Name: _____ Date: _____

The Small Moon That Sprays Ice Into Space

Circle group

Saturn has dozens of moons. One of the smallest is Enceladus. It turned out to be one of the most exciting. It is much smaller than Earth's Moon. Its surface is clean, bright ice. It reflects sunlight better than almost anything else in the solar system.

A spacecraft named Cassini flew past Enceladus many times. Its cameras found long cracks near the south pole. Jets of water vapor and tiny ice grains were shooting out of the cracks and up into space. Scientists call these jets plumes. Cassini even flew through one and tested the spray.

The plumes explained two puzzles. First, much of the spray falls back like snow. That keeps the surface fresh and bright. Second, some of the spray escapes. It spreads out along the moon's orbit. The ice grains feed one of Saturn's faint outer rings.

The spray also gave a clue about what is under the ice. Cassini found salt in the grains. Many scientists think the plumes come from a salty ocean of liquid water. The ocean is hidden under the frozen shell. The water may touch the rocky core below.

So scientists want to study Enceladus more. Living things on Earth need liquid water. Researchers are curious if this far moon has the right conditions. For now, no one knows. It would take more missions to find out.

Questions

1. What covers the surface of Enceladus?

_____

_____

2. What did Cassini's cameras find near the south pole?

_____

_____

3. What are the jets called?

_____

_____

4. Why does the surface of Enceladus stay bright and fresh?

_____

5. What did Cassini find in the ice grains that hints at a hidden ocean?

6. Why are scientists curious about this moon?

Words to know

plumes: tall streams of gas or spray rising into the air
vapor: a gas made from a liquid, like steam
reflects: bounces light back
conditions: the situation or surroundings that affect something
frozen: turned hard by cold into ice

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

The Small Moon That Sprays Ice Into Space

Triangle group

Saturn has dozens of moons, and one of the smallest, Enceladus, turned out to be among the most exciting. It is far smaller than Earth's Moon, and its surface is covered with clean, bright ice. In fact, it reflects sunlight better than almost anything else in the solar system.

The spacecraft Cassini flew past Enceladus many times. Its cameras revealed long cracks near the moon's south pole. From those cracks, jets of water vapor and tiny ice grains were shooting high into space. Scientists call such jets plumes. Cassini even flew through one and tasted the spray with its instruments.

The plumes helped explain two puzzles. First, much of the spray falls back like snow and keeps the surface looking fresh and bright. Second, some of it escapes and spreads out along Enceladus's orbit. That stream of ice grains feeds one of Saturn's faint outer rings.

The spray also gave a hint about what lies under the ice. Cassini found salt in the grains, along with other materials. Many scientists think the plumes come from a salty ocean of liquid water hidden beneath the frozen shell. They also think the water may touch the rocky core below.

That makes Enceladus a place scientists want to study more. Liquid water is one thing that living things on Earth need, so researchers are curious about whether this faraway moon could have the right conditions. For now, nobody knows. More missions would be needed to find out.

Questions

1. What covers the surface of Enceladus?

_____

_____

2. What did Cassini's cameras reveal near the moon's south pole?

_____

_____

3. What are the jets called?

_____

_____

4. Why does the surface of Enceladus stay bright and fresh?

_____

_____

5. What did Cassini find in the ice grains that hints at a hidden ocean?

_____

_____

6. Why are scientists curious about this moon?

_____

_____

Words to know

plumes: tall streams of gas or spray rising into the air
vapor: a gas made from a liquid, like steam
reflects: bounces light back
conditions: the situation or surroundings that affect something
frozen: turned hard by cold into ice

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

The Small Moon That Sprays Ice Into Space

Square group

Saturn has dozens of moons, and one of the smallest, Enceladus, has proved to be among the most fascinating. It is considerably smaller than Earth's Moon, and its surface is blanketed in clean, brilliant ice. In fact, it reflects sunlight more effectively than almost anything else in the solar system.

The spacecraft Cassini swept past Enceladus many times. Its cameras revealed long fractures near the moon's south pole, and from those cracks, jets of water vapor and tiny ice grains were erupting high into space. Scientists refer to such jets as plumes. Cassini even flew straight through one of them and sampled the spray with its instruments.

The plumes helped to resolve two puzzles. First, a large portion of the spray falls back like snow and keeps the surface looking fresh and bright. Second, some of it escapes and spreads out along the orbit of Enceladus. That stream of ice grains supplies one of Saturn's faint outer rings.

The spray also offered a hint about what lies beneath the ice. Cassini detected salt in the grains, along with other materials. Many scientists believe the plumes originate from a salty ocean of liquid water concealed under the frozen shell. They also suspect that the water may come into contact with the rocky core below.

That possibility makes Enceladus a place that researchers are eager to study further. Liquid water is one thing that living things on Earth require, so scientists wonder whether this distant moon might have suitable conditions. At present, nobody knows, and additional missions would be needed to find out.

Questions

1. What blankets the surface of Enceladus?

_____

_____

2. What did Cassini's cameras reveal near the moon's south pole?

_____

_____

3. What do scientists call these jets?

_____

_____

4. Why does the surface of Enceladus remain bright and fresh?

_____

_____

5. What did Cassini detect in the ice grains that hints at a hidden ocean?

_____

_____

6. Why are researchers eager to study this moon further?

_____

_____

Words to know

plumes: tall streams of gas or spray rising into the air
vapor: a gas made from a liquid, like steam
reflects: bounces light back
conditions: the situation or surroundings that affect something
frozen: turned hard by cold into ice

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

For the teacher: The Small Moon That Sprays Ice Into Space

Each student sheet carries a shape, not a level. The same topic and facts, written three ways.

Circle: The Small Moon That Sprays Ice Into Space

Easier · 225 words · Flesch-Kincaid grade 3.7

1. Clean, bright ice.
2. Long cracks with jets of water vapor and ice grains shooting out.
3. Plumes.
4. Much of the spray falls back like snow.
5. Salt.
6. Living things on Earth need liquid water, so they wonder about the conditions there.

Triangle: The Small Moon That Sprays Ice Into Space

This passage · 244 words · Flesch-Kincaid grade 5.9

1. Clean, bright ice.
2. Long cracks with jets of water vapor and ice grains shooting out.
3. Plumes.
4. Much of the spray falls back like snow.
5. Salt.
6. Liquid water is something living things on Earth need, so they wonder about the conditions there.

Square: The Small Moon That Sprays Ice Into Space

Harder · 261 words · Flesch-Kincaid grade 8.1

1. Clean, brilliant ice.
2. Long fractures with jets of water vapor and ice grains erupting from them.
3. Plumes.
4. A large portion of the spray falls back like snow.
5. Salt.
6. Living things on Earth require liquid water, so they wonder whether the moon has suitable conditions.