

Grades: 6-8

Nova, “The Planets: Mars”

Mars was once a blue water world studded with active volcanoes. But when its magnetic field and protective atmosphere faded, it became the frozen desert planet we know today. With so many necessary elements in place, did life ever form on Mars?

After watching this episode, choose from the following questions and/or tasks to extend your learning

Question Box 1

- What are the uncountable blueberries called Concretions and what are they made of?
- Organic compounds are found in rocks on Mars, should scientists focus their attention on these rocks for clues of life?
- Explain the Late Heavy Bombardment as evidence from Apollo Missions to the Moon in the formation of life.
- Where did life start? Was it delivered from space, deep sea hydrothermal vents or terrestrial geothermal systems?
- Weather data is tracked by MRO Marci weather camera which sees horizon to horizon images on every orbit and builds a global map of the entire planet’s weather system every day. Why are these images from Mars important to humans on Earth?
- What are Saponite Minerals that are found in hydrothermal vents on Earth and how are they similar to Mar’s Eridania Basin for catalysts of formation of life?
- The Magnetic field on Earth protects the atmosphere and all life.
- Explain how the magnetic field is produced on Earth and why Mars no longer has a magnetic field?
- Recount Mars evolution of planetesimal formation and critical size difference that shaped its history.

Question Box 2

- Were conditions on Mars once suitable for life?
- Explain Nebular Theory.
- Where did Mars’ water go?
- What are the volatile conditions on Earth that are responsible for turning the simple organic molecules already present into complex organic material capable of replicating itself, DNA.
- How did Echus Chasma create the largest waterfalls our solar system has ever seen and why did they disappear?

Continued on the next page...

- How would humans react to finding life on Mars?

Box 3 (Tasks)

- [Exploring Space Science Mathematics](#)

Box 4 (Enrichment)

- Make a PowerPoint or illustration of 50 years of Mars Exploration from Mariner 4, Viking 1 & 2, Spirit, Opportunity Rovers and Curiosity, MRO, Atlas V, Maven and NASA's Orion.

Box 5 (Extend/Real-Life)

- In a container, add all organic matter suitable for life. What other factors will be necessary to "jumpstart" life?
- Make a PowerPoint on how we could develop life on Mars besides its lack of magnetic field and internal thermal energy.
- The cost of traveling to and from space is huge. Elon Musk saw this problem as an opportunity to create his company, SpaceX. As you watch these episodes of our solar system, ask yourself the following questions:
 1. What's keeping mankind from doing more in space?
 2. What opportunities does our solar system present?
 3. What kind of careers/businesses might be needed in our future to take advantage of those opportunities?
 4. Collect answers to those questions after each episode. Let the information you gain from each episode spark your imagination and creativity. On Friday, you will put to use the ideas you've collected.
- Learn more about Elon Musks' SpaceX mission - <https://www.spacex.com/elon-musk>