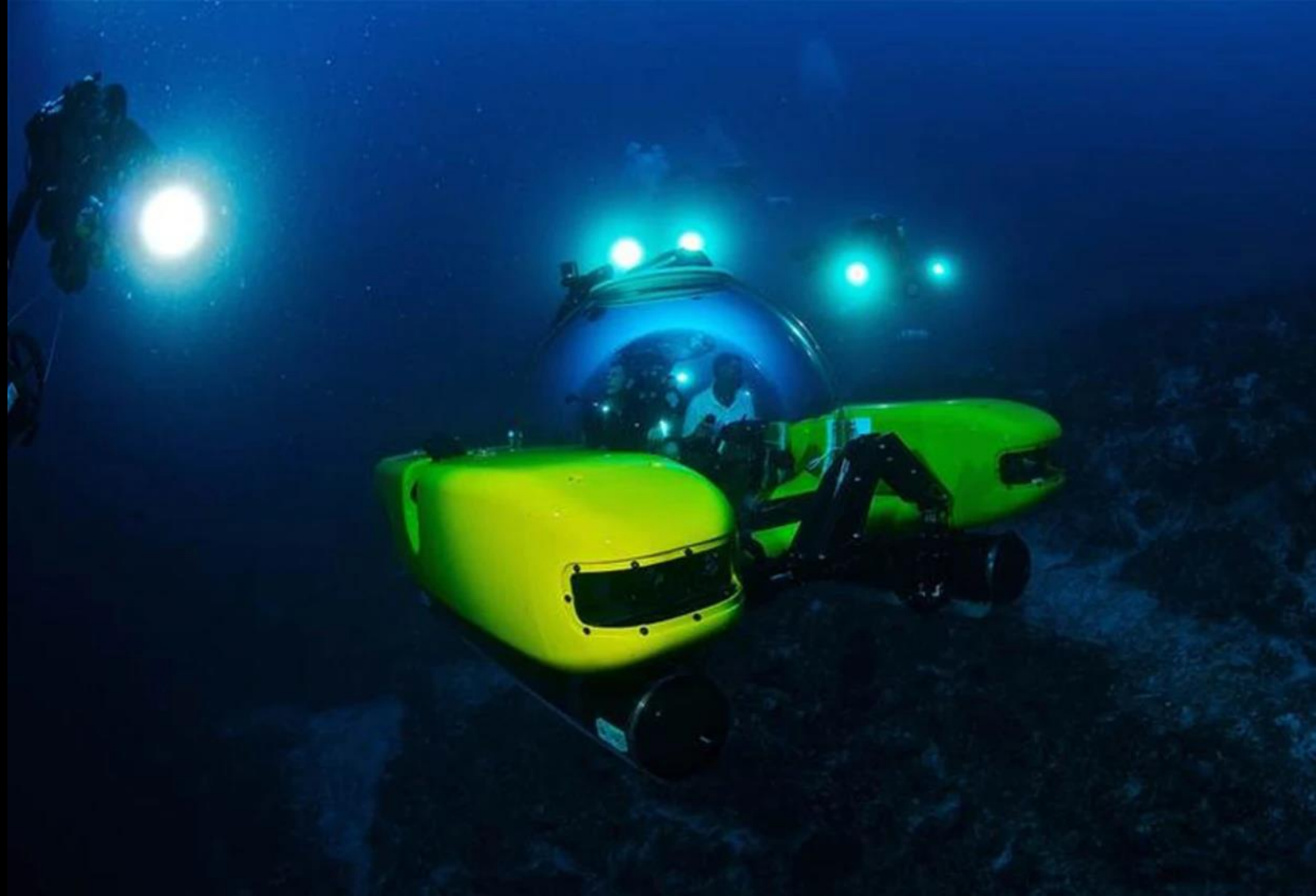


<https://www.youtube.com/watch?v=PvMCXCGSj-o>

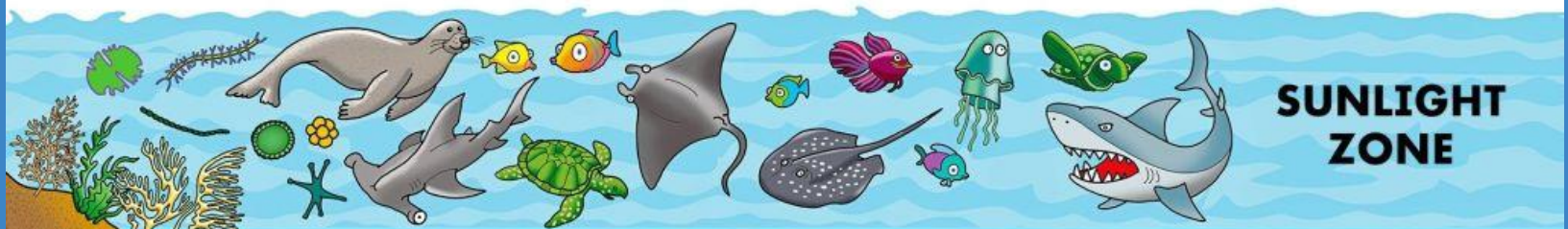
*Dive into the sea
with me!*



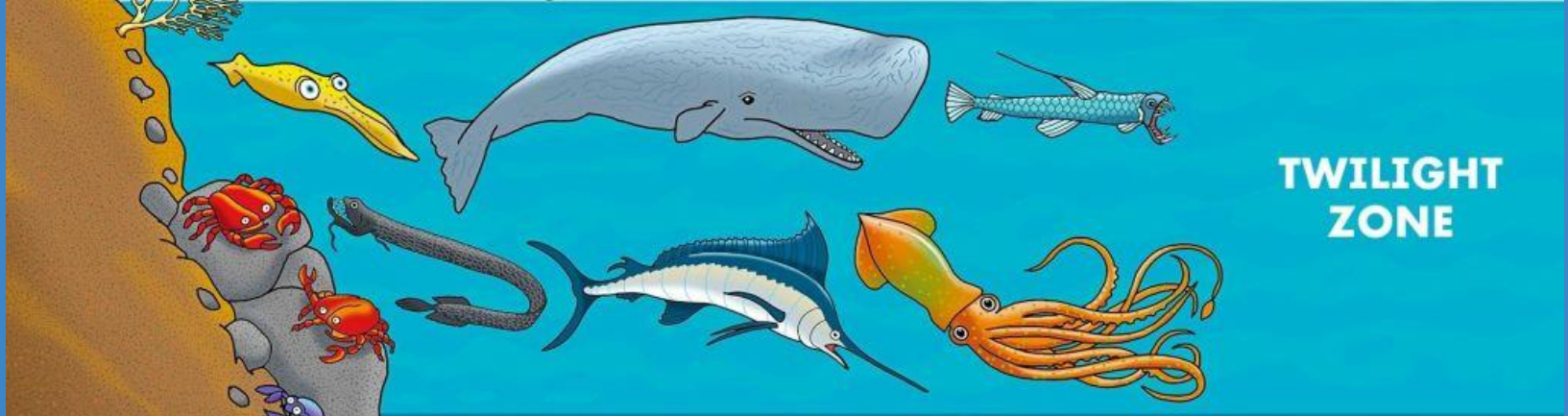


Light Learning Goals

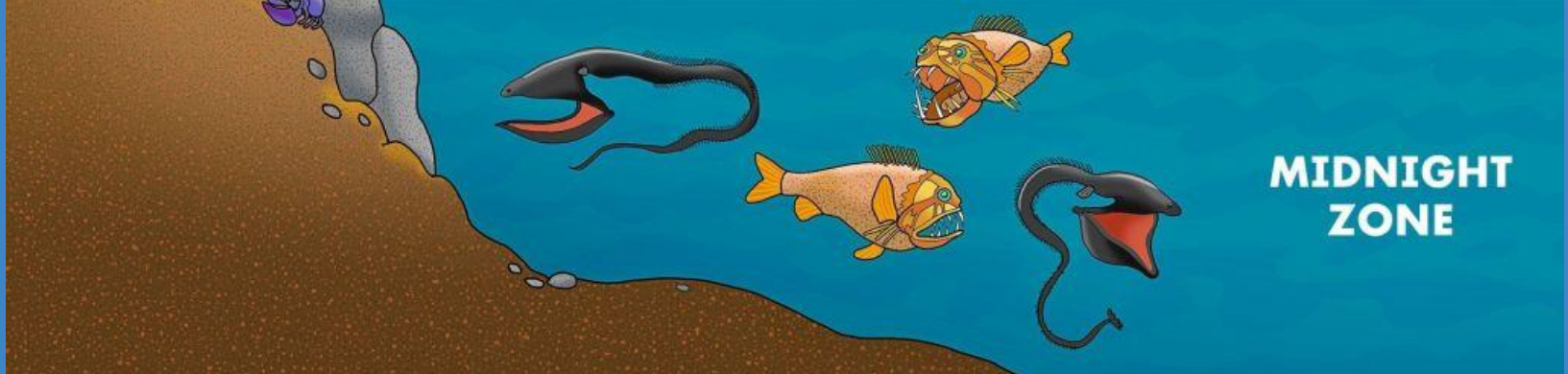
- 3 Ocean Layers
- Chemiluminescence, Bioluminescence, Triboluminescence



**SUNLIGHT
ZONE**



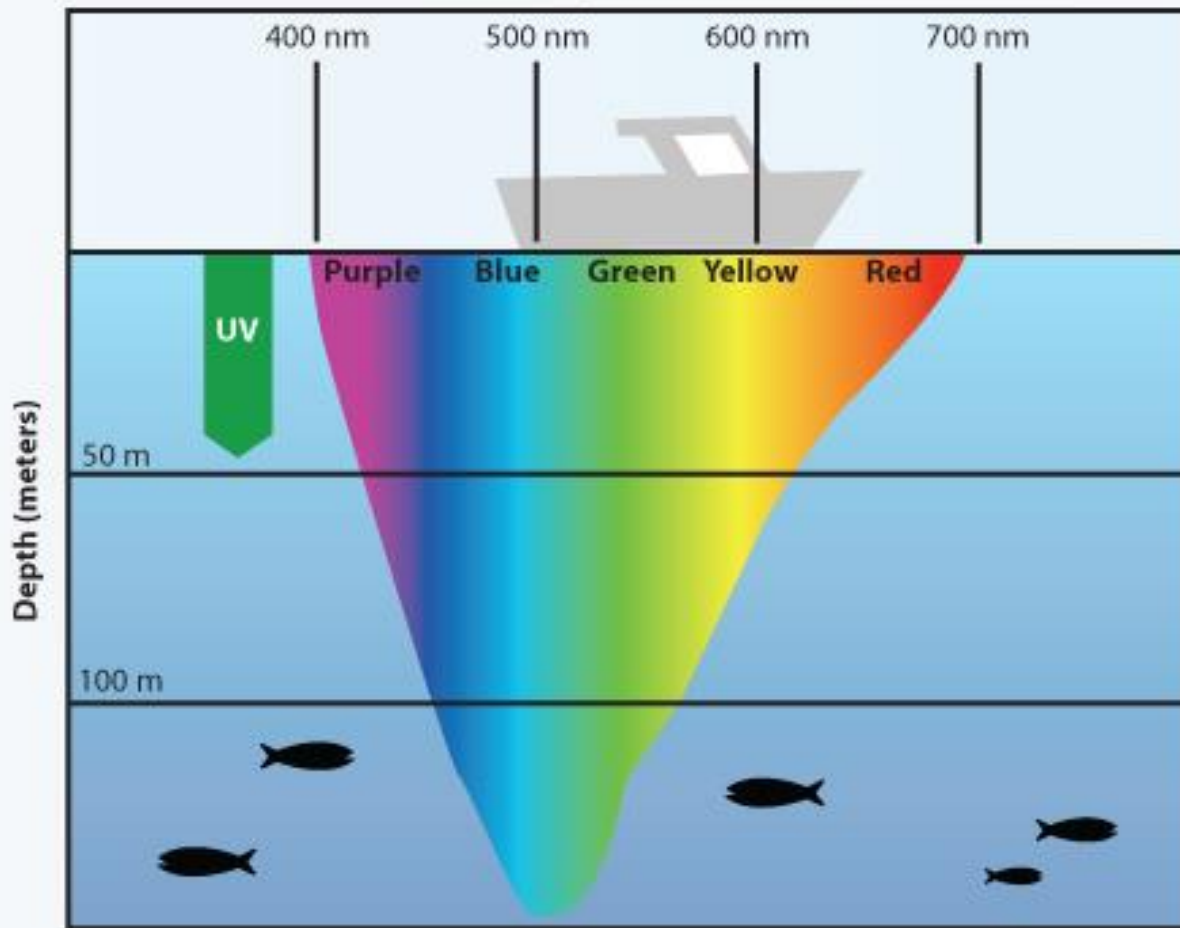
**TWILIGHT
ZONE**



**MIDNIGHT
ZONE**

Light Penetration in Lake Superior (Open Water, Clear Day)

Wavelength (nanometers)





<https://www.360virtualtour.co/portfolio/underwater-ocean-coral-reef-virtual-tour/>



Bioluminescent creature: Anglerfish



Bioluminescence: Living organisms that give off light!



Bioluminescence

<https://www.youtube.com/watch?v=oKjFVBVGad0>

<https://www.youtube.com/watch?v=UXI8F-eloiM>

<https://www.youtube.com/watch?v=14FFM-eE3KI>



This is not a glowstick, it's a....

Glowing animals in the ocean



Anglerfish



Firefly squid



Comb jellies



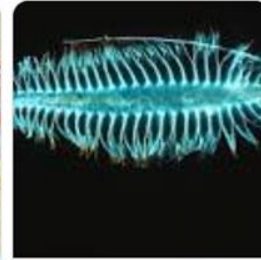
Lanternfish



Atolla jellyfish

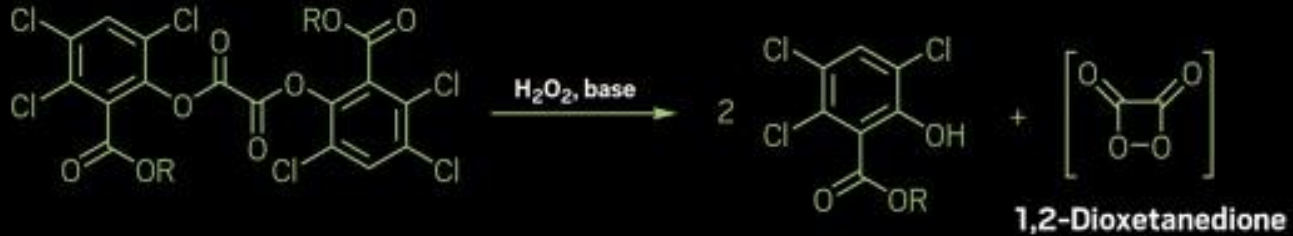


Euprymna
scolopes



Tomopteris

Chemiluminescence: Light from a Chemical Reaction



Trichlorosalicylate oxalate ester

R = alkyl



Triboluminescence: Light from Breaking

Triboluminescence is a phenomenon in which light is generated when a material is mechanically pulled apart, ripped, scratched, crushed, or rubbed.

https://www.youtube.com/watch?v=tW8q_JfmcBU

<https://www.youtube.com/watch?v=hny5cJVNbrk>



Online Games!

<https://kids.nationalgeographic.com/search?q=ocean%20light&location=srp&type=manual>



Drama Games!

1. Musical Boats
2. Sea creature drama tableaux
3. Sea creature limbo
4. Fish, fish, shark!