Does Mars Have a Water Cycle?

Mars once had water flowing on its surface. Today, it is a frozen desert. Most astronomers think that there has been no liquid water on Mars for the past 3.9 billion years. Others, though, think that Mars has had flowing water recently—in the last 10 million years. They suggest that Mars may have a multimillion-year water cycle. According to their hypothesis, occasional volcanic activity melts ice, releasing floods of water. After the water evaporates, condenses, and falls as rain, it becomes ice again. And if Mars does have a water cycle, it could have something else that goes with water on Earth: life.

**Issues**

For Mars to have a water cycle, it would need several features.

- a source of energy for melting ice into water
- conditions for water to evaporate
- conditions for water vapor to condense

**Observations**

Astronomers have observed several facts about Mars.

- Mars has water ice at its north and south poles.
- Mars has had very large volcanoes in the past, although it seems to have no active volcanoes today.
- Mars takes about 687 Earth days to orbit the Sun.
- Mars is the fourth planet from the Sun.
- Mars has an atmosphere that is 100 times thinner than the atmosphere of Earth.
- Mars has an average surface air temperature of –55°C (–67°F).
- Mars has features that look like ones shaped by water on Earth: ocean shorelines, river valleys, and gullies.
- Mars has many visible craters—unlike Earth, where most craters get washed away, filled with water, or covered up.

**Determine the Relevance of Each Observation**

**On Your Own** Decide whether each observation is relevant in determining whether Mars has a water cycle.

**As a Group** Discuss the relevance of each observation to the idea of a water cycle on Mars. List other information that might be helpful.

**CHALLENGE** Research information about Mars. Identify facts that support or oppose the idea of a Martian water cycle.