Virtual Learning

# Unmanned Flight Safety and Operations

**The Mars Rovers**

April 29, 2020

# Unmanned Flight Safety and Operations
Lesson: April 29, 2020

## Objective/Learning Target:

Students will learn about the importance of the Mars Rovers.

## Bell Work:

When did the first rover land on Mars?

## Let’s Get Started:

Watch Videos:

- The Curious Life of a Mars Rover
- The Stunning Images Of Mars: Curiosity Rover

# The Mars Rovers

A rover is a motor vehicle that travels across the surface of a planet upon arrival. Rovers have several advantages over stationary landers: they can examine more area, they can be directed to different areas and features, and they can place themselves in sunny positions to weather winter months. Rovers have wheels and specialize in moving around. They land on the surface of Mars and drive around to different spots.

There have been four successful robotically operated Mars rovers, all managed by the Jet Propulsion Laboratory:

Sojourner, Opportunity, Spirit and Curiosity

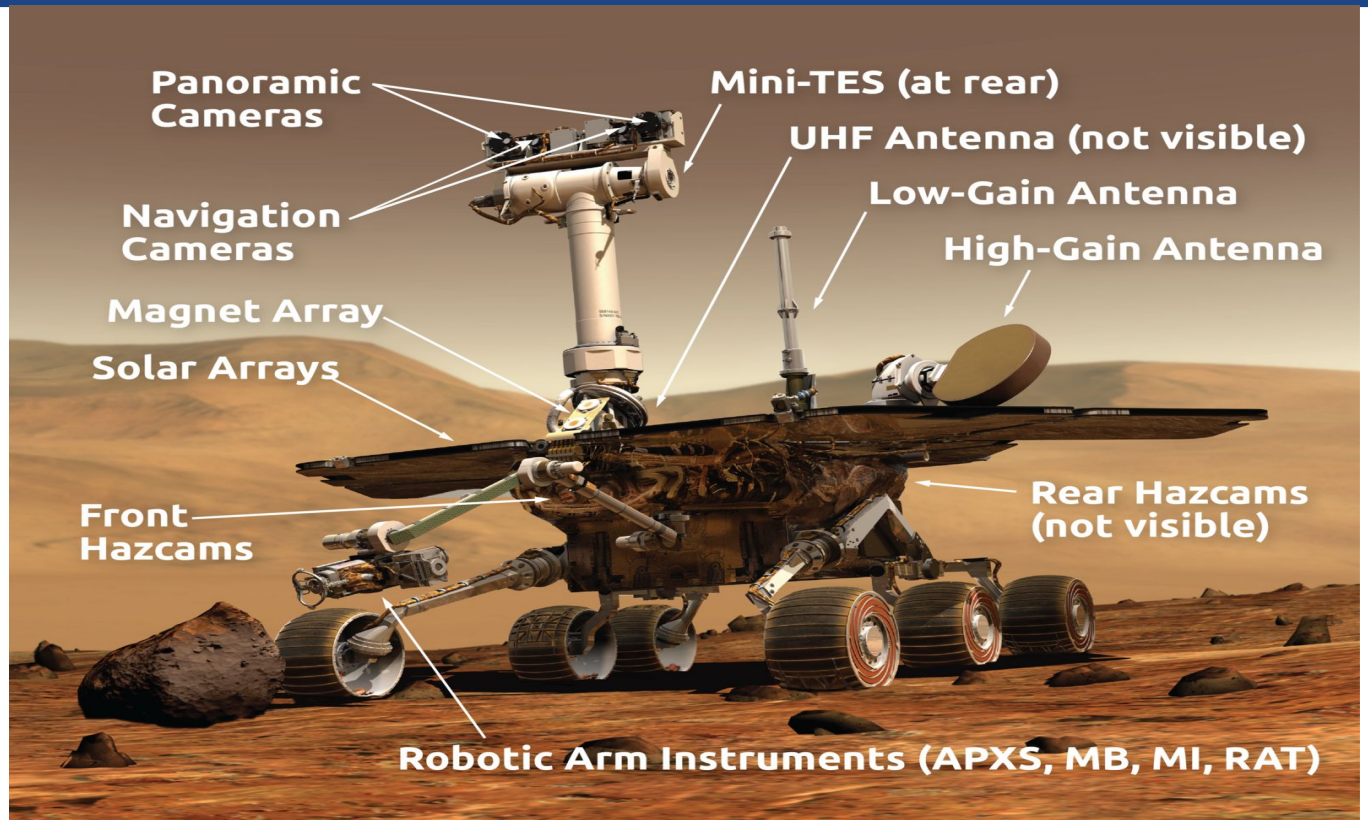
# The Mars Rovers

Rovers help scientists to understand what different parts of Mars are made of. Mars is made up of a lot of different types of rocks, and each rock is made up of a mixture of chemicals. A rover can drive around to different areas, taking samples and studying the different chemicals in each rock. These chemicals can help tell scientists about the environments that changed that rock over time.

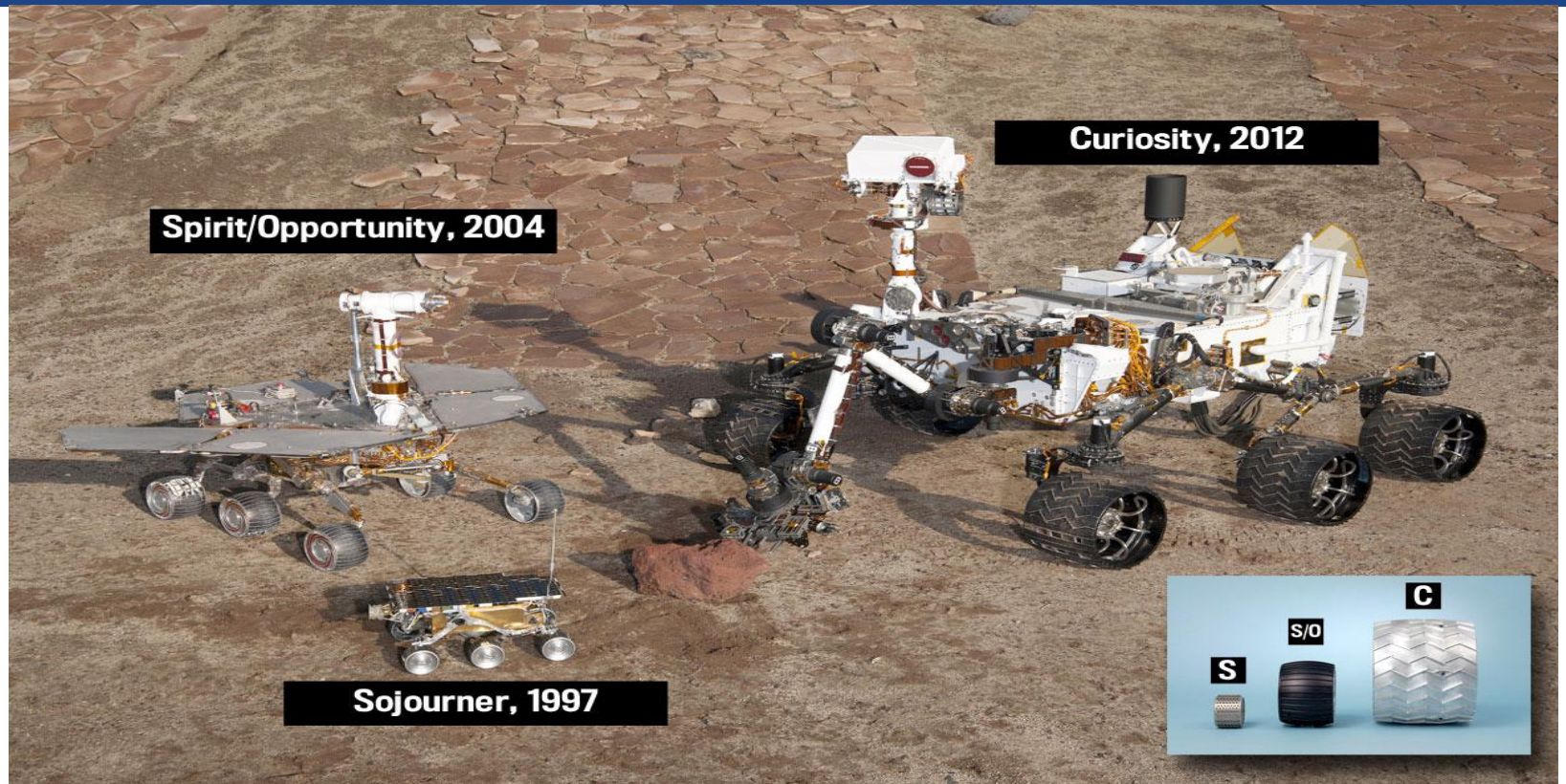
# The Mars Rovers

On January 24, 2016, NASA reported that current studies on Mars by Curiosity and Opportunity would be searching for proof of ancient life. This included looking for microorganisms and potential water sources. The search for evidence of habitability and organic carbon on Mars is now a primary NASA objective. In June 2018, Opportunity went out of contact after going into hibernation mode during a dust storm. NASA declared the end of the Opportunity mission on February 13, 2019, after numerous failures to wake up the rover.

# The Mars Rovers



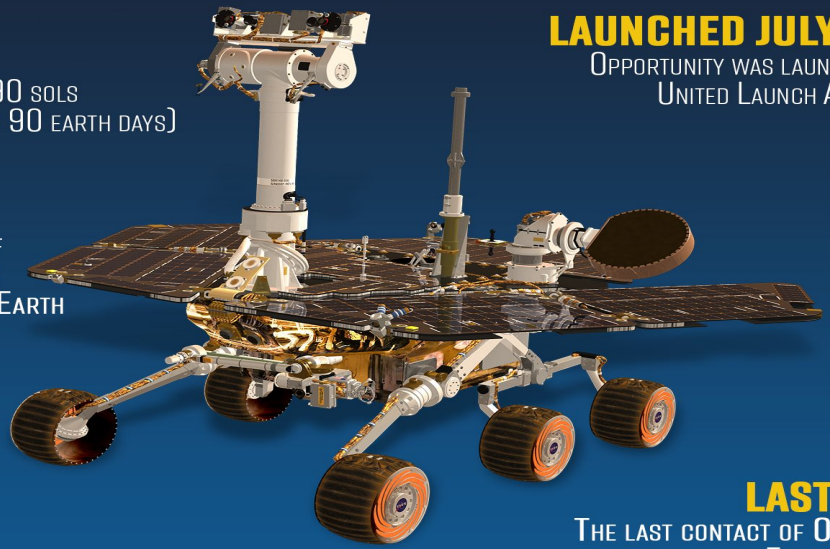
# The Mars Rovers



# The Mars Rovers

## MARS OPPORTUNITY ROVER

THE LONGEST-RUNNING MARS ROVER



### 15 YEAR LIFESPAN

THE ORIGINAL LIFESPAN WAS PLANNED FOR 90 SOLS
DURATION OF ACTIVITY (SLIGHTLY MORE THAN 90 EARTH DAYS)

### LAUNCHED JULY 7TH 2003

OPPORTUNITY WAS LAUNCHED ABOARD THE
UNITED LAUNCH ALLIANCE DELTA II

### SCIENCE UNCOVERED

THE ROVER UNCOVERED THE PRESENCE OF
HEMATITE, GYPSUM AND OTHER ROCKS ON
MARS THAT TEND TO FORM IN WATER ON EARTH

### 228,771 RAW IMAGES

INCLUDING MANY PANORAMA AND
MICROSCOPIC IMAGES

### LAST ATTEMPT

THE LAST CONTACT OF OPPORTUNITY WAS
ATTEMPTED ON FEBURARY 12TH 2019

### 28+ MILES TRAVELED

OPPORTUNITY HAS TRAVELED OVER 28 MILES OR 45 KILOMETERS.

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# The Mars Rovers

# The Mars Rovers

Three rovers are scheduled to launch to Mars in 2020, all aiming for different landing sites. These will all pack chemical and geological instruments on to answer questions about Mars's past habitability and whether life ever existed there.

# Mars Rover Understanding

Pick one of the 4 Mars Rovers and research it.
Then create a PowerPoint/Google Slide presentation over your selected rover.