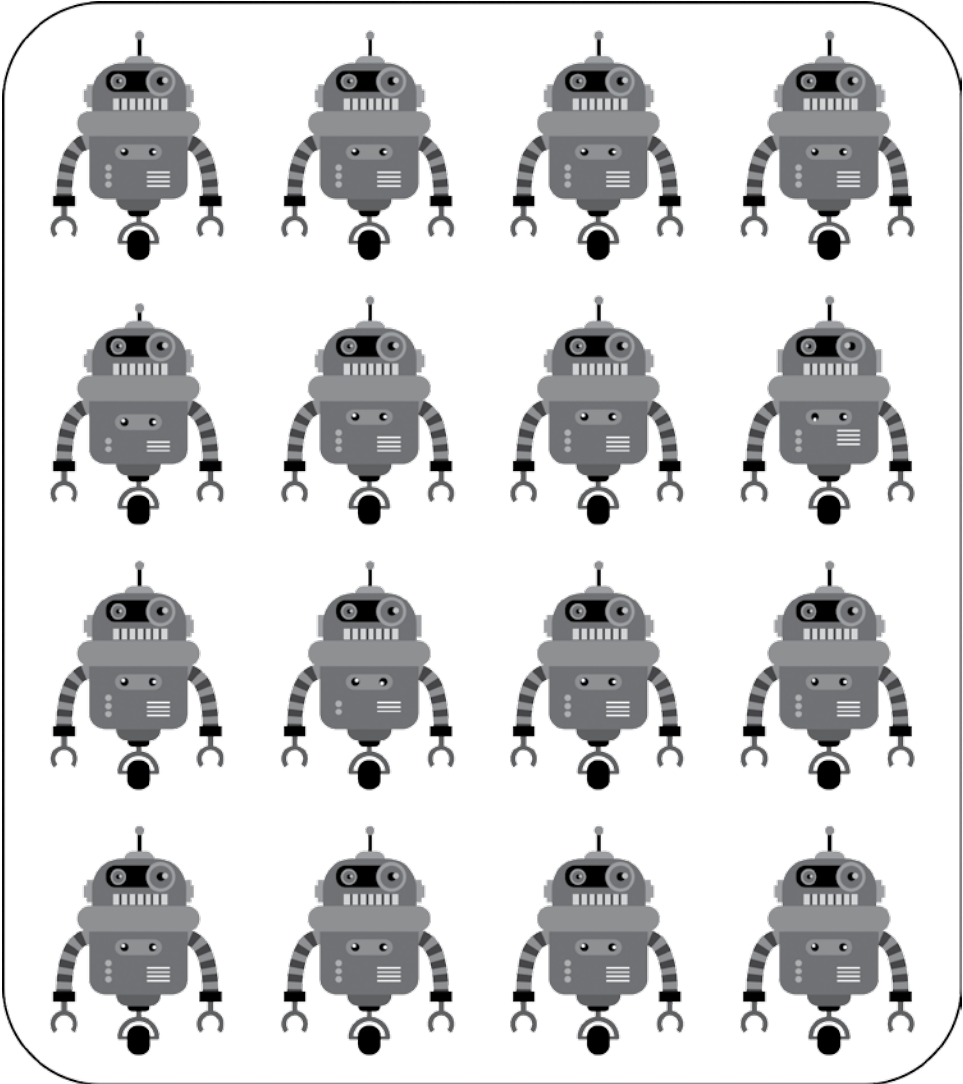
Safely through the dangerous radiation belts of Jupiter!



Juno is a space probe that will orbit and study Jupiter. This will tell us important information about how our solar system formed. Juno's sensitive electronics must be protected from Jupiter's radiation by a titanium container.

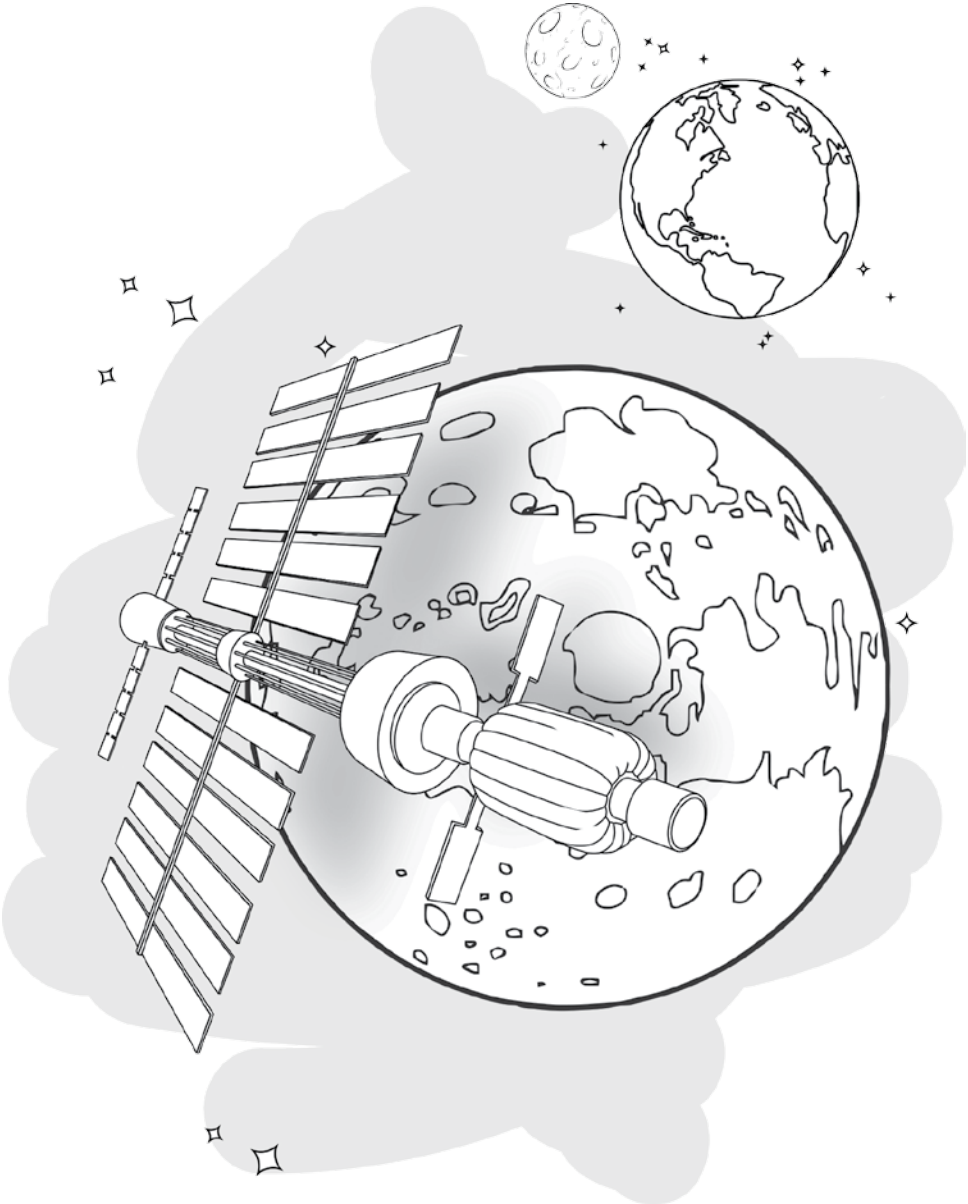
OUT of PLACE

Circle the robot that is different from the others.



Solar Electric Propulsion

Coloring the Worlds



Solar electric propulsion (SEP) is a project to create technology that can push spacecraft to far-off destinations. SEP would collect the Sun's energy through solar panels so that less fuel is required for the spacecraft and it can reach much more distant worlds.

DRAW NASA

Draw a picture to represent what each letter in NASA stands for.

National



Aeronautics



and

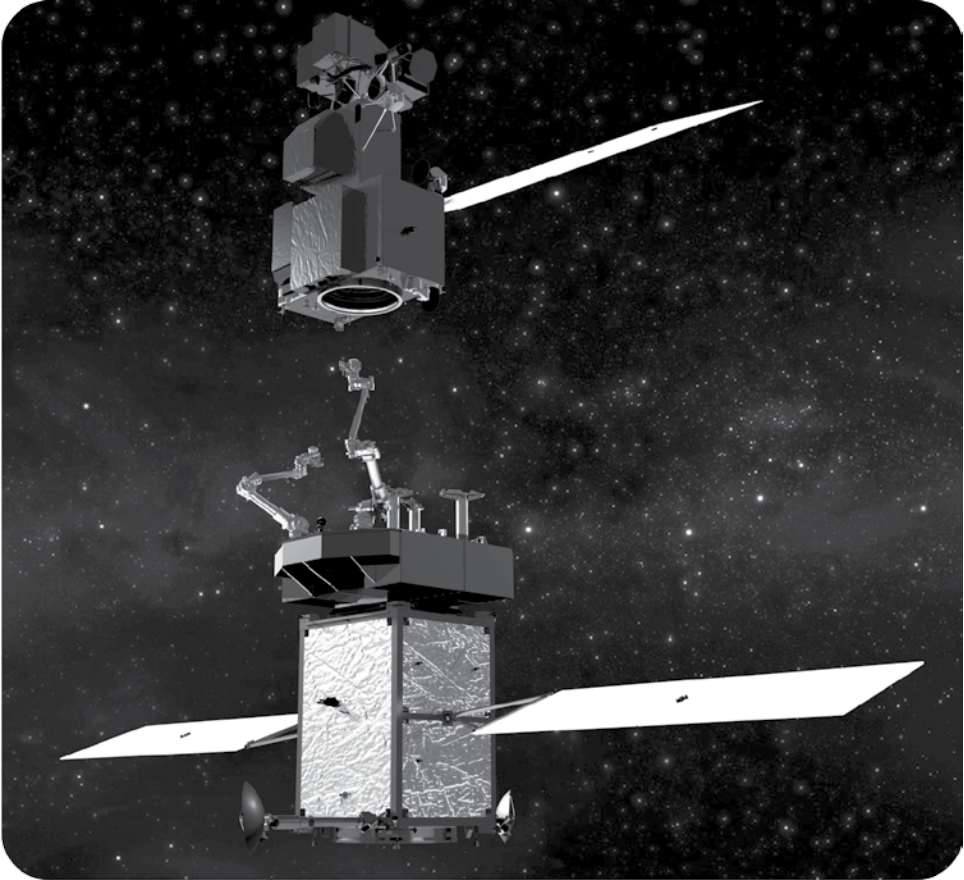
Space



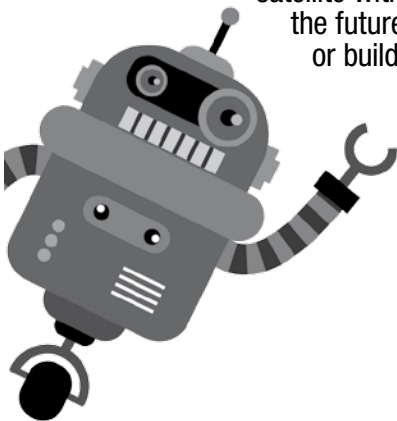
Aministration



NASA's Restore-L

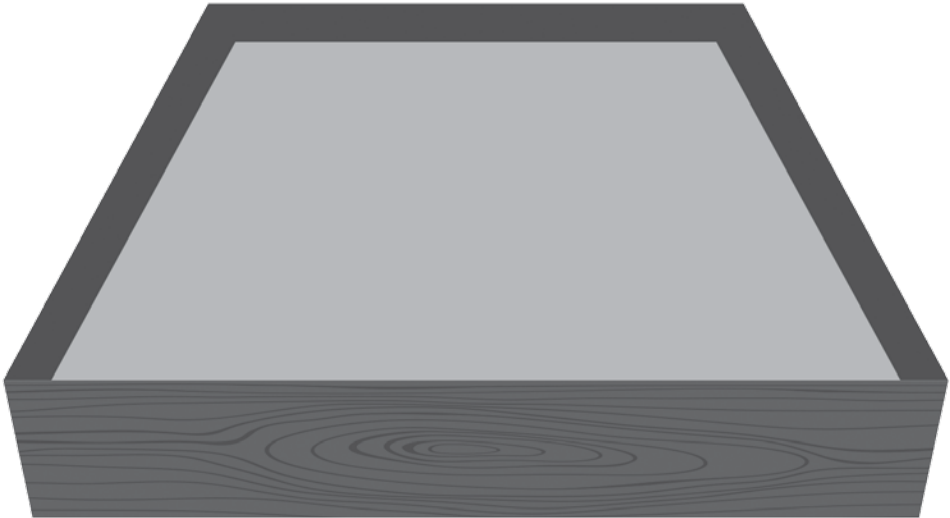
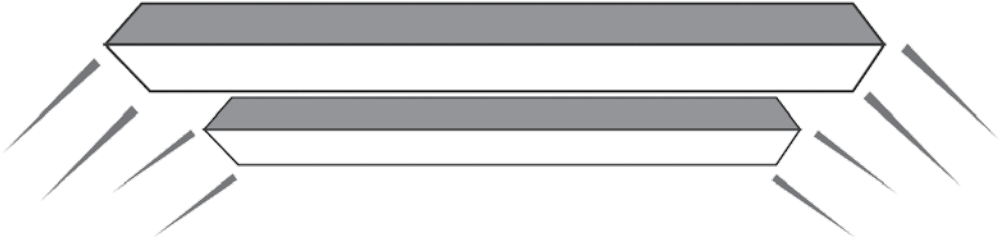


Restore-L is a mission to use robotic spacecraft to refuel a satellite that is already in space. The spacecraft must know how to grasp the satellite with its robotic arm without humans controlling it. In the future, similar robotics could help fix damaged satellites or build new ones.



VEGGIES

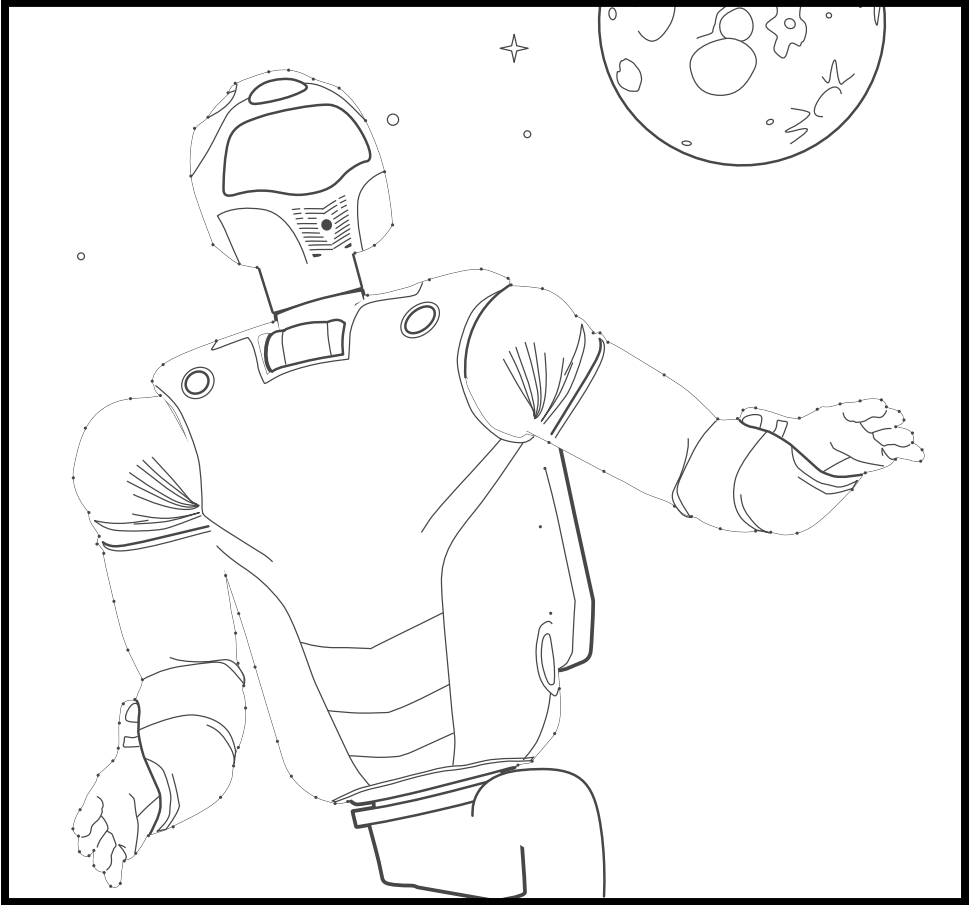
Astronauts on the International Space Station used a special Vegetable Production System (VEGGIE) to grow lettuce that they could eat.



Draw your own garden of food for astronauts to harvest and eat.

NASA's Outer Space Assistant

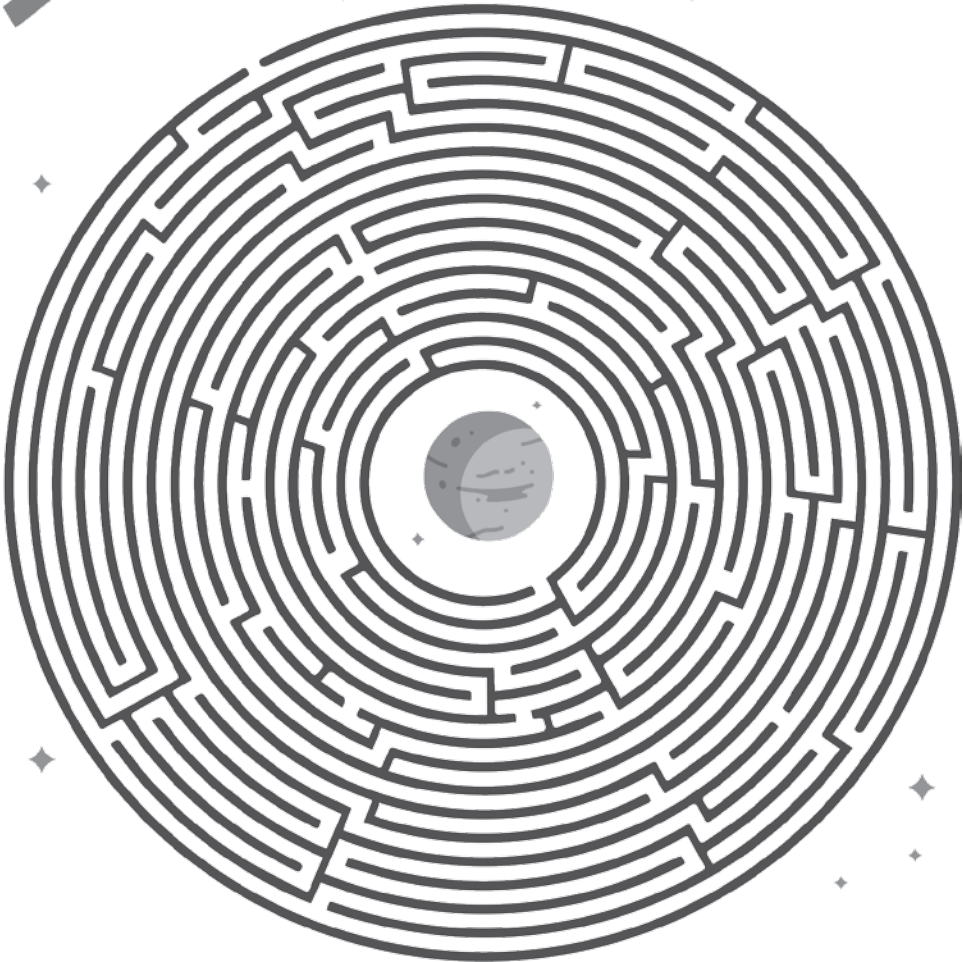
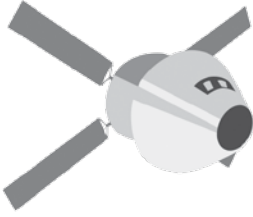
Connect the dots to see who's helping astronauts on the International Space Station.



Robonaut 2 (R2) is a humanoid robot that works aboard the International Space Station. It can perform tasks in microgravity and uses special climbing legs to help anchor it while it uses its hands. R2 will help astronauts make repairs to the Station.

ORION MAZE

Help Orion Find Mars

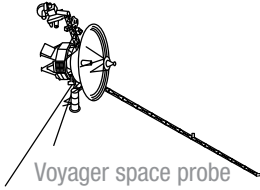


Orion is a spacecraft that will carry astronauts to Mars and beyond. It will be NASA's most advanced spacecraft in order to keep crew safe during their mission. It is designed to support long periods of space travel and to withstand the harsh environment of reentry into atmosphere.

HOW FAST

Match the spacecraft and speed in order from fastest to slowest

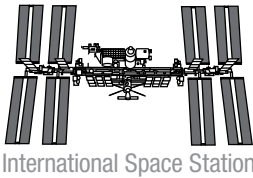
A.



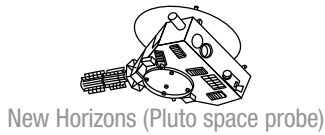
B.



C.



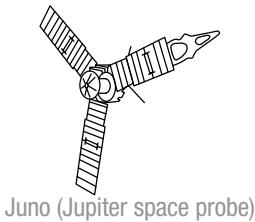
D.



E.



F.



G.



36,373 mph (launch)

4,520 mph (fasted piloted aircraft)

24,791 mph (fastest piloted spacecraft)

17,150 mph

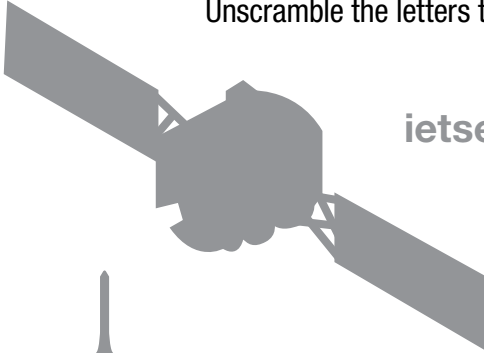
448 mph

38,610 mph

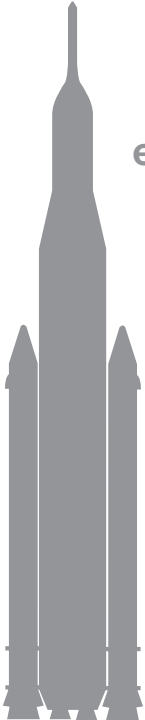
165,000 mph

Mystery Shadows

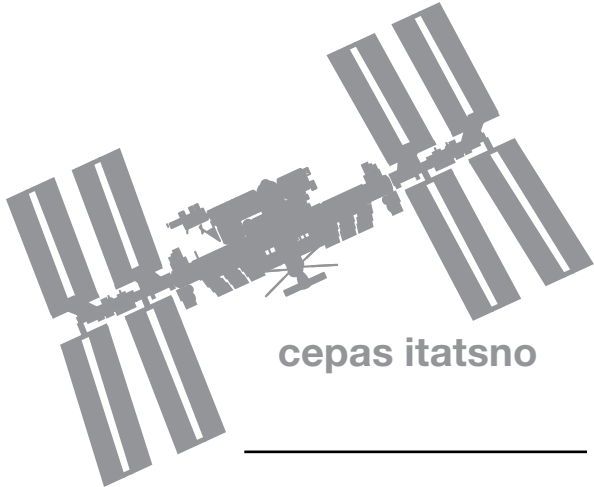
Unscramble the letters to name the shadow.



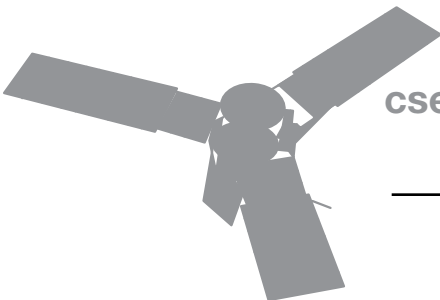
ietselalt _____



eortck _____

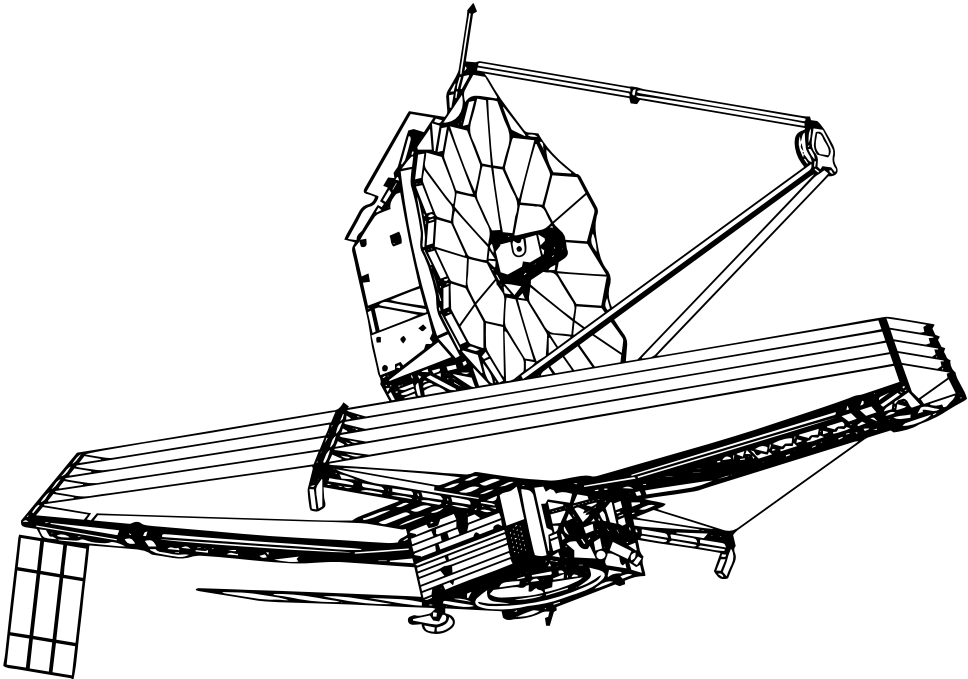


cepas itatsno



cseap robpe

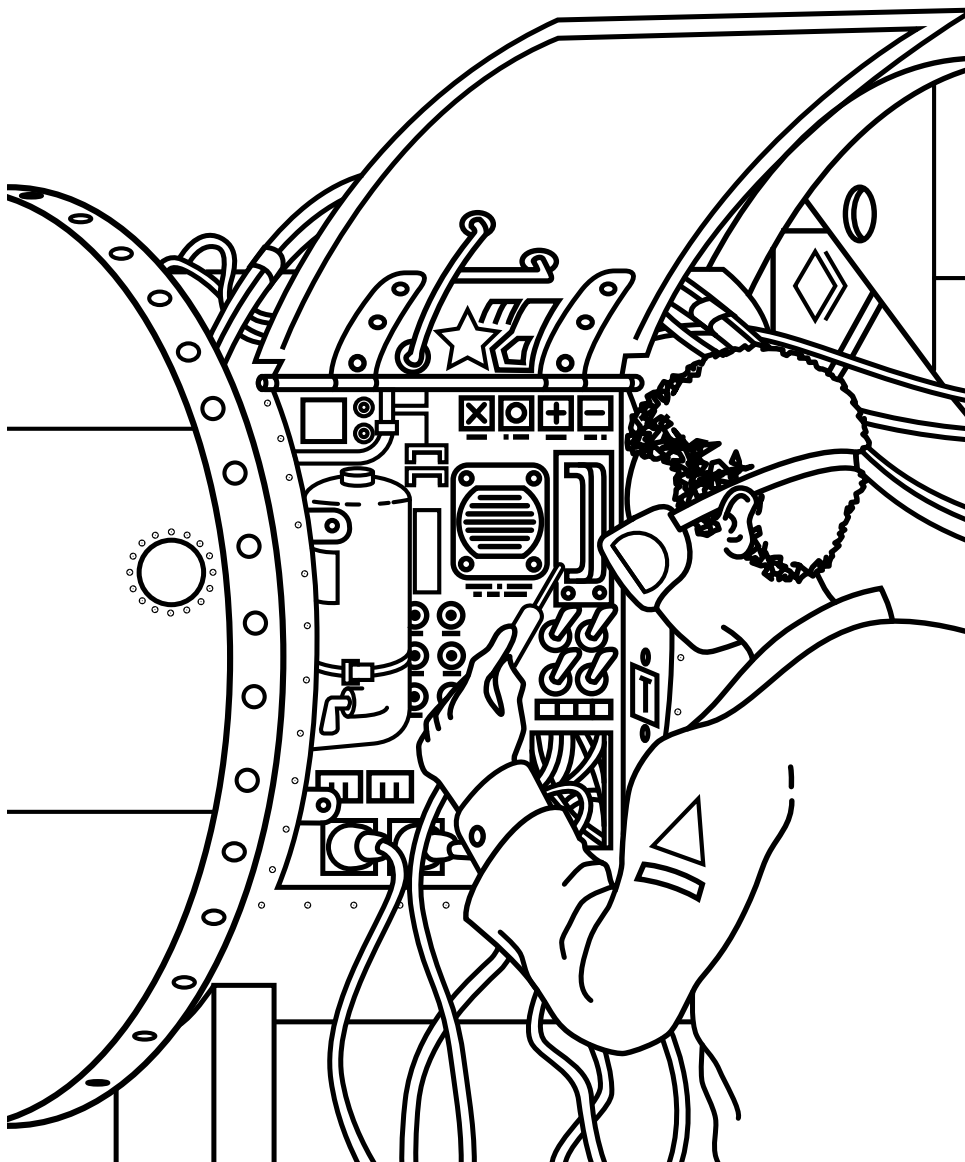
Color the James Webb Space Telescope



The James Webb Space Telescope (JWST) is an infrared telescope that will look deep into space to study the earliest stars and galaxies in the universe. It is more sensitive than the Hubble Telescope, with much larger mirror optics that have a highly reflective gold layer to gather lots of light.

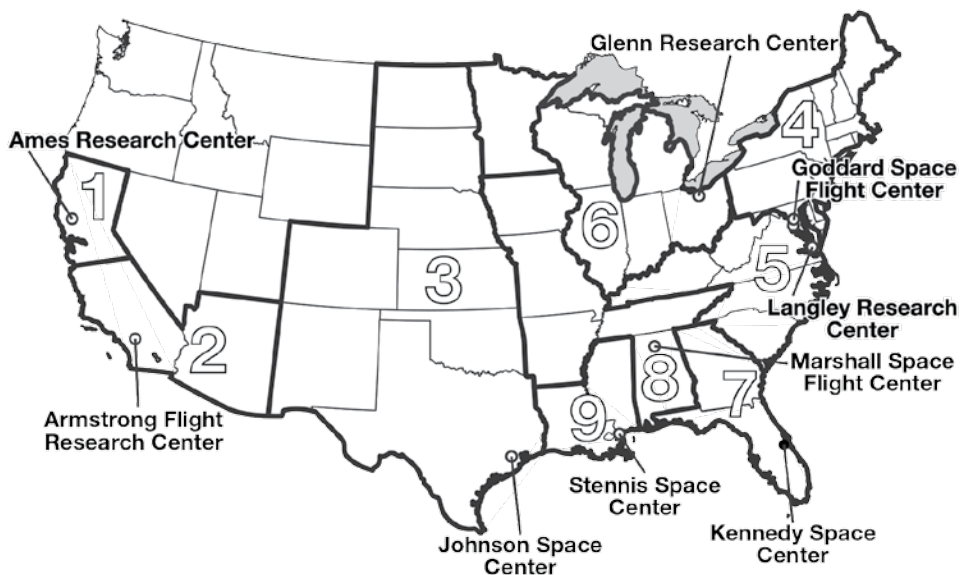
Building Technology

Find and circle these hidden shapes.



Where Is NASA?

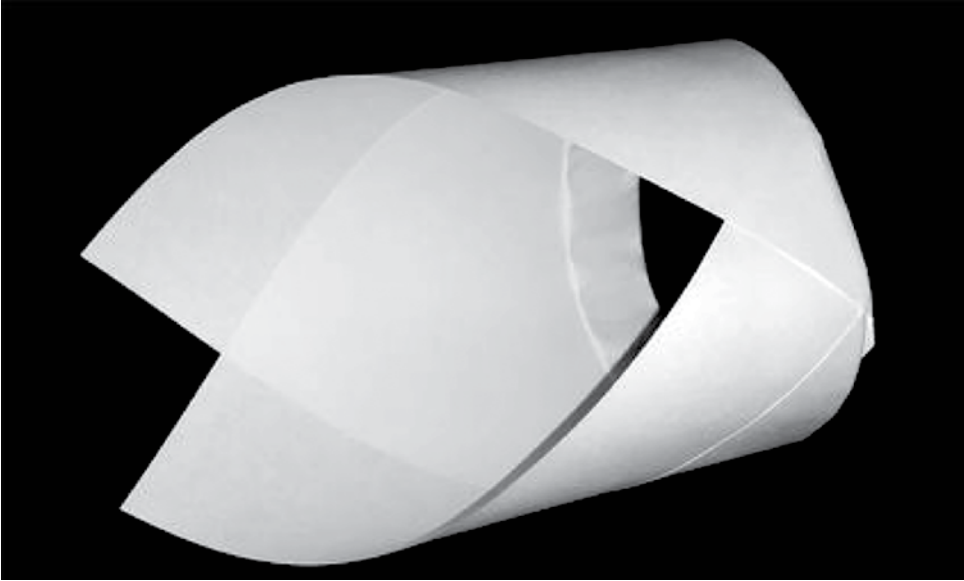
NASA has many Centers across the United States that study Earth and space and build technology for exploration. Which ones are near you?



Each Center has its own region for educational programs. Color the regions by number.

- 1 = Yellow (Ames)
- 2 = Orange (Armstrong)
- 3 = Purple (Johnson)
- 4 = Red (Goddard)
- 5 = Dark Green (Langley)
- 6 = Blue (Glenn)
- 7 = Pink (Kennedy)
- 8 = Light Blue (Marshall)
- 9 = Light Green (Stennis)

Build the NASA Ring Wing Glider



Procedure

1. Fold a piece of 8.5- x 11-inch paper diagonally as shown in diagram 1.
 2. Make a 1/2-inch fold along the previously folded edge. See diagram 2.
 3. Make a second 1/2-inch fold. See diagram 3.
 4. Curl the ends of the paper to make a ring and tuck one end into the fold of the other. See diagram 4.
 5. Gently grasp the “V” between the two “crown points” with your thumb and index finger.
 6. Toss the glider lightly forward.
- Note: The folds in the paper make the airplane’s front end heavy and the back end light. Curling the ends to make a ring changes the shape of the wing and improves the wing’s flight performance.

Diagram 1

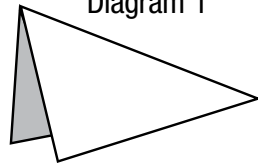


Diagram 2

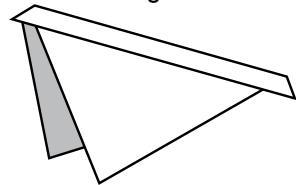


Diagram 3

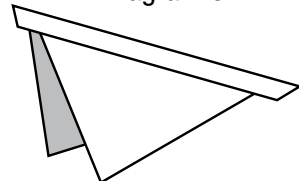
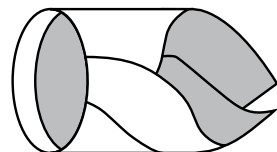
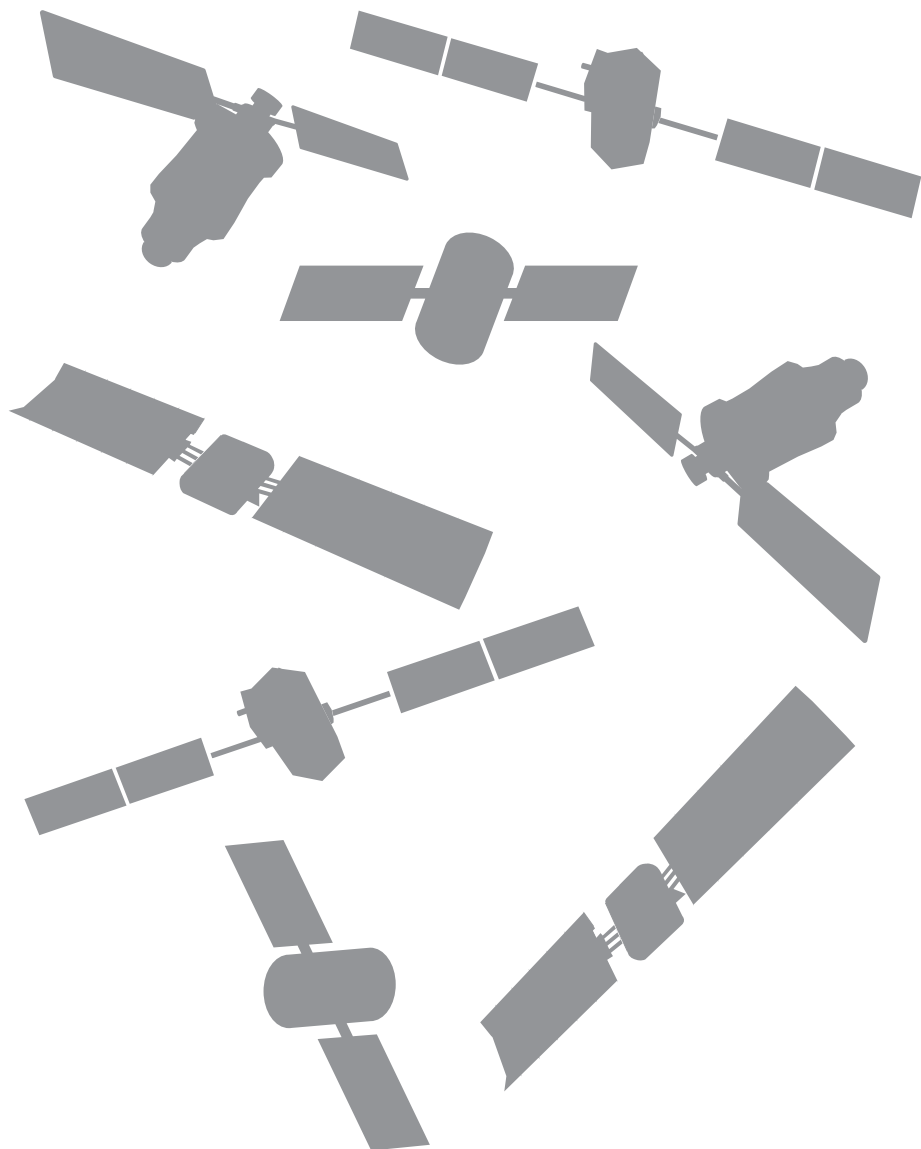


Diagram 4



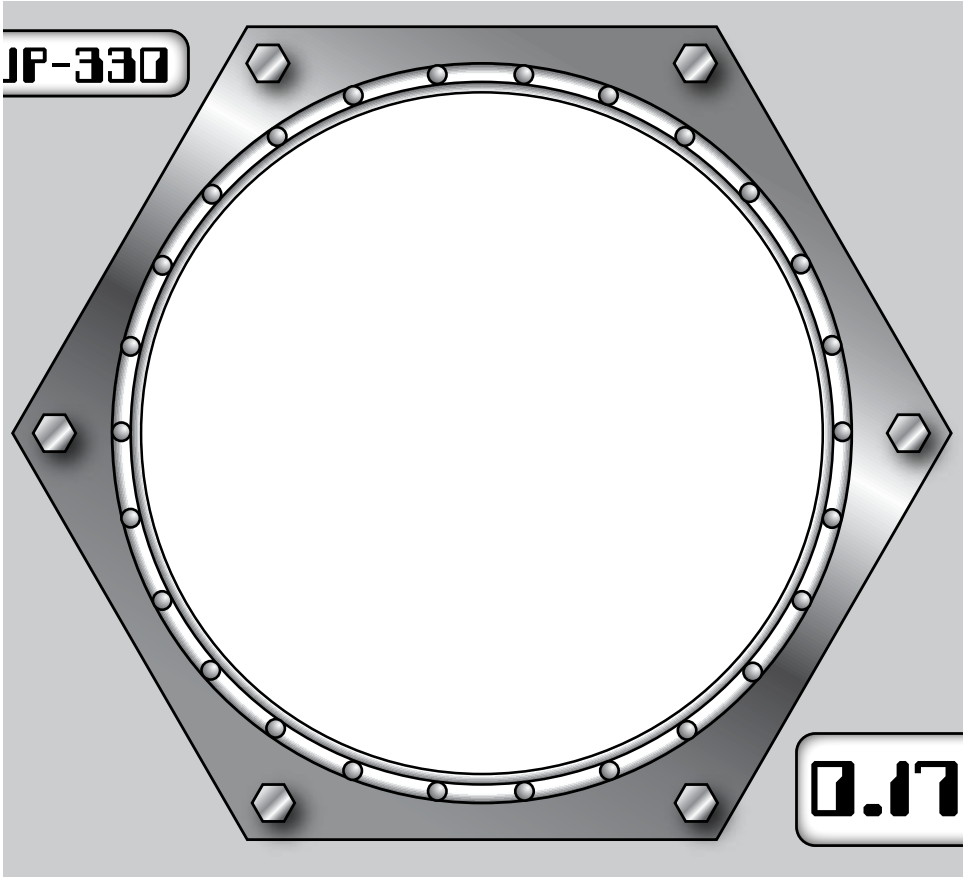
Match the Satellites

Draw a line from each satellite to its twin.



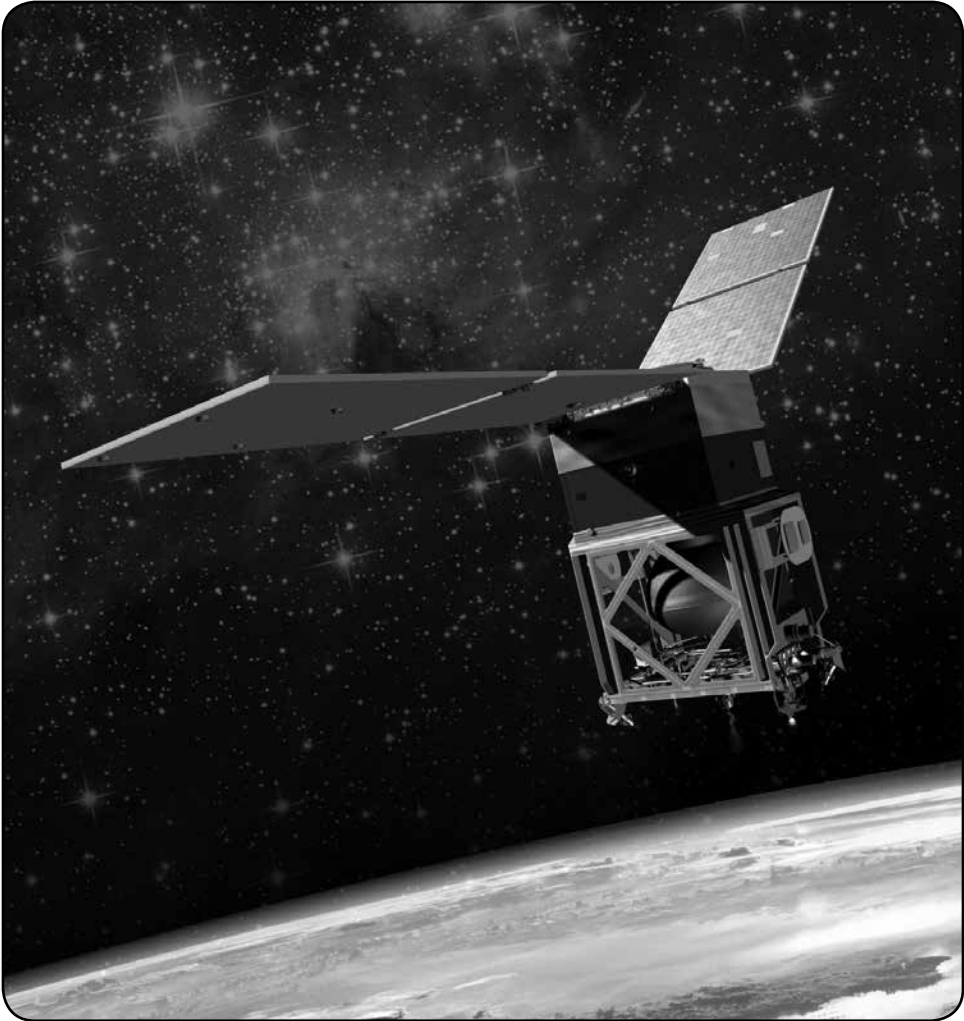
What do you see?

Draw what is outside the window of your deep-space habitat on Mars.



New life support technology will allow astronauts to live and work in habitats on Mars. The variable oxygen regulator keeps oxygen and pressure at a safe and comfortable level, and the rapid cycle amine swing bed takes carbon dioxide and water out of the air.

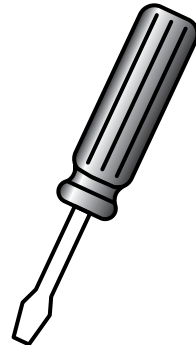
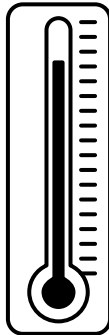
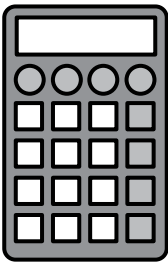
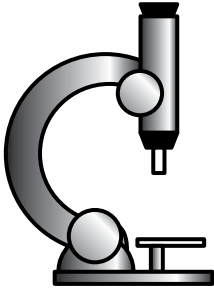
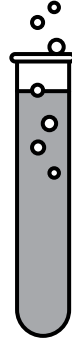
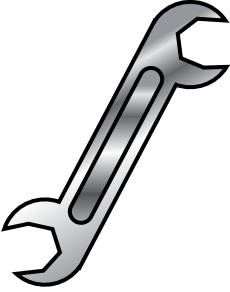
Green Propellant Infusion Mission



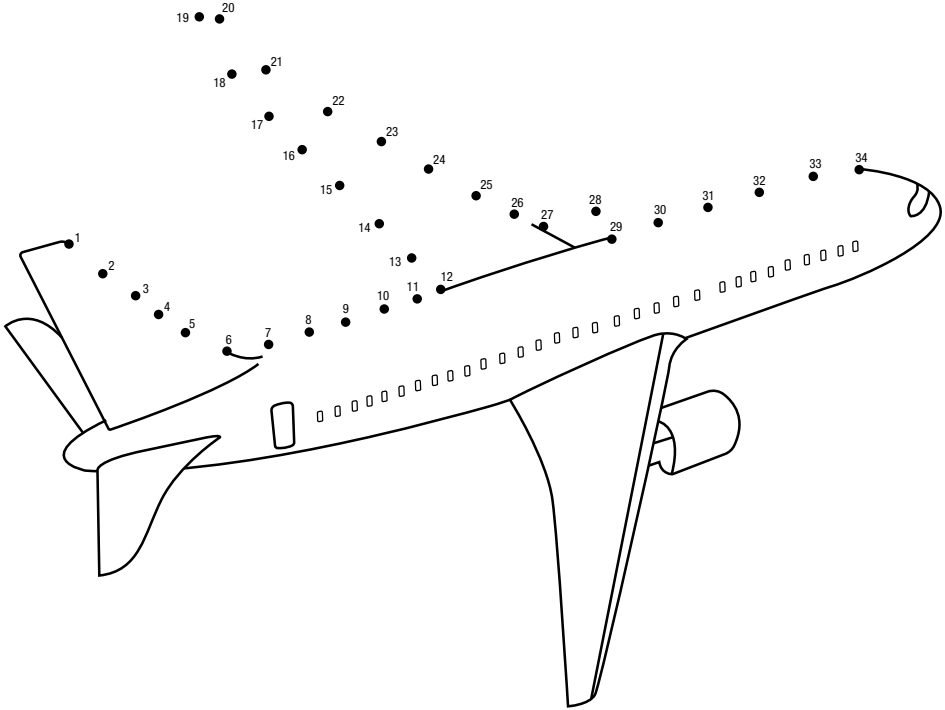
The goal of the Green Propellant Infusion Mission is to test new types of spacecraft fuel. The fuel that NASA currently uses, called hydrocine, is toxic and dangerous to handle. The new fuel will be much less harmful and will be much more environmentally friendly.

Lab Tech

Can you name these common tools used by scientists and engineers?



Connect the Dots



The design of aircraft has changed a lot over the years. NASA has helped improve airplanes with technology that saves fuel, makes flights quicker, helps pilots train better, and makes taking off and landing safer.

With You When You Fly

How is NASA technology improving flights at your local airport?

* NASA is developing a coating that will keep bugs from sticking to the surface of planes. This improves the planes' speed because stuck bugs slow them down.

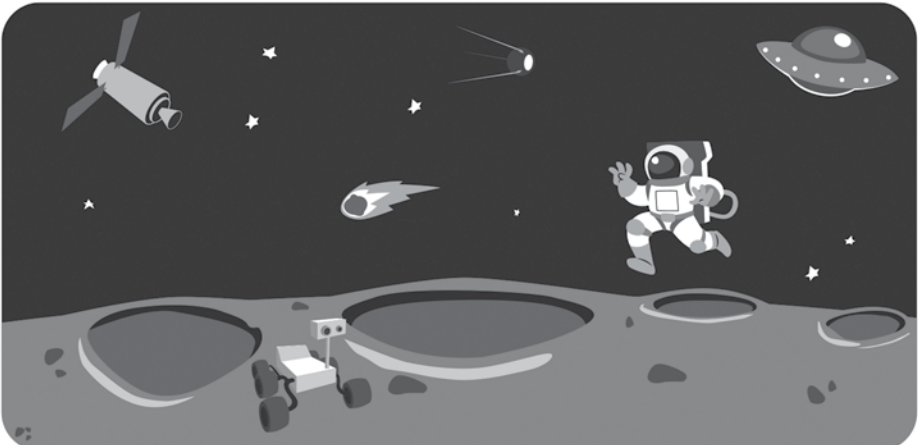
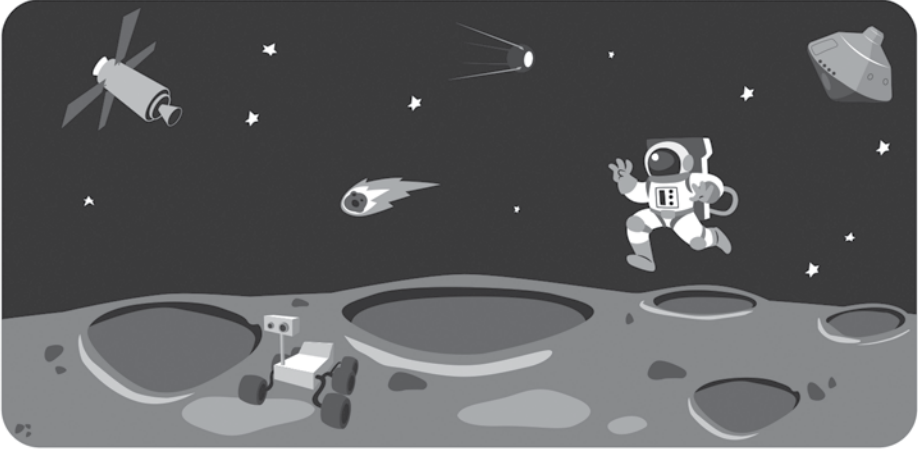


* Many of today's air traffic control systems, which tell planes when it is safe to land and when to take off, are based on NASA-developed software.



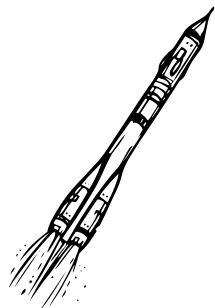
Life on Mars

Circle 8 things that are different in the images of astronauts on Mars.

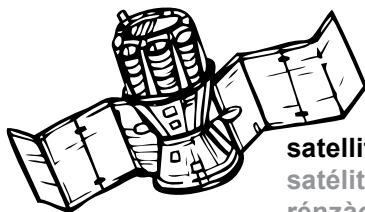


NASA is making new tools and systems to support astronauts going to Mars. Things they need include advanced life support systems to help them breathe; an updated space suit design; technology to produce water, oxygen, and fuel on the surface of Mars; and better ways to communicate with Earth.

Learn how to say these words in Spanish, Chinese, French, and Russian.



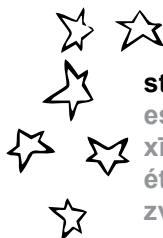
rocket
cohete
huǒjiàn
fusée
raketa (paketa)



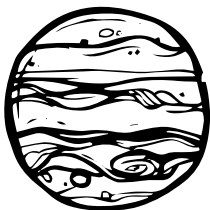
satellite
satélite
rénzào weixing
satellite
sputnik



galaxy
galaxia
xingxi
galaxie
galaktika



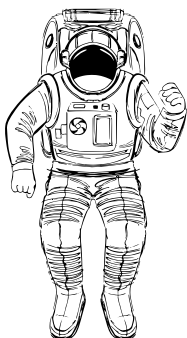
star
estrella
xīng
étoile
zvezda



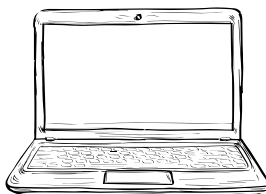
planet
planeta
xingxing
planete
planet



airplane
avion
fēist
avion
samoleb



astronaut
astronaut
yǔhángyuán
astronaut
kozmonaut



technology
tecnologia
gōngyixué
technologie
tehnologii

LCRD

Laser Communications Relay Demonstration



The Laser Communications Relay Demonstration (LCRD) is demonstrating a new way of sending information between Earth and space. Satellites will use lasers instead of radio waves to communicate, because lasers can send much more data than radio waves. With this new and powerful system, NASA can gather more knowledge than ever, faster, on Earth and in space.

Spinoff Fun Facts

Every year, NASA develops new technology that helps Earth research and space exploration. These innovations often go on to change life on Earth, too. What are some inventions in your life that got their start at NASA?

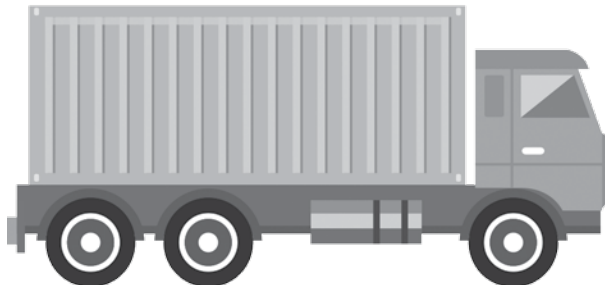
Ski boots came from the boots in an astronaut's spacesuit that let the wearer move around while the feet remained attached to the surface.



Today's baby formula was created when scientists discovered a healthy ingredient for babies in algae that they were using to develop life support.



Modern big rig trucks are designed with curves that help air move past the vehicle better. This is based on NASA's research on making vehicles faster and more aerodynamic.



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SPACE TECH FUNPAD

