Name _____Per _____ Score_____

**B**

Science Article of the Week: Mars

*Directions*:

**Step 1:** As you read the article, STOP when you notice something important, surprising, and interesting or though provoking. Then before you continue reading, make a quick sketch of what you were thinking in the margin. The goal is to create a quick picture that will help you remember your thoughts and the information. Don't worry if you don't feel like you are an artist. Stick figures are fine. Sketching is a different way for you to think about the material. (You should have at least 7 sketches)

**Step 2:** When you finish, go back to the article, reexamine your sketches, and try to add further details so you can just glance down at your drawings and easily remember what the article is about without having to read it again.

**Step 3:** Answer the questions:

1. Which paragraph in the section "Much To Observe" indicates that the salts absorb water?

2. Which sentence from the article helps the reader understand that the liquid saltwater may be creating land formations on Mars?
A. They found perchlorates in abundance, and it seems like they have been getting water, too.
B. They look like the slow movement of dark, damp sand, which are called recurring slope lineae (RSL).
C. The hydrated salts seem to disappear in areas where RSL were not forming anymore, or were shrinking.
D. These perchlorates could make the boiling point of Mars's water much higher, which could allow it to remain liquid.

3. Based on the section "Pockets Of Tiny Life Forms," which of the following conclusions can be drawn?
A. Mars supports tiny life forms.
B. Astronauts can harvest perchlorates from Mars.
C. Water evaporates too quickly on Mars for scientists to be able to study it.
D. It will be many years before the salt and liquid water on Mars could be used.

4. Based on the article, which of the following represents the next likely step in studying liquid water on Mars?
A. collecting evidence of life forms on Mars
B. sending another rover to explore the streaks on Mars
C. sending astronauts to Mars to examine the salts
D. collecting a sample of the water on Mars for analysis

# If NASA is right, astronauts to Mars will be able to fill up water bottles

By Washington Post, adapted by Newsela staff 09.30.15 Word Count **745**

NASA announced new evidence that could prove there is liquid water on Mars. It increases the possibility that astronauts traveling to the Red Planet might be able to drink the water there instead of bringing their own.

Liquid water is a popular topic, said Lujendra Ojha. He is a Ph.D. student at Georgia Tech University who led the research. Water has been discovered on Mars before, but this is the first evidence of liquid water. Mars is now the only planet in our solar system to show evidence of the stuff on its surface, other than our own. Other worlds have it in oceans under the surface, or as vapor in the atmosphere. However, Mars is the only place where we have solid evidence for liquid that sits right there in the open air.

It would be a major leap to suggest that Mars may have life on it, even microbial life. However, liquid water at least makes it possible that parts of the planet are livable.

## Curiosity Makes A Find

The study builds on research from last April. Scientists using information from the Curiosity rover noted that the planet might have liquid water. The Curiosity rover is a robotic, automated vehicle that explored Mars. Because of the extremely low pressure on Mars, water has a boiling point of just a few degrees Celsius before it evaporates. The April study noted the presence of perchlorates, a kind of salt. These perchlorates could make the boiling point of Mars's water much higher, which could allow it to remain liquid. They proposed that the planet's temperature would be right for liquid, perchlorate-filled water to form every day during winter and spring.

In theory, water that periodically turned liquid before evaporating could form geographic features. Such features are often spotted on the planet. They look like the slow movement of dark, damp sand, which are called recurring slope lineae (RSL).

In the new study, a different group of researchers took the search for perchlorates one step further. They went looking for them in the very RSL features thought to be formed by salty liquid. They found perchlorates in abundance, and it seems like they have been getting water, too.

## Much To Observe

Ojha and his colleagues used the Mars Reconnaissance Orbiter (MRO) to study the wet-looking streaks. The MRO is a spacecraft used for exploring Mars from high up in the orbit. They used a method called spectroscopy. This method keeps track of what type of light an object absorbs to find out its composition. With this method, scientists can identify glass, ice and other substances from miles above the surface.

"We're going to places where we thought we were seeing the presence of water and finding chemical evidence of perchlorates," Ojha said. The correlation goes further than that. The hydrated salts seem to disappear in areas where RSL were not forming anymore, or were shrinking.

"We're observing the leftover molecules of water in the salt," Ojha said. "We're finding evidence that they're getting hydrated."

## Send Rover On Over

Morten Bo Madsen of the University of Copenhagen said the new results were significant. He co-authored the April study, but was not involved in the latest work.

"(The) flow of liquid salty water is no longer just a possibility, it does actually occur," he said. "The results shows that liquid does indeed flow on Mars today."

Ojha's work shows that the liquid salt water may help form the wet-looking streaks on Mars. However, there is more work to do to prove the presence of liquid water itself. The MRO only allows us to examine Mars's surface at what Ojha believes is the driest point in the day. Eventually, the hope is that a rover can take a closer look at the streaks themselves.

## Pockets Of Tiny Life Forms

If liquid is truly forming on the surface because of these salts, it still easily evaporates away. It evaporates at about 20 degrees Celsius (68 degrees Fahrenheit). However, it could create pockets of the planet where tiny forms of life can live, even today.

In theory, it could be extracted and used by astronauts on a Mars mission. Perchlorates could also be helpful in their own right. They can be used to make rocket propellant.

"If we ever go there, we could probably utilize this. We wouldn't have to bring tons of water," Ojha said. "This stuff seems like science fiction, but in 100 years or so it could be fact."