Incredible Icebergs

A Reading A–Z Level S Leveled Book
Word Count: 1,295

Connections

Writing

Research the saying "That's just the tip of the iceberg." Write about what this saying means and how it relates to the information presented in this book.

Math

If an iceberg travels 0.8 kilometers (0.5 mi.) per hour, how long would it take an iceberg to travel 350 kilometers (217 mi.)? Solve the problems two ways.

LEVELED BOOK • S

Incredible Icebergs

Written by Cynthia Kennedy Henzel

Glossary

calve *(v.)* to break off and separate from an ice mass (p. 5)

compacts *(v.)* presses together to become denser and tighter (p. 5)

currents *(n.)* waters that flow in a certain direction (p. 12)

dense *(adj.)* having parts that are crowded or closely packed together; compact (p. 5)

endanger *(v.)* to put someone or something in a harmful or dangerous situation (p. 8)

glaciers *(n.)* large bodies of accumulated ice and compacted snow that are found year-round and that slowly move downhill (p. 5)

icebergs *(n.)* large pieces of ice that have broken away from a glacier and float in the sea (p. 4)

monitors *(v.)* observes or checks the progress of something over time (p. 9)

satellite *(n.)* a natural or human-made object that orbits Earth or another object in space (p. 9)

Incredible Icebergs

Written by Cynthia Kennedy Henzel

www.readinga-z.com

Focus Question

How do icebergs affect people?
How do they affect the environment?

Words to Know

calve
compacts
currents
dense
endanger
glaciers
icebergs
monitors
satellite

Page 3: A glacier in Alaska calves into the sea. Soon it will be an iceberg.

Photo Credits:
Front cover, back cover: © iStock/mlharing; title page: © iStock/Sloot; page 3: © iStock/sarkophoto; page 4: © Bettmann/Getty Images; page 5: © iStock/oporkka; page 7: © Bill Coster/FLPA/Minden Pictures; page 8: courtesy of International Ice Patrol/U.S. Coast Guard; page 10: © John Eastcott & Yva Momatiuk/National Geographic/Getty Images; page 11: © Jody Martin/REUTERS/Newscom; page 12: © Vadim Balakin/Moment/Getty Images; page 13: courtesy of Ted Scambos and Rob Bauer, NSIDC IceTrek Web site; page 14 (all): contains Copernicus Sen6nel data (2017), processed by ESA, CC BY-SA 3.0 IGO; page 15: © James + Courtney Forte/Getty Images

Incredible Icebergs
Level S Leveled Book
© Learning A–Z
Written by Cynthia Kennedy Henzel

www.readinga-z.com

Correlation

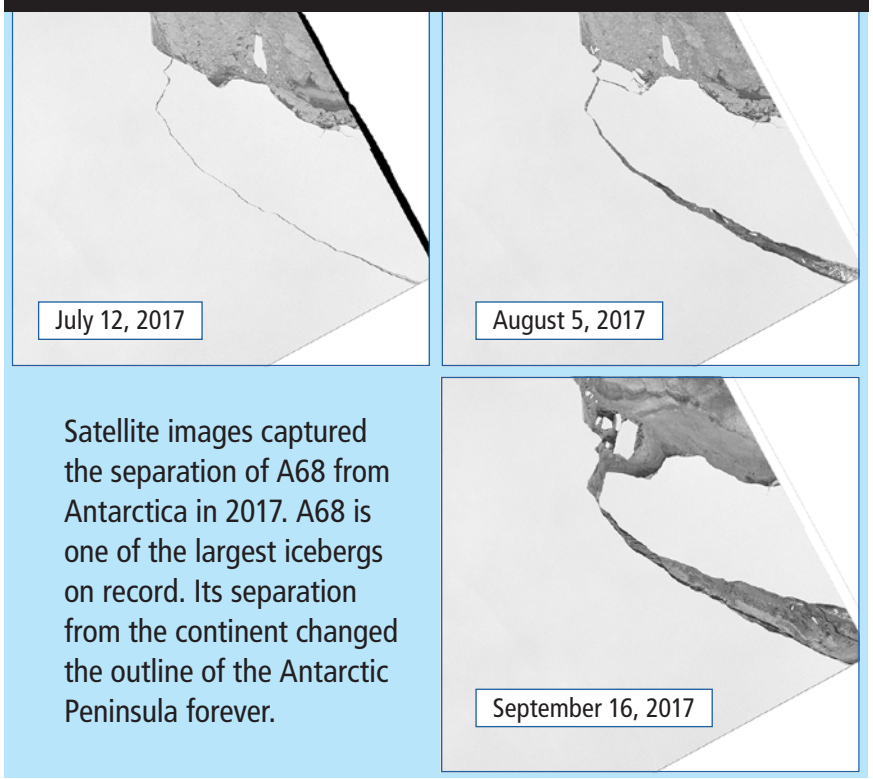
LEVEL S	
Fountas & Pinnell	O
Reading Recovery	34
DRA	34

Conclusion

Icebergs have troubled us since people first set sail through chilly waters, but our relationship with them has changed. Today, more people worry about what melting icebergs mean for coastal cities than for sailors at sea. We may come to rely on these giants of nature for fresh drinking water—or some other use we haven't even dreamed of yet. As research continues, we may find that what we know about them today is really just the tip of the iceberg.

A man paddles past an iceberg in Kenai Fjords National Park, Alaska.

Farewell, Antarctica



Satellite images captured the separation of A68 from Antarctica in 2017. A68 is one of the largest icebergs on record. Its separation from the continent changed the outline of the Antarctic Peninsula forever.

In the short term, calving of icebergs like A68 adds little to rising sea levels. That's because most of the ice is already beneath the water when the iceberg breaks off. However, ice sheet calving speeds the movement of glaciers off the land, and glacier ice moving into the sea makes sea levels rise much more. This, in turn, floods coasts around the world. It's one reason scientists study icebergs: to help predict future sea level rise and help humans plan for it.

Table of Contents

This painting depicts the *Titanic* as it sinks. The iceberg that sank the ship was 15–30 meters (50–100 ft.) high and 61–122 meters (200–400 ft.) long, according to 1912 newspaper estimates.

Introduction

For centuries, **icebergs** have frightened sailors in cold seas—and for good reason. When the ship *Titanic* made its first voyage in 1912, the ship hit an iceberg off the northeastern coast of Canada. The ship sank less than three hours later, taking about 1,500 people with it beneath the icy water.

Icebergs rise from the ocean like mysterious white whales or snowy mountains. They are amazing to see, and yet what we see is just the small part that floats above the water's surface. That tip only hints at the massive amount of ice beneath the surface, hidden from view.

Two scientists drag a sled across their test iceberg, named Chip.

Today, the ice in the Arctic and Antarctic is shrinking because Earth is getting warmer. More icebergs are calving. In order to better understand this melting process, one team of scientists landed on an iceberg to study it.

In February 2017, another team of scientists flying over Antarctica photographed a rift, or crack, in an ice shelf. An ice shelf is a large sheet of ice that is attached to land but sits in the water. That July, the cracked shelf broke off from the continent. It formed A68, an iceberg almost the size of the U.S. state of Delaware.

Do You Know?

On average, icebergs travel slower than most people walk.

Scientists Afloat

Along with companies and cowboys, some scientists take an interest in icebergs. Some study to understand how melting icebergs may affect ocean **currents**—or be affected by them. A big iceberg can spend ten years drifting through the ocean, pulled by tides and deep ocean currents. It may break into pieces as it collides with other icebergs or ice shelves. Finally, most will drift into warmer water and melt.

Animals Afloat

Arctic seals rely on icebergs as refuge from predators and as a spot to give birth. Polar bears hunt Arctic seals, so they spend time on icebergs, too. In fact, as many as twenty polar bears were observed living on an iceberg off the Canadian Arctic coast.

A mother and two cubs travel on a drifting iceberg near Russia.

All About Icebergs

Icebergs come from the ends of the Earth—Antarctica in the south and the Arctic in the north. Ice sheets and **glaciers** there form when snow falls, then **compacts** over thousands of years. They move slowly downhill and break off, or **calve**, when they reach the sea. This separation from land creates an iceberg. By definition, an iceberg is floating ice that rises at least 5 meters (16 ft.) above the sea's surface.

Why does it float like that? When water freezes, it develops crystals that spread the same amount of water over a larger area. For this reason, ice is about 10 percent less **dense** than water. It's why about 10 percent of an iceberg floats above the surface.

This is not an iceberg and its reflection. It's actually two images in one—the ice above the water combined with the ice below.

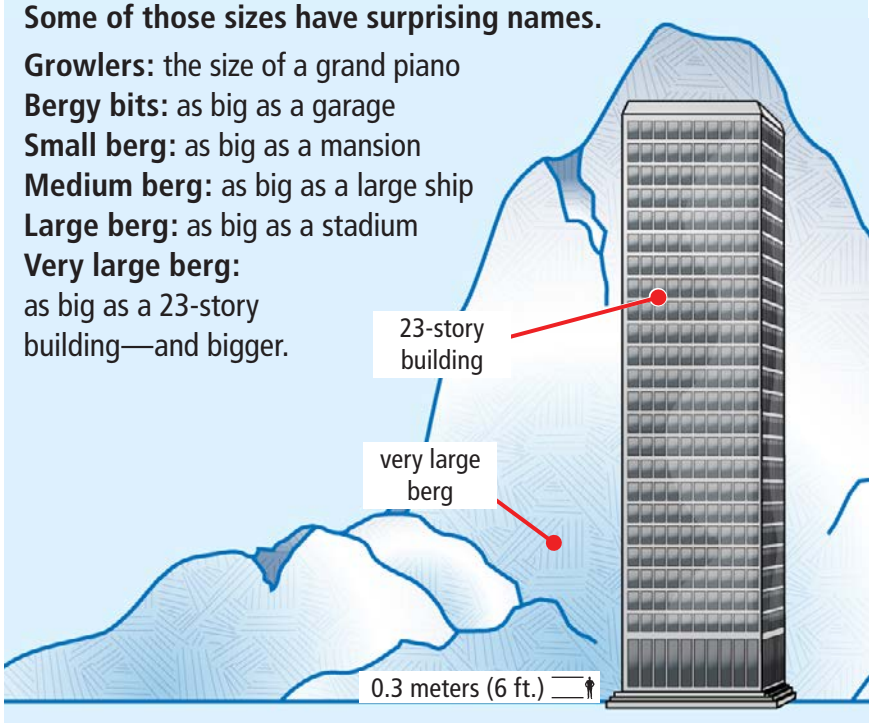
Many Antarctic icebergs are broad and flat like a tabletop because they break off from flat sheets of ice. Many are also huge. The largest known iceberg, B15, was 295 kilometers (183 mi.) long and 35 kilometers (23 mi.) wide. It was large enough for everyone in the world to stand on!

Icebergs in the Arctic are smaller and often pointed. They travel down valleys to the sea.

Big and Bigger Bergs

Icebergs come in many sizes.
Some of those sizes have surprising names.

Growlers: the size of a grand piano
Bergy bits: as big as a garage
Small berg: as big as a mansion
Medium berg: as big as a large ship
Large berg: as big as a stadium
Very large berg: as big as a 23-story building—and bigger.



Math Minute

A good-sized iceberg contains about 76 billion liters (20 billion gal.) of fresh water. If 1 million people each use about 38 liters (10 gal.) of water a day, how long would the water from one iceberg last?

Answer: 2,000 days

Some companies use pure iceberg water to make things—skin-care products, for instance. First, though, someone must harness the icebergs. Canada now has "iceberg cowboys" who round up icebergs. These icebergs aren't going to hot places, so cowboys don't have to worry about them melting. However, iceberg harvesting can be dangerous work: an iceberg can roll over and crush a ship.

Sometimes icebergs attract admirers. In April 2017, Ferryland, Canada, became a tourist magnet when a 46-meter (150 ft.) iceberg grounded just offshore.

The Upside of Icebergs

Icebergs could have some handy uses. Glaciers and ice sheets contain almost 70 percent of the world's fresh water—and it's very pure water. These types of ice formed thousands of years before air and water pollution. Someday, icebergs might supply water to places that need it, like the Middle East or Southern California. The problem is how to move icebergs to where water is needed.


A workboat tows an iceberg away from an oil-drilling ship near Newfoundland, Canada.

Icebergs can be towed. People working on oil platforms, for instance, lasso icebergs and tow them away from the platforms. If moved into warm waters, though, icebergs melt. People are trying to find a way to insulate icebergs to keep them frozen.

Another idea is to fill tankers—ships designed to carry large amounts of liquid—with iceberg chips, then ship the melted chips across the ocean. However, like towing icebergs, this method is still too expensive to be practical.

Most icebergs are white because they contain air bubbles. Because the air inside is so compacted, those bubbles may hold twenty times more pressure than a car tire! When an iceberg melts, it makes a fizzing sound like soda as ten-thousand-year-old air slowly escapes.

Blue icebergs are made of old ice that has pressed out the air bubbles or of ice that has melted and frozen again. Green icebergs, which are rare, contain organic matter—matter from once-living animals or plants—frozen into the ice.


This green- and blue-striped iceberg floats near Antarctica. The different colors appear because the different layers of ice formed in different conditions. Blue stripes are the most common.

Watch Out!

Because icebergs are so compacted, the ice found in them is much harder than ice from your freezer. It's hard enough to sink a ship, if a ship hits one.

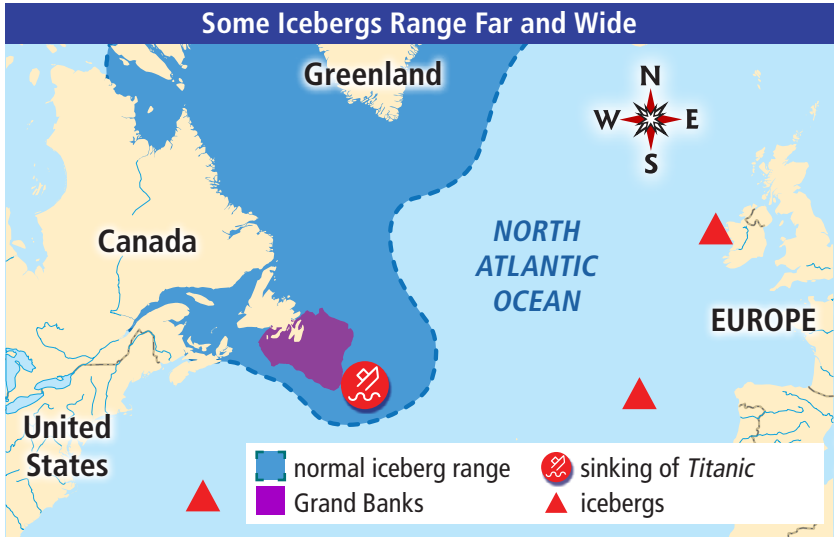
The *Titanic* was not the first ship sunk by an iceberg. Between 1882 and 1890, fourteen ships were lost and forty were damaged by icebergs. The loss of the *Titanic*, however, spurred the United States and a handful of other nations to form the International Ice Patrol (IIP) in 1912.

From the air, an IIP officer surveys the sea below and notes the location of an iceberg.

In the North Atlantic, ice season runs from late winter through late summer. This is the period when icebergs break off from Greenland glaciers. Their journey takes several months and moves through a busy shipping area called the Grand Banks. It is the only location in the world where icebergs **endanger** a major shipping route.

The IIP **monitors** the Grand Banks. It uses airplanes, reports sent from ships, and **satellite** images to create maps showing where icebergs have been seen. It spots about six hundred icebergs a year. Some years have many more; a record two thousand icebergs were spotted in 1984. Other years—like 1966—have none. No one knows why the number of icebergs changes.

Since the IIP began, no ship that heeded its warnings has hit an iceberg. However, some captains take their chances. Trying to take a shortcut through the icebergs has sunk several ships.



Occasionally, icebergs drift far beyond their normal range. Those shown are three that traveled the farthest.