

Best Practices

NEW EDITION

in Reading

Level

G



**Build Comprehension!
Develop Critical Thinking!**

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The MYSTERY of the TIDES

For centuries, no one had been able to explain the ocean’s tides. Why did they seem to vary with the positions of the moon and sun? To solve this mystery, it would take a great detective who also just happened to be a great scientist.

Recognize Genre

In **historical fiction**, certain characters, settings, and events are taken from the pages of history. However, many incidents in the story are made up. Facts about a real person are often combined with fictional ideas about how that person may have felt and acted in a certain situation.



Check each statement that describes features of historical fiction.

- People from history can have fictional conversations.
- All the characters must have actually lived.
- The setting is in the present.
- The main events are taken from history.

Could all the characters in a historical fiction story be made up? Explain.

Connect to the Topic

Reread the above introduction to “The Mystery of the Tides.” Ask yourself, “*What do I know about the tides?*” List your ideas on the lines below.

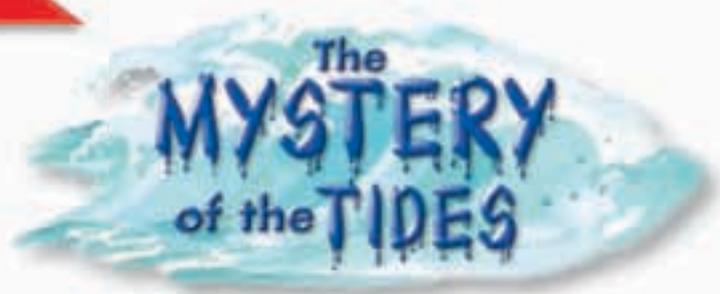
Preview and Predict

Look ahead at the illustrations in “The Mystery of the Tides.” What do you think is the key to the mystery? Write your predictions below.



STRATEGIES

VISUALIZE
MAKE INFERENCES
UNDERSTAND GENRE
MAKE CONNECTIONS



VISUALIZE

Descriptive details help readers picture the setting and characters in their minds.

I can picture a cold winter day with snow on the ground.

Which words help you visualize Uncle Isaac?

What clue does visualizing Uncle Isaac give you about his work?

On an icy March day in 1722, Uncle Isaac drew his chair closer to the fire and said, “Did I ever tell you about the time I solved the mystery of the tides?”

I glanced at my wife, Catherine. Because she has been her uncle’s housekeeper since before our marriage, she has already heard many of his stories. He did not start telling them to me until I moved into their house at 35 St. Martin’s Street in London.

“Why no, Uncle Isaac,” Catherine smiled. “I don’t believe you have told John that story.”

I quietly picked up my journal and **quill** and settled back to take notes. Uncle Isaac has led such a remarkable life and uncovered so many of the universe’s mysteries that last year I decided to record his **memoirs** for future generations to read.

In his old age, Uncle Isaac is short and stout with pointed features, silver hair, and keen, brown eyes. At times he becomes so focused on his ideas that he forgets what he is doing. One night he rose from the dinner table to get some bread in the kitchen and never returned. We found him **slouched** over the desk in his study, absorbed in solving a problem.

“It all began with the fishermen,” Uncle Isaac said. “For thousands of years they have been able to predict when the tide would be high or low. But no one knew what caused the ocean’s waters to rise or fall.”



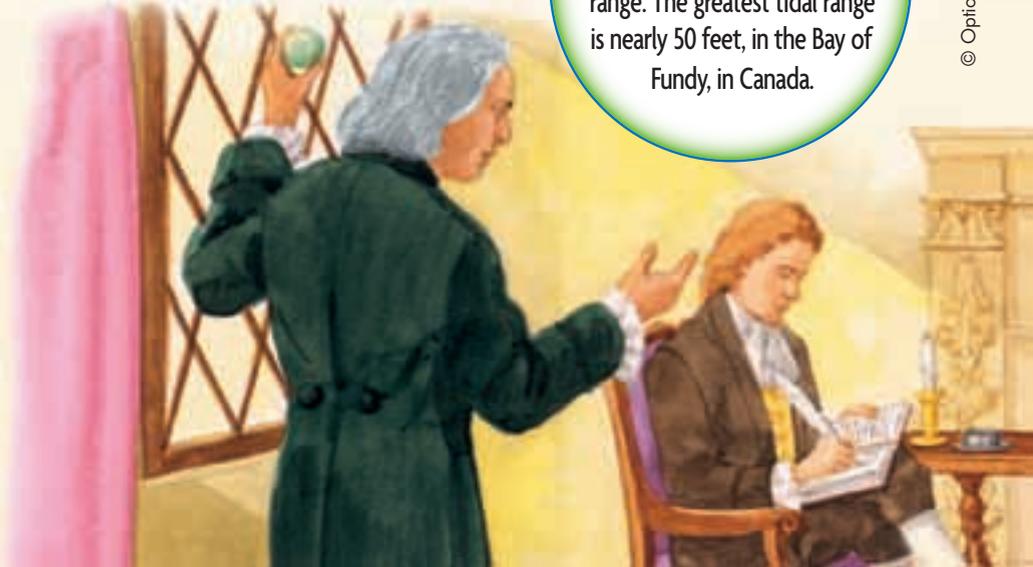
DID YOU KNOW?

The difference between high and low tides is called the tidal range. The greatest tidal range is nearly 50 feet, in the Bay of Fundy, in Canada.

memoirs (MEM-wahrz) written memories of a person’s life

quill (KWILL) a bird’s feather used as a pen

slouched (SLOWCHD) bent over



“Now when are the tides high or low?” I asked, wanting to include every detail in my account.

“There are two high tides and two low tides every day. About six hours separate each low and high tide,” Uncle Isaac explained. “Tides are highest around the times of the full moon—when the moon is opposite the sun—and the new moon—when the moon is closest to the sun. They are lowest when the moon is in one of its two half-phases.”

Uncle Isaac’s mention of the moon made me suspect that it had something to do with tides. My suspicion was proven correct when he said, “Before my time, there was a German mathematician named Kepler who believed that an **attractive force** holds all the planets in their **orbits**. He thought that this same force existed between the earth and the moon, and that it was the moon’s pull on the oceans that caused tides.”

Uncle Isaac continued. “There was an Italian astronomer and **physicist** named Galileo who disagreed with Kepler. He said that it wasn’t the moon that affected tides, but the speed of the earth’s **rotation** and its orbit around the sun that caused tides to be high or low.”

Uncle Isaac suddenly slapped the top of the oval table next to him, making me jump. “But what neither one of those men could explain,” he shouted, “was why there were two high tides a day!”

MAKE INFERENCES

Authors do not always tell you everything. Use clues, along with what you already know, to make an inference.

Kepler and Galileo were famous scientists. I think Uncle Isaac must be a scientist, too.

Which clue suggests Uncle Isaac is a scientist?

UNDERSTAND GENRE

(historical fiction)

Some stories belong to more than one genre. “The Mystery of the Tides” is historical fiction, but it is also a mystery.

In what ways is Uncle Isaac like a detective in a mystery?

THINK CRITICALLY

Detectives and scientists both work by making careful observations and organizing clues or facts into theories. What clues about the cause of tides can you gather from the story?

attractive force (ah-TRAK-tiv FORS) a natural power that draws or pulls objects
orbits (OR-bits) planets’ paths around the sun
physicist (FIH-zuh-sist) a scientist who studies matter and energy
rotation (roh-TAY-shun) the spinning of an object, like a top



MAKE CONNECTIONS

When reading, connect new information to ideas you already know.

I know that gravity is a force that pulls objects together.

Fill in the bubble next to each example of gravity.

- (A) water flowing down a drain
- (B) a ball dropping from your hand
- (C) a car coming to a stop at a light
- (D) a spaceship orbiting Earth

How do the examples of gravity help you understand Uncle Isaac's theory of tides?

calculations (kal-kyoo-LAY-shuns) solutions of mathematical problems
gravity (GRA-vih-tee) the pulling force between any two objects
reluctant (rih-LUK-tuhnt) unwilling

“And what about Kepler’s attractive force?” I said. “That sounds like your theory of **gravity**.”

“Yes, exactly!” Uncle Isaac cried triumphantly. “Building on Kepler’s ideas, I stated that all objects in the universe exert an attractive force on each other. And once I had proven the existence of gravity with mathematical **calculations** and experiments, I could explain tides in terms of the pull of the moon on the earth’s oceans.

“You see, the water on the side of Earth facing the moon is more strongly pulled toward the moon than the water on the other side. The earth itself is pulled toward the moon and slightly away from the water on its far side. This produces two high tides, each twelve hours apart. As the earth turns, these high tides sweep across the oceans and coasts. Over the course of a month, as the earth and moon come closer to each other, gravity becomes stronger. Tides become higher. As the two bodies move farther away, tides become smaller.”

“And what about the sun?” I asked hesitantly.

“Good question!” he answered. “The sun has a similar but weaker effect because of its great distance from Earth. So, that’s the story of how I solved the mystery of the tides.”

“Don’t forget,” Catherine reminded him. “You were so **reluctant** to publish your findings until you were absolutely sure they were correct that you might never have revealed your solution if Edmund Halley hadn’t begged you to share it.”

“And then,” I remarked, “the world might never have known the name ‘Isaac Newton!’”

