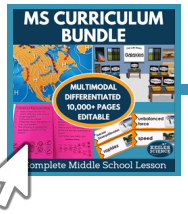
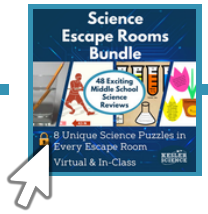
What Can Kesler Science Do for You?

4th - 8th grade science teachers love our Life, Earth, and Physical Science materials! With these easy and engaging materials, teachers can save planning time and put their focus back on the teaching that really matters.



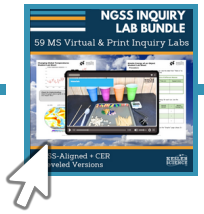
5E LESSONS

Two-week lessons with over 100 topics



ESCAPE ROOMS

Engaging activities for review

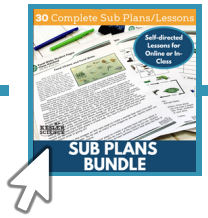


INQUIRY LABS

Three different levels to fit every student

AMAZING ANCHORS

Anchoring phenomenon to book-end your lessons



SUB PLANS

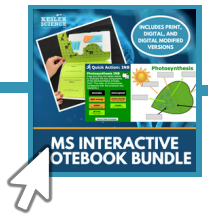
Never worry about planning for a sub again.

WARM-UPS

Bellringers for the entire year

STATION LABS

Student-led exploration

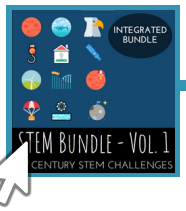


INTERACTIVE NOTEBOOKS

Bring science journals to life.

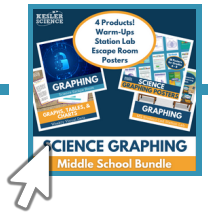
WIKI TICKETS

Quick formative assessments



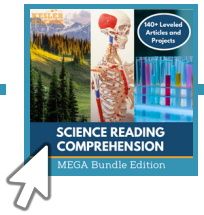
STEM CHALLENGES

Real-world STEM problem-solving



GRAPHING

Table and charts and graphs ... OH MY!

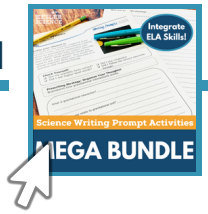


SCIENCE READING COMPREHENSION

Leveled reading passages with mini-activities

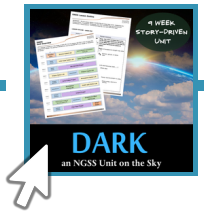
SPANGLER COLLABORATION

Exclusive Steve Spangler lessons and videos



WRITING PROMPTS

Writing activities covering 100+ topics



EXPLORIES

Story-driven units with integrated activities

The Kesler Science Professional Learning Network (PLN) group on Facebook has a huge community of engaged and supportive science teachers - come join us!

KESLER SCIENCE

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Name: _____

Date: _____

Geoengineering Ice Sheets

The year was 1915. Bold explorers led by Earnest Shackleton was investigating Antarctica by ship. After days of chopping through ice sheets, the boat could go no further. The sailors had to jump ship as the ice overtook the boat and squeezed the wooden planks into splinters. 🧊 They made headlines for surviving a whole **year** after they abandoned their boat.

Fast-forward to today, and those ice sheets are still making headlines. Cracks in massive glaciers, chunks of ice the size of U.S. states drifting off into the ocean - the ice sheets are looking fragile these days. Scientists are worried that most solutions could take a decade to show any effect. That's why they're looking at some brain-bending possibilities.

They're focusing on the Thwaites Glacier—aka the "Doomsday Glacier." It's the widest glacier in the world, about the size of Florida, and it holds a **lot** of ice. (Well, technically 480,000 cubic kilometers, but who's counting?)

Thwaites Glacier interacts in a special way with the ocean floor. There are tall, undersea mountains that sit below the glacier. These mountains act as an underwater dam, preventing warm ocean currents from rushing below the Antarctic sheet of ice.

Naturally, warm temperatures cause glaciers to melt. But what speeds the process along are rivers of warm ocean water wearing away at the ice from below. Fifty years ago, the underwater mountains did a good job at blocking this kind of current.

As the glacier has been melting, though, it has become more buoyant. That makes it float a little higher in the water. This means it separates from the natural sea wall below. Warm ocean currents slip under the glacier, causing the melting to speed up.

It's one of those vicious cycles: the more it melts, the faster it melts. 🌡️ Ice sheets shrink and grow with the seasons, but lately, the growing during the cold seasons isn't making up for the shrinking in the warm seasons. In fact, scientists say Thwaites is losing **80 cubic kilometers of ice** every year. That's like taking 400,000 Olympic swimming pools... and multiplying it by 80. 😳

This rush toward ice sheet oblivion has scientists looking at some wild possibilities. One option is building a wall 1,000 feet tall that extends for 60 miles to stop the warm ocean water from rushing under the glacier. The problem? The expense and challenge of building such a massive structure under the coldest waters on Earth makes it nearly impossible.

Other options scientists are looking at to save glaciers are also complicated. One idea is using thermosiphons to pull heat away from glaciers. They've even considered pumping water out from underneath glaciers so they don't slide around so much. None of these options are cheap or easy, but scientists keep searching for solutions to slow the melting.

Researching Antarctica got me thinking; how does the ice on this continent change over the course of a year? Even Shackleton knew it was easier to explore during certain months. Check out the graph on the next page.

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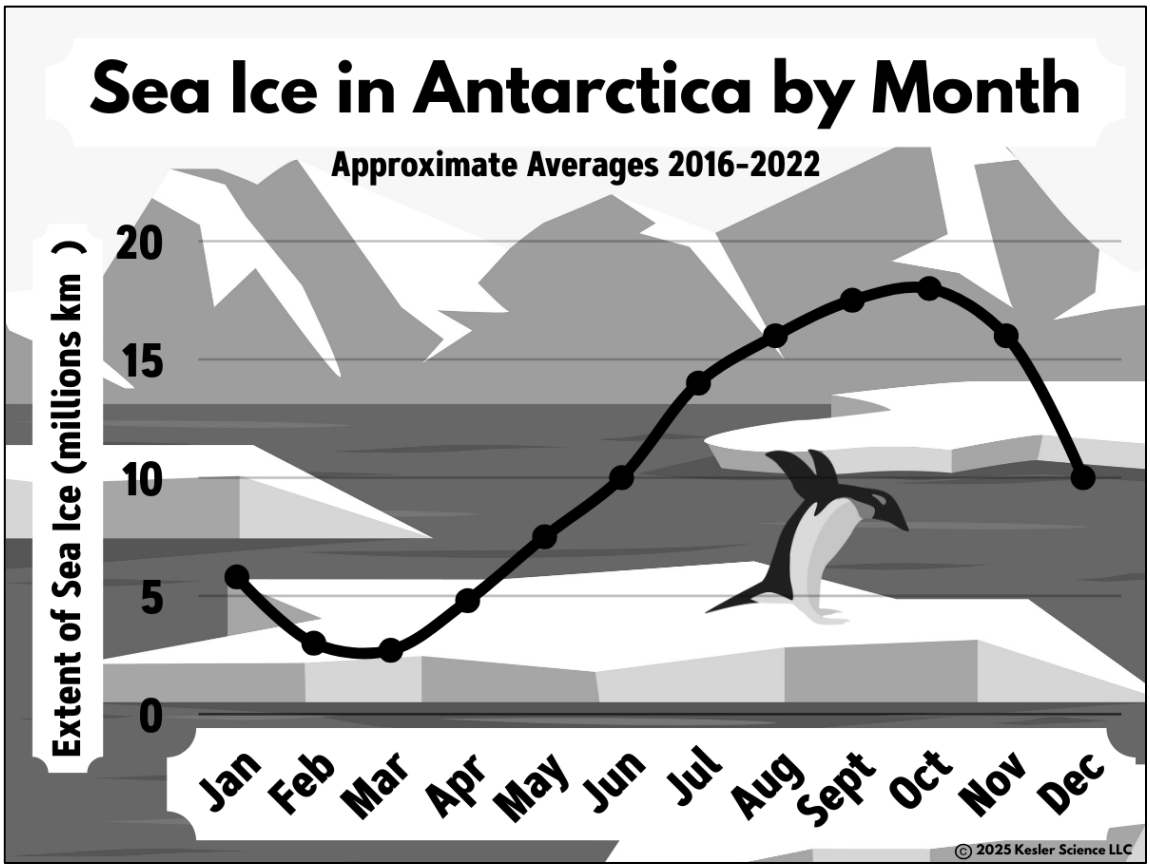
Geoengineering Ice Sheets



1. What is the greatest amount of ice that covers Antarctica? During what time of year does this occur?

_____

_____

2. During what times of year would there be 10 million km^2 of ice covering Antarctica?

_____

_____

3. Antarctica is in the Southern Hemisphere. Use your knowledge of seasons and Earth's movement to predict how this graph might look if it represented glaciers in the Northern Hemisphere, like in Greenland.

_____

_____

_____

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Blog Link: https://blog.keslerscience.com/phenomenon-and-graphing/geoengineering-ice-sheets

Geoengineering Ice Sheets

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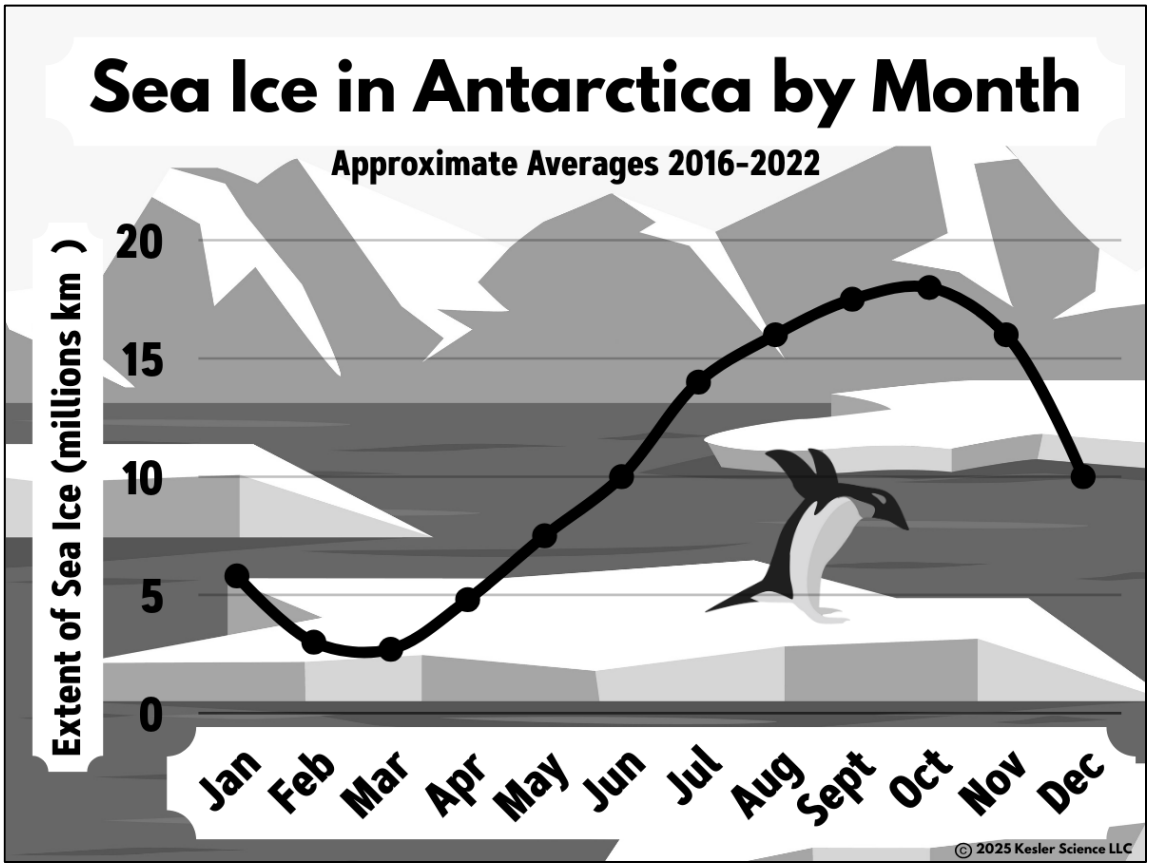

1. What is the greatest amount of ice that covers Antarctica? During what time of year does this occur?

   There are about 18 million square kilometers covering Antarctica in the month of October.

2. During what times of year would there be 10 million km^2 of ice covering Antarctica?

   The graph crosses the 10 million km^2 during the months of June and December.

3. Antarctica is in the Southern Hemisphere. Use your knowledge of seasons and Earth's movement to predict how this graph might look if it represented glaciers in the Northern Hemisphere, like in Greenland.

   The Southern Hemisphere is pointed towards the Sun when the Northern Hemisphere is pointed away from it. This means the Southern half of Earth experiences seasons that are "opposite" the Northern half. A graph showing glacier ice in the Northern Hemisphere would likely have the most ice during February or March and the least during September or October.

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