JR. SCIENTIST SERIES™

New type laboratory where you can conduct experiments with your bonus items

Enjoy and deeply understand the themes of this book. Experience things that you can't get from a school science textbook.

This contains all the materials you need to conduct experiments. This book contains an experiment kit to enable you to quickly begin experimenting and helps you to thoroughly understand fundamental principles. This science picture book and bonus items is ideal for enabling you to conduct experiments!

Sound Control UFO

The UFO stops running when it hears a sound. As the saucer drops to the ground, the alien start rising.

When the alien is completely revealed, the alien starts turning around and moving arms wildly. The turning continues till next sound is heard.

Spin with waving arms

Convertible characters

Create your own games

UFO bowling

Zip zag race

MADE IN CHINA P38-GK015-81001000

EDU-TOYS®

A Science Guide with Supplemental Experiment Kit

AGES 8+

JR. SCIENTIST SERIES™

Sound Control UFO

The Sound Control UFO hears sounds!
It runs, stops and turns around by sound signal.

Sound stops the running UFO, the alien rises and turns.

Sound stops turning alien and UFO starts running as the alien retrieving into the tower.

Requires 3 x AAA batteries (Not included)

Sound Control UFO

The Sound Control UFO hears sounds! It runs, stops, and turns around by sound signal. Can you master the controls?

WARNING

Please be sure to read this before using the bonus item. (Please make certain that your parents read this too).

The bonus materials contain small parts. Be careful not to swallow them accidentally as you may choke - The materials contain sharp objects and thin metal plates. Please handle them carefully to avoid injuries.

If you misuse the battery, it can overheat, become damaged, and leak its content. Thus, please note the following:

Do not use batteries other than manganese, alkali batteries. Do not mix and use old and new or different types of batteries together. *Please place the batteries in the appropriate + and - direction. *After the experiment, turn the switch off and pull out the battery. *Do not intentionally short-circuit, re-charge, disassemble, apply heat to, or incinerate the battery.

For your safety, please follow the assembly and operating instructions in this magazine. Also, do not use any bonus items that are damaged or deformed during the experiment. After the experiment, keep the items away from children.

You will need the inside box to play. Be careful not to discard the box.

STEP 01

Sound Control UFO Assembly

Please purchase 3 AAA batteries separately.

Parts List


Saucer


Hatch


Tower


Alien

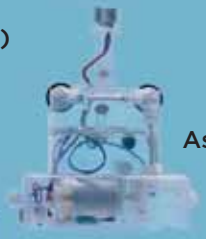

Back Wheels


Right Arm Left Arm


Front Wheel Pins (2)

Front Wheels (2)


Decal


Motor Assembly


Battery Lid

01 Hold the alien upside down and hook the arms.

02 Insert the motor assembly into the alien.

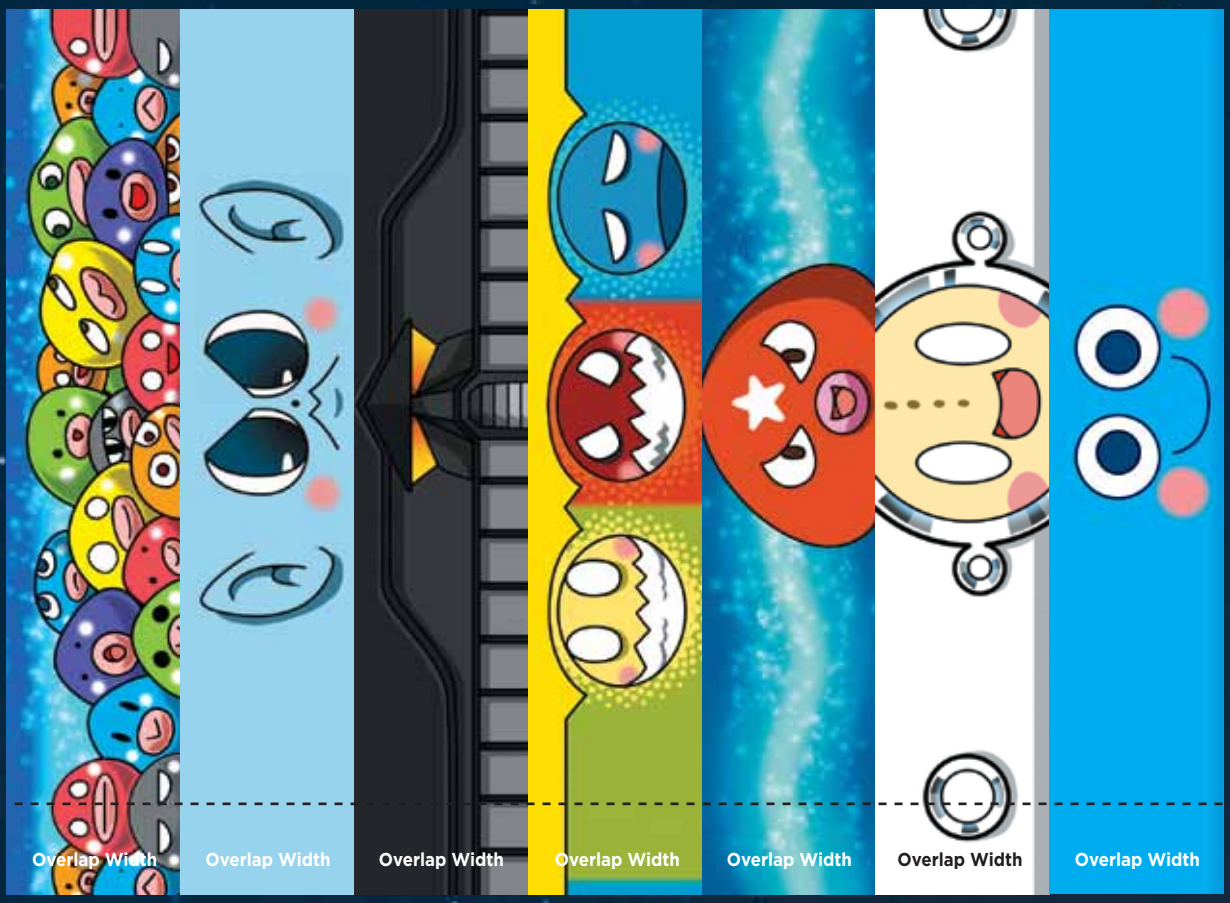
Sound Control UFO Sheet of Faces

How to use face sheet

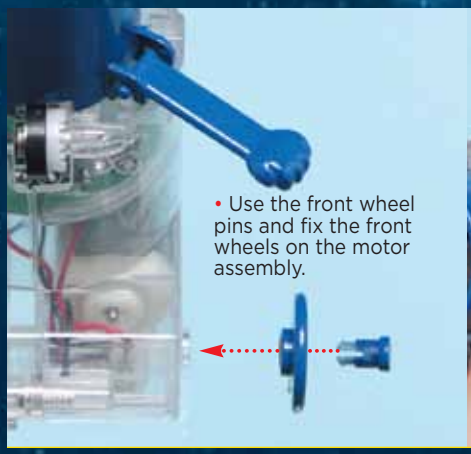
01: Cut out each face strip along the line.

02: Make a loop and tape or glue the ends.

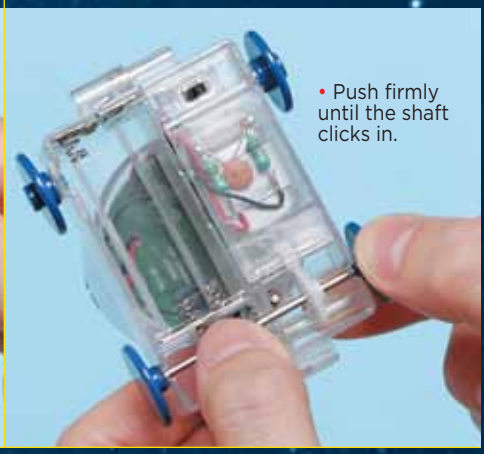
* Use the blank backside to design your original face.



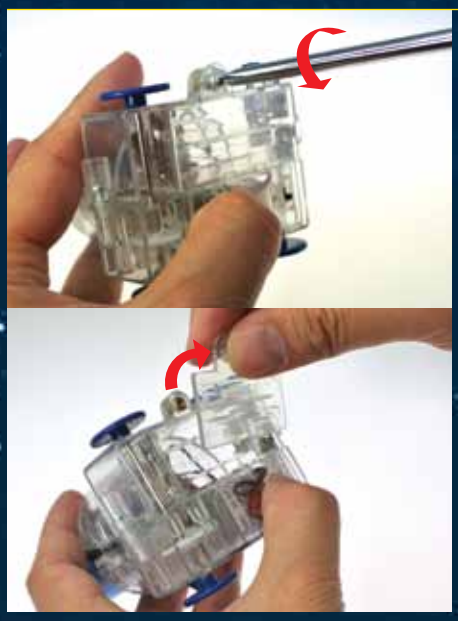
03 Use the front wheel pins and fix the front wheels on the motor assembly.



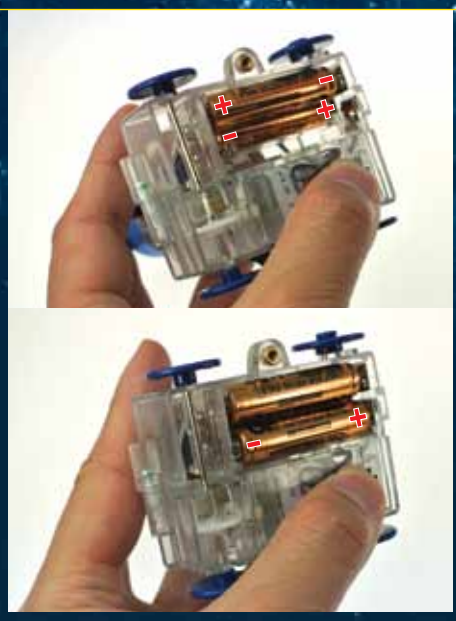
04 Attach the back wheels to the motor assembly.



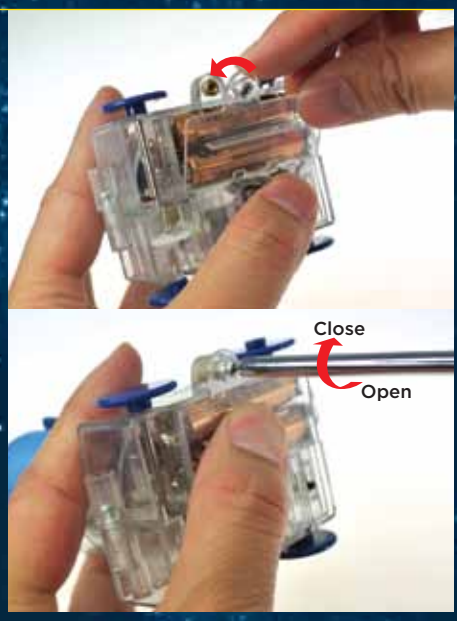
05 Insert 3 AAA batteries. Follow the indicated positive-negative direction.



Open the cover with a screwdriver.



Make sure the correct direction of batteries.



Close the cover with a screwdriver.

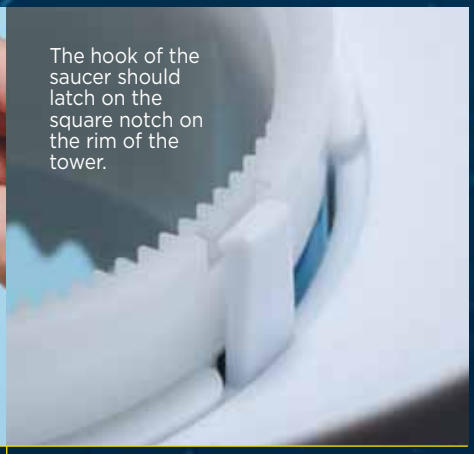
⚠ Caution! Be careful with +/- of batteries.

The blank back side of face sheet can be used for your own creative design. You can draw, put stickers, or paste photo cut-out!

Cut out each of the face strip according to the front side's guide line.

06 Put stickers on the indented sections of the hatch.

07 Insert the tower in the middle hole of the saucer from the underside.



08 Insert the motor assembly in the UFO.

Holding the alien's arms up, insert the body assembly into the saucer from underside.

09 Put face on Alien.

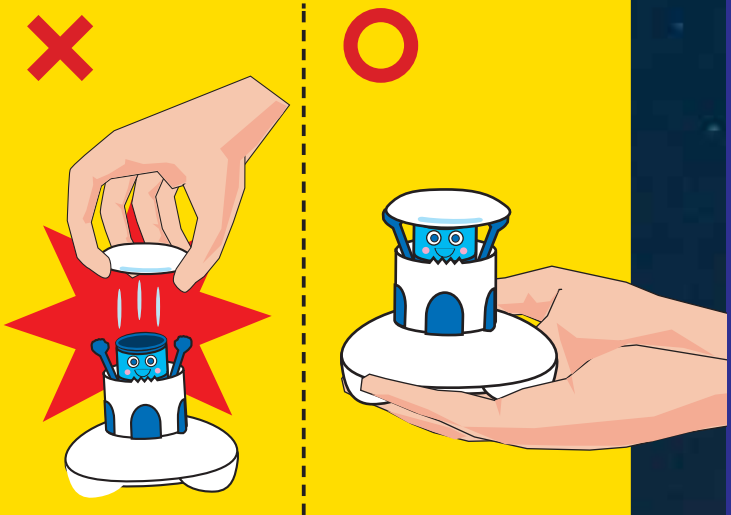
Cut out and make face from page 3 of this instruction book.

10 Attach the hatch

Two slits on the side of the alien head will slide over the tabs at the inside rim the tower.

Caution

Carry the UFO always supporting from the bottom. Lifting the UFO by the hatch or the head of alien may cause the rest of the parts to drop on the ground.



STEP 02

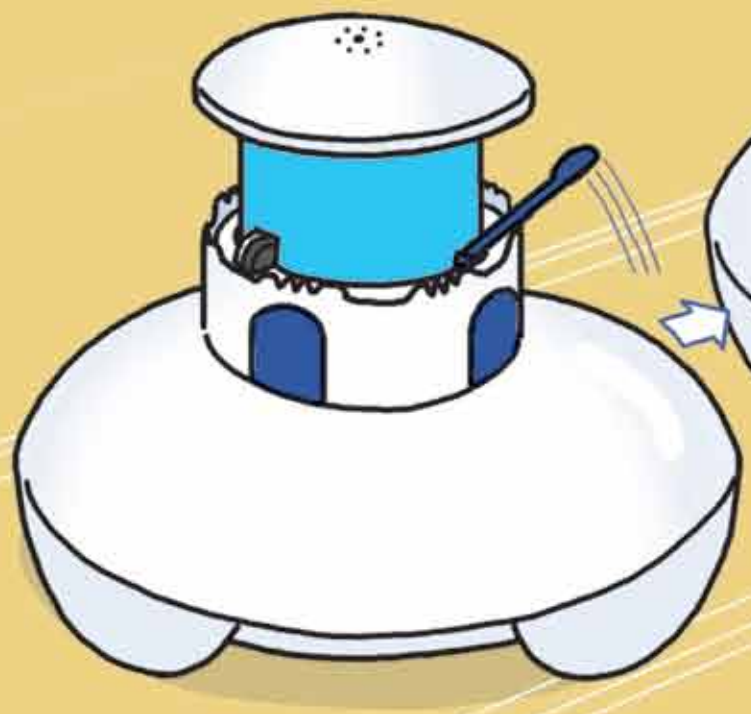
Stop and Go with sound signal !

Let's operate Sound Control UFO

The inside box (folds inside out) becomes a controller. Try and find out the different ways to tap the controller and the reaction of the UFO.

Switch it on!

The switch is located on the bottom side of the UFO. When you turn the switch on, you will not know which of the two modes the UFO begins. Be sure to start the UFO in the middle of the table so the UFO does not drop off the edge.

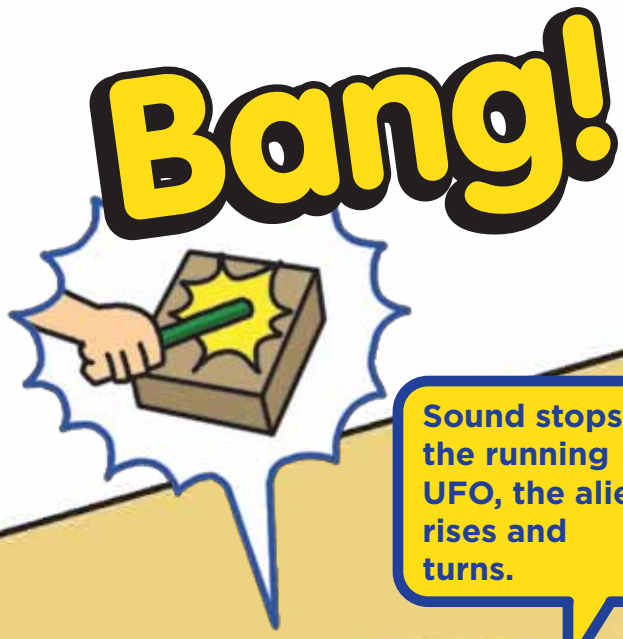


The Sound Control UFO is sensitive enough to switch the modes by vibration and sound when being set on the table.

A Going straight Running Mode

The UFO keeps running until it hears the next sound.

It might switch modes when it goes over a rough surface. Operate on a flat and smooth surface.



Sound stops the running UFO, the alien rises and turns.

Stop and Turn B
Turn Mode

The UFO stops running when it hears a sound.

As the saucer drops to the ground, the alien start rising.

When the alien is completely revealed, the alien starts turning around and moving arms wildly. The turning continues till next sound is heard.

Sound stops turning alien and UFO starts running as the alien retrieving into the tower.

Let's look for sounds that the UFO senses!

The sound control UFO can be controlled by various types of sounds beside the cardboard box controller. Let's experiment and search for the types of sounds that the UFO senses.

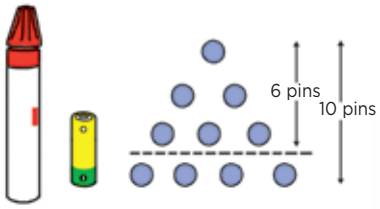
Knock them all!

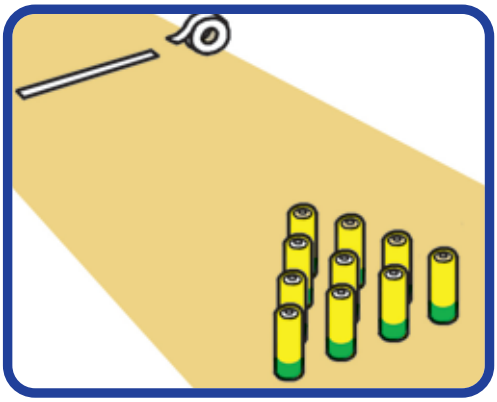
UFO Bowling

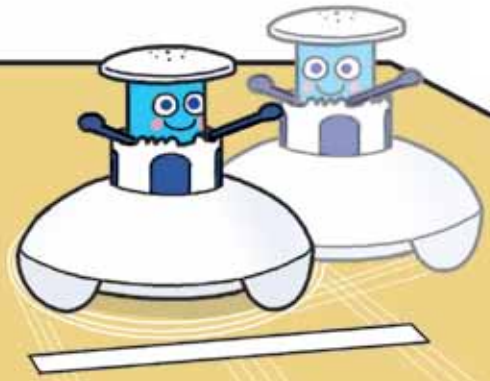
Let's bowl using the Sound Control UFO instead of a bowling ball! Can you score a strike?

Things to Prepare:

Chubby markers or AA batteries. Things that can stand upright easily.







Line up markers or AA batteries just like bowling pins. Arrange the pins so that each pin will fall onto the adjacent pins.

Start controlling the UFO behind the start line. Once the UFO runs through the start line, stop controlling and let the UFO run.

*If the UFO senses ambient noise and stops running in the middle of the lane, add more control to restart the 0UFO.

Let's make a score card and play games with your friends!

Who is the winner?

Zig Zag Race

Let's make an obstacle course and race!
Who can goal the fastest?
Who can goal with least number of turns?

Things to Prepare: Soda bottles, stationaries, paper cups, etc.

How to Play

01

Arrange the objects to make the course. Make sure that the obstacles are far enough for the UFO to pass through.

02

Decide the start line and goal line. Map out the course and start the race.

Perfect control!

UFO Garage Parking Challenge

When you become expert on controlling the UFO, try parking without scraping the walls of the garage.

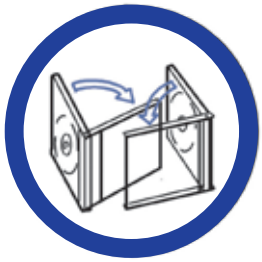
How to Play

01 Make a garage with the CD cases.

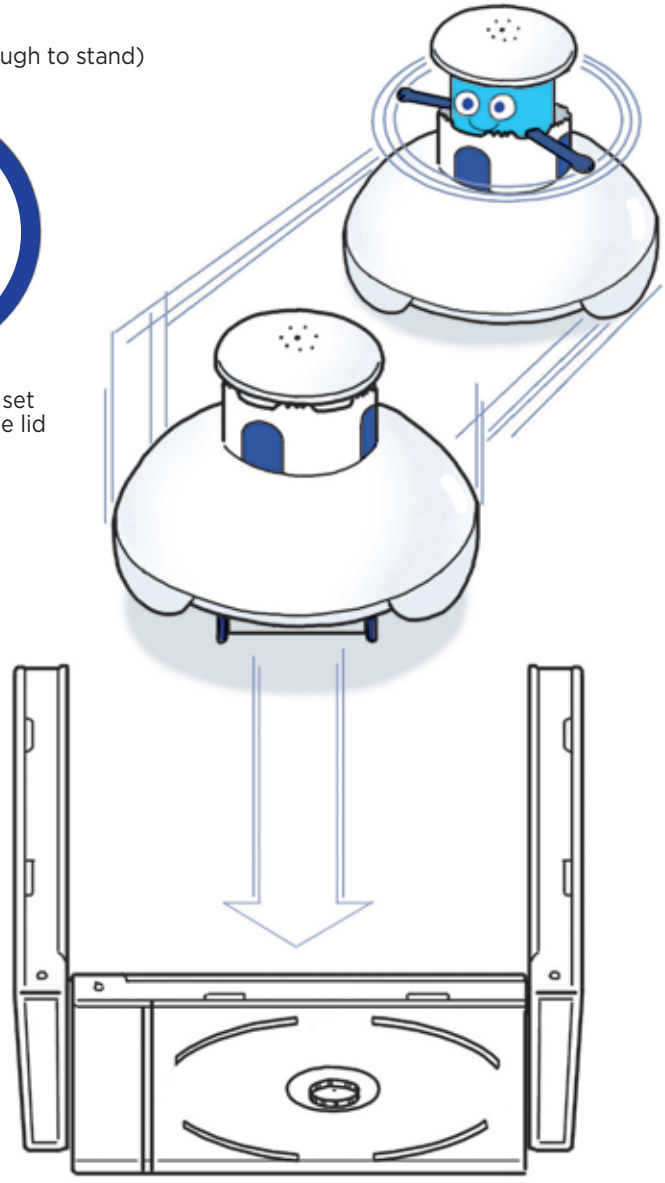
02 Park the UFO in garage without knocking the walls down.

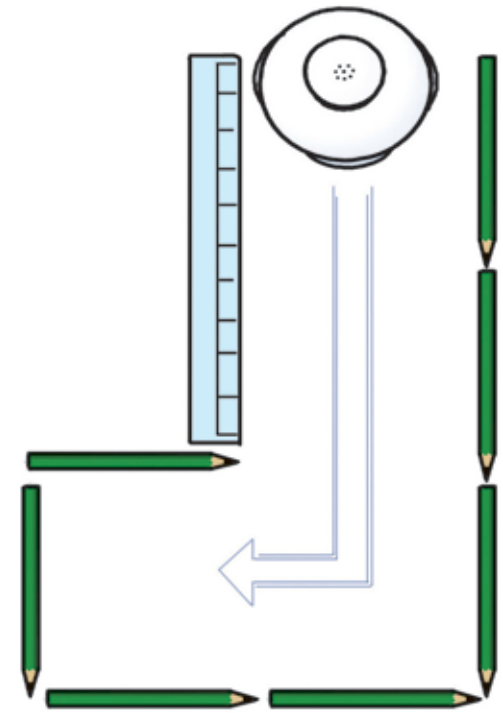
Things to Prepare:

3 CD cases (thick enough to stand)



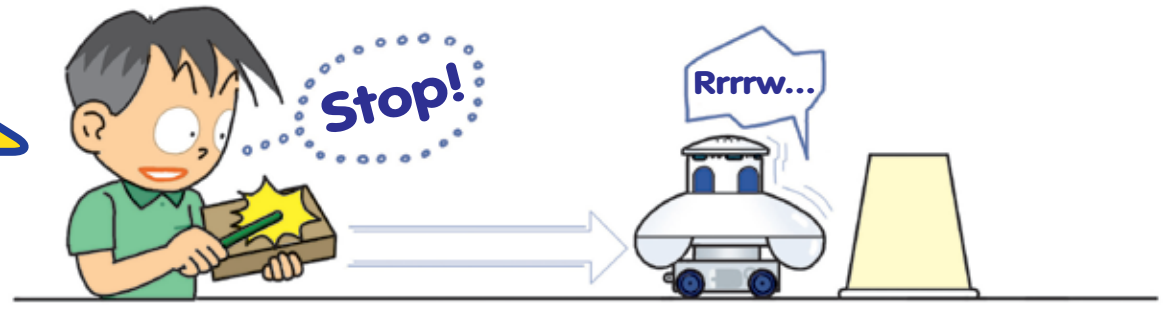
Thin CD cases can be set upright by opening the lid in 90 degree angle.





You can use other objects such as pencils and rulers.

It is fun to practice a short stop. How close can you bring the UFO to an object without touching it.



Play with balls!

UFO Soccer

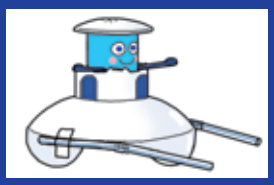
Attach straws to the saucer and sweep a ball to a goal.
Remember the UFO can push a ball but not pull!

Things to Prepare:

* 2 bendable straws
* Newspaper
* Scotch tape

How to Play

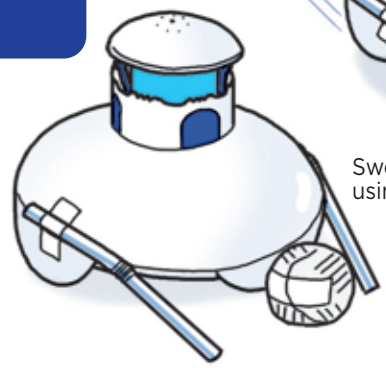
01
Trim the straws to the length you like and attach them to the saucer.



02
Use a quarter sheet of newspaper and make a ball. Tape the end so the ball doesn't fold out.

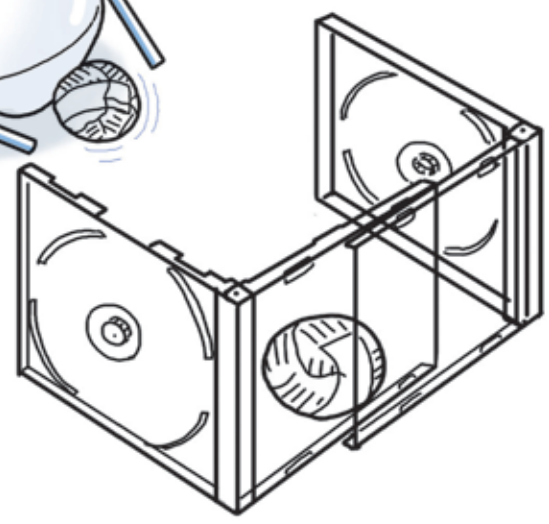
03
Control the UFO to sweep the ball into a goal!

Sweep the ball using straws.



Go forward to get the ball.

Bring the ball to the goal.



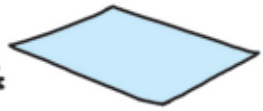
Masterpiece! UFO Art

Attach a pen on the saucer, and you can trace the UFO's move. Can you control the UFO to draw something?

Things to Prepare:


Water marker

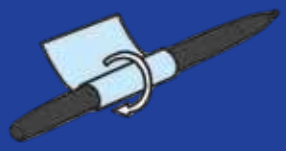

Newspaper


Drawing paper, and Craft paper


Scotch tape

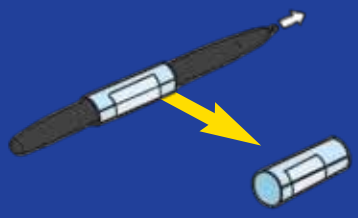
How to Play

01



Cut the craft paper in a 3cm x 10cm rectangle. Roll the piece of paper around the pen and make a tube.

02



Tape the end of paper tube.

03

Tape the paper tube onto the saucer. This becomes a pen holder.

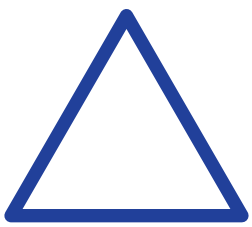
04

Uncap the pen and set the pen into the pen holder.

You can use other objects such as pencils and rulers.

Challenge this! Can you control the UFO ?

Level 1



Level 2

Level 3

Try this!

Immobilize one of the front wheels with tape. The UFO starts zigzag motion or spins around. The UFO will sketch an interesting motion with a pen.

A pattern created by the UFO when one front wheel was immobilized.

*** There are many other ways to play with the Sound Control UFO than the examples in this manual. It is fun to play with the UFO alone or with friends!

Sound Control UFO

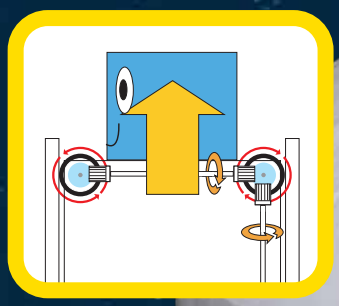
The secrets of the motion

01 The sound sensor acknowledges the sound!!

The sound sensor senses sound (vibration of the air) and sends electrical signal to the control board. The control board reverses the rotational direction of the motor.

02 Two gears (front and back) moves the body assembly.

In this diagram, the front gear turns clockwise when the UFO is running. The same gear turns counterclockwise when the Alien is turning. The front and back gears are connected by a geared shaft, so they always turn in the opposite direction to each other.



The arrows indicate the direction of gear rotation when the UFO is turning.

03 The horizontal gear spins the body assembly.

When the body assembly rises up, this gear engages the teeth cut on the inside rim of the tower. The body assembly starts turning.

When the UFO runs, the tires are on the ground. When the Alien Turns, the tires are lifted in the air.

When the alien is turning, these gears are detached. The motor's reversed rotation will not cause the UFO to run backward.

The sound sensor can detect more than sounds!

A sound sensor senses various types of vibration including a sound (vibration of the air). This is why the UFO switches the modes when the UFO is shaken or blown by winds.

*** Run the UFO on a flat and smooth surface.**

Super Remote Control

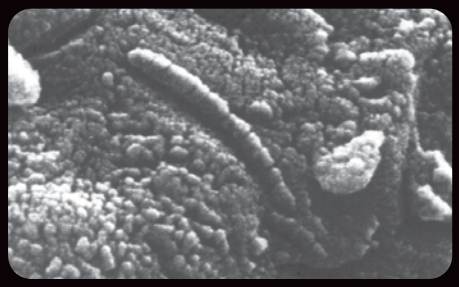
The Views from Mars Probes

The Sound Control UFO is remotely controlled by sound waves. The remote control technology is widely used in space exploration missions. Mars exploration is one of them. NASA operates their space probes on Mars remotely from Earth.

Cooperation=Akira Sasaki, National Observatory

Find Traces of lives and water activity on Mars!

In 1996, researchers discovered a small tube like object in a meteor that was considered to have come from Mars. (The meteor was found in 1984 in the Antarctic) We haven't yet determined if this is a fossilized life form. One of the important missions of the Mars exploration is to find out if there are/were life forms and if there are/were water existing to support organic life forms.

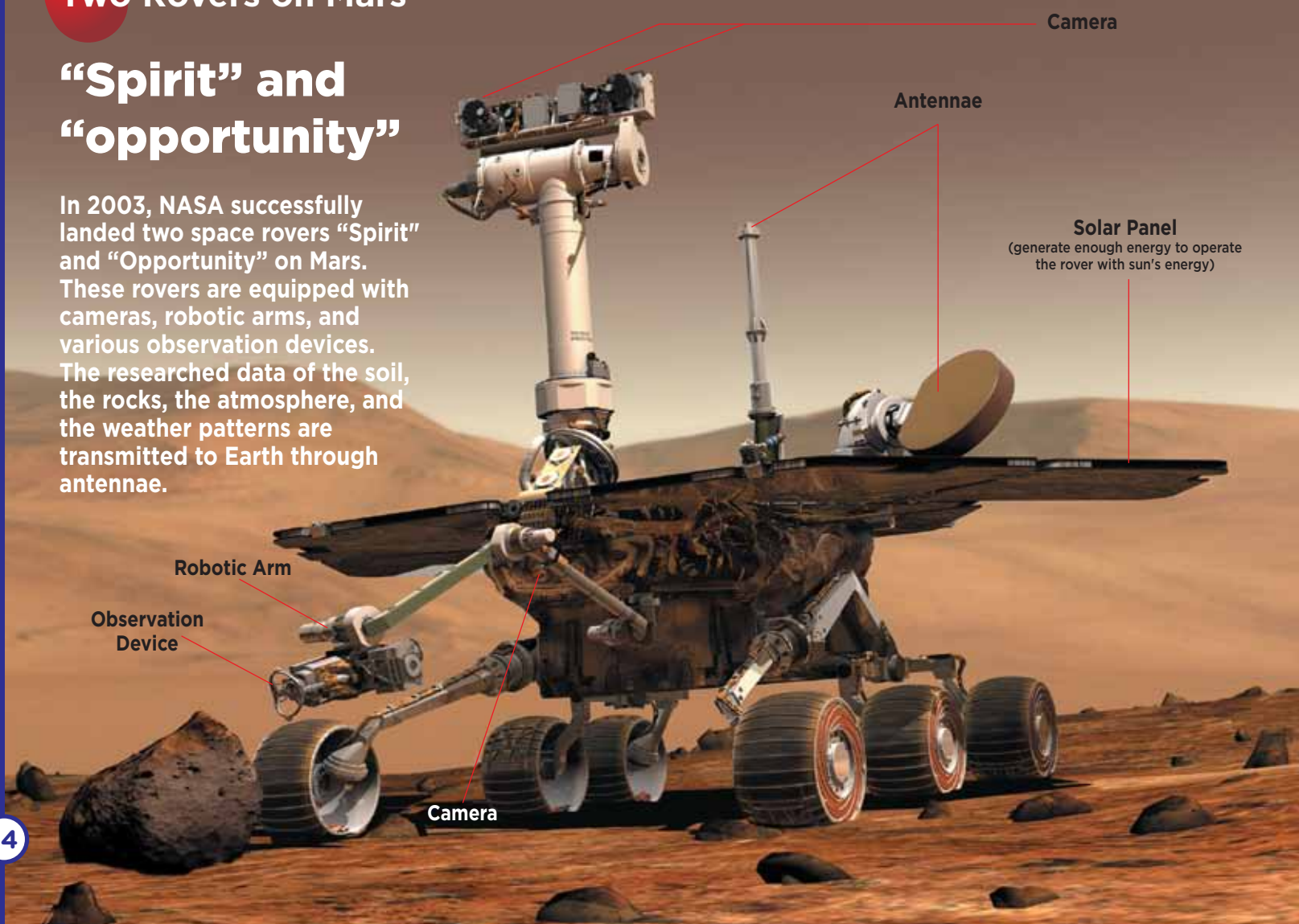


The tube type object is very small. It's about 20-100 nm (nm is 1/1000,000,000 of 1m)

Two Rovers on Mars

"Spirit" and "opportunity"

In 2003, NASA successfully landed two space rovers "Spirit" and "Opportunity" on Mars. These rovers are equipped with cameras, robotic arms, and various observation devices. The researched data of the soil, the rocks, the atmosphere, and the weather patterns are transmitted to Earth through antennae.



"Phoenix" The newest probe, looks for water on Mars!!

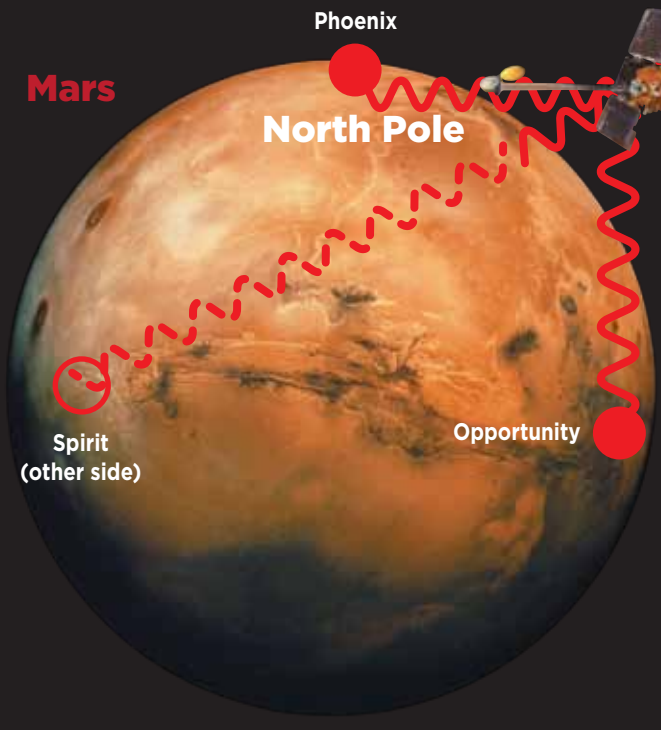
Phoenix was launched on August 4th, 2007 and landed near Mars northern polar region on May 25th 2008. It researched the underground ice in the polar region and the possibility of water existence. See the details in page 18.

From Earth to Mars!! Control over several hundred million km.

The distance between Mars and Earth is approximately 400 million km at the furthest. It is approximately 55 million km when Mars is nearest to Earth. Phoenix is controlled directly from Earth for the most of the time. When a large amount of information needs to be transmitted, the satellite orbiting Mars, "Odyssey", relays the transmission.

NASA Jet Propulsion Laboratory

Earth



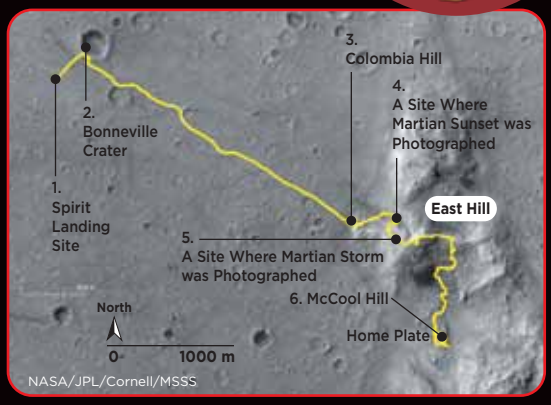
Bulk Information Transmission via Odyssey!

Mars Odyssey 2001 was launched on April 7th and reached Mars orbit on October 23rd 2001. It observes Martian surface and the atmosphere. It also assists the transmission of information between the probes on Mars and Earth.

Conceptual Drawing of Mars Odyssey 2001

Spirit

On January 4th, 2004, Spirit landed in the Gusav Crater Field. It moved toward the East Hill, observing and researching the area.



NASA/JPL/Cornell/MSSS

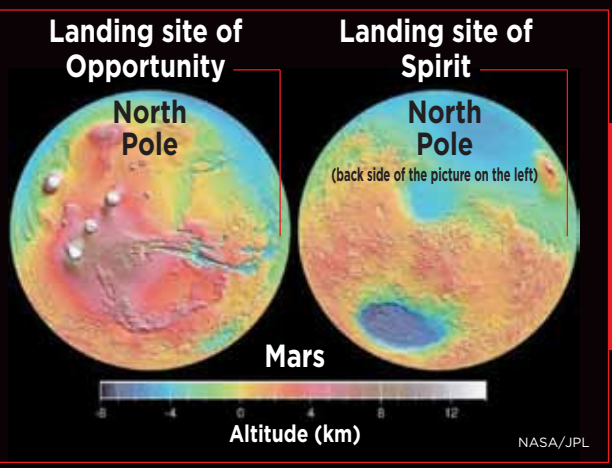
1. The View from Spirit's Landing Site (360 degree panorama image)
The picture shows the image of the "Adirondack" rock and two rocks, "Sushi" and "Sashimi".


NASA/JPL/Cornell


Insulation Shield

2. Arriving at Bonneville Crater!
March 12th, 2004. Across the crater, a piece of insulation shield is photographed. The insulation must have fallen off from Spirit when it entered Mars atmosphere on its descent.

3. East Hill and Columbia Hill
On September 29th, 2004, a layered rock "Tetl" was found. Researchers suspect that the rock may have been formed under water.



NASA/JPL

Distance Travelled Spirit - more than 7km!!
Opportunity - more than 10 km!!

Opportunity

January 25th, 2004, Opportunity landed at Eagle Crater in Meridiani Planum. The rover started heading toward Victoria Crater.

NASA/JPL/Cornell/
University of Arizona/MSSS


NASA/JPL/Cornell/USGS

1. proof of past water activity!?
Discovery of "Blueberry"

On February 6th, 2004, near Eagle Crater, popcorn size round shape formations (Blueberry) were found on the coating of a rock. This formation was considered to be created by water activity in the past.

NASA/JPL

2. Looking Back at the Landing Site
On March 22nd, 2004, Opportunity looked back at the landing site and took a picture. The landing vehicle and the Opportunity's tread markings are shown.

4. Look up at Martian Sunset!
On May 19th, 2005, Spirit took an image of Martian sunset. At sunset, sun light travels the atmosphere for a long distance. On Earth, the air particles scatter blue light first, thus red light reaches near surface. We see the reddish sunset on Earth. To the contrary, on Mars, the atmosphere is thin and packed with dust particles. Dust particles scatter red light and blue light reaches surface. Thus, Mars sunset has bluish color.

5. Martian Storm "Dust Devil"!
July 13th, 2005, Spirit captured an image of Dust Devil. These types of storms were observed more frequently after the start of Martian spring.

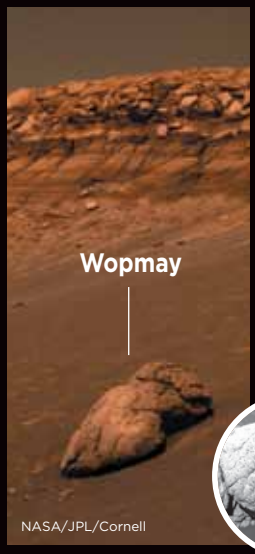
6. Discovery of White Material at McCool Hill!
March 22nd, 2006, Spirit churned up sulfate by its wheels. Sulfate is related to water.

In 2008, to pass the winter, Spirit moved to Home Plate to continue the research.

The Spectacular Images from Mars

Both Spirit and Opportunity were originally planned to investigate Mars for 3 months, however they have continued their operations over 6 years. There are some of the spectacular images sent by the rovers.

3. Martian Dessert Research!
On August 10th, 2004, Opportunity went in the desert inside the Endurance Crater for research. Once in, there was a possibility that the rover's wheels may be caught by the sand and not be able to come out of it. NASA simulated maneuvering of the same type rover in the sand on Earth.

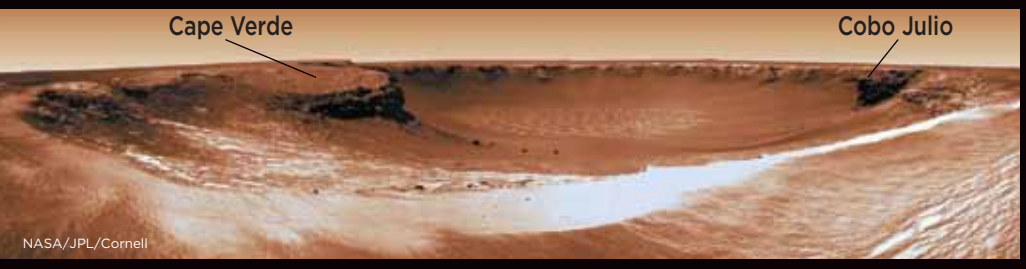


4. Discovering "Wopmay"!!
On August 24th, 2004, in Endurance Crater a boulder "Wopmay" was found. This boulder is about 1m long and its surface possibly indicates that it was affected by water.

Surface of Wopmay

In 2008, Opportunity researched the inside of Victoria Crater.

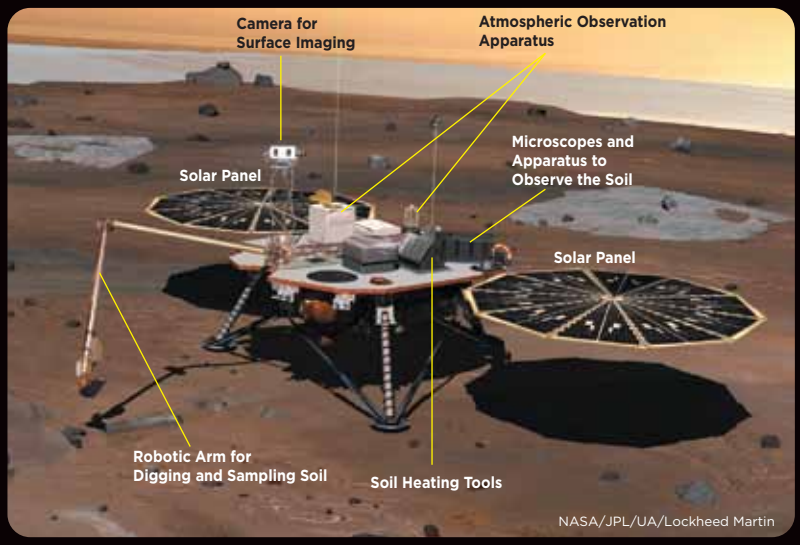
6. Martian Cloud Above the Sky
October 2nd, 2006, the image of floating clouds were captured.



5. Arrive at Victoria Crater!
September 27th, 2006, Opportunity arrived at majestic Victoria Crater, whose diameter is about 800m and depth about 70m. The layered rock formation at the capes suggests possible water activity in the past.

Phoenix Searching Water at Mars Polar Region!

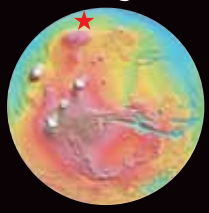
The on-going Mars exploration since 1960s taught us that there exists underground ice layer in Mars Polar region. Phoenix was sent to Mars to dig up soil in the region.



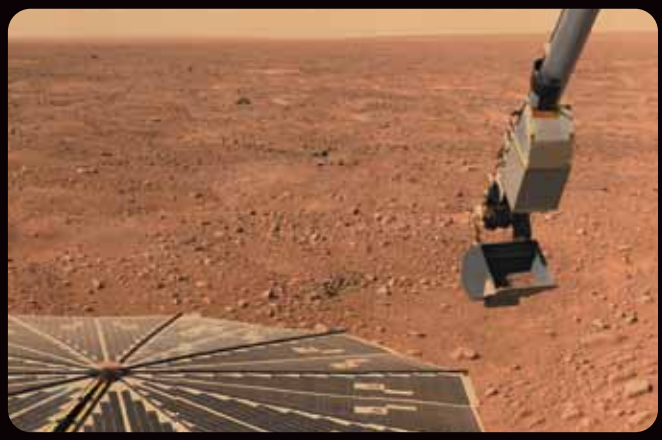
The mythological firebird, Phoenix, has an ability to be reborn from its own ashes, implying its immortality. The Phoenix Mars Lander was named after this myth since this rover was remodeled from the rover of the abandoned mission in the past.

Landing Site is Northern Polar Region of Mars

Landing Site



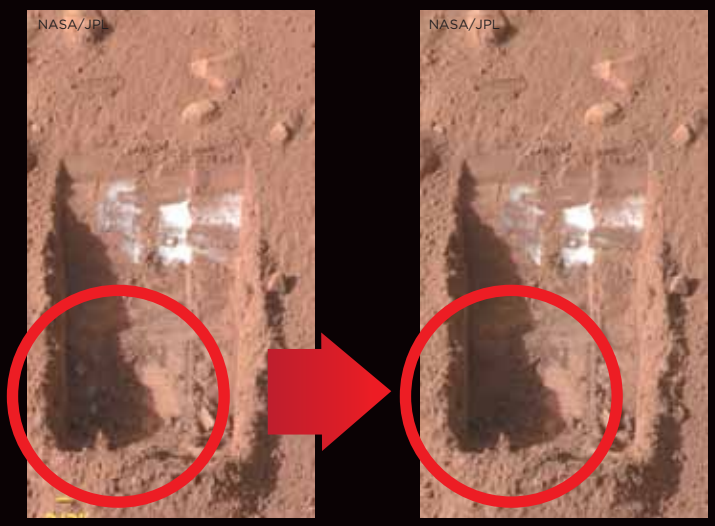
Conceptual Image of Phoenix Landing
Phoenix parachuted down towards the Mars surface and used rocket motors at final decent.



View from the Landing Site
In the image, the robotic arm and a part of solar panel is shown.

Discovery of Water?!

June 15th, 2008, Phoenix dug the soil at the northern polar region and found ice like objects (indicated by the red circle) This object was gone in the picture taken four days later on June 19th. It suggests that the ice may have evaporated. Later in July, the analysis of soil sample verified that there are some trace of water in the soil.



June 15th June 19th

Ice like object under Phoenix

May 31st, 2008, There found bright and shiny ice like object under Phoenix. (circled in red) The jet of Phoenix at the time of landing may have scattered top soil off the ground surface and revealed ice underneath.

Water Existence on Mars Extends Future Possibilities

If there is water on Mars, there is a possibility that some sort of life form had existed in the past. Martian atmosphere is consisted of mostly carbon dioxide at the moment. It is not suitable for humans to live on Mars. However, if there is an access to water on Mars, we can recreate Mars atmosphere to be suitable to human beings. There is a possibility of humans living on Mars someday in the future.

Conceptual Image of Mars Space Base

NOTES