HiRISE High Resolution Imaging Science Experiment

Taking Pictures of Mars with RECON the Martian

A MRO-HiRISE Coloring Book

NASA Ames Research Center SETI Institute

Draft version

Taking Pictures of Mars with RECON the Martian: A MRO-HiRISE Coloring Book

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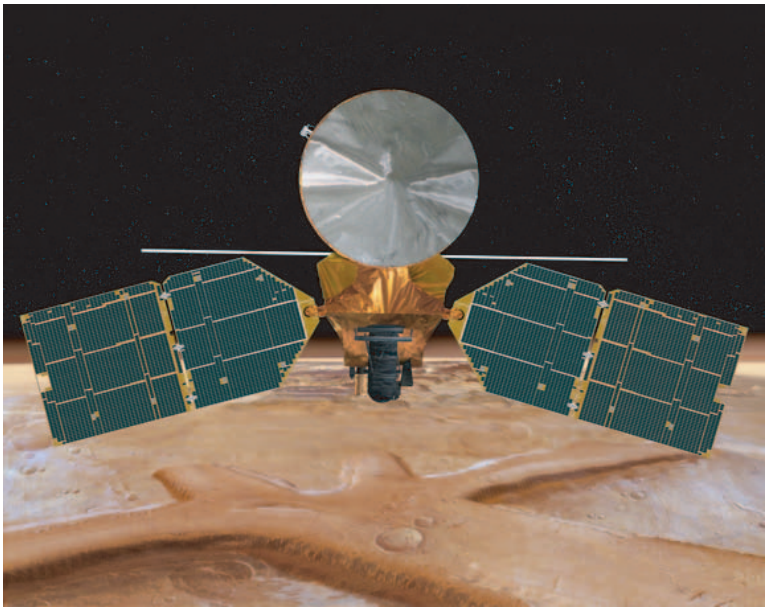
The HiRISE Camera on Mars Reconnaissance Orbiter



Mars Reconnaissance Orbiter (MRO)

MRO Rocket case

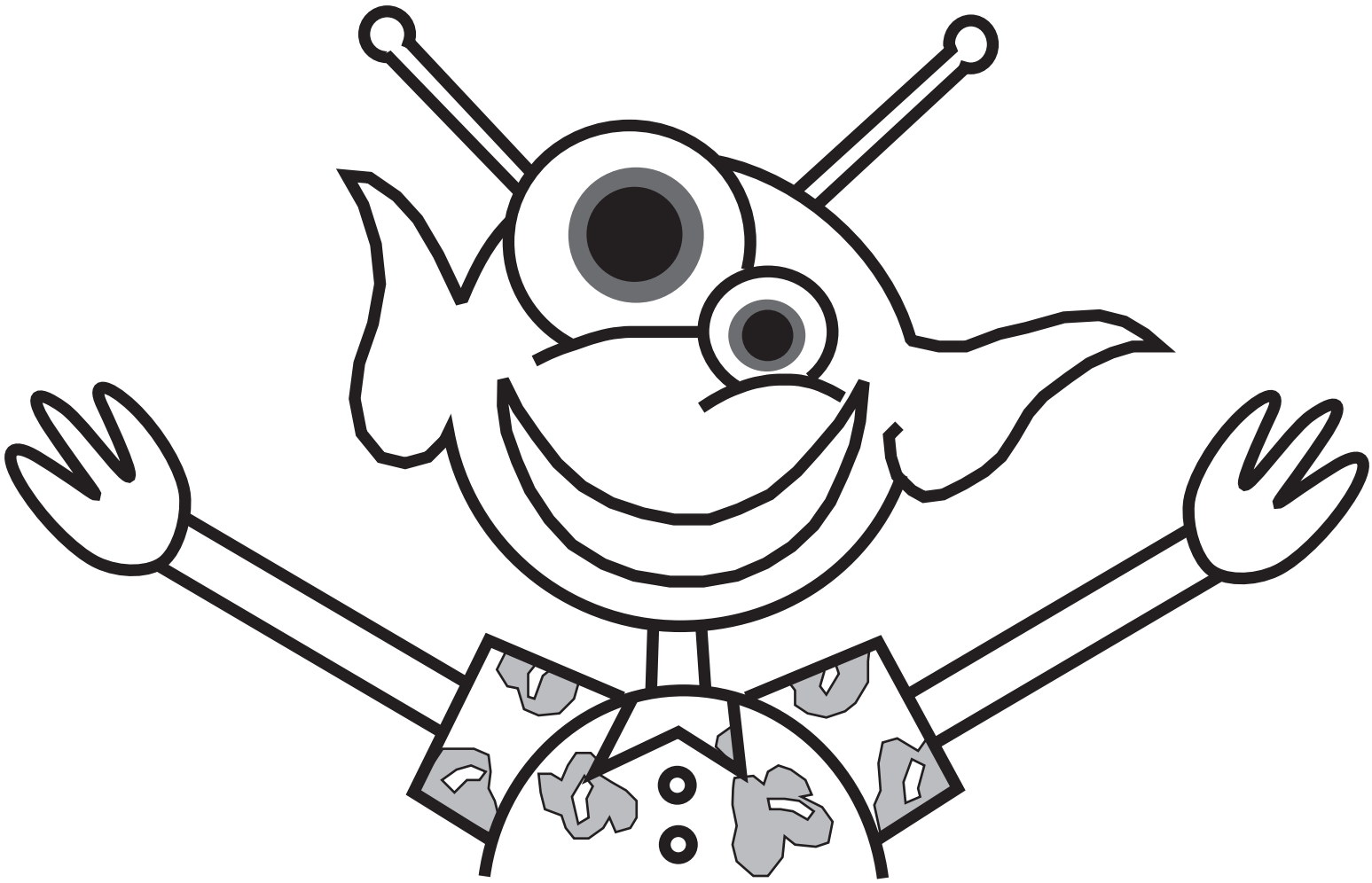
Image Credits:

MRO: NASA/JPL
MRO fairing: NASA
HiRISE: NASA/JPL/Ball Aerospace
Launch: Lockheed Martin
Original Green Man drawing (on cover): NASA/JPL/DiCicco

Note to teachers/parents: This coloring book has been designed for children of all ages. For children younger than 2nd grade, the teacher or parent should read the book to the child and allow them to color it. Children in grades 2 and above will be able to read and color the book, though they may need assistance with a few words.

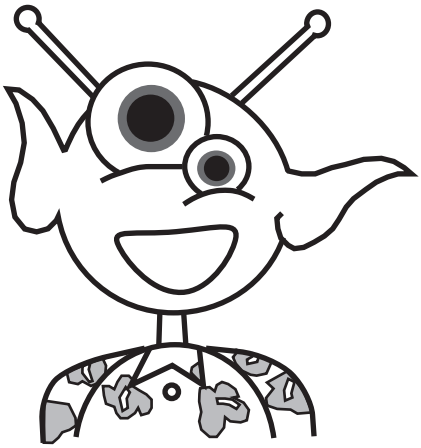
For more information about HiRISE on MRO, go to: http://marsoweb.nas.nasa.gov/hirise.

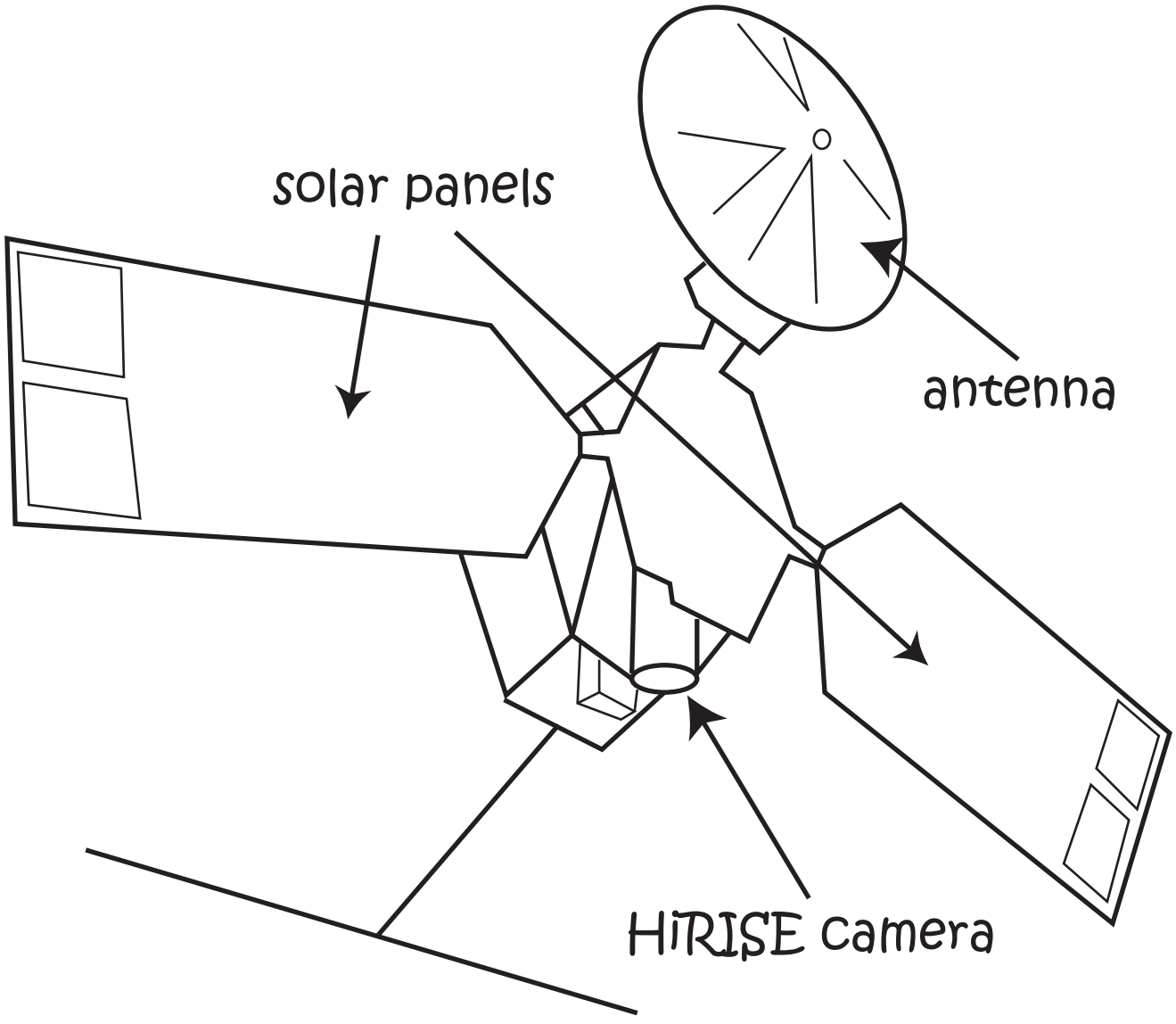
Online games are also available at http://hirise.seti.org/epo

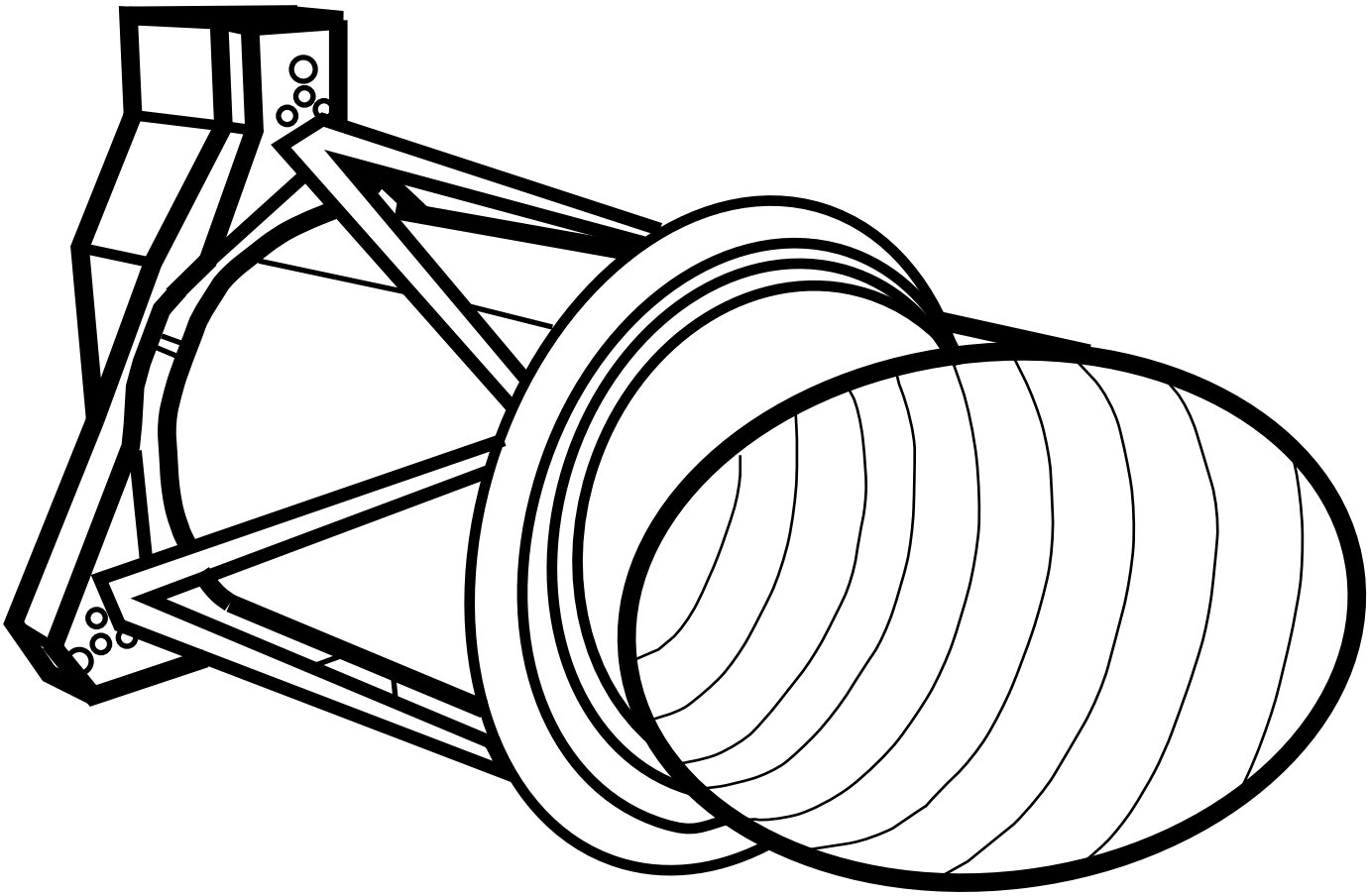


Hello! My name is RECON. I am from Mars. I am helping scientists at NASA make a spacecraft to visit my home and take pictures of it. Come with me to see the spacecraft and we will all take a trip to Mars!

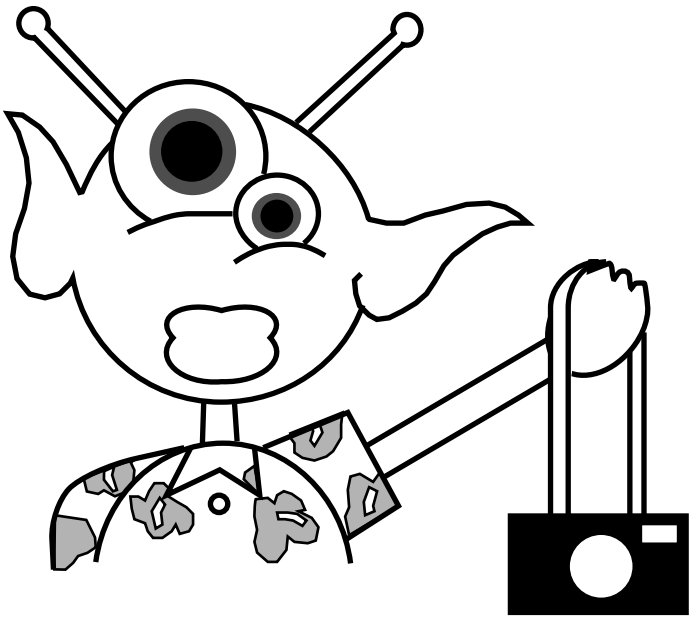
Here is the spacecraft. Its long name is Mars Reconnaissance Orbiter, but I just call it MRO. Reconnaissance means to explore and find out more about something. MRO is going to Mars to find out more about the planet. There are lots of cool tools on MRO, like cameras that will take pictures of Mars.

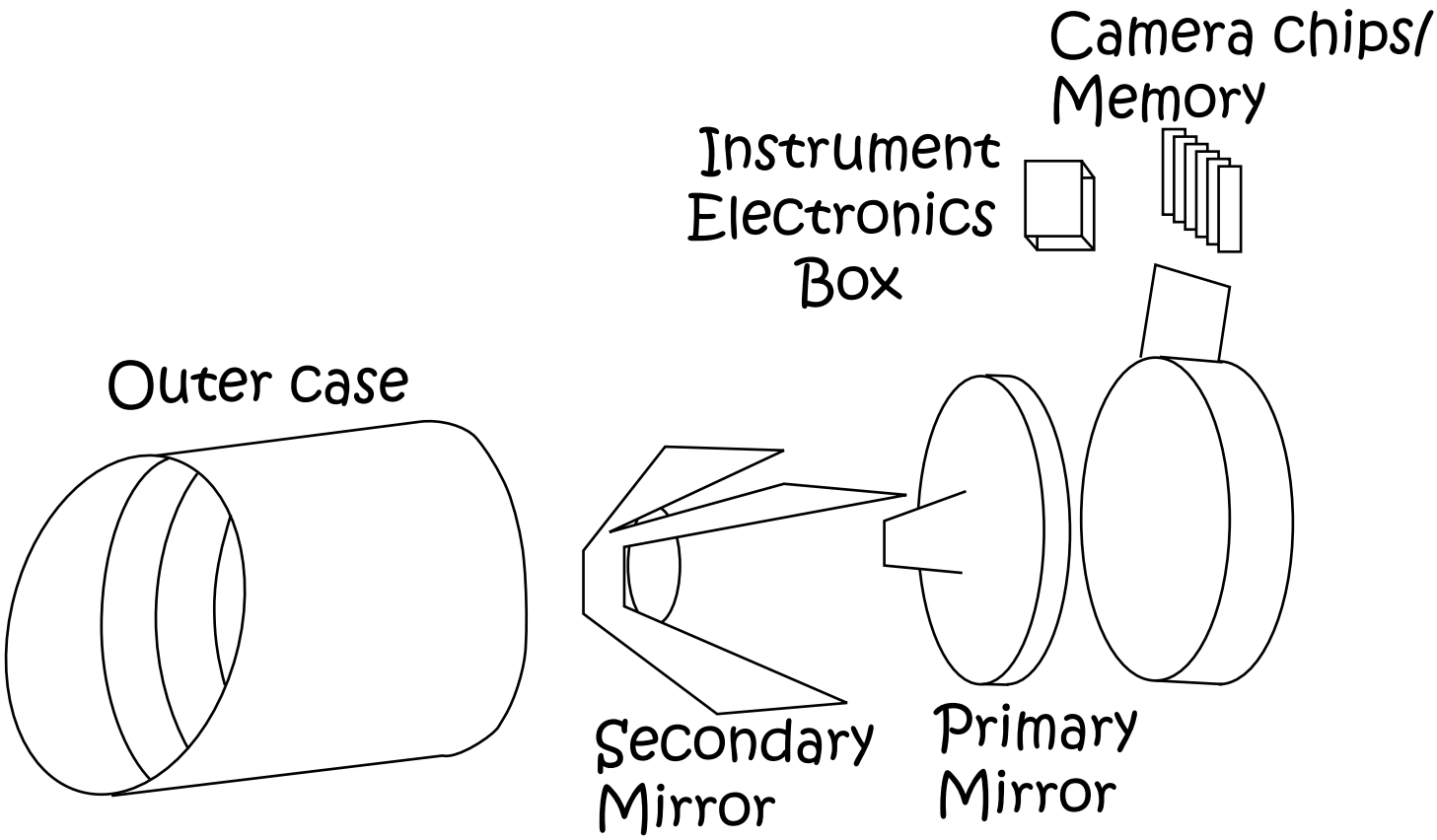


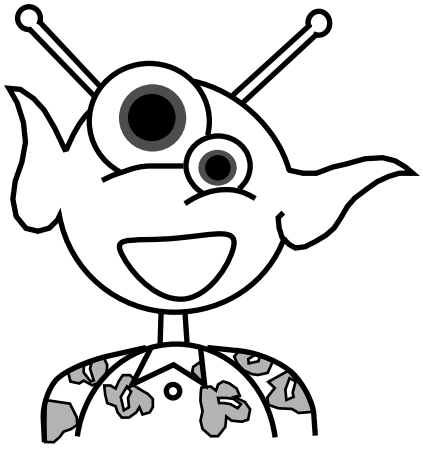




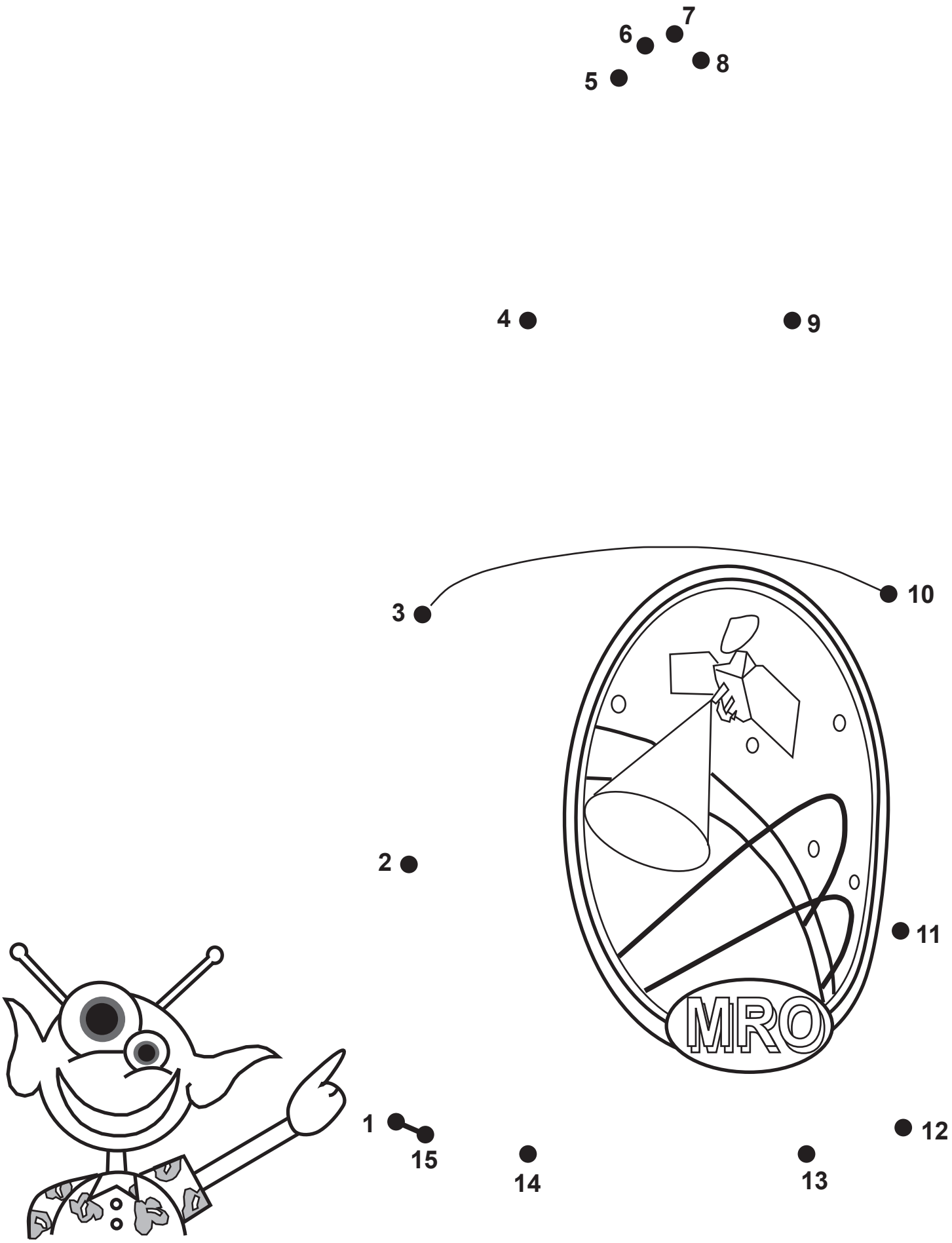
One camera on MRO is called HiRISE. This is what the outside of it looks like. It doesn't look like my camera! It circles Mars on MRO and takes pictures of the surface of Mars from orbit. It is a lot like taking pictures of Earth from an airplane, but from even higher up.



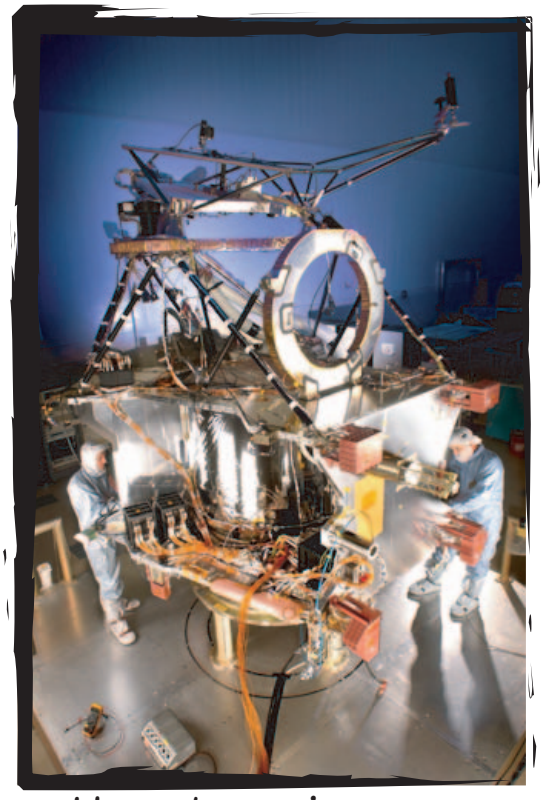




This is what it looks like inside of the HiRISE camera with all of the pieces pulled apart. There are actually three mirrors inside.



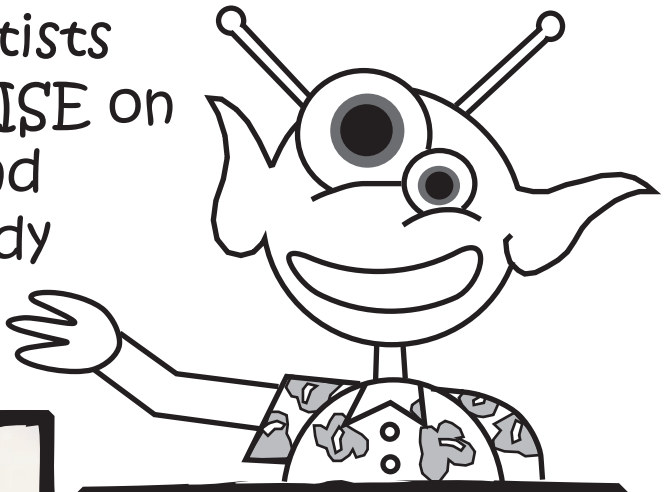
Connect the dots to see the MRO Rocket!

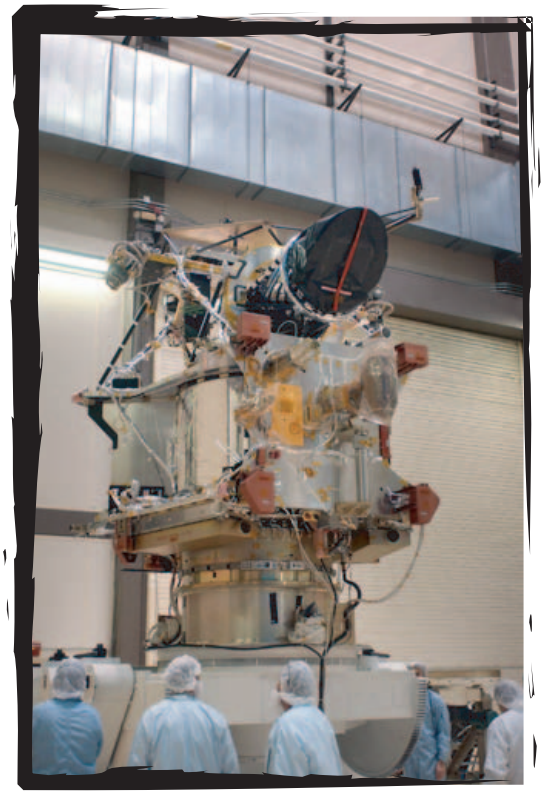


Here the engineers are putting the spacecraft together.

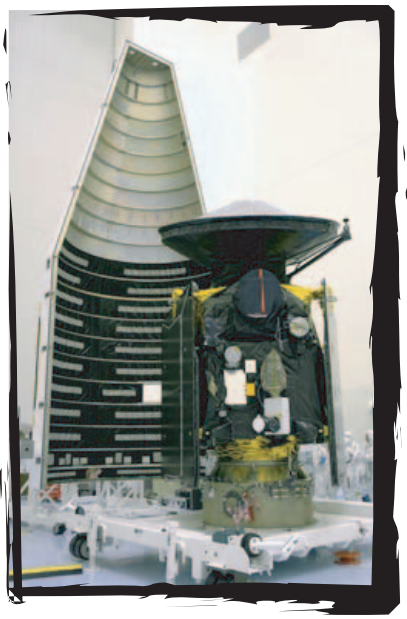
Here the scientists are putting together HiRISE.

Here is my photo album. These photos show all of the scientists getting HiRISE on MRO and getting ready to launch!



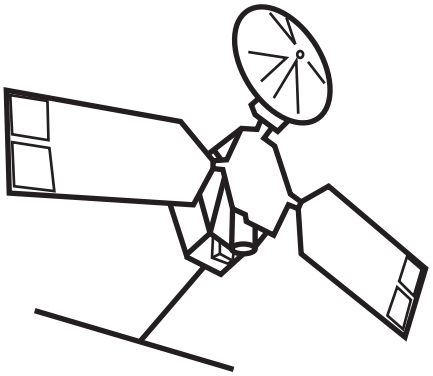


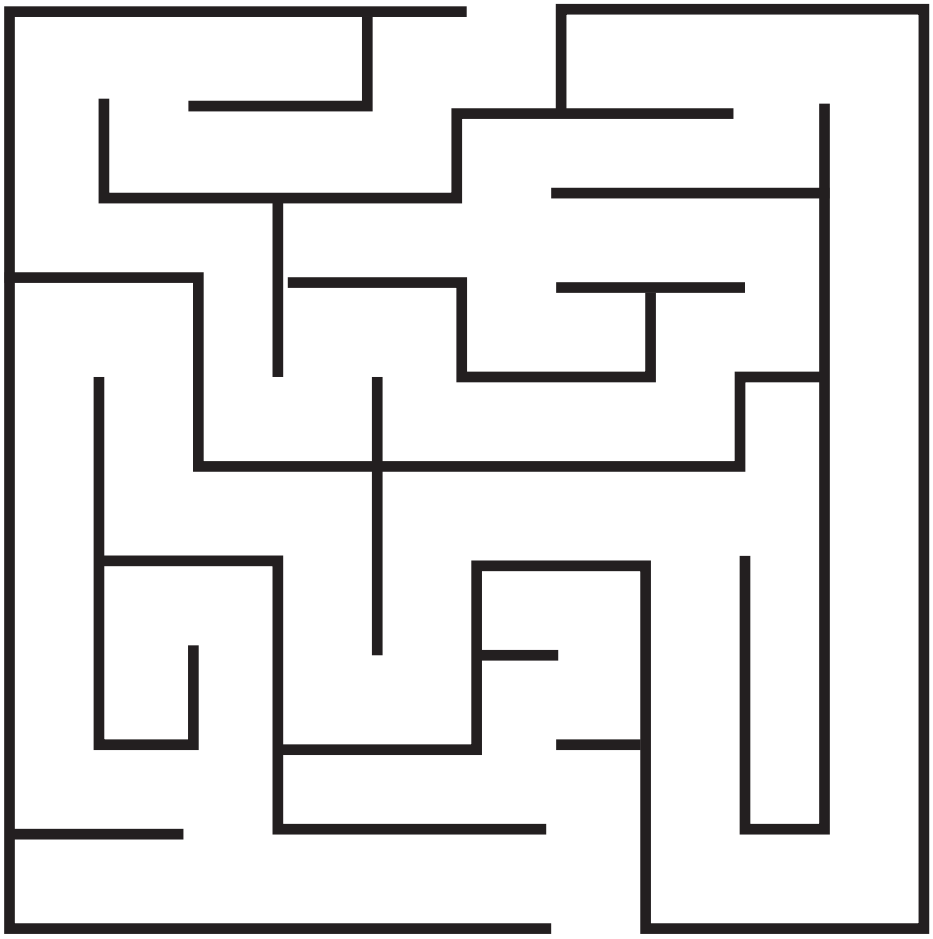
The HiRISE camera is put on MRO

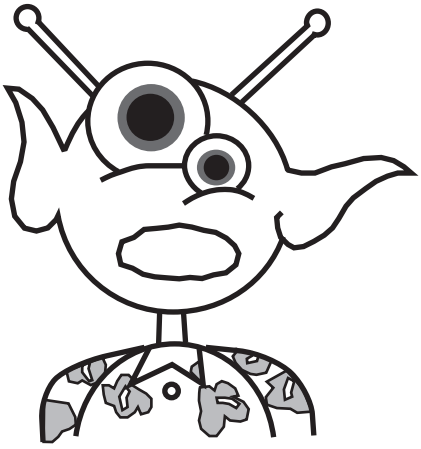


Here they are putting the case on the spacecraft to protect it when it is launched.

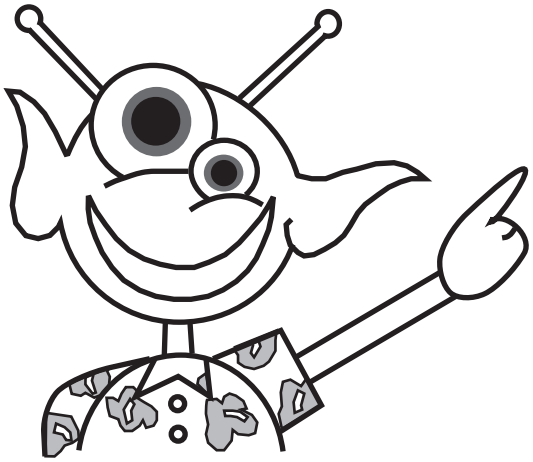
MRO is launched on August 12, 2005!!!!





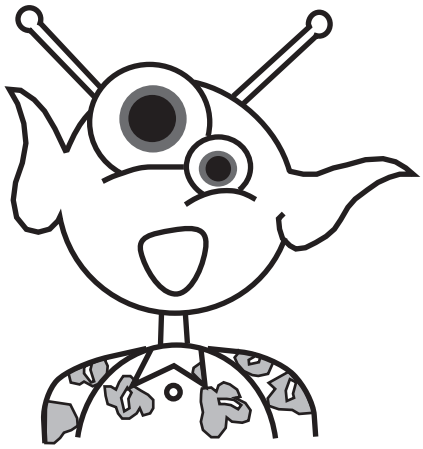


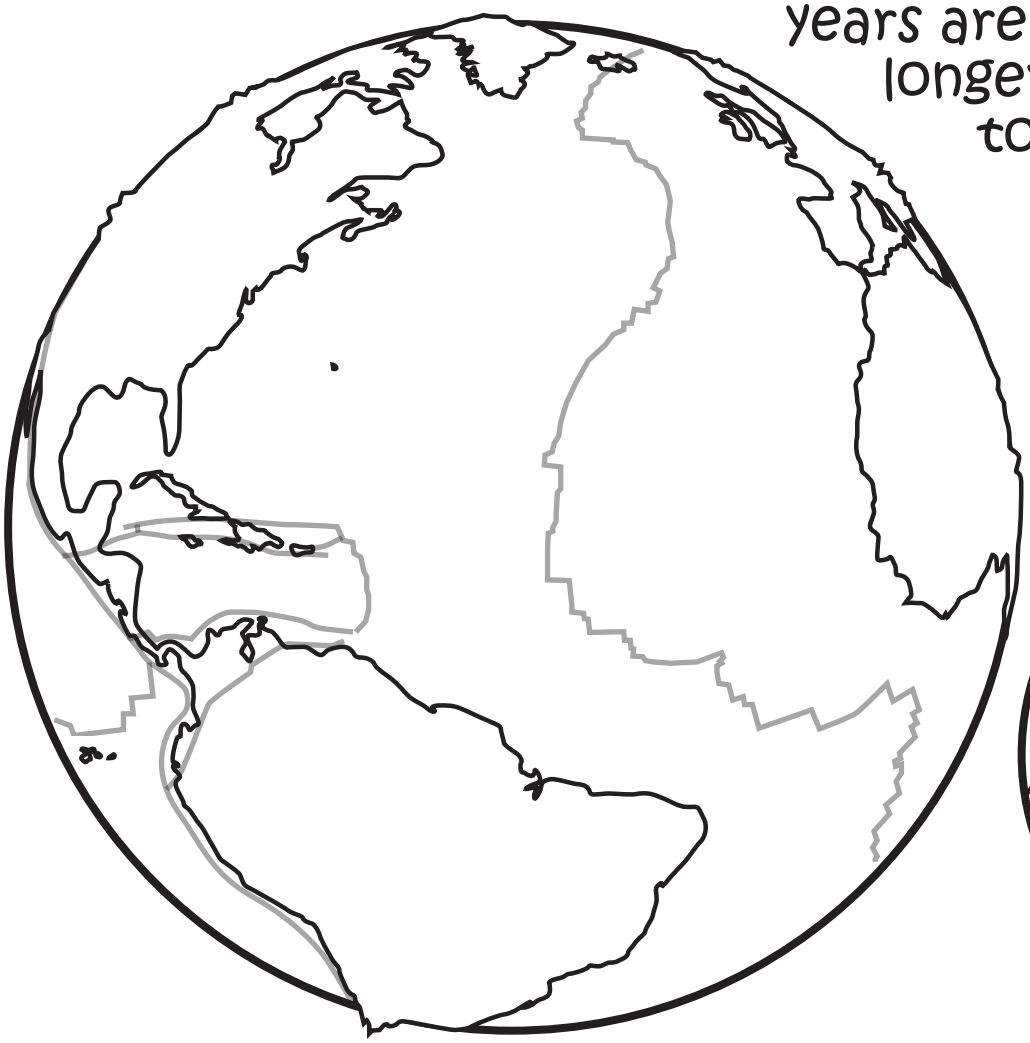
It is a long, hard trip to Mars!
Please help MRO find its way
to Mars safely!

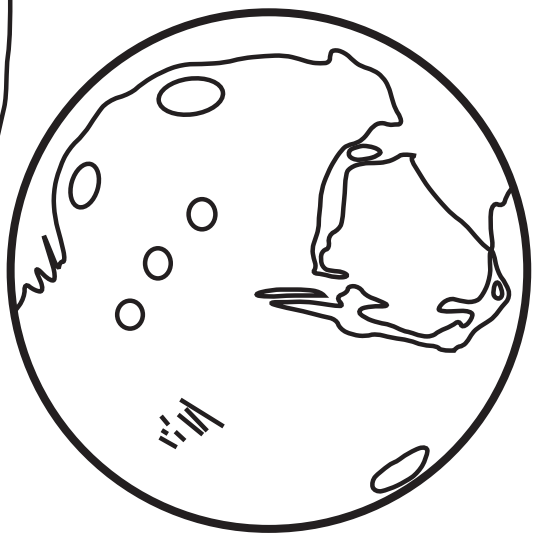


With the HiRISE camera, we will be able to see individual rocks about the size of your desk on the surface of Mars!

My home and your home are so different! Earth is much bigger than Mars. We are farther from the sun and our days and years are longer too!





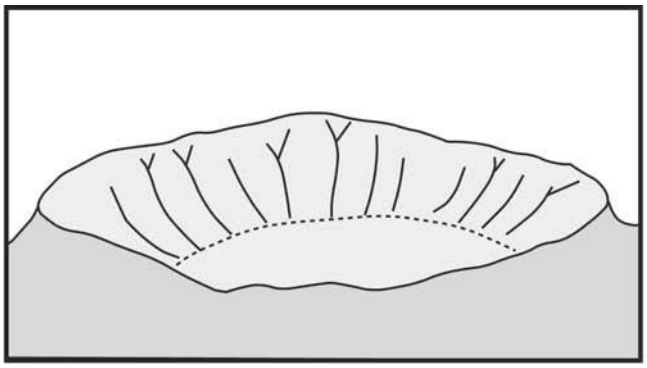


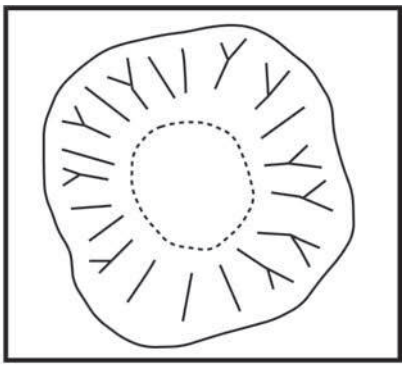
EARTH

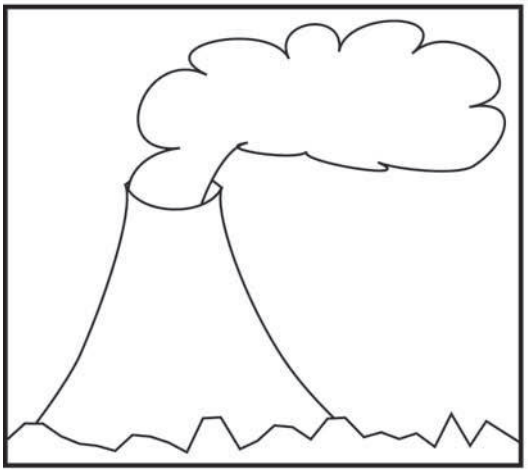
MARS

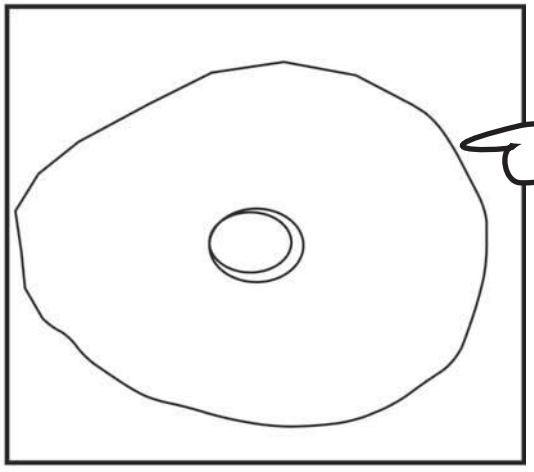
	Earth	Mars
If you wanted to drive from the Sun to this planet, you would have to drive...	93 million miles	142 million miles
If you stretched a string around the planet, it would be this long...	7,926 miles	4,220 miles
A year lasts...	365.25 Days	687 Earth Days
A day lasts...	23 hours 56 min	24 hours 37 min
The average temperature on the planet is...	57 degrees F	-81 degrees F Brrrrrr!
There are this many Moons...	1	2

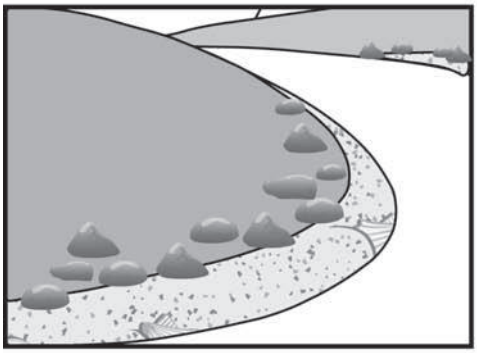
Just like on Earth, on Mars we have volcanoes, craters and ice caps. There used to be rivers too, but now they are all dry! Can you tell what these are drawings of? The drawing on the left side is what it looks like from the side. The drawing on the right shows what it would look like from space. Draw a line from the picture to the name.

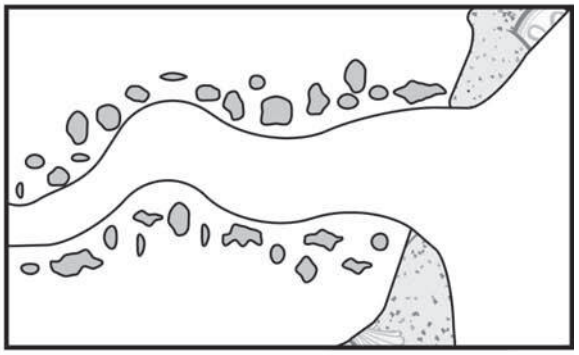


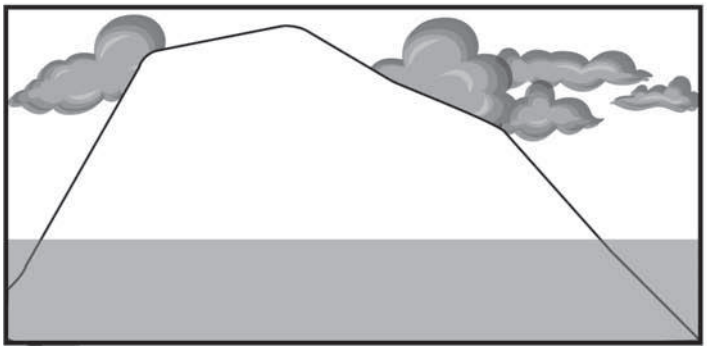


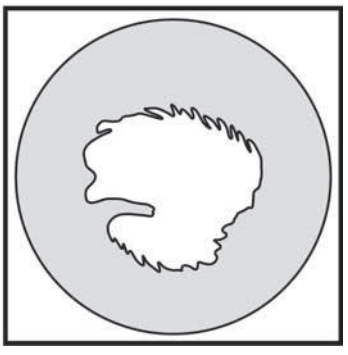


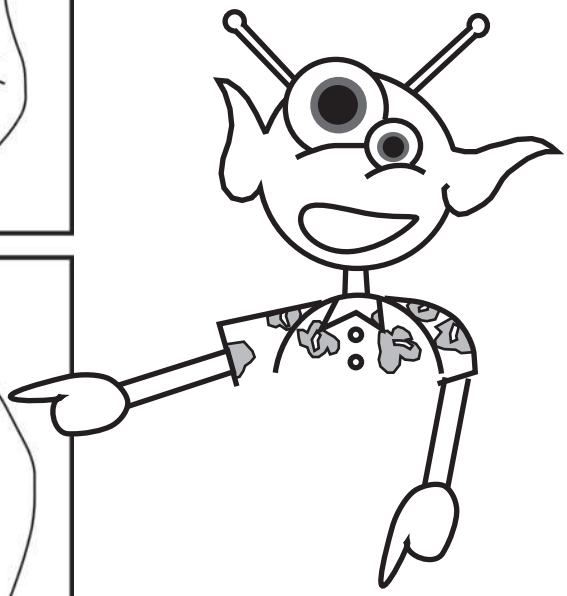










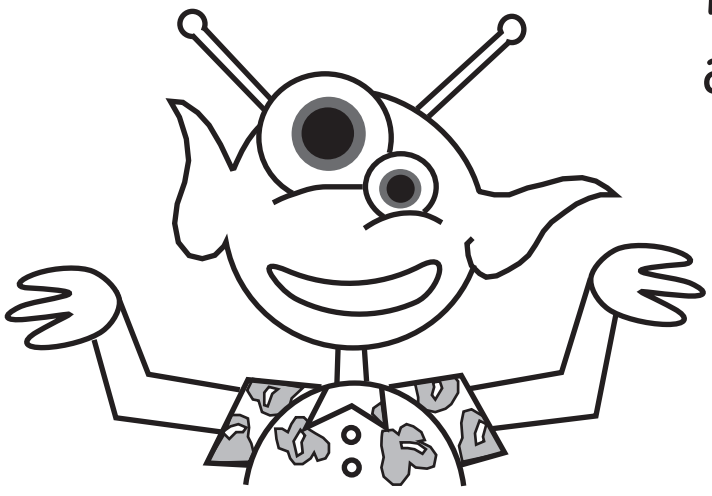


Volcano

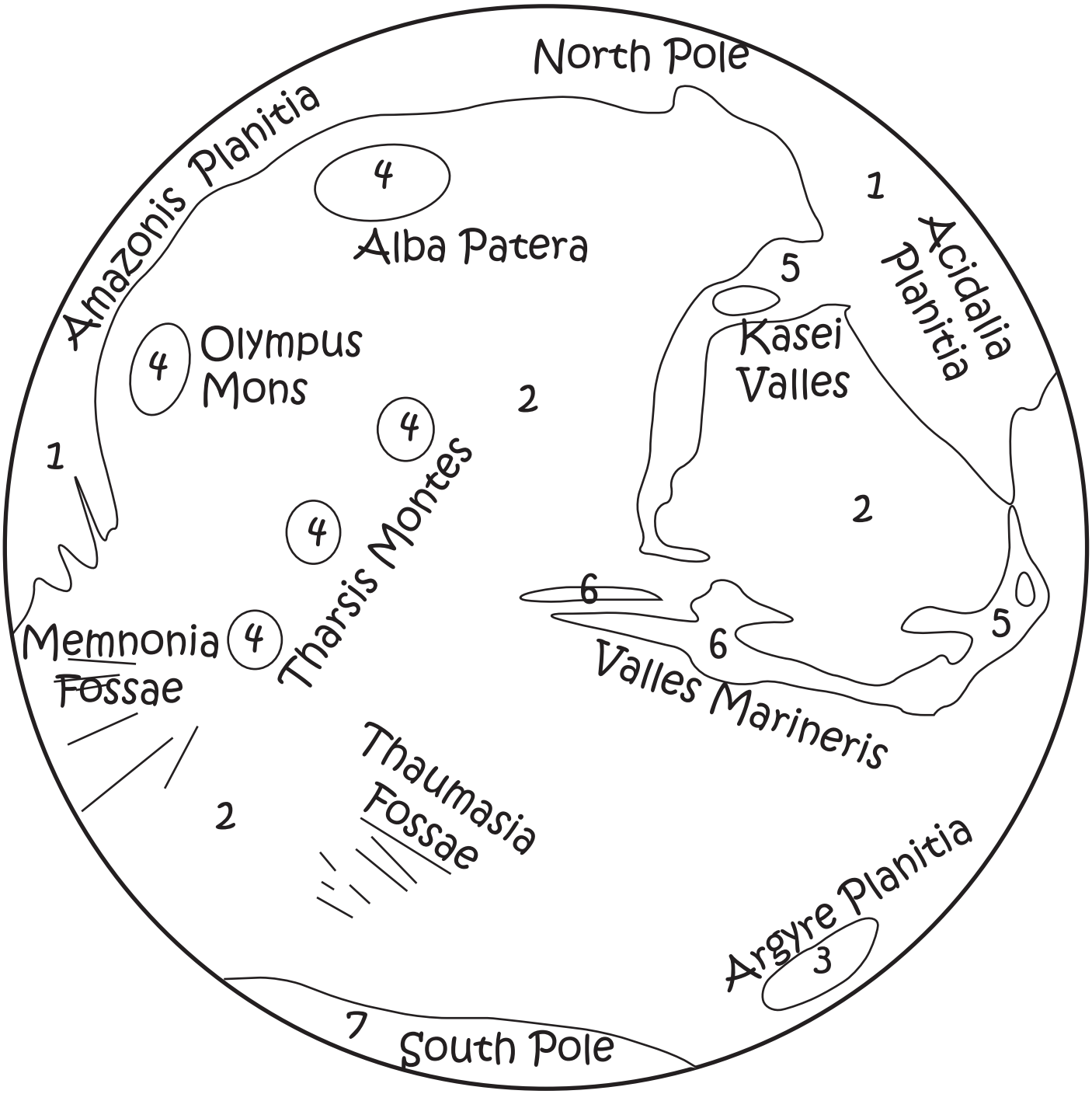
Crater

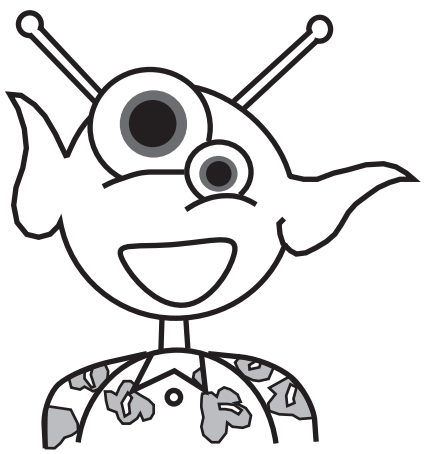
Ice cap

River



They put a lot of cameras and other stuff on MRO so that they can take pictures of my home. What do you think my home looks like? Draw it here!





Color Mars using the colors below:

1 = Orange (Lowlands)
2 = Yellow (Highlands)
3 = Green (Large craters)
4 = Red (Volcanoes)
5 = Blue (Large channels)
6 = Purple (Large canyons)
7 = White (Ice cap)

Appendix 1: National Standards for Grades K through 4	Coloring pages	HiRISE Games
STANDARD:		
As a result of activities in grades K-12, all students should develop understanding and abilities aligned with the following concepts and processes:		
1. Systems, order, and organization	✓	✓
2. Evidence, models, and explanation	✓	✓
3. Constancy, change, and measurement	✓	✓
4. Evolution and equilibrium	✓	
5. Form and function	✓	✓
CONTENT STANDARD A:		
As a result of activities in grades K-4, all students should develop:		
1. Understanding about scientific inquiry		✓
CONTENT STANDARD D:		
As a result of their activities in grades K-4, all students should develop an understanding of:		
1. Properties of earth materials	✓	✓
2. Objects in the sky	✓	✓
CONTENT STANDARD G:		
As a result of activities in grades K-4, all students should develop understanding of:		
1.Science as a human endeavor	✓	✓

Appendix 1: National Standards for Grades K through 4	Coloring pages	HiRISE Games
TEACHING STANDARD A:		
Teachers of science plan an inquiry-based science program for their students. In doing this, teachers:		
1. Select science content and adapt and design curricula to meet the interests, knowledge, understanding, abilities, and experiences of students.	✓	✓
2. Select teaching and assessment strategies that support the development of student understanding and nurture a community of science learners.	✓	✓
3. Work together as colleagues within and across disciplines and grade levels.	✓	✓
TEACHING STANDARD B:		
Teachers of science guide and facilitate learning. In doing this, teachers:		
1. Focus and support inquiries while interacting with students.	✓	✓
2. Orchestrate discourse among students about scientific ideas.	✓	✓
3. Encourage and model the skills of scientific inquiry, as well as the curiosity, openness to new ideas and data, and skepticism that characterize science.	✓	✓
TEACHING STANDARD C:		
Teachers of science engage in ongoing assessment of their teaching and of student learning. In doing this, teachers:		
1. Use multiple methods and systematically gather data about student understanding and ability.	✓	✓
2. Guide students in self-assessment.		✓
TEACHING STANDARD D:		
Teachers of science design and manage learning environments that provide students with the time, space, and resources needed for learning science. In doing this, teachers:		
1. Make the available science tools, materials, media, and technological resources accessible to students.	✓	✓

Appendix 1: National Standards for Grades K through 4	Coloring pages	HiRISE Games
TEACHING STANDARD E: **Teachers of science develop communities of science learners that reflect the intellectual rigor of scientific inquiry and the attitudes and social values conducive to science learning. In doing this, teachers:**		
1. Display and demand respect for the diverse ideas, skills, and experiences of all students.	✓	✓
2. Structure and facilitate ongoing formal and informal discussion based on a shared understanding of rules of scientific discourse.	✓	✓
3. Model and emphasize the skills, attitudes, and values of scientific inquiry.	✓	✓