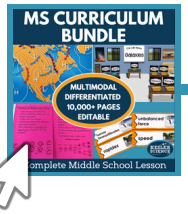
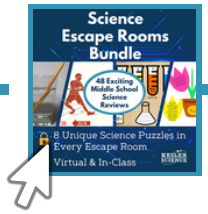
What Can Kesler Science Do for You?

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.



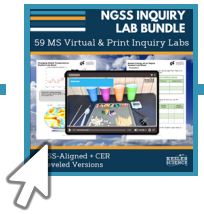
5E LESSONS

Two-week lessons with over 100 topics



ESCAPE ROOMS

Engaging activities for review

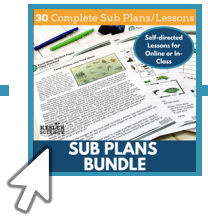


INQUIRY LABS

Three different levels to fit every student

AMAZING ANCHORS

Anchoring phenomenon to book-end your lessons



SUB PLANS

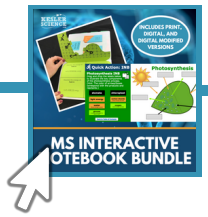
Never worry about planning for a sub again.

WARM-UPS

Bellringers for the entire year

STATION LABS

Student-led exploration

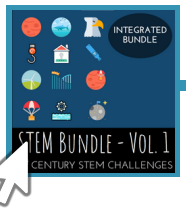


INTERACTIVE NOTEBOOKS

Bring science journals to life.

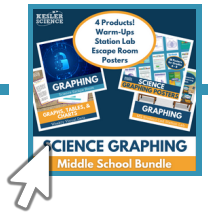
WIKI TICKETS

Quick formative assessments



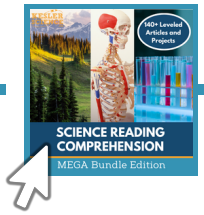
STEM CHALLENGES

Real-world STEM problem-solving



GRAPHING

Table and charts and graphs ... OH MY!

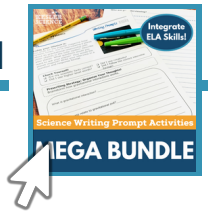


SCIENCE READING COMPREHENSION

Leveled reading passages with mini-activities

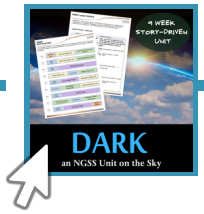
SPANGLER COLLABORATION

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: _____

Sandy Beach Minerals

When I'm on vacation at the shore, I appreciate a wide, shallow beach. There's lot of room to play volleyball and build sandcastles, and you can take your time getting wet without instantly being up to your neck. 😆 As beaches erode, though, there can be massive drop-offs and narrow strips of sand where water meets land. It's just not as fun! 🥵

Sand erosion not only creates a huge eyesore, but it disrupts the natural shore ecosystem. If a big enough storm hits a coastal area, sand erosion can cause serious property damage...or worse.

Engineers have been hard at work for years trying to preserve sandy beaches. Installing rocks along the shore is a classic way to pin sand down. Building up sand dunes can protect against storm surges and wave action as well. When all else fails, beach towns might simply bring in new sand or dredge up old sand to replenish what has been washed away. This is not the most practical solution, and it costs a fortune!

Recently, a group of scientists looked to nature to help tackle this problem. Marine organisms use energy from their food to convert minerals from the ocean into their shells or skeletons. In other words, they use the materials found in their local environment to help grow sturdy body parts. 🐚

Instead of bringing in outside materials to protect beaches, like cement or plastic, could engineers use the ingredients that are already there to build a buffer?

That's exactly what scientists attempted when they passed 4 volts of electricity through a sample of sand soaked in ocean water. This mild current, which is about equal to a few AA batteries, binds the sand with minerals we can find dissolved in the ocean water. This makes the sand and minerals stick together permanently, and the process is completely safe for marine life in the area! 🐡

How does the rock-building work, exactly? The electric current turns minerals naturally found in sea water into a glue to hold sand together. This forms rocks like calcium carbonate and magnesium hydroxide - pretty much the same stuff found in limestone!

There could be lots of applications for this eco-friendly technology. Think of fortifying the foundations of beach-front buildings and homes or creating limestone structures under the sand to keep ocean waves from washing the beach away. It’s kind of like how coral reefs naturally keep beaches intact.

There are a couple of catches with this new technology. It takes 28 days of electric current to convert wet sand into erosion-proof material. Plus, the human-made limestone is only about 1/10th the strength of cement. Scientists say that's still plenty strong enough to be effective at preventing sand loss.

Ecologists see this as a timely discovery, as sand erosion has been taking place at an alarming rate. Check out this graph on how beach erosion has changed over the years at certain beaches in Hawaii:

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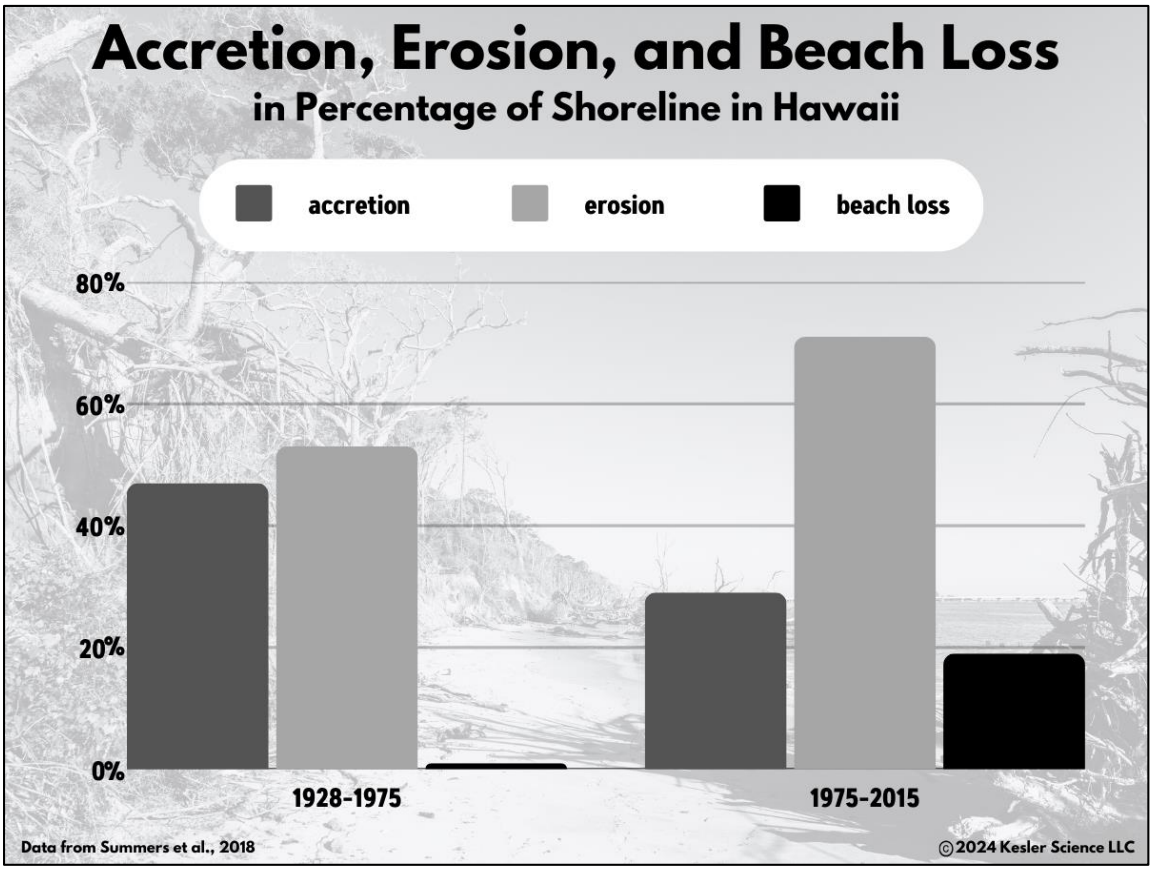
Sandy Beach Minerals



1. Look at the three categories of data: accretion, erosion, and beach loss. Using context clues from the graph, what do you think the word "accretion" means?

_____

_____

_____

2. What patterns do you notice in the graph data?

_____

_____

_____

3. How much has erosion and beach loss changed over the periods shown on the graph?

_____

_____

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Blog Link: https://blog.keslerscience.com/phenomenon-and-graphing/sandy-beach-minerals

Sandy Beach Minerals

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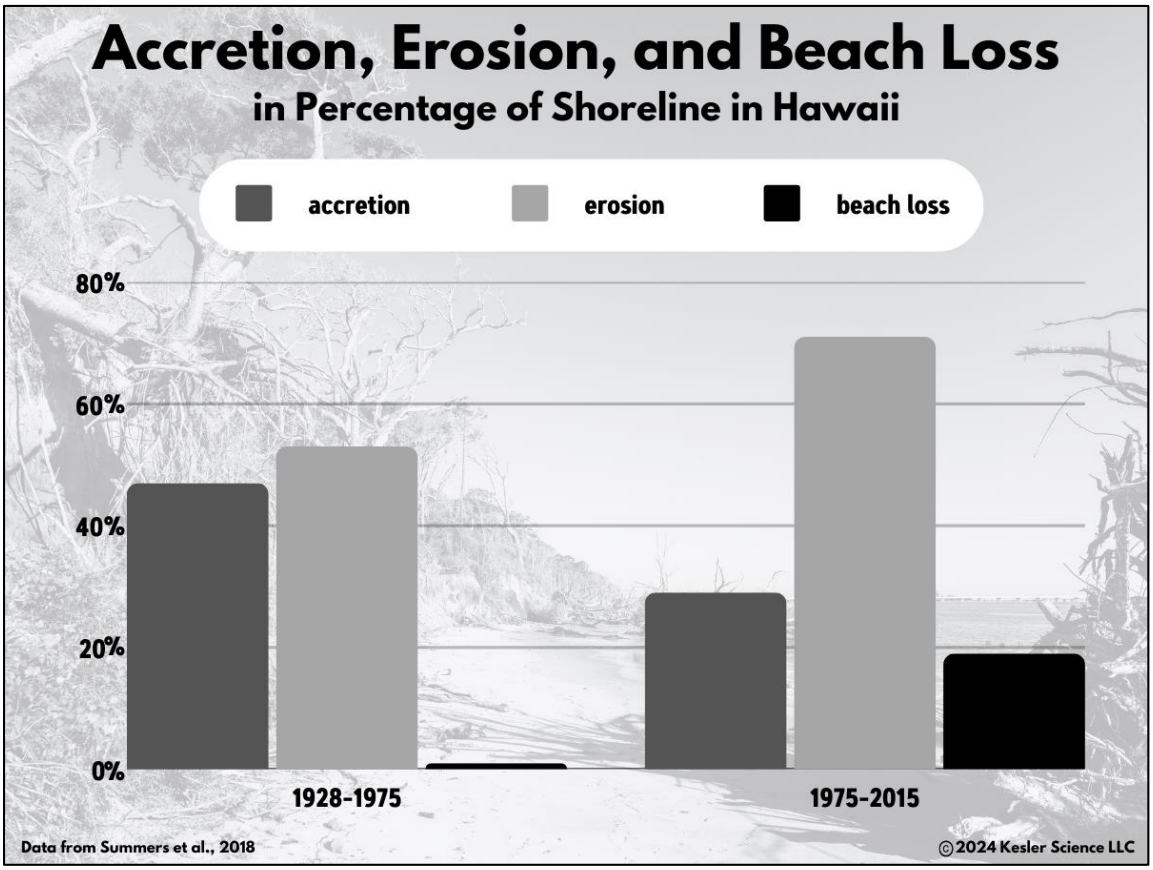

If I were to bring this graph to my science students, here are some questions I would ask them:

1. Look at the three categories of data: accretion, erosion, and beach loss. Using context clues from the graph, what do you think the word "accretion" means?

   Logically, if erosion means sand is leaving the beach, and accretion seems to cancel out erosion when you look at the total beach loss, then accretion probably means the rate at which beaches gain sand.

2. What patterns do you notice in the graph data?

   The rates of sand erosion and beach loss have increased in the period between 1975 and 2015. The sand accretion rate has decreased.

3. How much has erosion and beach loss changed over the periods shown on the graph?

   Erosion has increased by about 20%. Beach loss also appears to have gone up about 20%.

Hope this helps your students get thinking about the science of beaches next summer!

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