#projectphenomena
more good stories for your sphere

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Phenomenon-based learning (PhBL or PhenoBL) is a multidisciplinary, constructivist form of learning or pedagogy where students study a topic or concept in a holistic approach instead of in a subject-based approach. PhBL emerged as a response to the idea that traditional, subject-based learning is outdated and removed from the real-world and does not offer the optimum approach to development of 21st century skills.
Phenomena-based Learning & SOS

Professional Development

Hello my name is

INTERN
The Tortoise (not turtle!) that Crossed the Indian Ocean
Underwater Cabinet Meeting in the Maldives
Can Elephants Sense Tsunamis Before They Happen?
Plastic in the Deepest Part of the Ocean
Singing Sands
This is STEVE,
He’s from
Outer Space
Exoplanet Travel Bureau
Take a trip outside our solar system

Book a Flight to Another Solar System
Q: Commonalities?
A: Fascinating!

Scientific phenomena makes students wonder and ask questions. So does SOS!
Are these a good fit?
Definitely!

Singing Sand Dunes and FIM Forecast Model: Wind Streamers fit together in a module ...a stretch?
Sure ... so what? Learning excitement is the goal.

Are singing sand dunes memorable?
Yes.

Are phenomena[l] stories engaging?
Most certainly!

What are you waiting for?
The Ocean is Glowing with Microorganisms

Mosquito Bay in the Caribbean island of Vieques literally lights up at night. This is because it is home to almost a million individuals of Pyrodinium bahamense, a specie of tiny dinoflagellates that you can’t see during the day but lights up at night through bioluminescence. Much of the life in the ocean is tiny, from the tiny glowing creatures of the shallow and deep, to phytoplankton that build the base of the marine food web, and chemotrophic bacteria and archaea in hydrothermal vents. Though these organisms might be hard to see, they light up the sea with a deluge of life.

Guiding Questions

- What kinds of microscopic organisms live in the ocean?
- What do these microscopic organisms do for our planet and oceans?
- How does size of different phytoplankton relate to temperature of water they live in?
- Why do deep sea vents host so much life?

Cross-cutting Concepts

- C4: Systems and System Models
- C6: Structures and Functions

Disciplinary Core Ideas

- ESS2.C: The Roles of Water in Earth's Processes
- LS2.B: Cycles of Matter and Energy Transfer in Ecosystems

Photo credit: common domain
Datasets

**ClimateBits: Phytoplankton**
This short film explores more about the importance of phytoplankton to the ecosystem.
Available for: SOS
For SOSx use Biosphere: Marine Chlorophyll Concentration and Land Vegetation

**Deep-Sea Vents: Life Without Sunlight**
In contrast to surface level phytoplankton, many tiny organisms live deep underwater near hydrothermal vents. This short film explains why and how life thrives in these areas.
Available for: SOS
For SOSx use Deep-Sea Vent Locations

**Exploring the Unknown Ocean**
This short film dives deep into the mysteries of our ocean, including the tiny organisms that live there.
Available for: SOS, SOSx

**Ocean Color (monthly) - Real-time**
This dataset displays information remotely sensed by satellites that tracks the location and extent of photosynthesizing organisms in the ocean in near-real-time.
Available for: SOS, SOSx

**Phytoplankton Model**
Phytoplankton are the primary producer for the ocean food web. Though they are tiny they have a huge impact on the ecosystem. Notice where different sized phytoplankton occupy different waters—mostly based on temperature.
Available for: SOS, SOSx

External Resources
- NASA Earth Observatory: What are Phytoplankton?
- Phytoplankton Science Careers (NASA)
SOS Showcase: Will animals evolve to have larger extremities? Phenomena[1] Storytelling

Phenomena do not need to be phenomenal to be academically productive!
#projectphenomena #phenomenaforngss

sos.noaa.gov/Education/Phenomena