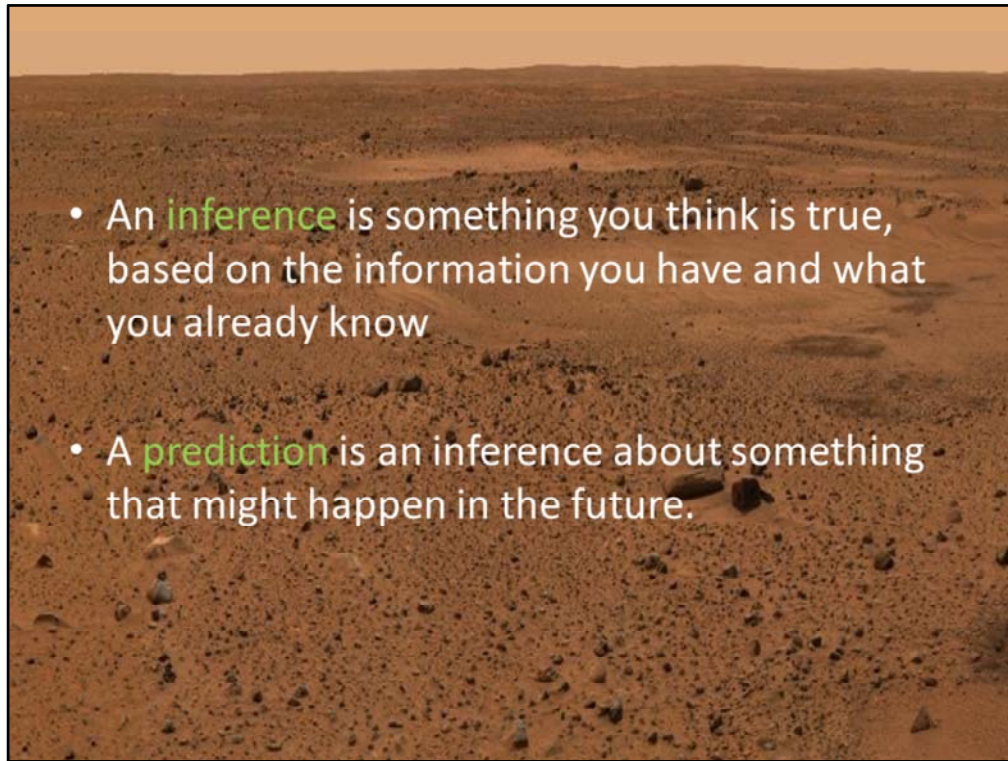


A wide-angle photograph of the Martian surface, showing a vast, flat, reddish-brown landscape with numerous small rocks and pebbles scattered across the ground. The horizon is visible in the distance under a hazy, orange-tinted sky.

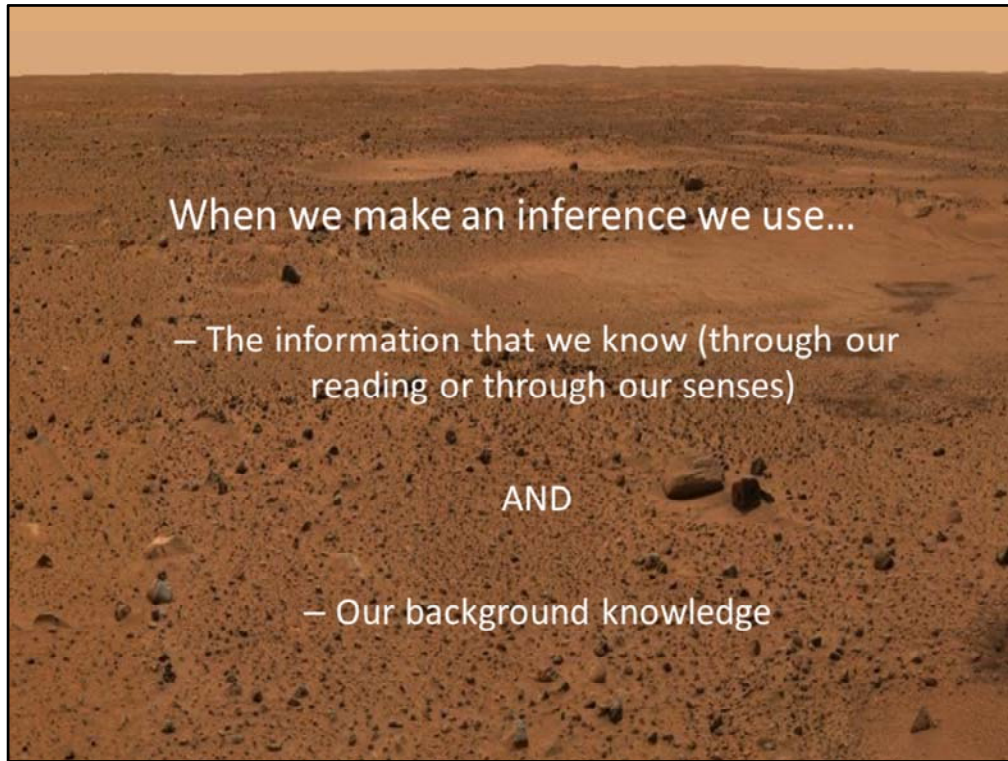
## Making Inferences and Predictions

Mars Rover Celebration  
Lesson 7



- An **inference** is something you think is true, based on the information you have and what you already know
- A **prediction** is an inference about something that might happen in the future.

Paraphrase the information on this slide.



Inferences have two parts. The first is the information we know. We may have found this information in our reading or research. We may observe this information. We might see it, hear it, smell it, touch it or taste it.

We combine this information with our background knowledge (the stuff we already know) and make a good guess about what we think is true. Let's look at some examples.



The image is a composite. On the left, a man in a white long-sleeved shirt and blue jeans is leaning over a dark leather sofa, looking under a cushion. On the right, a vast, reddish-brown, rocky landscape under a hazy orange sky, resembling the surface of Mars, is shown. The text on the slide is overlaid on the bottom left of the image.

**WHAT WE KNOW:** We see that the man is looking under the cushions.

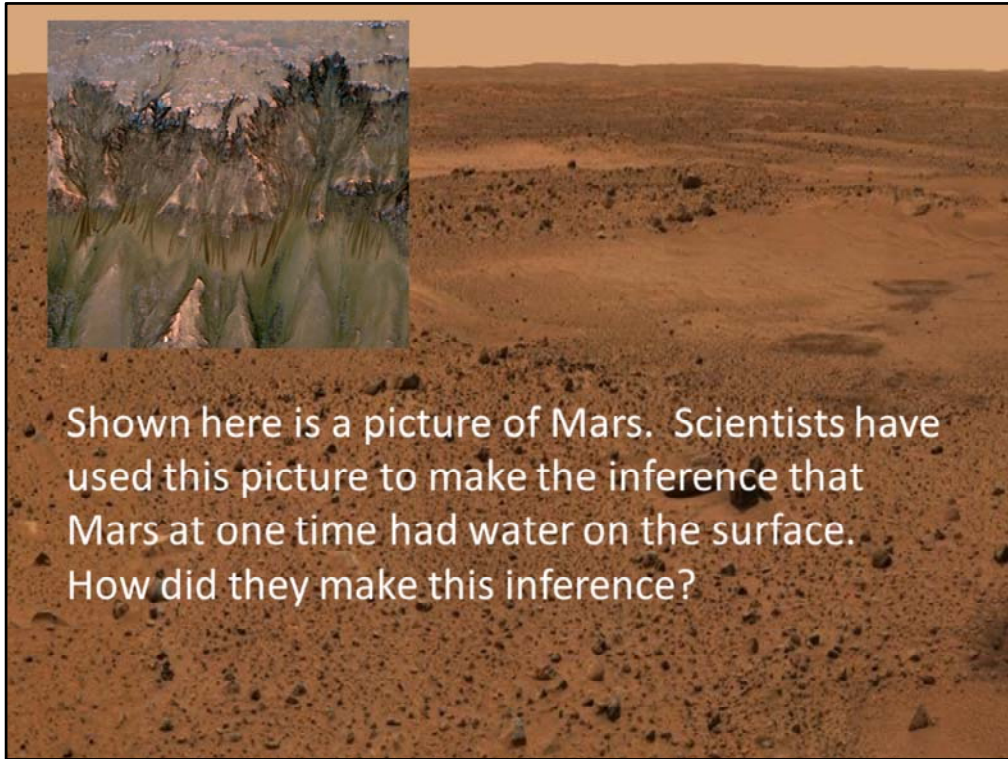
**BACKGROUND KNOWLEDGE:** We know small objects sometimes fall between the cushions of a sofa. We know people often look under sofa cushions for lost items.

**INFERENCE:** The man has lost something small.

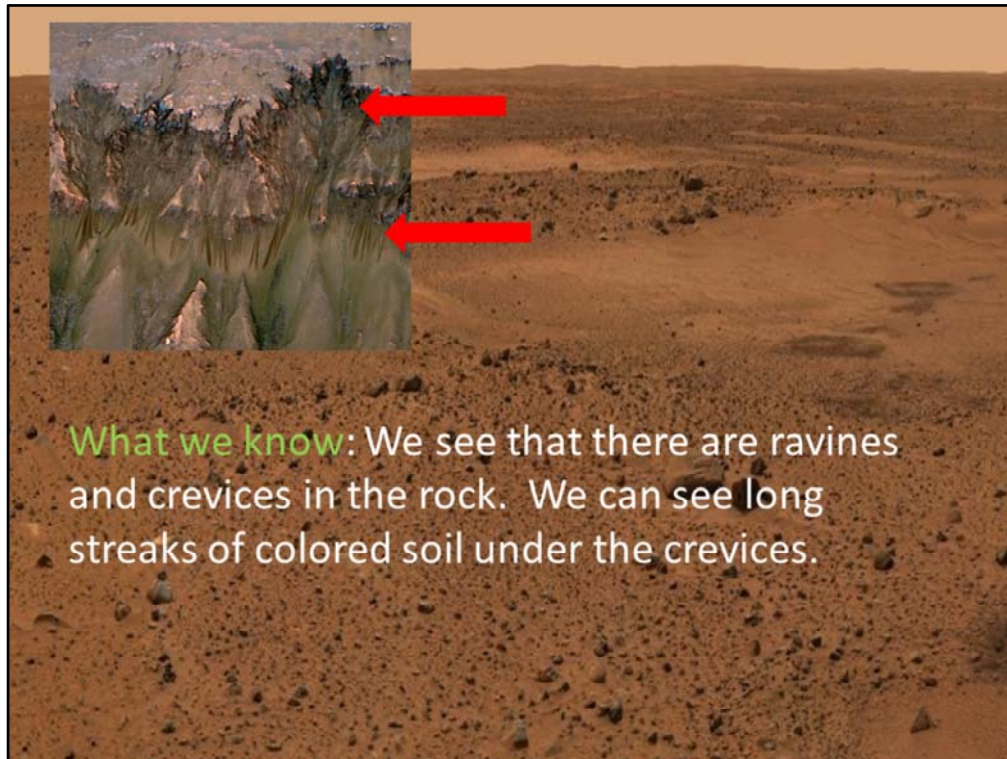
Paraphrase the information on this slide.

We also know that whatever the man has lost, it cannot be very big because it would not fit under the sofa.

Is it possible the man is doing something else? Most certainly. Perhaps he is lifting up the cushion to vacuum underneath. We won't always be correct when we make an inference. However, if we think deeply about the information we have and we use our background knowledge, we will make good inferences and we will often be right.



Read the information on this slide.



**What we know:** We see that there are ravines and crevices in the rock. We can see long streaks of colored soil under the crevices.





**Background knowledge:** Scientists know that similar rocks exist on Earth. The picture above shows similar erosion and staining of rock here on Earth and we know that these are caused by water.

Paraphrase the information on this slide.



The scientists put together what they know about Mars and their background information from Earth to make an inference. (Read the inference.)





Let's now practice what we have learned about inferences. Read the information on the next few slides. Then I will ask you to make an inference. You will base this inference on what you know and on your background knowledge.

(Allow the students to read this slide.)



## Let's Practice

Mimas is one of a very few large moons that orbit Saturn. Mimas is very round. This is because it is big enough that its gravity can pull all the material into a globe.

(Allow the students to read this slide.)



(Allow the students to read this slide.)





(Allow the students to read this slide.)

**?** Make an inference

What shape is Titan likely to be?

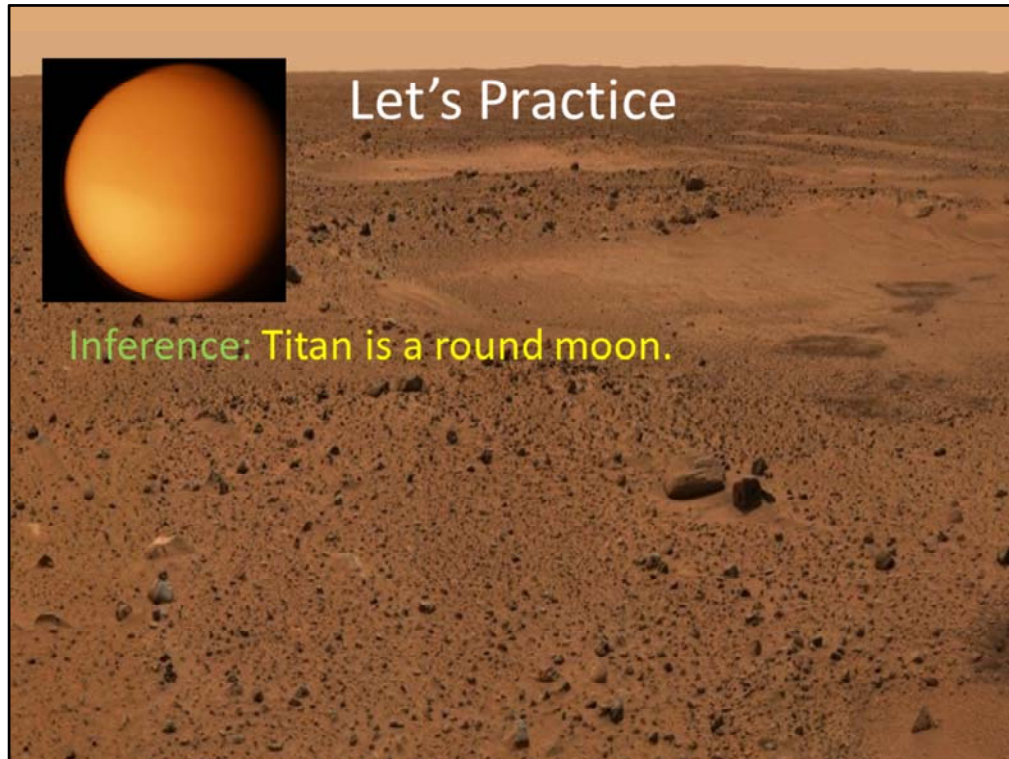
**What do you know:** Not all moons are round. When a moon is big enough, gravity will pull the moon into a round shape. Titan is a large moon. Titan is even bigger than Earth's moon.

**Background knowledge:** The moon that orbits Earth is round.

This slide has 2 CLICKS of animation.

Allow students to answer the question and explain their thinking. Guide them by asking: What do you know? What is your background knowledge? CLICK to bring up the "What do you know" animation. Discuss

CLICK to bring up the "Background Knowledge" and discuss. Allow students to make their inferences then move on to the next slide.



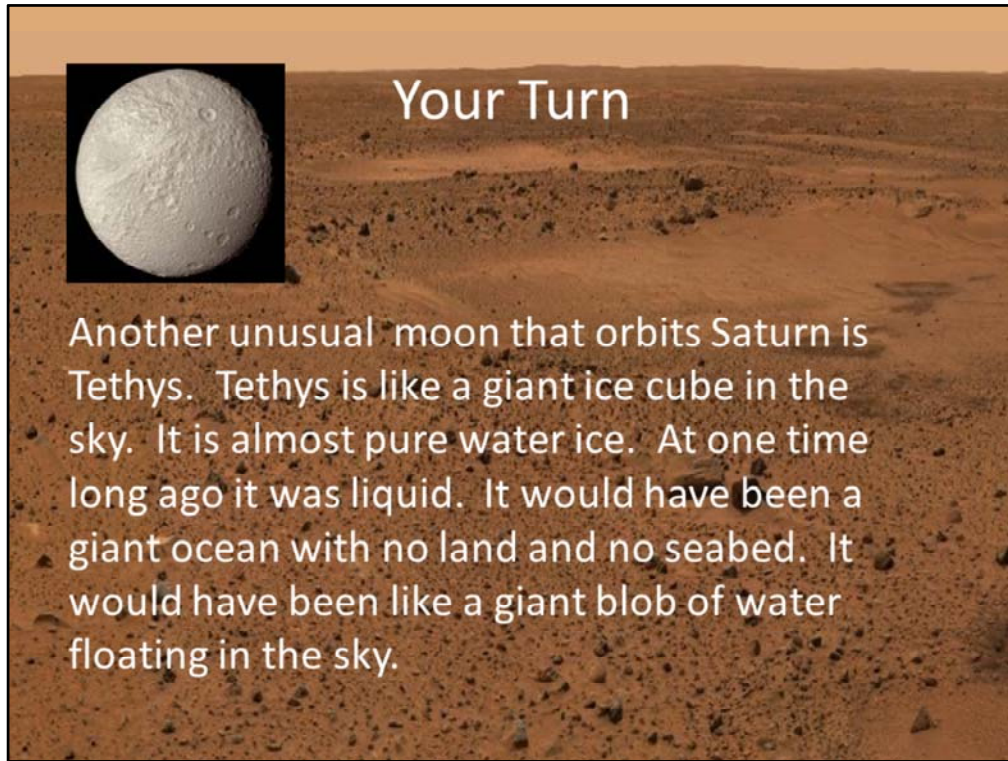
This slide has one CLICK of animation.

Your students should have come to the inference that Titan is probably a round moon. If not, help them to arrive at that inference.

“Let’s see if your inference is correct.” Then CLICK to bring up the image of Titan.

Our inference is





## Your Turn

Another unusual moon that orbits Saturn is Tethys. Tethys is like a giant ice cube in the sky. It is almost pure water ice. At one time long ago it was liquid. It would have been a giant ocean with no land and no seabed. It would have been like a giant blob of water floating in the sky.

Allow students to read the selection on the next several slides. Provide as much or as little support as you feel your students need.

## Your turn

By recording the number, size and extent of erosion of craters, lunar geologists can determine the ages of the surface of a moon and can piece together the geologic history of the moon. This technique works because older surfaces are exposed to impacting meteorites for a longer period of time than are younger surfaces.



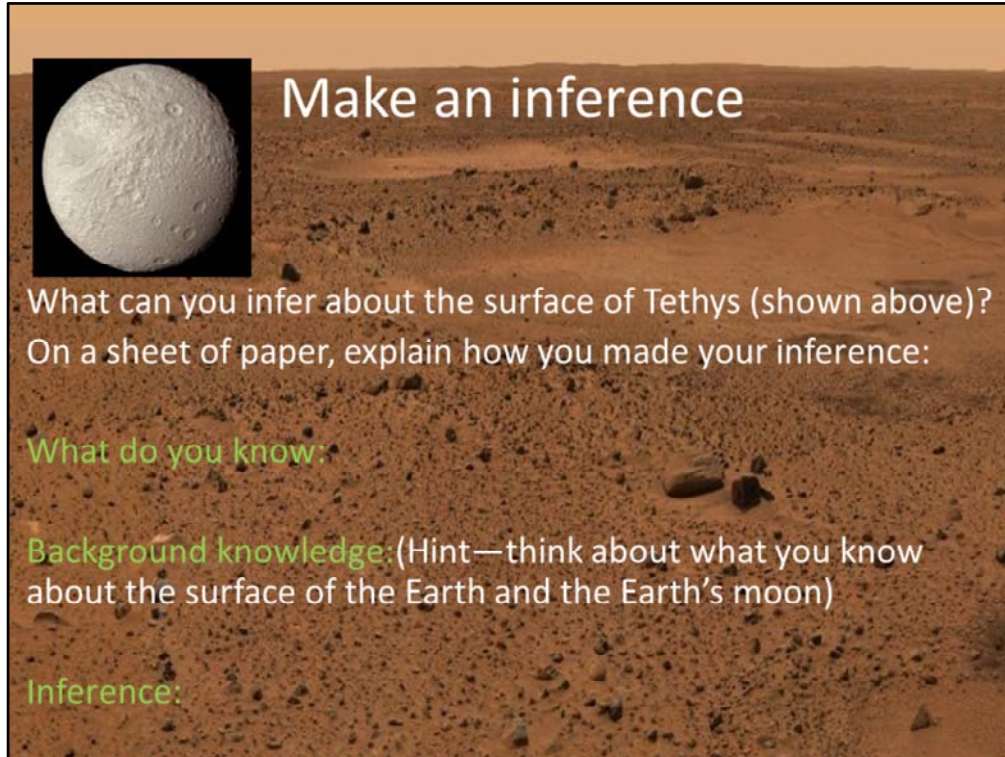
## Your turn



Because it has so many crater impacts, we know the Earth's moon has a very old surface. It is estimated that the Moon has 3 trillion crater impacts, with 75 to 150 hitting the moon every year.

By contrast, the Earth has less than 100 known crater impacts. The surface of the Earth is very new. It is constantly changing because of rain, wind and erosion.





## Make an inference

What can you infer about the surface of Tethys (shown above)?  
On a sheet of paper, explain how you made your inference:

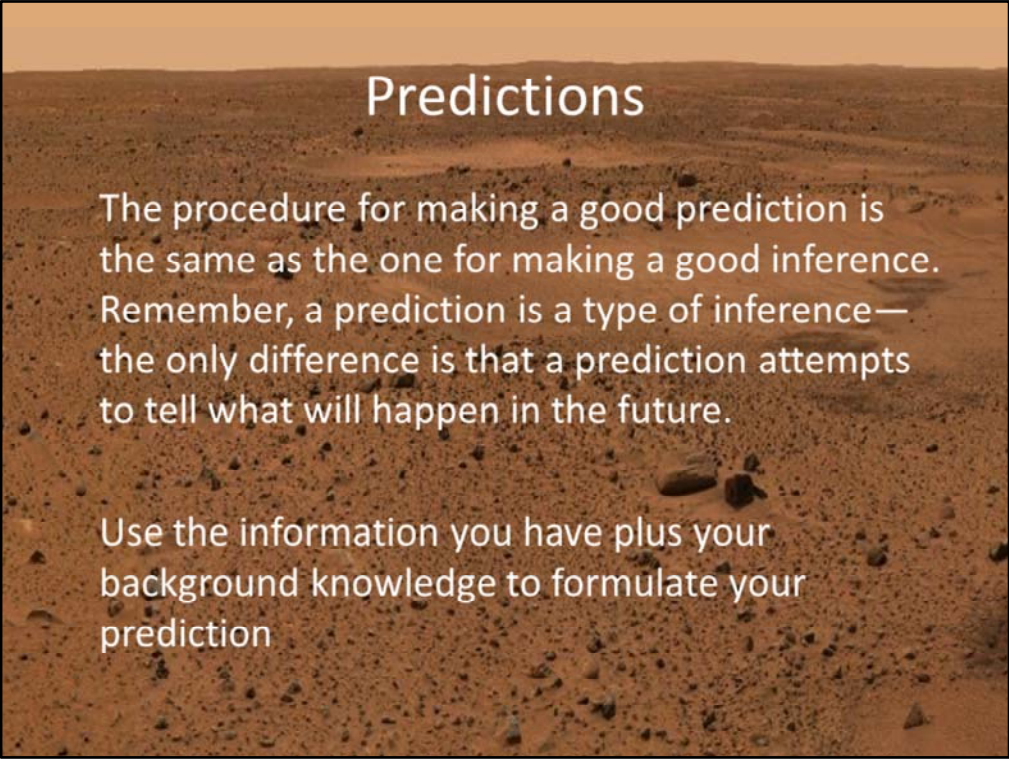
What do you know:

Background knowledge: (Hint—think about what you know about the surface of the Earth and the Earth's moon)

Inference:

Have students work individually or in groups to make an inference that answers the question posed at the top of the page. Have them answer the three questions in green on a sheet of paper. If this question is too difficult for your students, pose this as an alternative, “What can you infer about the age of the surface of Tethys?”

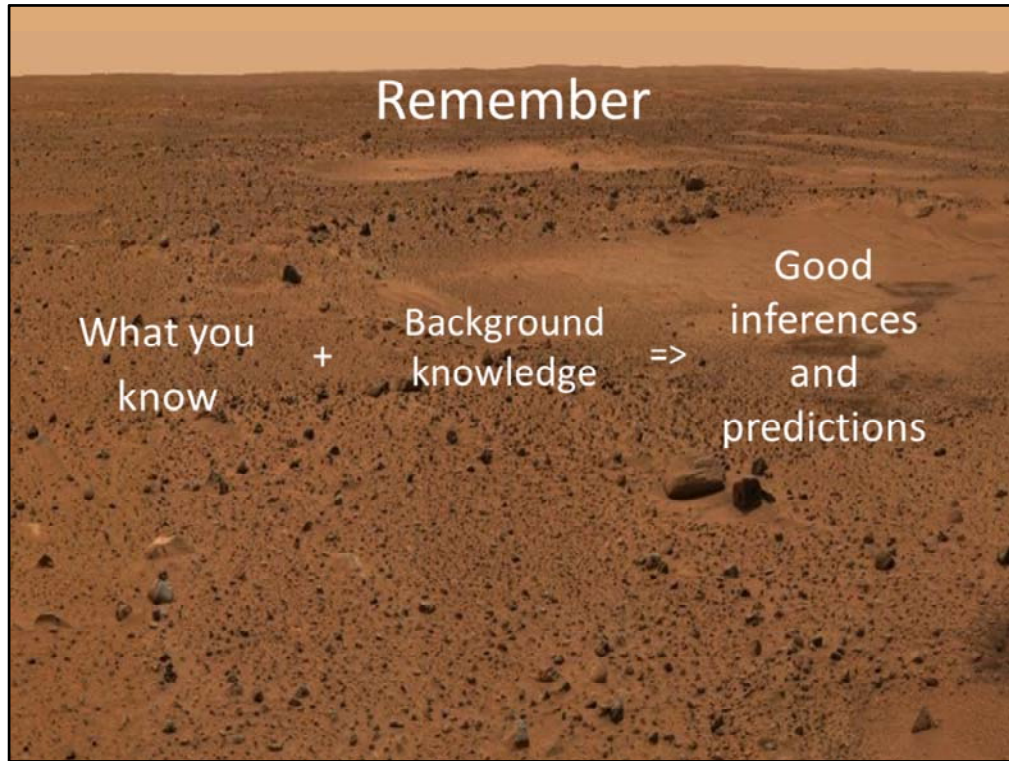
Students should be able to make the inference that Tethys has an old surface. Have students share their answers to the questions on this page. Be certain they explain how they arrived at their inferences. Accept any reasonable inference if the students can explain their inference using what they know and their background knowledge.



## Predictions

The procedure for making a good prediction is the same as the one for making a good inference. Remember, a prediction is a type of inference—the only difference is that a prediction attempts to tell what will happen in the future.

Use the information you have plus your background knowledge to formulate your prediction



Remember, in order to make good inferences, you should use what you know (what you read and what your senses tell you) plus your background knowledge.