

# Could Mars Really Support Life?

By:

Period 6 Students

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# First, The Necessities For Life:

- É On Earth, water is the key ingredient to live in all forms of life.
- É Life forms need energy as well.
- É On Earth, oxygen is mandatory to support all life



# Wonderful Water

“The biochemical reactions that sustain life need a fluid in order to operate... Water plays another key role in the biochemistry of life: bending enzymes. Enzymes are proteins that catalyze chemical reactions, making them occur much faster than they otherwise would.” (Life’s Little Essential, 1)

# Extreme Environments

There is evidence on Earth, that life can support itself in extreme environments.

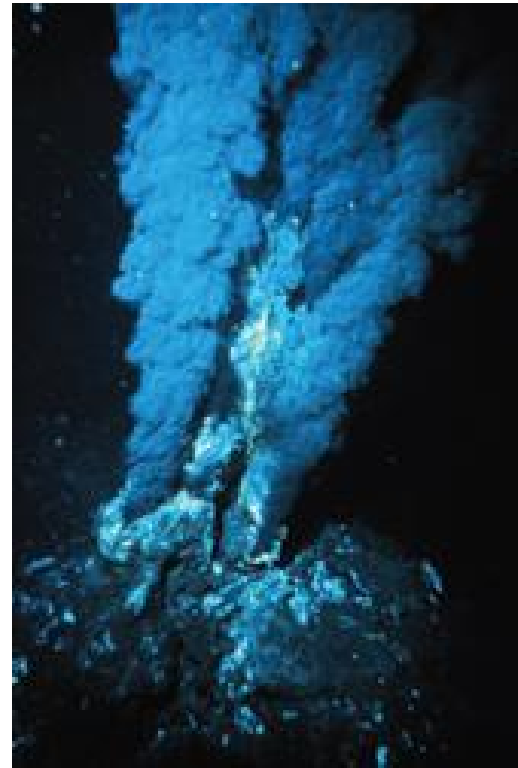
É *Ice glaciers* in Antarctica that reached temperatures of 128.6 degrees Fahrenheit

É **Hot Springs** in Yellowstone National Park, that can reach temperatures of over 200 degrees Celsius

É *Lightless caves* where energy comes from sulfuric compounds

É *Hydrothermal vents* that are over one mile beneath the surface, and that have temperatures of 340 degrees Celsius

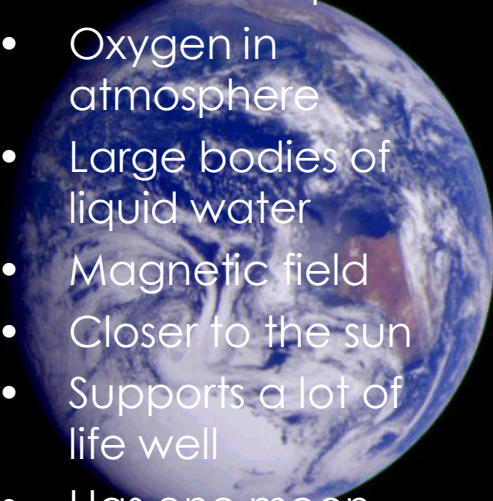
É Temperatures in the Mojave *Desert* can actually reach 150 degrees Fahrenheit



# Earth Vs. Mars

## Earth

- Thick atmosphere
- Oxygen in atmosphere
- Large bodies of liquid water
- Magnetic field
- Closer to the sun
- Supports a lot of life well
- Has one moon

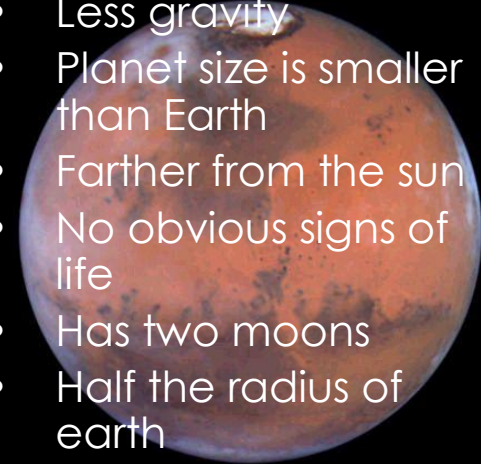


## Both

- Same day-length
- Seasons
- Tilted-axis
- Wind-erosion
- Mountains and volcanoes
- Iced-Caped Poles
- Iron oxide on surface

## Mars

- Thin atmosphere
- Less gravity
- Planet size is smaller than Earth
- Farther from the sun
- No obvious signs of life
- Has two moons
- Half the radius of earth
- Less dense than Earth
- Atmosphere 95% Carbon dioxide



# Characteristics of The Red Planet

## É Moons

- ó Phobos & Deimos
- ó Tiny with close orbits
- ó Phobos rises in the west and has 11 hr orbit
- ó Deimos rises in the east and has 30 hr orbit

## É Geology

- ó Primarily Basalt
- ó Surface is cover with dust
- ó Past of plate Techtonics
- ó Existance of Hermothite and Geothite
  - É Minerals that form only in the presence of water

# Mars's Atmosphere

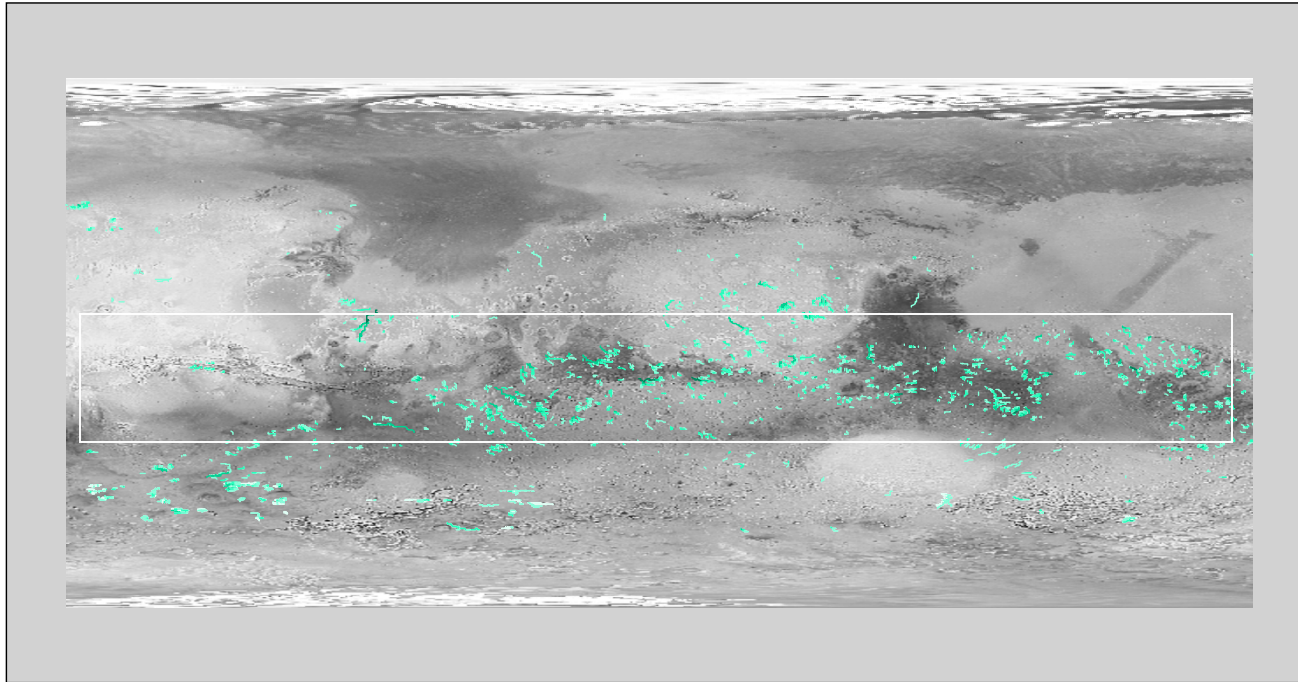
É There is almost no water in its atmosphere

É Very thin atmosphere

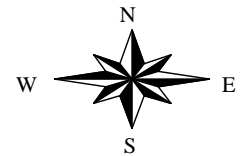
É 95% Carbon Dioxide

É 38% of Earth's gravity

# Marsø River Channels



3 000 0 3 000 6 000 Miles



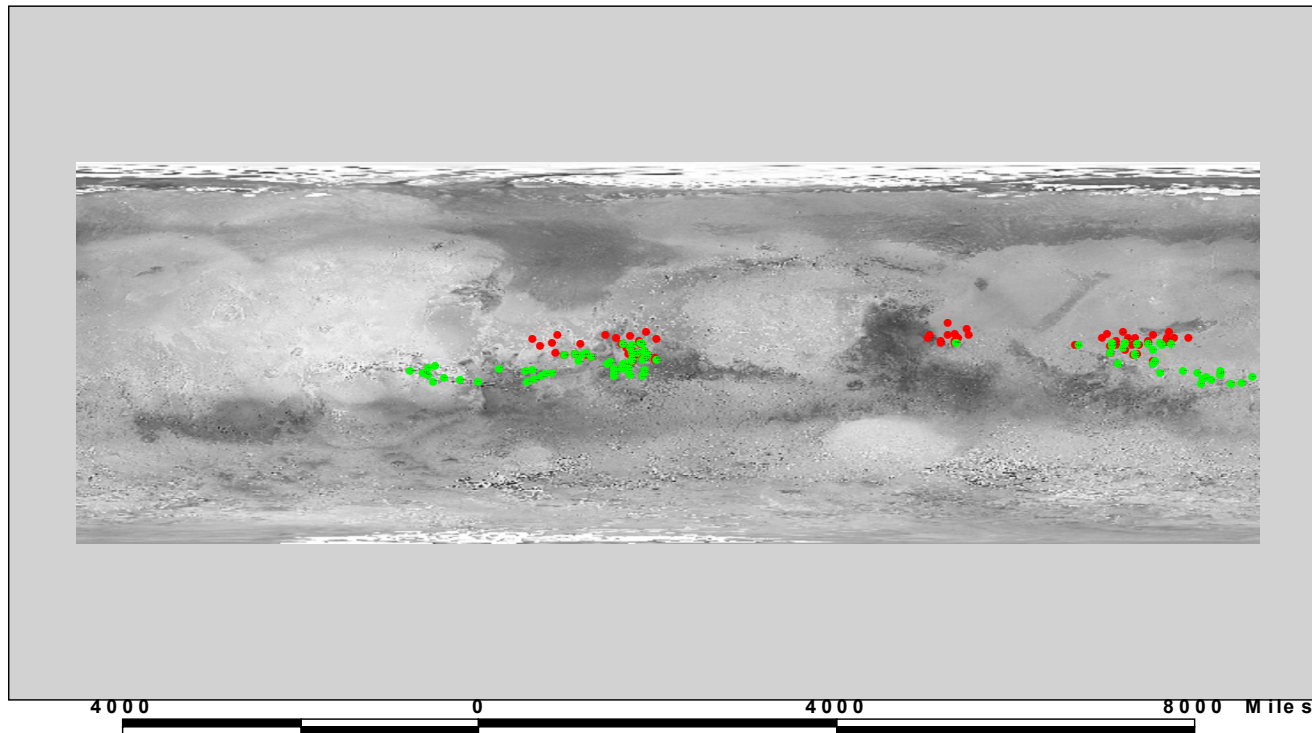
Scientists have found extremely old river channels on Mars surface

They believe there once were thousands of miles of water that covered the surface of the red planet

The channels could have sedimentary rock that would give us information on Mars history



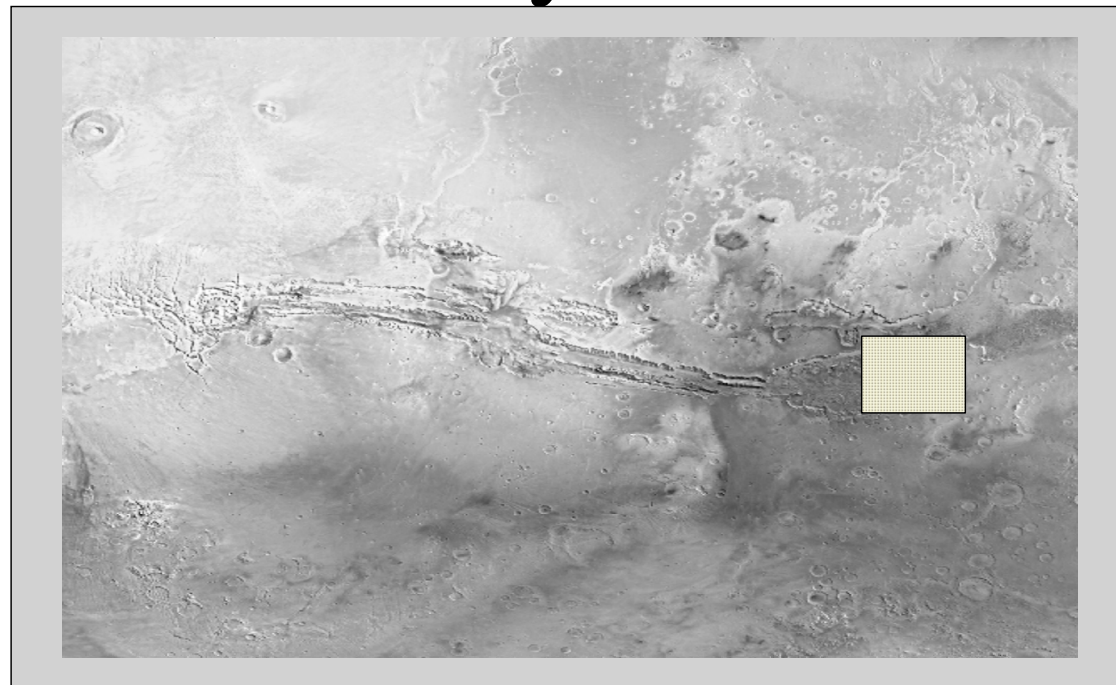
# NASA's Original Suggested MER Sites



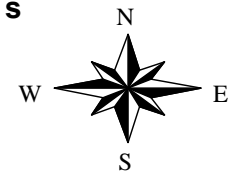
Scientists at NASA and JPL studied long and hard about which exact location to send the Land Rovers

They finally chose to send the rovers to Gusev Crater

# Mars Valley Outflow Area



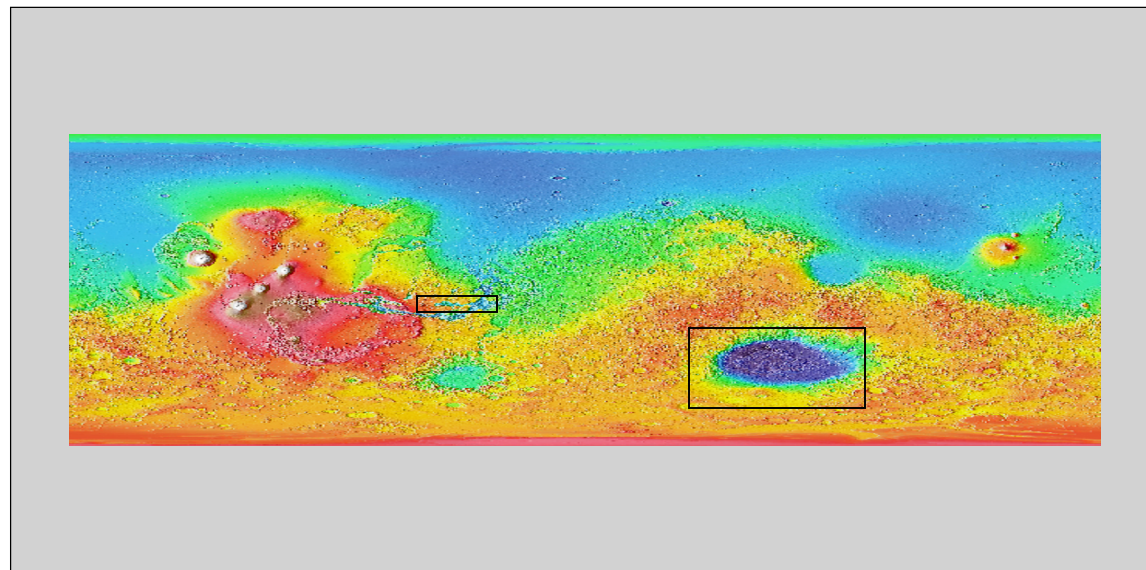
500 0 500 1000 Miles



 Valles Outflow Area

The picture shows the planet's  
old valleys and river channels

# Marsø Mola Shaded Relief



Legend

4000 0 4000 8000 Miles



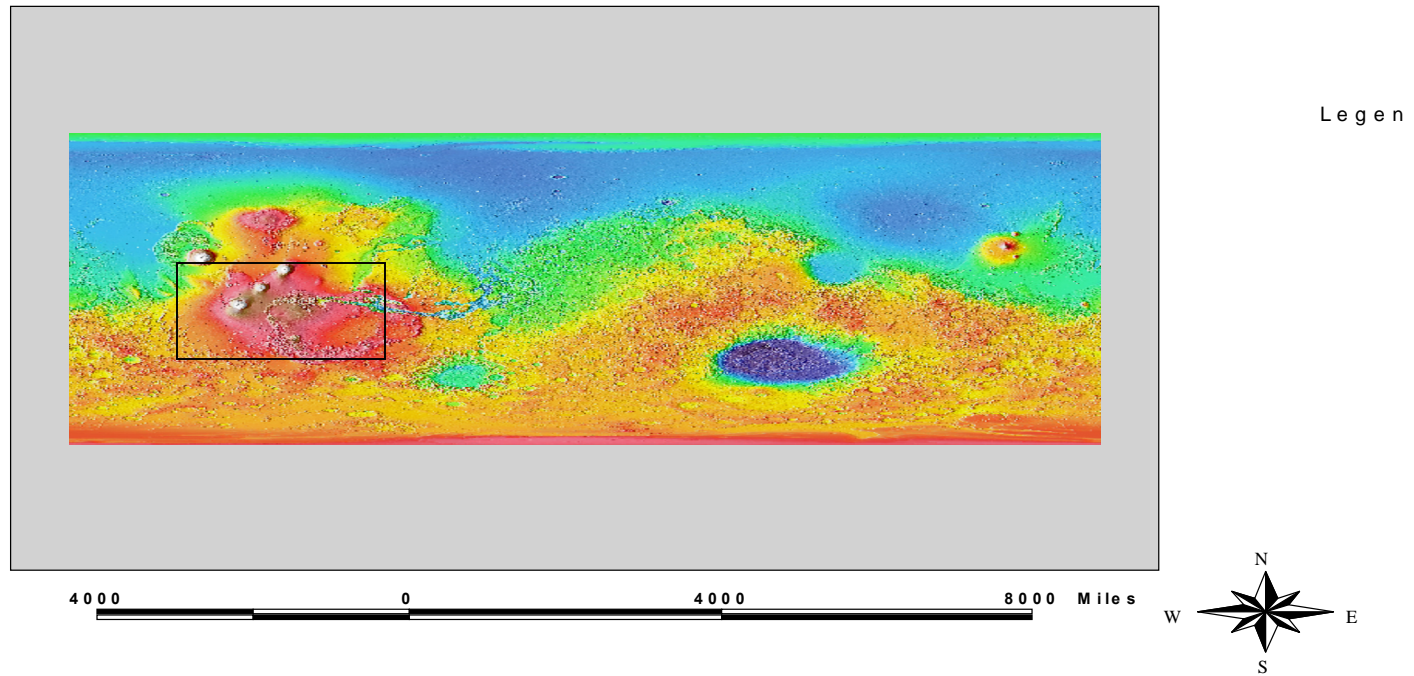
ÉPurple and blue are lowest points in elevation

ÉRed and orange are the highest points in elevation

ÉLiquid water forms into bodies at the lowest points

ÉTraces of water, and possibly underground liquid water, could be found at those sites

# Mars MOLA Shaded Relief



- Red and orange are the highest points in elevation and purple and blue are the lowest points in elevation
- We should check the highest points in elevation for life near the volcano because evidence on Earth shows that life can exist in extreme conditions and there might be traces of that on Mars
- The volcanoes may have evidence of unique life forms

# Chosen Sites

All of the sites were chosen with solar power in mind and situated near the equator to allow for maximum energy to the rovers

Evidence of  
plate  
tectonics

Water pathways and  
rocks show water  
was once there

**YES!**  
**MARS COULD SUPPORT LIFE!**

There is evidence that there was  
once liquid water.

Similarities to Earth;  
the only planet  
supporting life(that we  
know of)

# Surface Evidence

- **Spacecrafts that orbit Mars, have taken extremely detailed pictures of Mars' surface.**
- **These high-quality pictures have shown that there seems to have been a plenty source of water on it's surface in the past.**
- **The pictures also showed us that there were in fact huge volcanoes on Mars' surface.**
- **Although we know that Mars once had two of the biggest necessities for life- water, and energy, that does not mean that life is present, or was present on Mars – but it sure does make the red planet extraordinarily fascinating planet to study and search.**

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