

Lesson 2.1: “Investigating Landforms on Venus”

How do scientists gather evidence about things they cannot directly observe, such as planets that are far away? Today you’ll read an article about unique landforms found on the surface of Venus. You’ll find out how scientist Taras Gerya used a computer model to figure out what geologic process on Venus formed those landforms. You will practice reading like a scientist: carefully and actively, making sure that you understand the text and images. You will record your questions and ideas as you read, and you’ll have a chance to discuss your thoughts about the article with others.

Unit Question

- How can we search for evidence that other planets were once habitable?

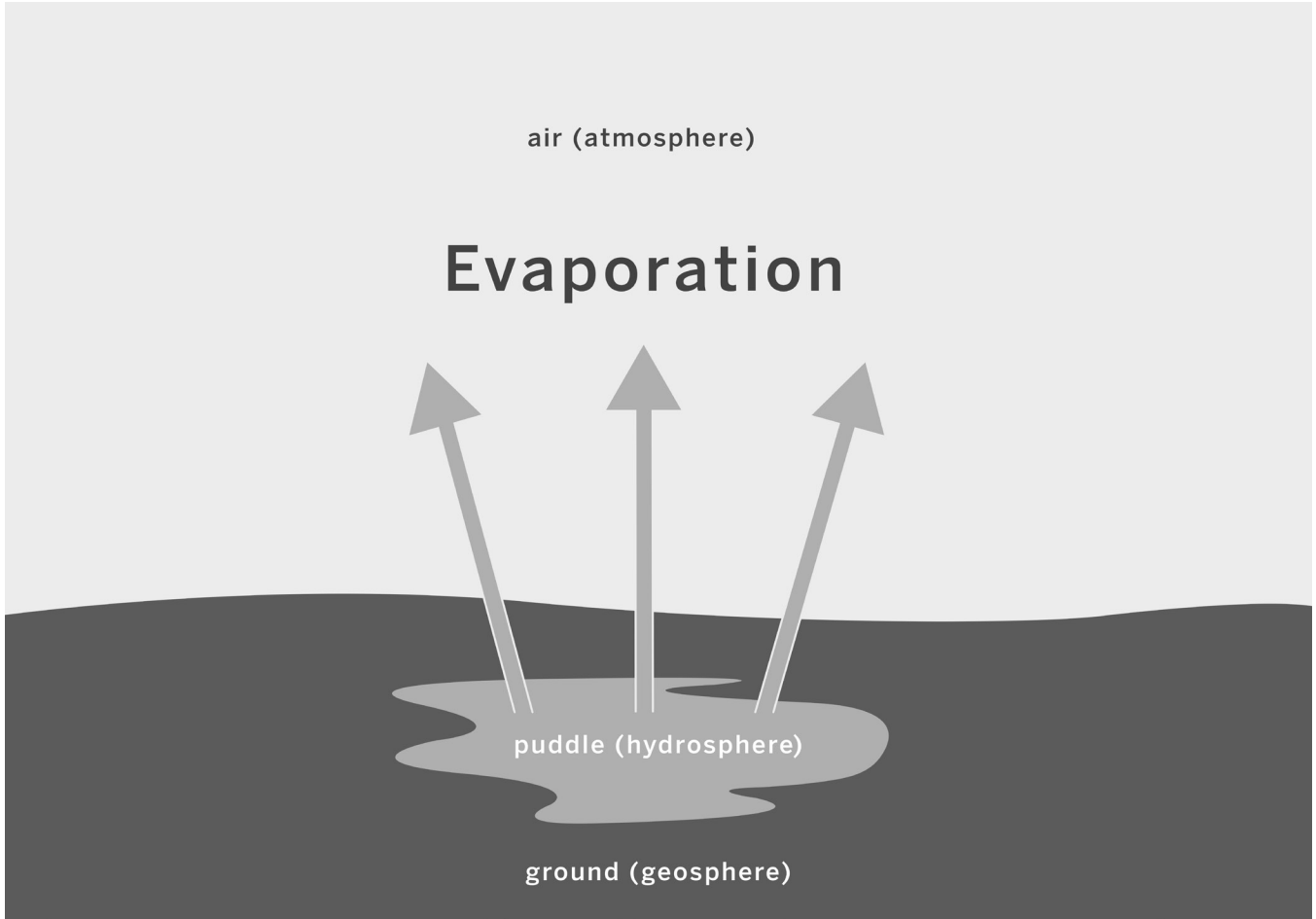
Chapter 2 Question

- How can we gather more evidence about whether lava or water formed the channel on Mars?

Vocabulary

- geologic process
- landform
- model

Warm-Up



Claire made the diagram above to show how the puddle she saw on the way to school disappeared by the end of the day. She wanted to show her idea that heat from the sun caused the water to evaporate into the air. However, Claire's diagram is incomplete.

Think about what's missing. What would you add to the diagram to better show Claire's idea?

Introducing Active Reading

They are so tiny, but so important!

that are incredibly powerful, and you can't see them, and they're everywhere," says Lynch. "And they dictate, in my book, pretty much everything that goes on on this planet."

The crosscutting concept of Systems

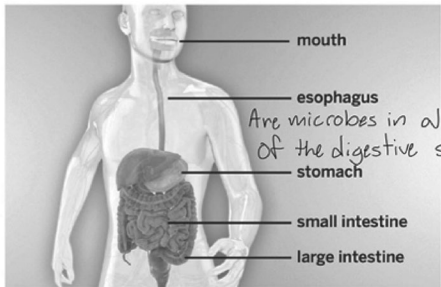
Today, at the University of California, San Francisco, Lynch works with many different types of scientists to study the human microbiome and how it affects the body as a system—which requires building bridges between different areas of science. To study the interactions between microorganisms and the body as a whole, scientists have to think and learn about topics outside of their usual areas of study. "In that way, we're kind of like our own little microbiome," she says. "Everybody brings different knowledge and skills to the table."

How long have scientists studied microbiome? The study of the human microbiome is still in its early stages: scientists are trying to find out and describe the basics of how the microbiome works. Someday, scientists hope to understand exactly what happens during each interaction—and that could open up whole new fields of study.

Interactions seem really important. What does that mean?

What are the challenges?

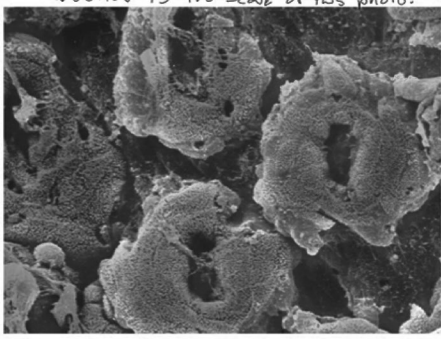
Studying the human microbiome has its challenges, but Lynch says she loves learning new things—and she encourages young people to find something they love, too. "Go after something that you really enjoy, something that isn't a chore," she says. "I've ended up where I am because I've always gone after things that interest me. I eat, breathe, and sleep this stuff, and I love it."



Are microbes in all parts of the digestive system?

Many of the microbes Dr. Susan Lynch studies are found in the human digestive system.

What is the scale of this photo?



This photo, taken with a microscope, shows the wall of a gut infected with ulcerative colitis, a digestive problem that may be caused by the interaction between microorganisms. Lynch's work may someday help heal people with this condition. (Colors were added to the photo to make it easier to see.)

BIG IDEA:

The microbiome interacts with and affects lots of things even though it's not visible

Discussion Questions

- What do you notice about this student's annotations?
- How do you know that she was thinking carefully while reading and trying to understand the article?

Name: _____

Date: _____

Reading “Investigating Landforms on Venus”

1. Read and annotate the article “Investigating Landforms on Venus.”
2. Choose and mark annotations to discuss with your partner. Once you have discussed these annotations, mark them as discussed.
3. Now, choose and mark a question or connection, either one you already discussed or a different one you still want to discuss with the class.
4. Answer the reflection question below.

Rate how successful you were at using Active Reading skills by responding to the following statement:

As I read, I paid attention to my own understanding and recorded my thoughts and questions.

- Never
- Almost never
- Sometimes
- Frequently/often
- All the time

Active Reading Guidelines

1. Think carefully about what you read. Pay attention to your own understanding.
2. As you read, annotate the text to make a record of your thinking. Highlight challenging words and add notes to record questions and make connections to your own experience.
3. Examine all visual representations carefully. Consider how they go together with the text.
4. After you read, discuss what you have read with others to help you better understand the text.

Name: _____

Date: _____

Homework: Recording Initial Ideas About the Chapter 2 Question

Chapter 2 Question: *How can we gather more evidence about whether lava or water formed the channel on Mars?*

One challenge in studying the channel on Mars is that Mars is too far away for scientists to directly observe what happens there.

Based on what you learned about Gerya in the article you read today, how can scientists study Mars if they can't directly observe what is happening there?
