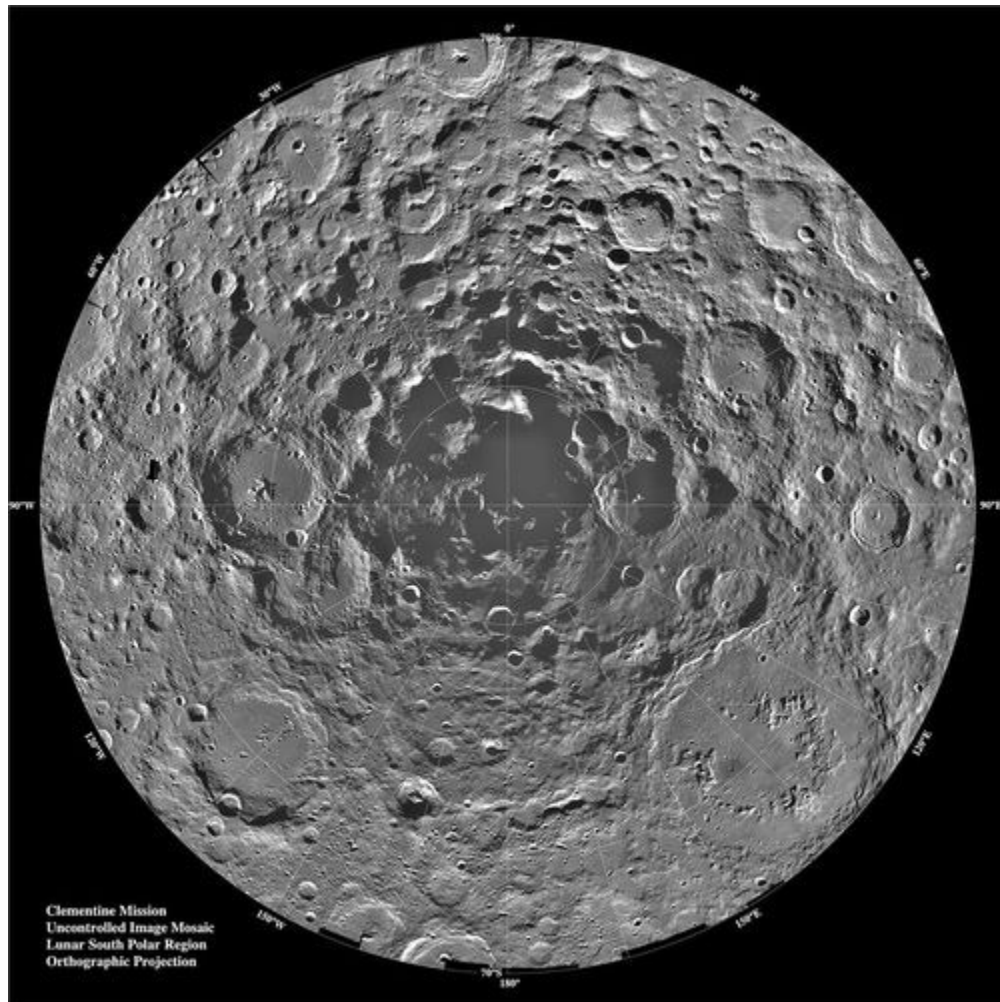


Why Is the Moon So Scarred with Craters?

This text is from NASA Space Place.

An asteroid or meteor is more likely to fall toward Earth than the moon because our planet's stronger gravity attracts more space debris. But we can see many thousands of craters on the moon and we only know of about 180 on Earth! Why is that?

The truth is both the Earth and the moon have been hit many, many times throughout their long 4.5 billion year history.



NASA/JPL/USGS

This view of the moon's cratered South Pole was seen by NASA's Clementine spacecraft in 1996.

Where did all of Earth's craters go?

The main difference between the two is that Earth has processes that can erase almost all evidence of past impacts. The moon does not. Pretty much any tiny dent made on the moon's

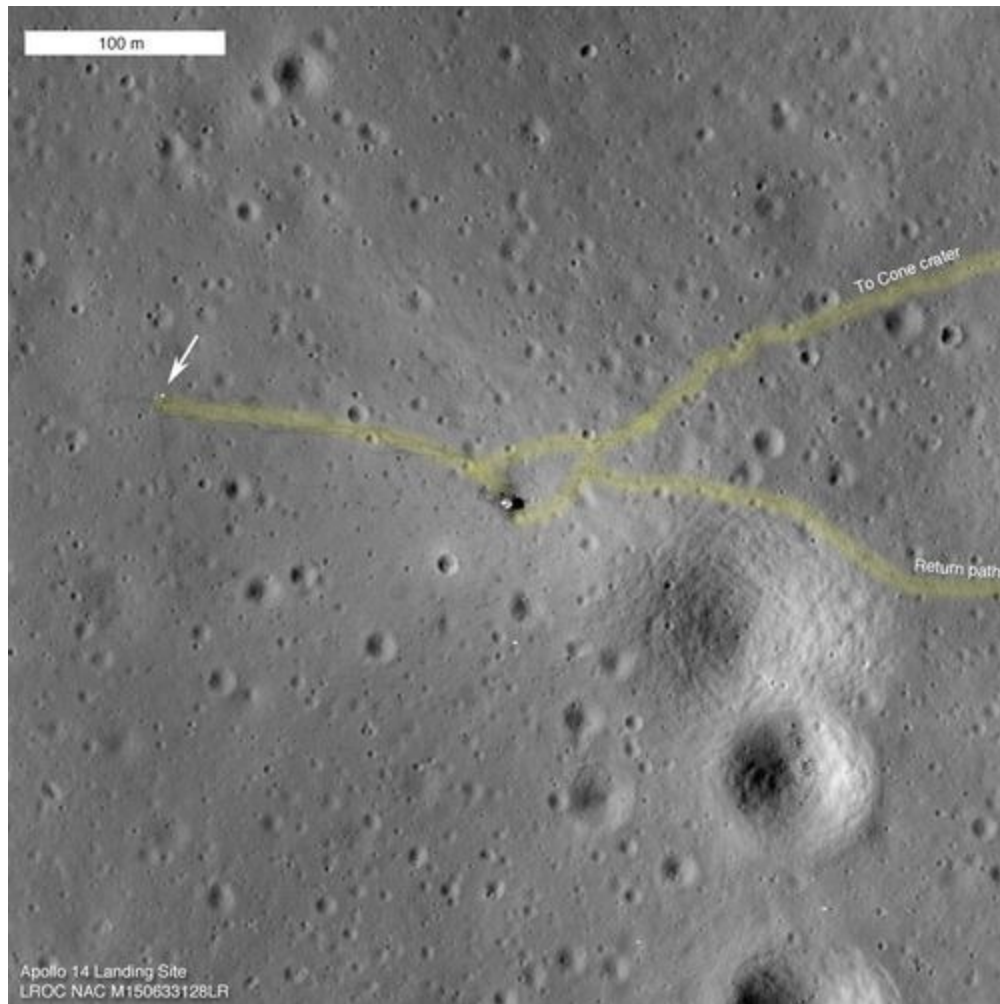
surface is going to stay there.

Three processes help Earth keep its surface crater free. The first is called erosion. Earth has weather, water, and plants. These act together to break apart and wear down the ground. Eventually erosion can break a crater down to virtually nothing.



NASA/GSFC/LaRC/JPL/MISR Team

Lake Manicouagan, a ring-shaped lake in Quebec, Canada, is all that remains of a crater from a massive impact over 200 million years ago.



NASA/LRO

Though they were made in 1971, these Apollo 14 astronauts' tracks were easily viewed from a NASA spacecraft in orbit around the moon in 2011 (tracks highlighted in yellow).

The moon has almost no erosion because it has no atmosphere. That means it has no wind, it has no weather, and it certainly has no plants. Almost nothing can remove marks on its surface once they are made. The dusty footsteps of astronauts who once walked on the moon are still there today, and they aren't going anywhere anytime soon.

The second thing is something called tectonics. Tectonics are processes that cause our planet's surface to form new rocks, get rid of old rocks, and shift around over millions of years.

Because of tectonics, the surface of Earth is recycled many times throughout its long history. As a result, very few rocks on Earth are as old as the rocks on the moon. The moon has not had tectonics for billions of years. That's a lot more time for craters to form and stay put.

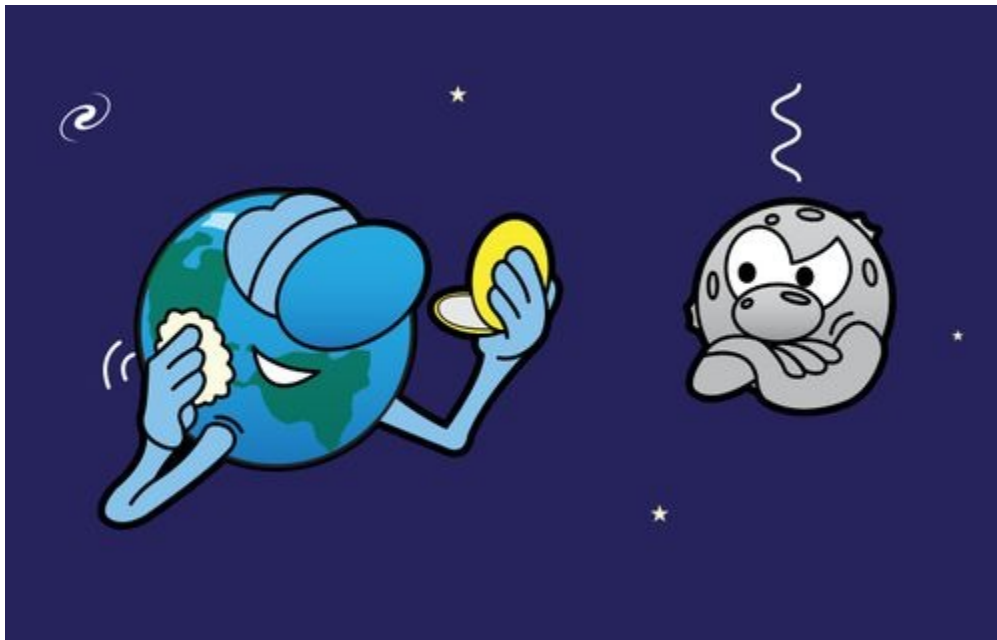
The third thing is volcanism. Volcanic flows can cover up impacts craters. This is a major way

impact craters get covered up elsewhere in our solar system, but it is less important than the recycling of crust here on Earth. The moon once had large volcanic flows way in the past that did cover up many of the bigger earlier impacts, but it has been without volcanism for around three billion years.

A powerless moon

The moon may attract fewer bits of space rock than the Earth, but the moon is powerless to do anything about it after it has been hit. Once something hits the moon, that event becomes frozen in time. Earth, on the other hand, simply brushes these impact craters off and moves on with its life.

No wonder there are so many craters on the moon compared to Earth!



NASA

Name: _____ **Date:** _____

1. Why does the Earth have fewer craters than the moon?

- A. The Earth has a stronger gravitational field and attracts more debris than the moon.
- B. The Earth is bigger than the moon.
- C. The Earth has processes that can erase almost all evidence of past impacts. The moon does not.
- D. The moon attracts fewer bits of space rock than the Earth.

2. What does this passage describe?

- A. This passage describes the three processes that help Earth keep its surface crater free.
- B. This passage describes the dusty footsteps of astronauts that you can still see on the moon today.
- C. This passage describes the 180 craters that you can still see on Earth.
- D. This passage describes the way volcanism covers up craters everywhere in our solar system.

3. Read these sentences from the text:

"Three processes help Earth keep its surface crater free. The first is called erosion. Earth has weather, water, and plants. These act together to break apart and wear down the ground. Eventually erosion can break a crater down to virtually nothing."

What can be concluded about Earth's surface based on this information?

- A. Earth's surface looks exactly the same as the moon's surface.
- B. Earth's surface is constantly changing
- C. Earth's surface has been the same for thousands of years.
- D. Earth's surface will eventually be completely smooth.

4. Based on the information in the text, what do you think would happen to Earth's surface if erosion, tectonics, and volcanism suddenly stopped occurring?

- A. Earth would continue to erase evidence of past impacts.
- B. Earth would have fewer craters.
- C. Earth would stop erasing evidence of past and future impacts.
- D. Earth would be completely smooth.

5. What is the main idea of this text?

- A. Tectonics are processes that cause our planet's surface to form new rocks, get rid of old rocks, and shift around over millions of years.
- B. The process of erosion uses weather, water, and plants to break down the ground on earth so that craters become virtually nothing.
- C. The Earth's gravity is stronger than the moon's, so it attracts more space debris than the moon does.
- D. Unlike the Earth, the moon does not have processes that remove craters from its surface.

6. Read the following sentences from the text:

"Three processes help Earth keep its surface crater free. The first is called erosion. Earth has weather, water, and plants. These act together to break apart and wear down the ground. Eventually erosion can break a crater down to virtually nothing."

As used in the passage, what does the word "process" mean?

- A. a way of thinking
- B. a set of changes that happen one after another
- C. a shield that Earth uses to protect itself from craters
- D. a way of moving forward

7. Choose the answer that best fits the sentence.

Once something hits the moon, that event becomes frozen in time. _____, Earth simply brushes these impact craters off and moves on with its life.

- A. for example
- B. therefore
- C. in contrast
- D. including

8. Why does the moon almost have no erosion?

9. Explain why the author calls the moon "powerless."

Support your answer with evidence from the text.

10. Explain what you think the moon's surface will look like in a million years if asteroids and meteors stopped hitting its surface?

Support your answer with evidence from the text.