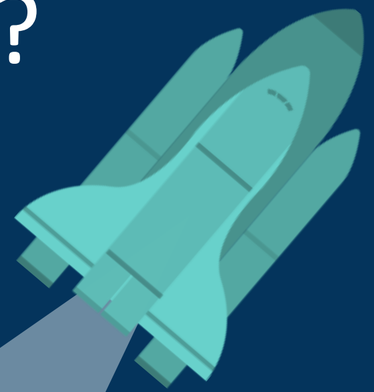
A Brief History of Mars

Was the Red Planet ever habitable?



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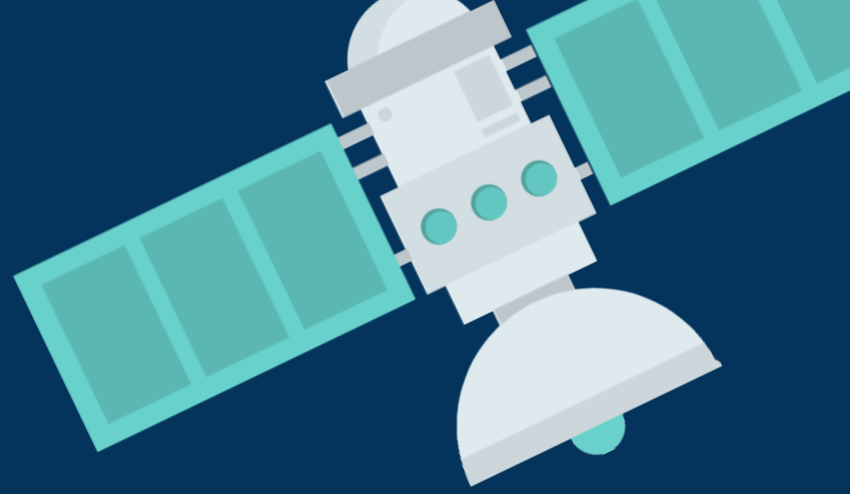
Objectives

By the end of this lesson, you will be able to:

- Understand how Mars has changed over time.
- Hypothesise how this has affected its habitability.
- Draw a conclusion as to which era of Mars's history was most likely to be able to support life.



Mars Timeline

How can we piece together a planet's history since it formed?

- On Earth?

- On Mars?

- Pre-Noachian
- Noachian
- Hesperian
- Amazonian

4.5 - 4.1 billion years ago

Pre-Noachian Era

Beginning of Era

- Thick atmosphere keeping in heat.
- Large (very hot!) oceans.

End of era

- Atmosphere became thinner.
- As a result water cooled.

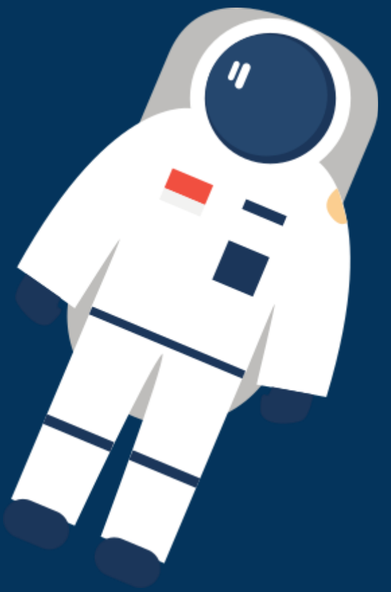
What happens to water on Mars without an atmosphere?

Click button below to link to video:

In groups, think about...

- How would this affect your body on Mars?
- (Remember your body is 70% water!)

- What can we do to avoid this?

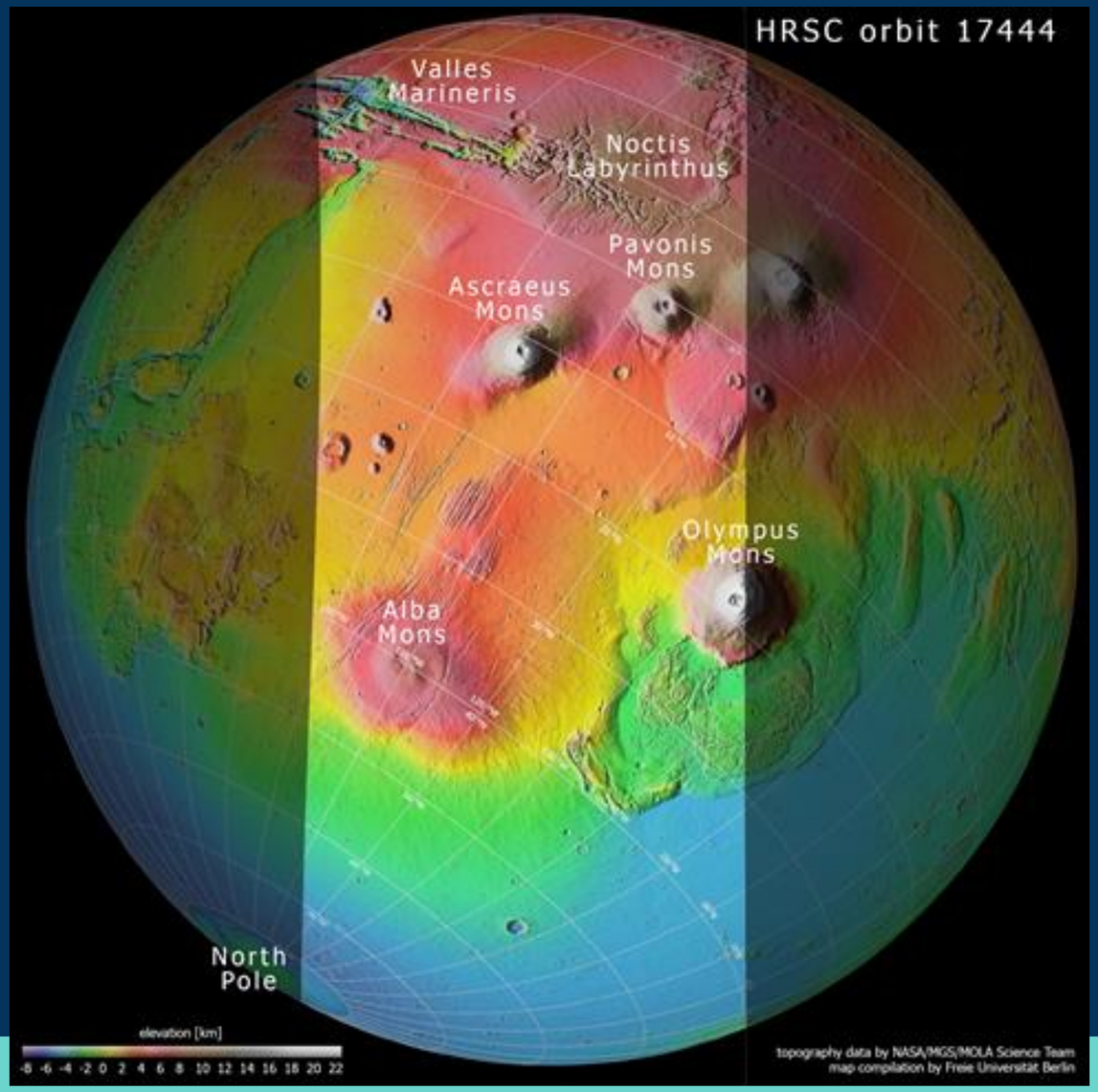


4.1 - 3.7 billion years ago

Noachian Era

- Lots of volcanism.
- Eruptions warmed planet by pouring ash and gases into the atmosphere.
- Lakes formed in many basins and craters.
- What did these volcanic regions look like?

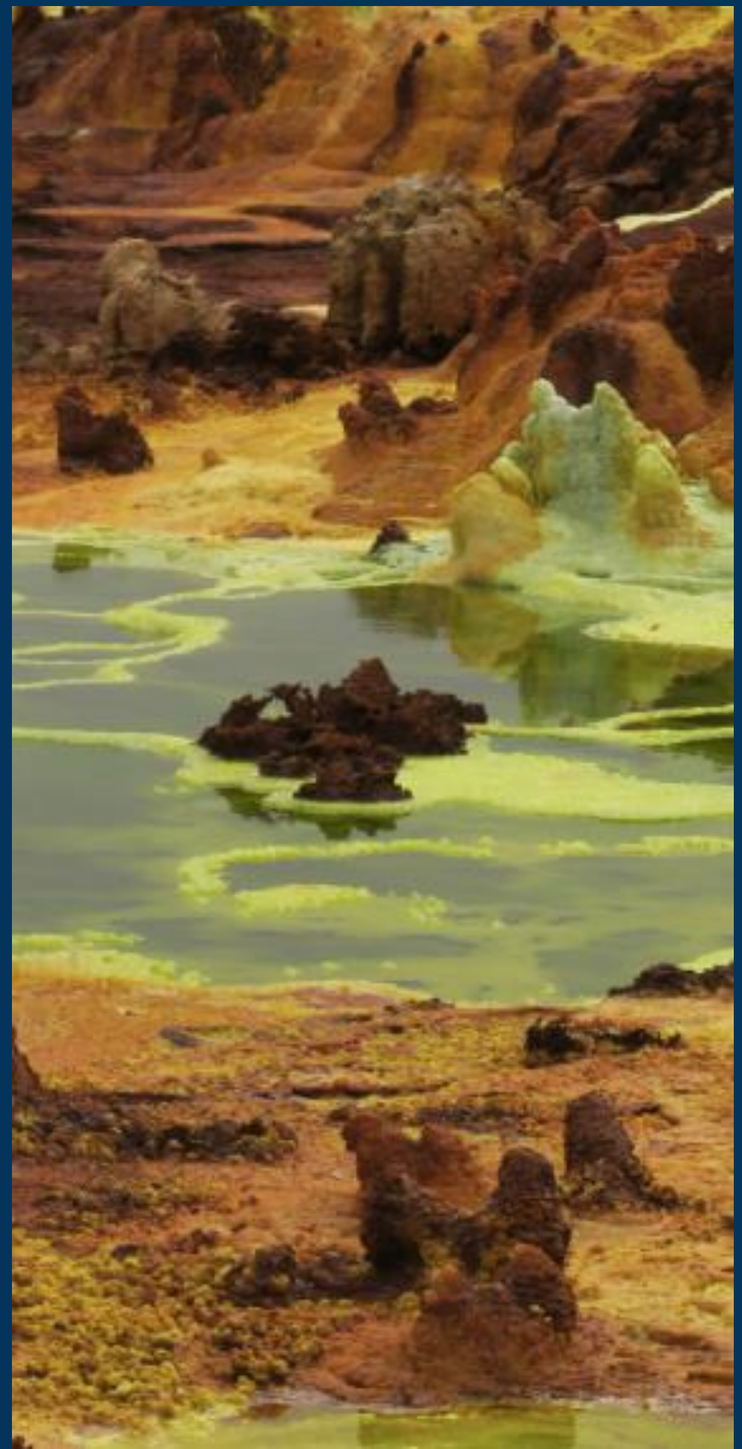
Tharsis Region



Danakil Depression

Ethiopia

- Can be used as analogues to volcanic areas of Mars, such as the Tharsis Region.



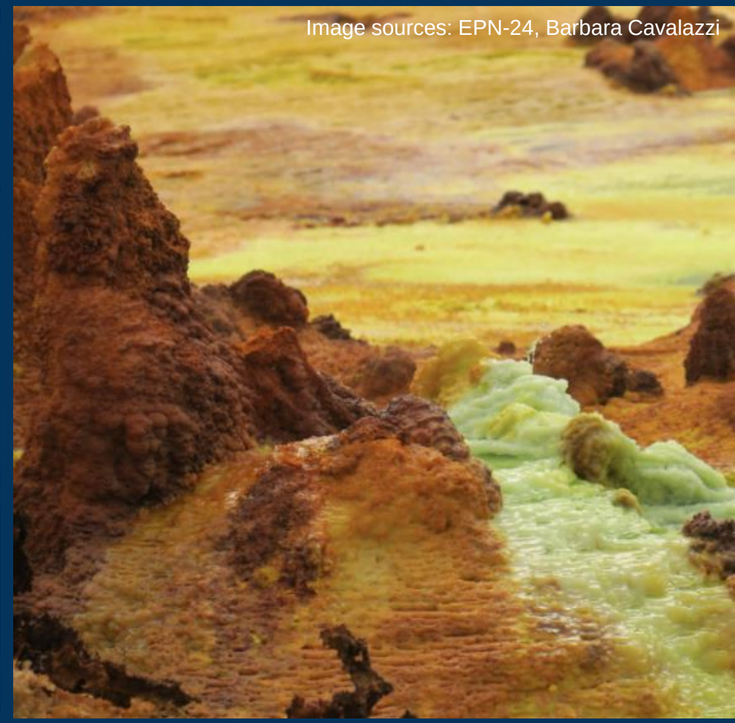


Image sources: EPN-24, Barbara Cavalazzi

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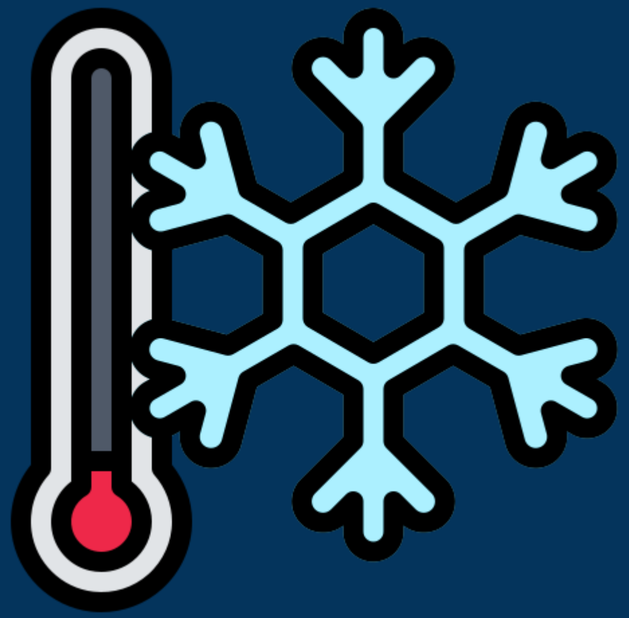
3.7 - 2.9 billion years ago

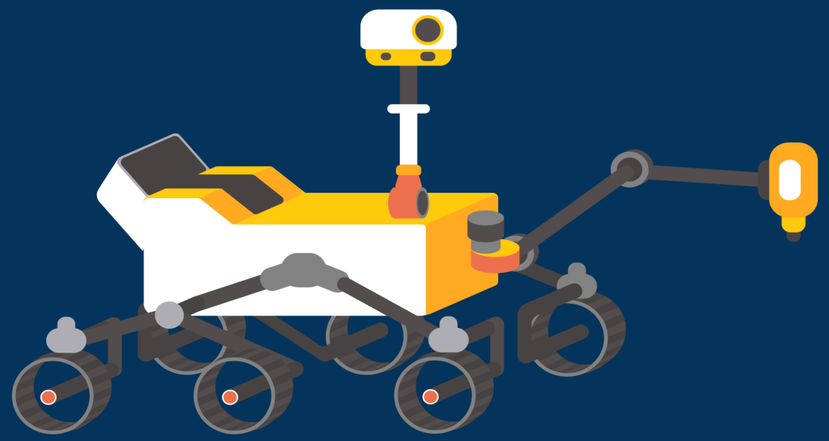
Hesperian Era



- Less impacts and geological activity.
- Volcanoes erupted sulphur dioxide and water, making the surface **acidic**.
- Colder climate
- Majority of water locked up as permafrost or subsurface ice.

2.9 billion years ago to present

Amazonian Era



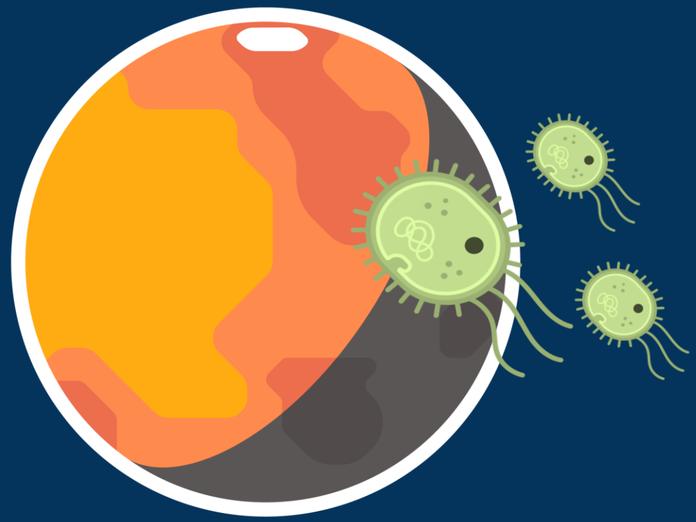
- The most recent period of Martian history.
- The Amazonian covers at least half of the planet's entire history!
- At present, the surface of Mars is cold, covered in toxic salts and bombarded by ultraviolet radiation!

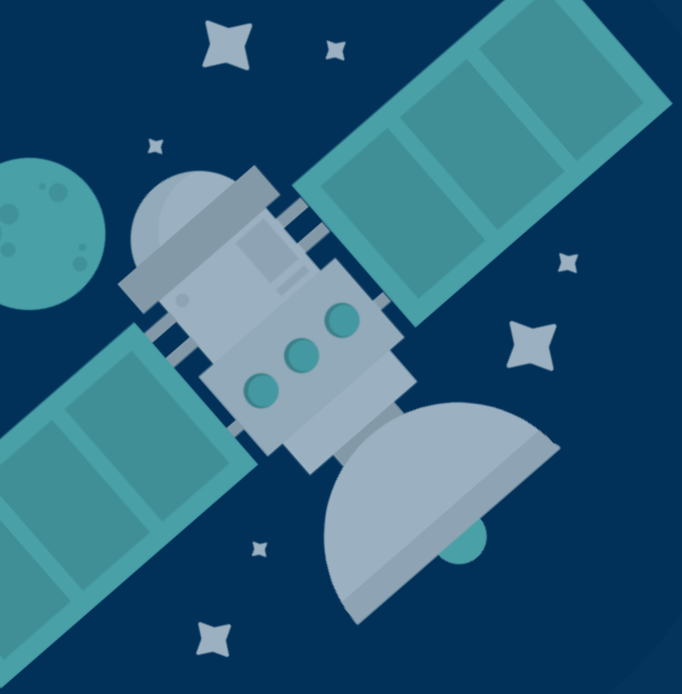
Habitability

Past and Present...

- Which of the eras of martian history do you think could best have supported life?

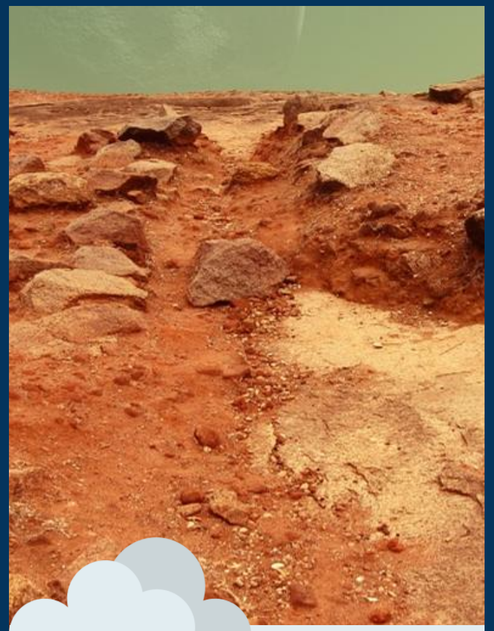
- Why? Discuss in groups.





Recap

Now we can...

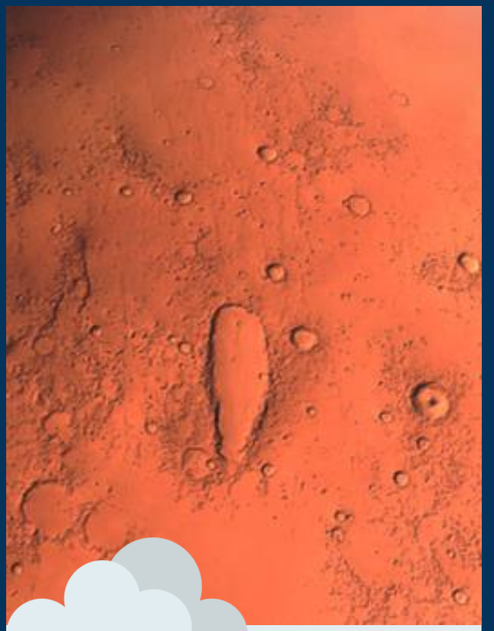


1

Understand how Mars has changed over time.

2

Hypothesise how this has affected its habitability.



3

Draw a conclusion as to which era was most habitable.

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