

Teaching Activity Guide

A Day in the Deep

SEA SLIME

It's Eeuwy, Gooley, and Under the Sea

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How to Use This Activity Guide (General)

There are a wide variety of activities that teach or supplement all curricular areas. The activities are easily adapted up or down depending on the age and abilities of the children involved. And, it is easy to pick and choose what is appropriate for your setting and the time involved. Most activities can be done with an individual child or a group of children.

For teachers in the classroom: We understand that time is at a premium and that, especially in the early grades, much time is spent teaching language arts. All Arbordale titles are specifically selected and developed to get children excited about learning other subjects (science, geography, social studies, math, etc.) while reading (or being read to). These activities are designed to be as comprehensive and cross-curricular as possible. If you are teaching sentence structure in writing, why not use sentences that teach science or social studies? We also know and understand that you must account for all activities done in the classroom. While each title is aligned to all of the state standards (both the text and the For Creative Minds), it would be near impossible to align all of these activities to each state's standards at each grade level. However, we do include some of the general wording of the CORE language arts and math standards, as well as some of the very general science or social studies standards. You'll find them listed as "objectives" in italics. You should be able to match these objectives with your state standards fairly easily.

For homeschooling parents and teachers in private schools: Use as above. Aren't you glad you don't have to worry about state standards?

For parents/caregivers: Two of the most important gifts you can give your child are the love of reading and the desire to learn. Those passions are instilled in your child long before he or she steps into a classroom. Many adults enjoy reading historical fiction novels . . . fun to read but also to learn (or remember) about historical events. Not only does Arbordale publish stories that are fun to read and that can be used as bedtime books or quiet "lap" reading books, but each story has non-fiction facts woven through the story or has some underlying educational component to sneak in "learning." Use the "For Creative Minds" section in the book itself and these activities to expand on your child's interest or curiosity in the subject. They are designed to introduce a subject so you don't need to be an expert (but you will probably look like one to your child!). Pick and choose the activities to help make learning fun!

For librarians and bookstore employees; after-school program leaders; and zoo, aquarium, nature center, park & museum educators: Whether reading a book for story time or using the book to supplement an educational program, feel free to use the activities in your programs. We have done the "hard part" for you.

What Do Children Already Know?

Young children are naturally inquisitive and are sponges for information. The whole purpose of this activity is to help children verify the information they know (or think they know) and to get them thinking “beyond the box” about a particular subject.

Before reading the book, ask the children what they know about the subject. A list of suggested questions is below. The children should write down their “answers” (or adults for them if the children are not yet writing) on the chart found in Appendix A, index cards, or post-it notes.

Their answers should be placed on a “before reading” panel. If doing this as a group, you could use a bulletin board or even a blackboard. If doing this with individual children, you can use a plain manila folder with the front cover the “before reading” panel. Either way, you will need two more panels or sections—one called “correct answer” and the other “look for correct answer.”

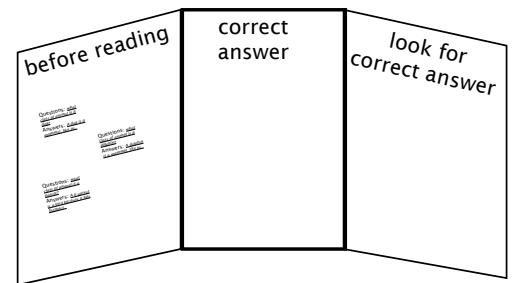
Do the children have any more questions about the subject? If so, write them down to see if they are answered in the book.

After reading the book, go back to the questions and answers and determine whether the children’s answers were correct or not.

If the answer was correct, move that card to the “correct answer” panel. If the answer was incorrect, go back to the book to find the correct information.

If the child/children have more questions that were not answered, they should look them up.

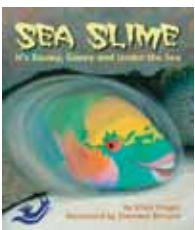
When an answer has been found and corrected, the card can be moved to the “correct answer” panel.



Pre-Reading Questions



- Describe what you think it might be like deep in the ocean?
- What are some animals that live in the ocean?
- Are fish the only type (class) of animals that live in the ocean?
- What are some ways that some deep-ocean animals lure prey?
- How can some deep-ocean animals see in the dark water?
- Can plants grow at the bottoms of the ocean? Why or why not?
- How are some deep-sea animals like fireflies?



- What is slime?
- Can you think of any other words that mean slime or slimy?
- What are some animals that use slime to survive in their habitat?
- Why do you think animals use slime?
- How do you think animals use slime?
- What are some habitats in which you might find “slimy” animals?
(List as many as you can.)

Comprehension Questions & Writing Prompts

Objective Core Language Arts;

Identify basic similarities in and differences between two texts on the same topic.

Ask and answer questions about key details in a text read aloud or information presented orally or through other media.

Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if necessary

Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.

Retell stories, including key details, and demonstrate understanding of their central message

Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

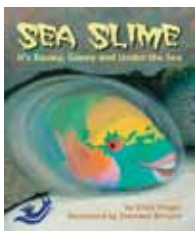
In what ecosystem do the animals in the books live?

Within the ocean ecosystem, describe some of the different habitats in which animals might live.

Are there any ocean habitats observed in both books? If so, which and what are the animals mentioned?

Compare how the ocean (marine) animals in the two books protect themselves. How do they defend themselves? How do they capture their food?

Are there any animals found in both books, indicating that their slime is bioluminescent?



How do some animals use slime to move?

How do some animals use slime to capture food?

How do some animals use slime to avoid becoming food?

Which animals mentioned use slime to float?

Which animals mentioned use slime as an overcoat or wetsuit?

Which animals mentioned use slime to wash?

Have you ever used “slime” for any of these reasons? If so, what and how?

What are some land-living animals that use slime?



What's the darkest place you've ever been?

How did you see in the dark?

What were some things you could see without any light?

Why could you see them (if you could)?

What do you think it would be like to live in total darkness day and night?

How would you see?

How would you get your food?

How are deep-sea animals the same as or different than deep-cave animals? (research, compare animals to those found in *Home in the Cave*, also published by Arbordale).

Can you think of any land-based animals that make their own lights (bioluminescence)?

Why don't we see some of the deep-sea animals?

What are some things that change the deeper one goes in the ocean?

Why do most animals live in the "sunlight" zone?

Why do you think the "twilight" zone has that name?

Cross-Curricular Vocabulary Activities

Objective Core Language Arts:

Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade-level reading and content.

Identify new meanings for familiar words and apply them accurately (e.g., duck is a bird & the verb to duck). Use words & phrases acquired through conversations, reading/being read to, and responding to texts.

Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade-level topic or subject area.

Explain the function of nouns, pronouns, verbs, adjectives, and adverbs in general and their functions in particular sentences.

Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.

Use frequently occurring adjectives.

Vocabulary Game: This activity is a very general idea and is designed to get children thinking of vocabulary words that will then be used as the beginning vocabulary list for a science lesson.

Select an illustration from the book and give the children a specific length of time (five minutes?) to write down all the words they can think of about the particular subject. It is helpful to project an illustration on a whiteboard. Use eBook or book preview found at www.ArbordalePublishing.com.

The children's word list should include anything and everything that comes to mind, including nouns, verbs, and adjectives. At the end of the time, have each child take turns reading a word from his/her list. If anyone else has the word, the reader does nothing. However, if the reader is the only one with the word, he/she should circle it. While reading the list, one person should write the word on a flashcard or large index card and post it on a bulletin board or wall.

At the end, the child with the most words circled "wins." And you have a start to your science vocabulary list. Note: if a child uses an incorrect word, this is a good time to explain the proper word or the proper usage.

Glossary/Vocabulary Words: Word cards may be used (see Appendix) or have children write on index cards, a poster board, or on a chalkboard for a "word wall." If writing on poster board or chalkboard, you might want to sort words into nouns, verbs, etc. right away to save a step later if using for Silly Sentences (on the next page). Leaving the words posted (even on a refrigerator at home) allows the children to see and think about them frequently. The glossary has some high-level words. Feel free to use only those words as fit your situation.

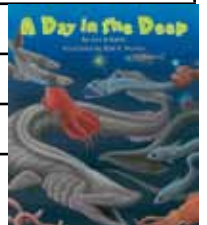
Using the Words: The following activities may be done all at once or over a period of several days.

- Sort vocabulary words into nouns, verbs, adjectives, etc. and write what they are on the backs of the cards. When the cards are turned over, all you will see is "noun," etc. (these can then be used for the "silly sentences" on the next page).
- After the cards have been sorted, go over the categories to ensure that all cards have been placed correctly. (Mistakes are a great opportunity to teach!)
- Choose two words from each category and write a sentence for each word.
- Write a story that uses at least ten vocabulary words from the word sort.
- Have children create sentences using their vocabulary words. Each sentence could be written on a separate slip of paper. Have children (individually or in small groups) sort and put sentences into informative paragraphs or a story. Edit and re-write paragraphs into one informative paper or a story.

Silly Sentence Structure Activity: This "game" develops both an understanding of sentence structure and the science subject. Use words from the "word wall" to fill in the blanks. After completing silly sentences for fun, have children try to fill in the proper words by looking for the correct information in the book.

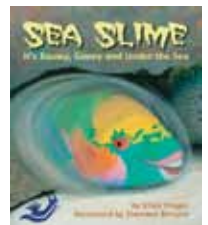
Word Bank

Adjective	Noun		Adverb	Verb
Barren	Algae	Night	Above	Attack
Big	Anglerfish	Oasis	Below	Attract
Binocular	Atolla	Ocean	Less	Bite
Black	Bacteria	Oxygen	Patiently	Change
Blue	Barrel	Part	Some	Convert
Bright	Beam	Pelican eel		Crush
Circular	Belly	Photophore		Descend
Clear	Binocular	Photosynthesis		Disappear
Colder	Bioluminescence	Plankton		Disguise
Deap-sea	Bulge	Predator		Dive
Deep	Cookiecutter shark	Pressure		Encounter
Edible	Crustacean	Prey		Fall
Five hundred	Darkness	Raptor		Feed
Five thousand	Dimness	Sargassum		Float
Four thousand	Disguise	School		Glow
Freezing	Energy	Sea		Hide
Frilled	Evening	Sea level		Light
Higher	Feet	Shark		Lure
Living	Fins	Skin		See
Long	Fireflies	Snow		Shine
Marine	Fireworks	Spine		Startle
One thousand	Fish	Spookfish		Swallow
Protruding	Flashlight	Spotlight		Swim
Slow	Food chains	Sun		Travel
Three thousand	Fright	Sunlight		Wait
Tiny	Fronds	Surface		
Two thousand	Hands	Teeth		
	Headlight fish	Temperature		
	Light	Twilight		
	Lure	Vampire squid		
	Marlin	Viperfish		
	Mucus	Water		
		Zone		



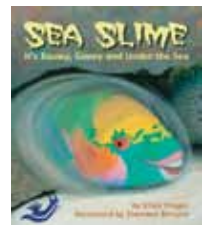
Word Bank

Adjective	Noun		Verb
afloat	air	overcoat	capture
bad	algae	polyp	crawl
clear	anemone	pteropod	drift
gooey	antibiotic	sand	float
inky	bacteria	seaweed	fly
long	blanket	shell	fool
see-through	bubble	shoot	hover
shallow	bubble gum	slide	slide
skinny	cloud	slime	slips
slippery	clownfish	slug	slither
sticky	coat	smokescreen	slurp
stinging	cocoon	snail	swim
stringy	colonies	snake	travel
undersea	coral	soap	wash
underwater	eel	stomach	wrap
warm	fins	sun	
	fish	sunlight	
	goo	surface	
	grime	tentacles	
	habitat	vampire squid	
	hagfish	wave	
	jellyfish	wetsuit	
	moray eel	wind	
	mucus	wing	



Cross Curricular: Silly Sentences

1. Water makes a _____ noun _____ adjective so you go down faster and smoother (and don't get stuck). Slime makes it easier to _____ verb over the sea floor or _____ noun.
2. Slime can be used like _____ adjective paper or _____ adjective bubble gum to _____ verb things that _____ verb, float, or _____ verb by.
3. A _____ noun made of slime and _____ noun _____ verbs at the water's surface and helps animals to stay _____ adjective.
4. _____ verbing slime at your enemies is a good way to make them go away. Or you could _____ verb them with a _____ noun of slime that looks like you to slip away unnoticed.
5. _____ verbing yourself in a _____ noun of _____ noun discourages enemies.
6. Like the _____ noun you put on cuts, slime keeps _____ adjective _____ noun out.
7. _____ noun makes water _____ adjective and _____ adjective, almost like slime. Some ocean animals coat themselves with slime. When they get _____ adjective, they just make some more slime and the old, grime slides off.



Language Arts: Word Families & Rhyming Words

Language Arts, Reading Standards: Foundational Skills, Recognize and produce rhyming words.

Word families are groups of words that have some of the same combinations of letters in them that make them sound alike...or rhyme. For example ad, add, bad, brad (Brad), cad, Chad, clad, dad, fad, gad, glad, grad, had, lad, mad, pad, plaid (silent 'i'), sad, shad, and tad all have an "ad" letter combination and rhyme.

- Find and write down rhyming words in the poem.
- Are they in the same word family?
- If so, circle the combination of letters that are the same.
- Can you think of more words in the word family?



Rhyming words are:

floor
and
before

They are / are not
from the same word family.
Other words that rhyme are:

Rhyming words are:

glow
and
slow

They are / are not
from the same word family.
Other words that rhyme are:

Rhyming words are:

jaws
and
claws

They are / are not
from the same word family.
Other words that rhyme are:

Rhyming words are:

away
and
prey

They are / are not
from the same word family.
Other words that rhyme are:

Word Search

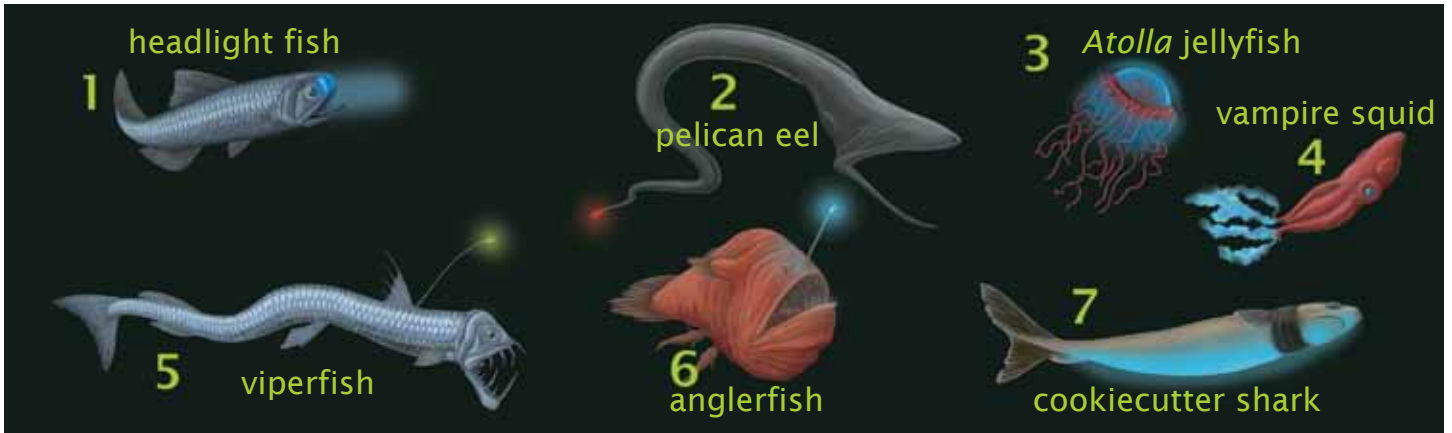
Find the hidden words. Even non-reading children can match letters to letters to find the words! Easy—words go up to down or left to right (no diagonals). For older children, identify the coordinates of the first letter in each word (number, letter).

	A	B	C	D	E	F	G	H	I	J
1	B	E	U	S	D	P	I	N	G	I
2	E	V	I	P	E	R	F	I	S	H
3	R	A	W	F	E	E	S	E	A	S
4	A	T	A	T	P	Y	A	K	R	U
5	L	O	C	J	S	M	Z	O	G	E
6	G	L	O	C	E	A	N	X	A	L
7	A	L	S	H	A	R	K	A	S	I
8	E	A	D	I	S	L	Q	M	S	D
9	O	H	M	A	R	I	N	E	U	Y
10	S	Q	U	I	D	N	P	V	M	O

ALGAE
ATOLLA
DEEP SEA
MARINE
MARLIN
PREY
OCEAN
SARGASSUM
SEA
SHARK
SQUID
VIPERFISH



Compare Bioluminescence



What are some ways that we see in the dark or that we attract prey (food) to come to us? Using the information in the book, compare some of the animal bioluminescence with:

Flashlights help light things in our sight range. Because they are small and battery-powered, they are easy to carry around with us. What are some other things that make light so we can see in the dark?

Fishermen attach fishing lures to the end of a fishing line to attract fish. The lures are designed to use movement, vibration, and color to catch a fish's attention so it bites the hook. The fish think they will get a meal but they end up becoming the meal. What are some other ways that humans attract animals to catch for food?

Have you ever played with a glow stick at night? Do you use it to see or to be seen? What are some reasons that you would want people to see you in the dark? If you use it to be seen, what do you do with it? What are some other things that humans might use to be seen in the dark? Why do some of these animals want to be seen?

We might watch fireworks on the 4th of July to celebrate but lights like fireworks can also be used to signal "help." What are some other things we might use to call for help?



Animal Sorting Cards

Objective: Classify organisms according to one selected feature, such as body covering, and identify other similarities shared by organisms within each group formed.

Describe several external features and behaviors of animals that can be used to classify them (e.g., size, color, shape of body parts).

Identify observable similarities and differences (e.g., number of legs, body coverings, size) between/among different groups of animals.

Animal Card Games:

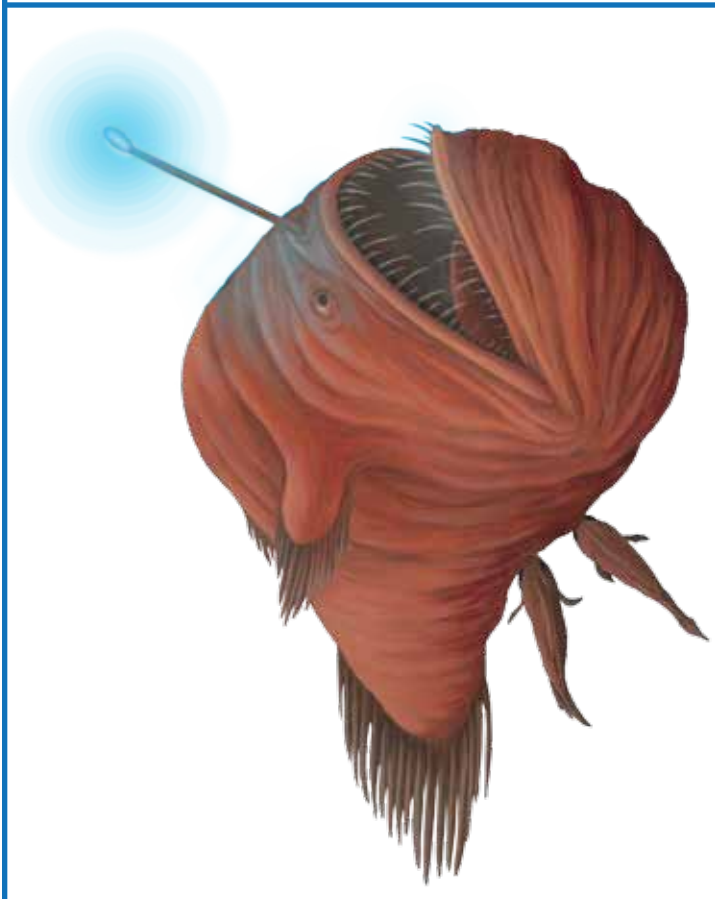
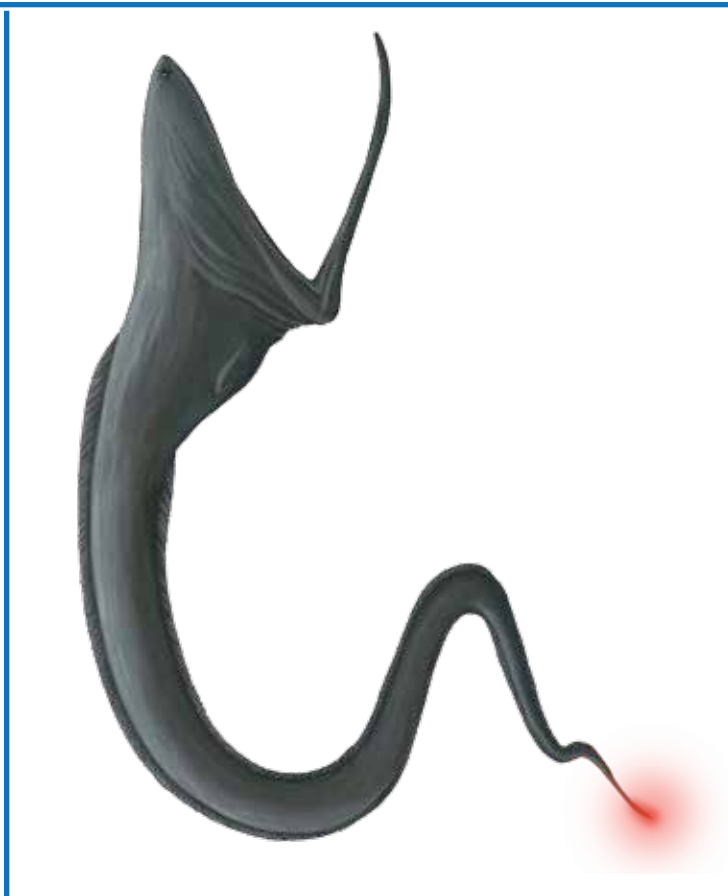
Sorting: Depending on the age of the children, have them sort cards by:

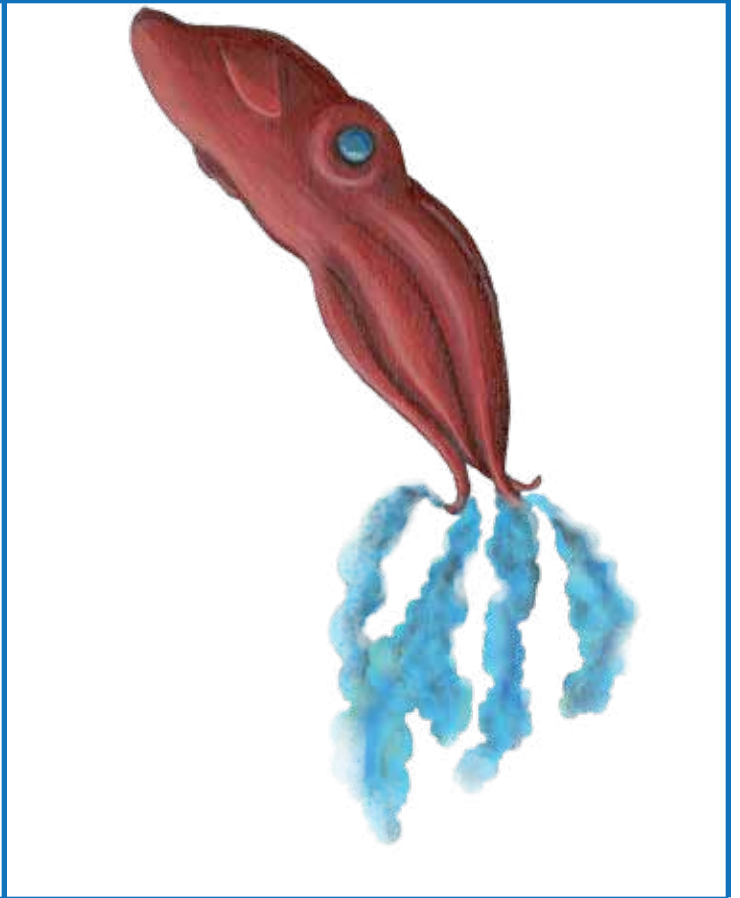
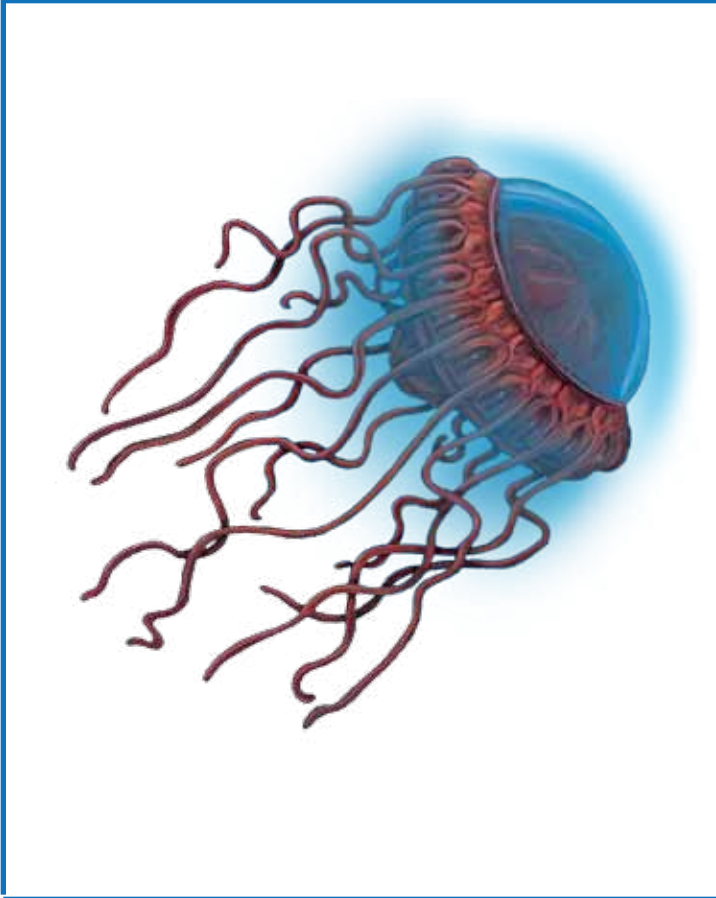
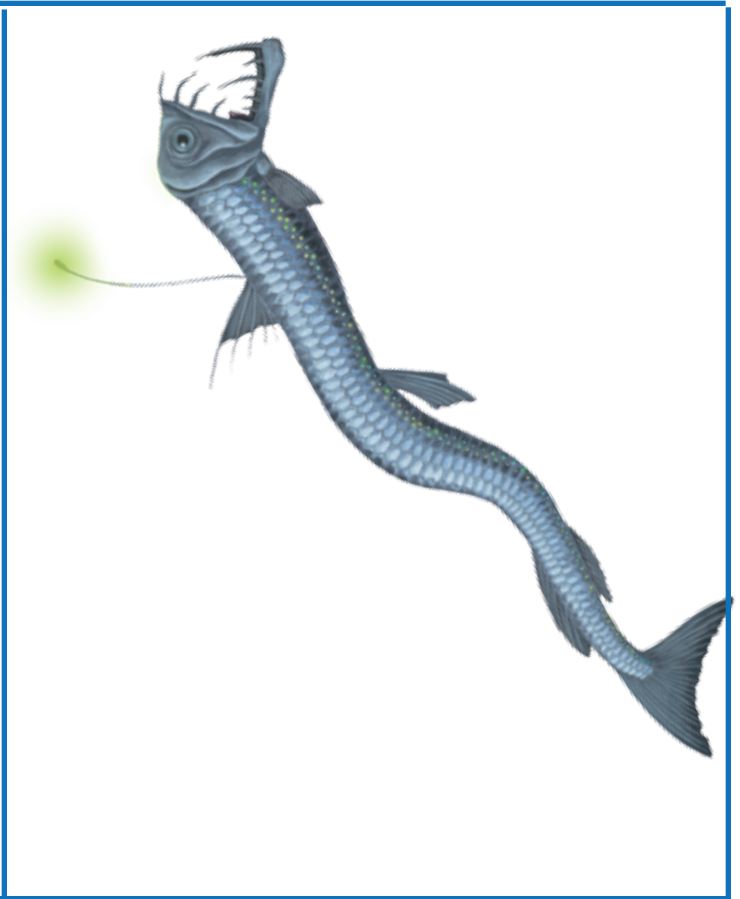
where the animals live (habitat)	tail, no tail
number of legs (if the animals have legs)	colors or skin patterns
how they move (walk, swim, jump, or fly)	animal class
type of skin covering (hair/fur, feathers, scales, moist skin)	
what they eat (plant eaters/herbivores, meat eaters/carnivores, both/omnivores)	

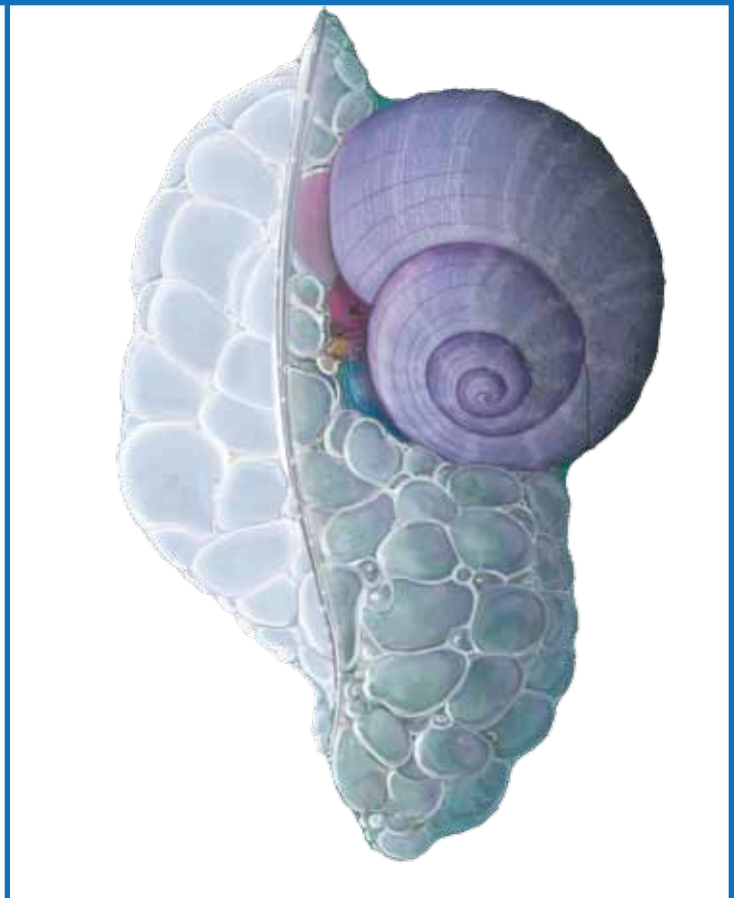
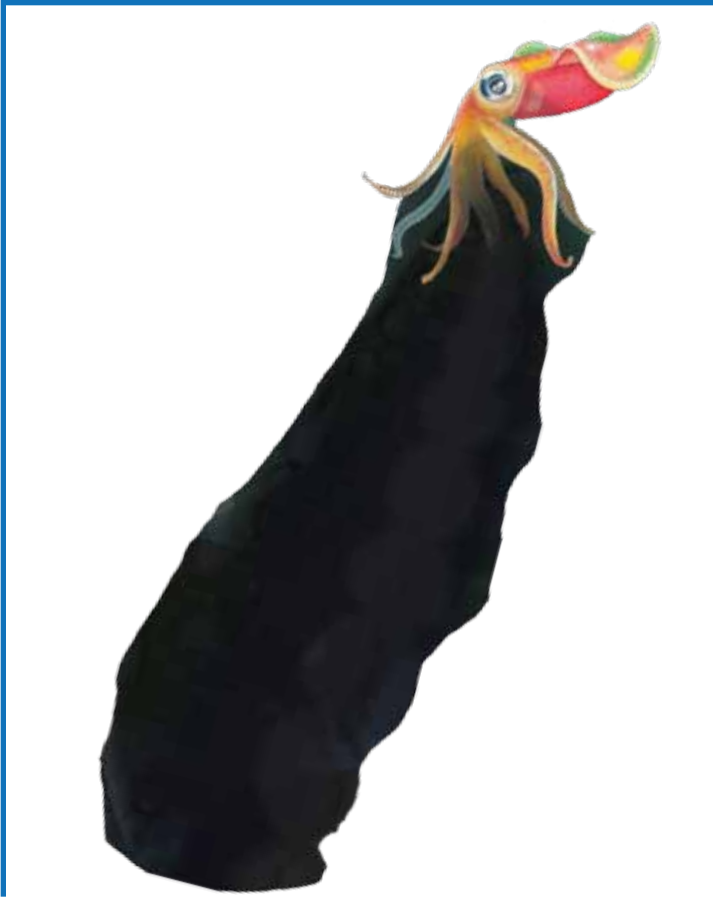
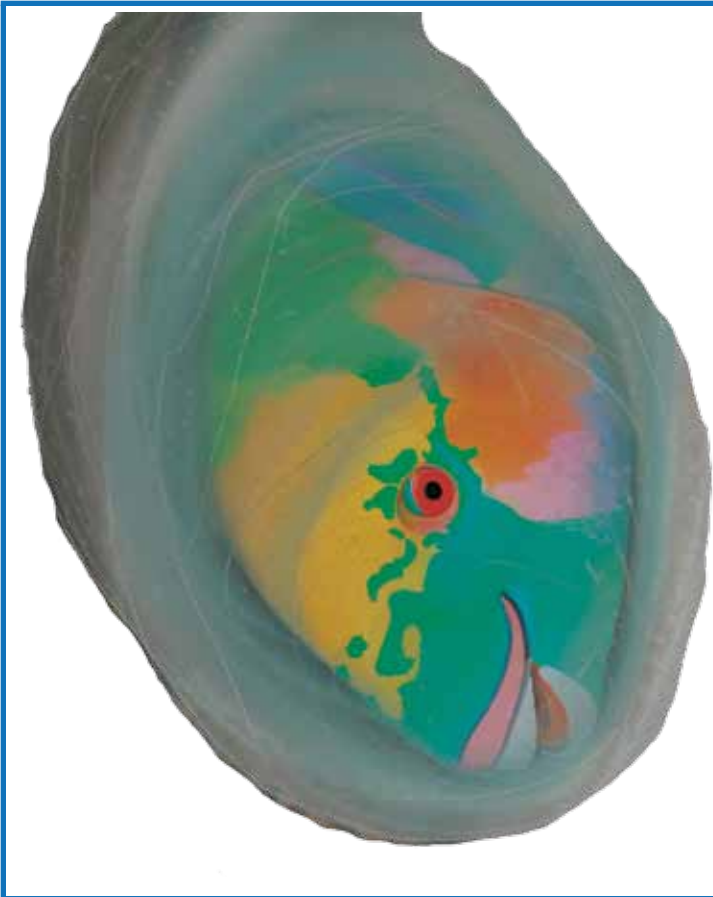
Memory Card Game: Make two copies of each of the sorting card pages and cut out the cards. Mix them up and place them face down on a table. Taking turns, each player should turn over two cards so that everyone can see. If the cards match, he or she keeps the pair and takes another turn. If they do not match, the player should turn the cards back over and it is another player's turn. The player with the most pairs at the end of the game wins.

Who Am I? Copy and cut out the cards. Poke a hole through each one and tie onto a piece of yarn. Have each child put on a "card necklace" without looking at it so the card hangs down the back. The children get to ask each person one "yes/no" question to try to guess "what they are." If a child answering the question does not know the answer, he/she should say, "I don't know." This is a great group activity and a great "ice-breaker" for children who don't really know each other.

Charades: One child selects a card and must act out what the animal is so that the other children can guess. The actor may not speak but can move like the animal and imitate body parts or behaviors. For very young children, you might let them make the animal sound. The child who guesses the animal becomes the next actor.







Science Journal (Vocabulary)

bioluminescence

my definition

my drawing

slime

my definition

my drawing

marine

my definition

my drawing

protection

my definition

my drawing

True or False?

Objective: Critical thinking skills

Note to teacher or parent: These True or False questions are based on commonly held misconceptions about the ocean. Instead of using the questions as a “circle the answer” exercise, these might be better used as discussion questions. Ask children whether they think the statement is true or not and to explain their reasoning. Answers and explanations are in the “Answer” section in the back of this PDF.

1. The ocean floor is no flatter than the land found on continents.
2. The ocean floor gradually gets deeper and deeper so the deepest parts of the ocean are in the middle.
3. The ocean floor is like a sandy desert.
4. The entire ocean floor is in the hadal zone.
5. If you make a statement about how many feet above or below sea level something is, the elevation or depth does not depend on the tide cycle.
6. Sea level at the beach depends on the tide.
7. The deepest part of the ocean floor is 19,700 feet (6,000 meters) b sea level.
8. Nobody has ever been to the bottom of the Challenger Deep.
9. We know everything there is to know about the ocean floor.
10. You could explore the bottom of the ocean.

Tools and Technology

Objective: Explain why people use science and technology and how scientists and engineers work. Identify examples of technology used to investigate Earth. Ex: sonar, radar, seismograph, weather balloons, satellites.

Identify tools people have invented for everyday life and for scientific investigations.

Look at the images below and describe how we use these tools and technology.

When would someone use the particular item?

How would someone use the item?

Have you ever used or seen?

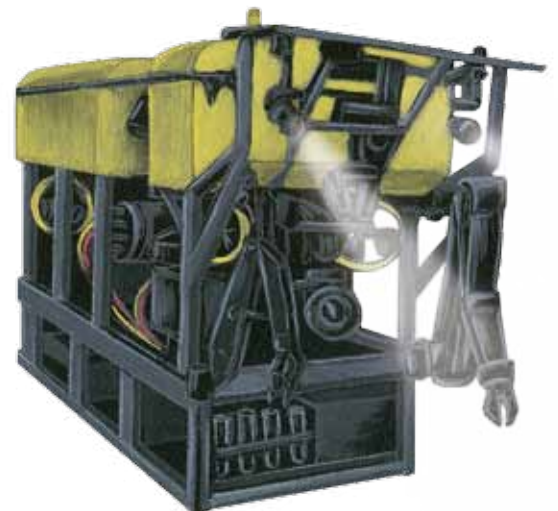
Research how deep each of these items will let a person dive and how long that person can stay underwater.



scuba equipment



snorkel



remotely operated vehicle (ROV)

Math: Pressure Chart Reading

Use the information in the charts below to fill in the blanks in the chart at the bottom of this page:

One
Square
Inch

Depth below sea level:		
feet	meters	zone
0-660	0-200	sunlight
660-3300	200-1,000	twilight
3300-13,100	1,000-4,000	midnight
13,100-19,700	4,000-6,000	abyssal
>19700	>6,000	hadal

What does pressure feel like in the deep ocean?

Depth below sea level:		PSI (Pounds per Square Inch)	Imagine that this is standing on every square inch of your body!
feet	meters		
at sea level	at sea level	14.7 psi	fat cat
500	152.4	223 psi	professional football player
1000	304.8	445 psi	lion
1500	457.2	668 psi	motorcycle
2000	609.6	890 psi	polar bear
2500	762.0	1,114 psi	manatee
3000	914.4	1,335 psi	tiger shark
3500	1066.8	1,558 psi	Holstein cow
4000	1219.2	1,780 psi	smart car and its driver
4500	1371.6	2,003 psi	bison

PSI (Pounds per Square Inch)	"feels like" per square inch	would be in this zone
14.7 psi	fat cat	
223 psi	professional football player	
445 psi	lion	
668 psi	motorcycle	
890 psi	polar bear	
1,114 psi	manatee	
1,335 psi	tiger shark	
1,558 psi	Holstein cow	
1,780 psi	smart car and its driver	
2,003 psi	bison	

Map Activity

Objective: NGSS 2-ESS2.B Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2-2)

Social Studies:

K-4)3.1.1 Properties and functions of geographic representations—such as maps, globes, graphs, diagrams, aerial and other photographs, remotely sensed images, and geographic visualization

K-4)3.1.2 Geospatial data are connected to locations on Earth’s surface

K-4)3.1.3 The interpretation of geographic representations

Look at the maps of the Atlantic and Pacific Oceans found in Appendix C. (Smaller versions are found below.) Compare and contrast the ocean maps to the world maps.

What color is land on these maps?

Many maps show water as a solid color, often blue. Lakes, rivers, and ocean are all the same color. The maps of the Atlantic and Pacific oceans in the appendix show water in different colors or shades.

The gray water indicates that the water depth (from the sea level to the ocean floor) is shallow.

The darker the color blue, the deeper the water.

Looking at the maps, can you find shallow areas and deep areas?

What do you notice about the location of the shallow areas?

Where are the deepest areas in the oceans?

Why do you think those areas are so much deeper than the other areas of the ocean? *(This could be a discussion question or a research question.)*



Maps: Oceans Highs and Lows

The deepest part of the ocean is called **Challenger Deep** and is 35,829 feet deep—almost seven miles straight down! Challenger Deep is found to the southwest of Guam, a US territory in the Pacific Ocean.

Mount Everest is the tallest mountain on land, but the tallest mountain in the world is actually **Mauna Kea**, a volcano in Hawaii that rises 33,474 feet (10,203 m) from the ocean floor to its peak 13,680 feet above sea-level.

The pressure in the Challenger Deep is more than 16,000 psi—as much pressure as if a big elephant were standing on every square inch of your body. Imagine three elephants all standing on your index finger. That's a lot of pressure!

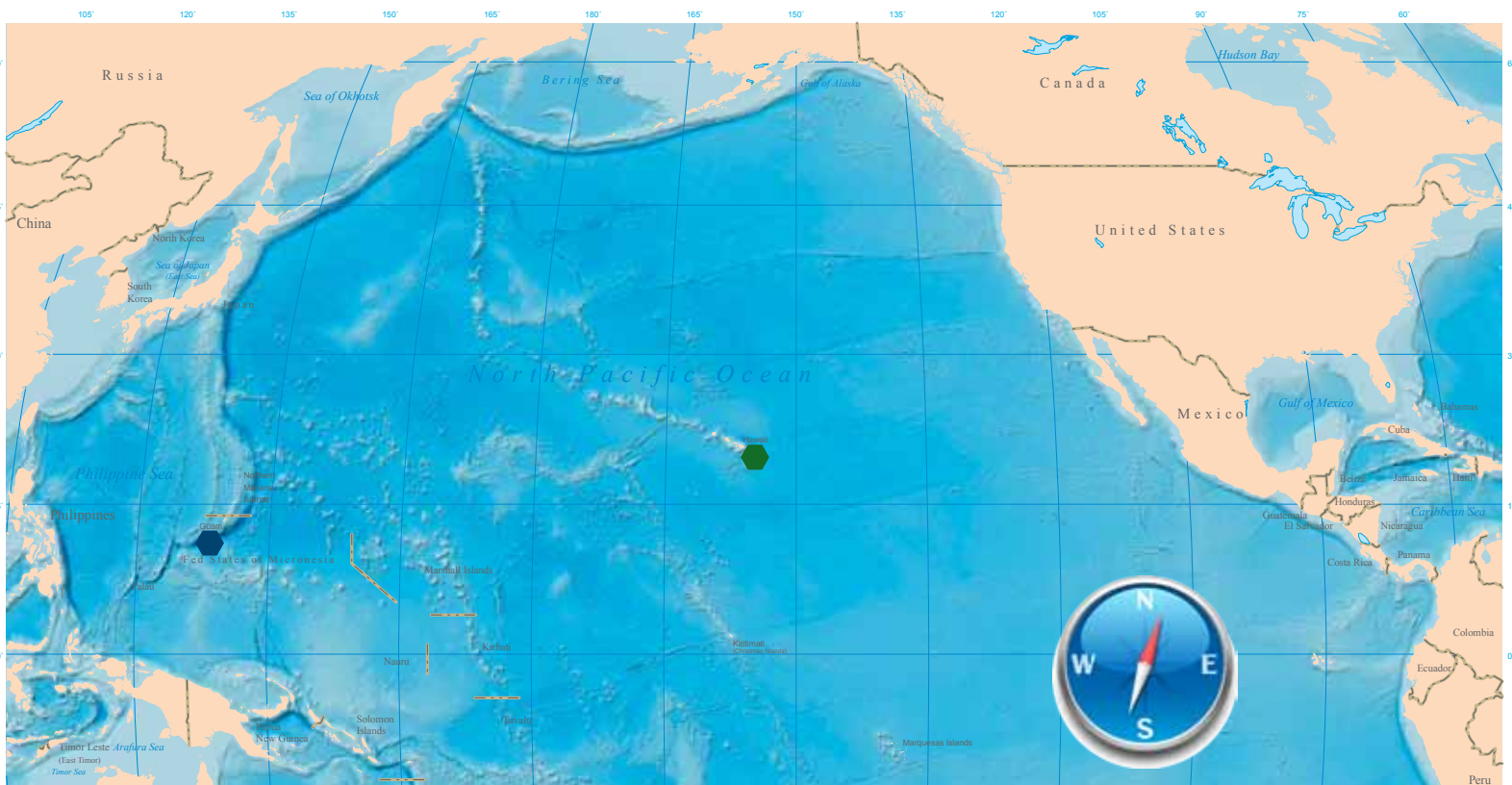


What ocean are the Challenger Deep and Mauna Kea in? Are they north or south of the equator?

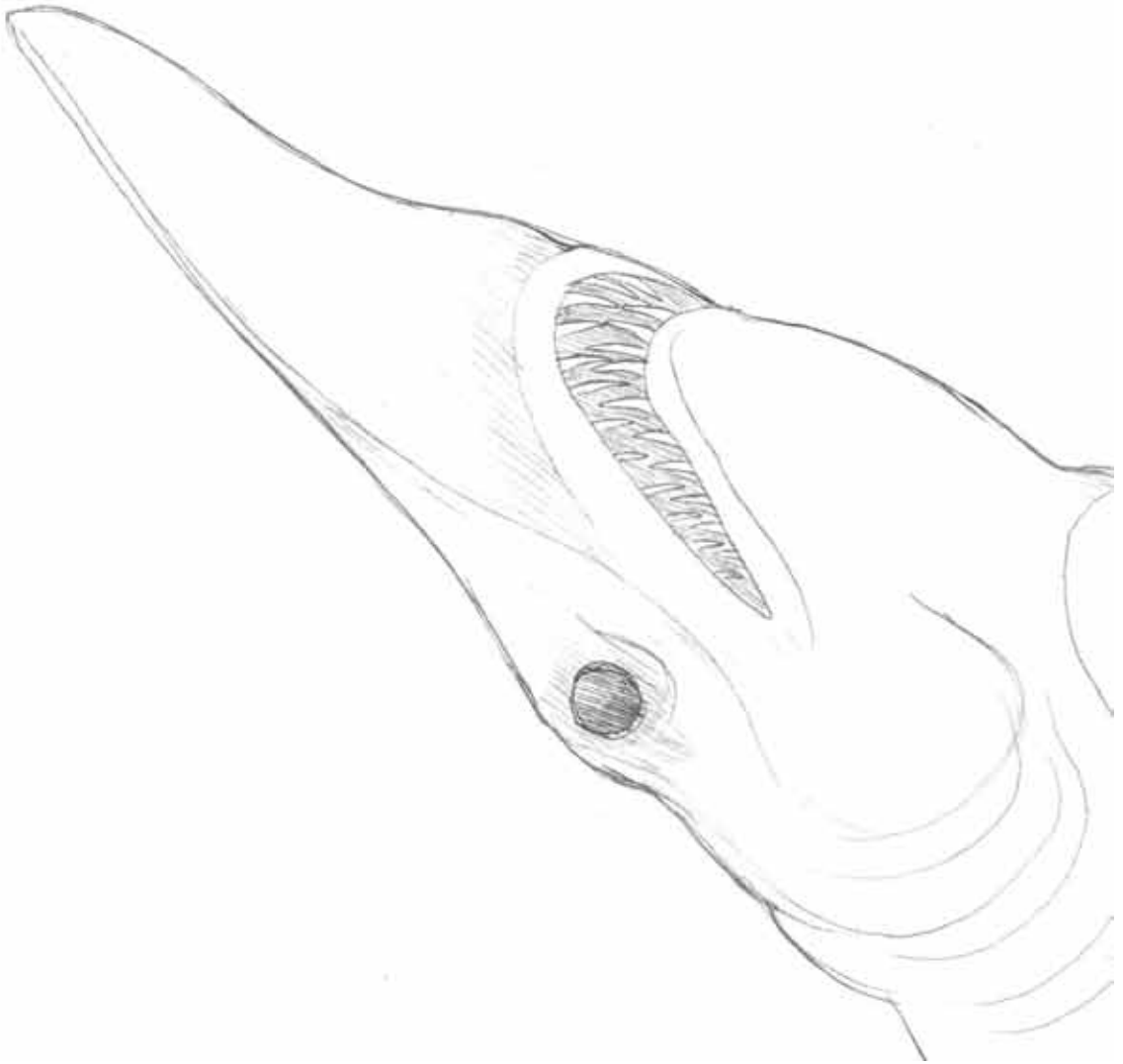
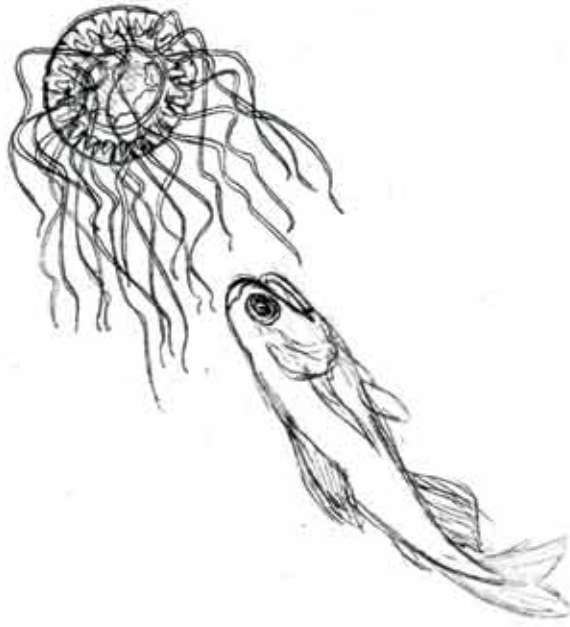
If Mauna Kea is 33,474 feet high, from sea floor to peak, and the peak is 13,680 feet above sea-level, about how much of the mountain's height is underwater?

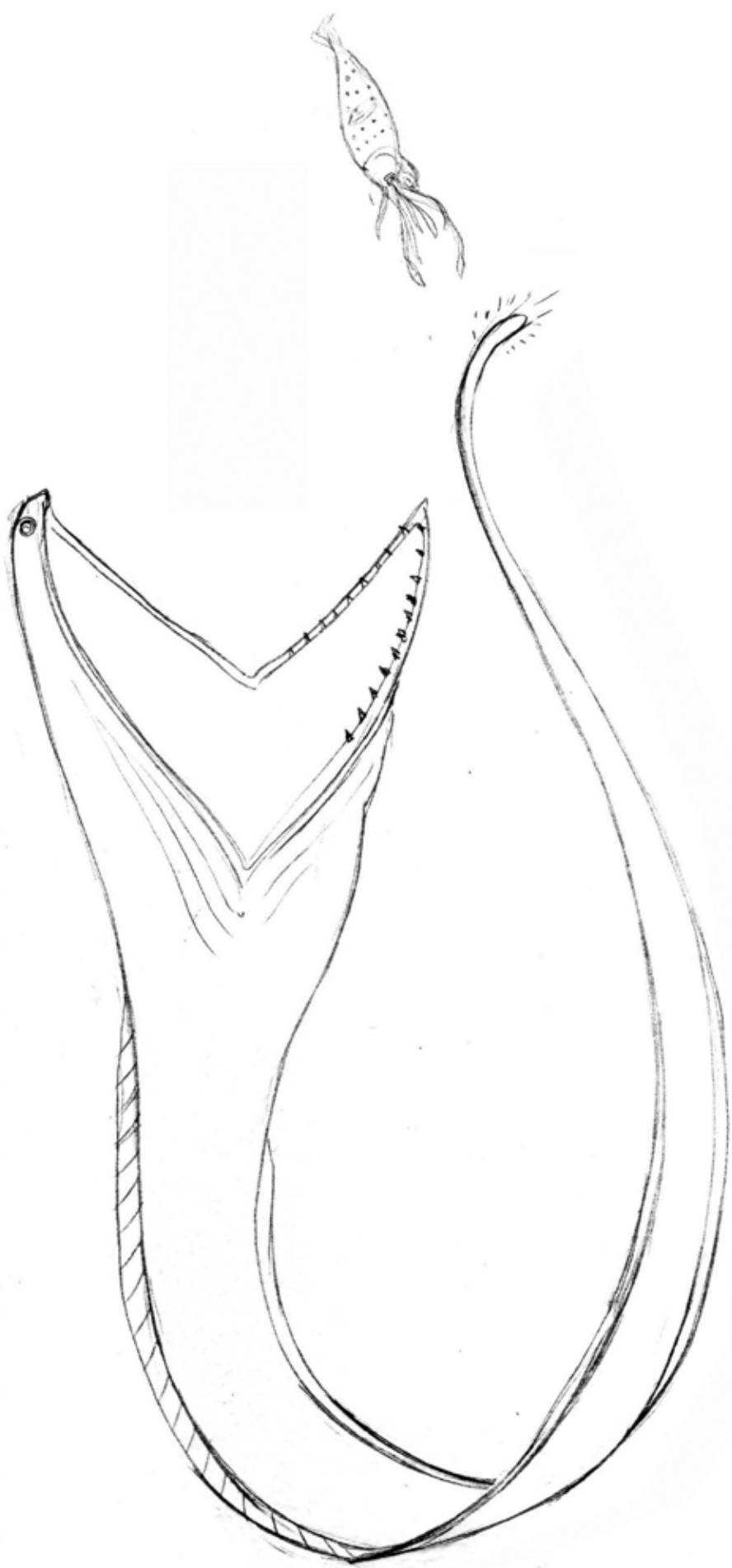
Can you find the Challenger Deep (●) on the map below? What countries are to the west of the Challenger Deep?

Can you find Mauna Kea (●) on the map? What country is east of Mauna Kea?



A Day in the Deep





A Day in the Deep

SEA SLIME

It's Eeuwy, Gooley, and Under the Sea



© Shenna Berman



SEA SLIME

It's Eeuwy, Goey, and Under the Sea

SEA SLIME

It's Eeuwy, Gooy, and Under the Sea



© Shannon Benson

Answers

Silly Sentences



Because sunlight cannot reach deep into water, most of the ocean is pitch black.

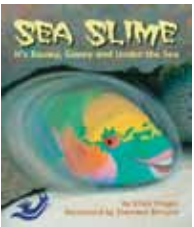
The deep ocean is so black that if you were down there, you could not even see your own hands or feet.

Many animals that live in the dark make their own light—similar to how fireflies light up.

The body parts that make the light are called photophores.

When living things make light, it is called bioluminescence.

Deep-sea animals use bioluminescence to lure prey, to hide from, attract, or startle predators, and to find mates.



Water makes a slide slippery so you go down faster and smoother (and don't get stuck). Slime makes it easier to travel over the sea floor or sand.

Slime can be used like sticky paper or goeey bubble gum to capture things that crawl, float, or swim by.

A bubble made of slime and air floats at the water's surface and helps animals to stay afloat.

Shooting slime at your enemies is a good way to make them go away. Or you could fool them with a cloud of slime that looks like you to slip away unnoticed.

Wrapping yourself in a blanket of mucus discourages enemies.

Like the antibiotic ointment you put on cuts, slime keeps bad bacteria out.

Soap makes water slippery and sticky, almost like slime. Some ocean animals coat themselves with slime. When they get dirty, they just make some more slime and the old, grime slides off. Slime washes.

	A	B	C	D	E	F	G	H	I	J
1	B	E	U	S	D	P	I	N	G	I
2	E	V	I	P	E	R	F	I	S	H
3	R	A	W	F	E	E	S	E	A	S
4	A	T	A	T	P	Y	A	K	R	U
5	L	O	C	J	S	M	Z	O	G	E
6	G	L	O	C	E	A	N	X	A	L
7	A	L	S	H	A	R	K	A	S	I
8	E	A	D	I	S	L	Q	M	S	D
9	O	H	M	A	R	I	N	E	U	Y
10	S	Q	U	I	D	N	P	V	M	O

ALGAE
DEEP SEA
MARLIN
OCEAN
SEA
SQUID

4A
1E
5F
6C
3G
10A

ATOLLA
MARINE
PREY
SARGASSUM
SHARK
VIPERFISH

3B
9C
1F
2I
7C
2B

True or False Questions

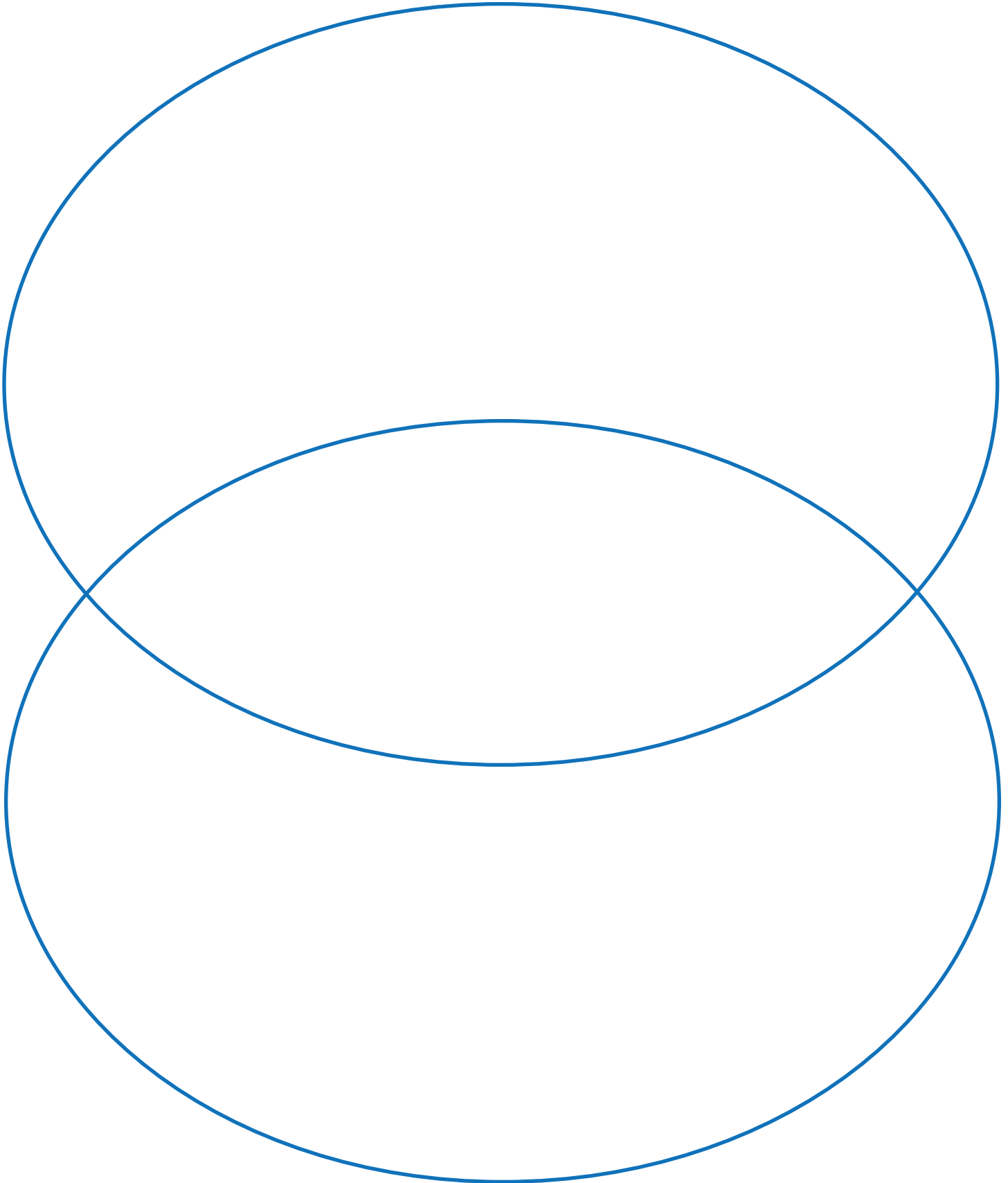
1. The ocean floor is no flatter than the land found on continents. True. There are even underwater mountain ranges.
2. The ocean floor gradually gets deeper and deeper so the deepest parts of the ocean are in the middle. False. Many of the oceans' deepest points are deep canyons (trenches) that are formed at plate boundaries.
3. The ocean floor is like a sandy desert. False. The ocean floor is different and depends on the depth and the location. The shallow ocean floor can be sandy, grassy or rocky. The deep ocean floor is rocky and uneven.
4. The entire ocean floor is in the hadal zone. False, the ocean floor near the coast where you might swim is in the sunlight zone. The zone of the ocean floor depends on its depth below sea level.
5. If you make a statement about how many feet above or below sea level something is, the elevation or depth does not depend on the tide cycle. True. Sea level is measurement that represents the average height of the ocean's surface.
6. Sea level at the beach depends on the tide. False, the term "sea level" refers to the average height of the ocean's surface. The ocean surface as seen at the beach does change according to tide.
7. The deepest part of the ocean is 19,700 feet (6,000 meters) below sea level. False. That is the beginning of the hadal zone. The deepest known part of the ocean is the Challenger Deep in the Mariana Trench off Guam. The Challenger Deep is 35,800 feet (10,900 m) below sea level.
8. Nobody has ever been to the bottom of the Challenger Deep. False. Using submersibles, there have been two different "trips" to the bottom of the Challenger Deep: On January 23, 1960- Don Walsh, then a U.S. Navy lieutenant, and Swiss oceanographer Jacques Piccard descended and returned. And then again, just over 52 years later, on March 26, 2012, James Cameron did the same.
9. We know everything there is to know about the ocean floor. False. We know more about the moon than we know about the ocean floor.
10. You could explore the bottom of the ocean. True. You may have already explored the bottom of the ocean when swimming. But, when you grow up, you could become a marine scientist to help us learn more about the deep ocean and its secrets.

Math: Pressure Chart Reading

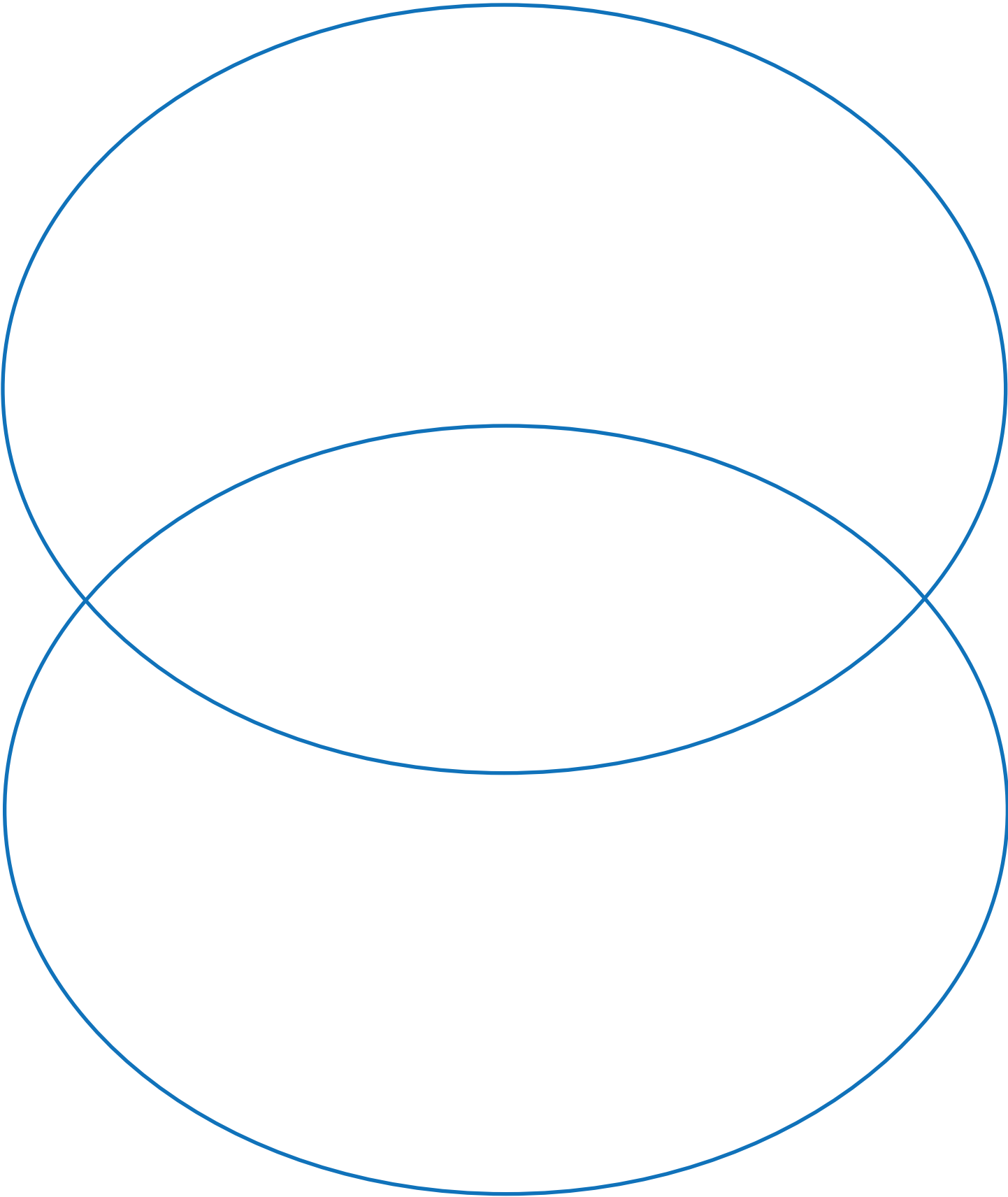
PSI (Pounds per Square Inch)	feels like per square inch	would be in this zone
14.7 psi	fat cat	sunlight
223 psi	professional football player	sunlight
445 psi	lion	twilight
668 psi	motorcycle	twilight
890 psi	polar bear	twilight
1,114 psi	manatee	twilight
1,335 psi	tiger shark	twilight
1,558 psi	Holstein cow	midnight
1,780 psi	smart car and its driver	midnight
2,003 psi	bison	midnight

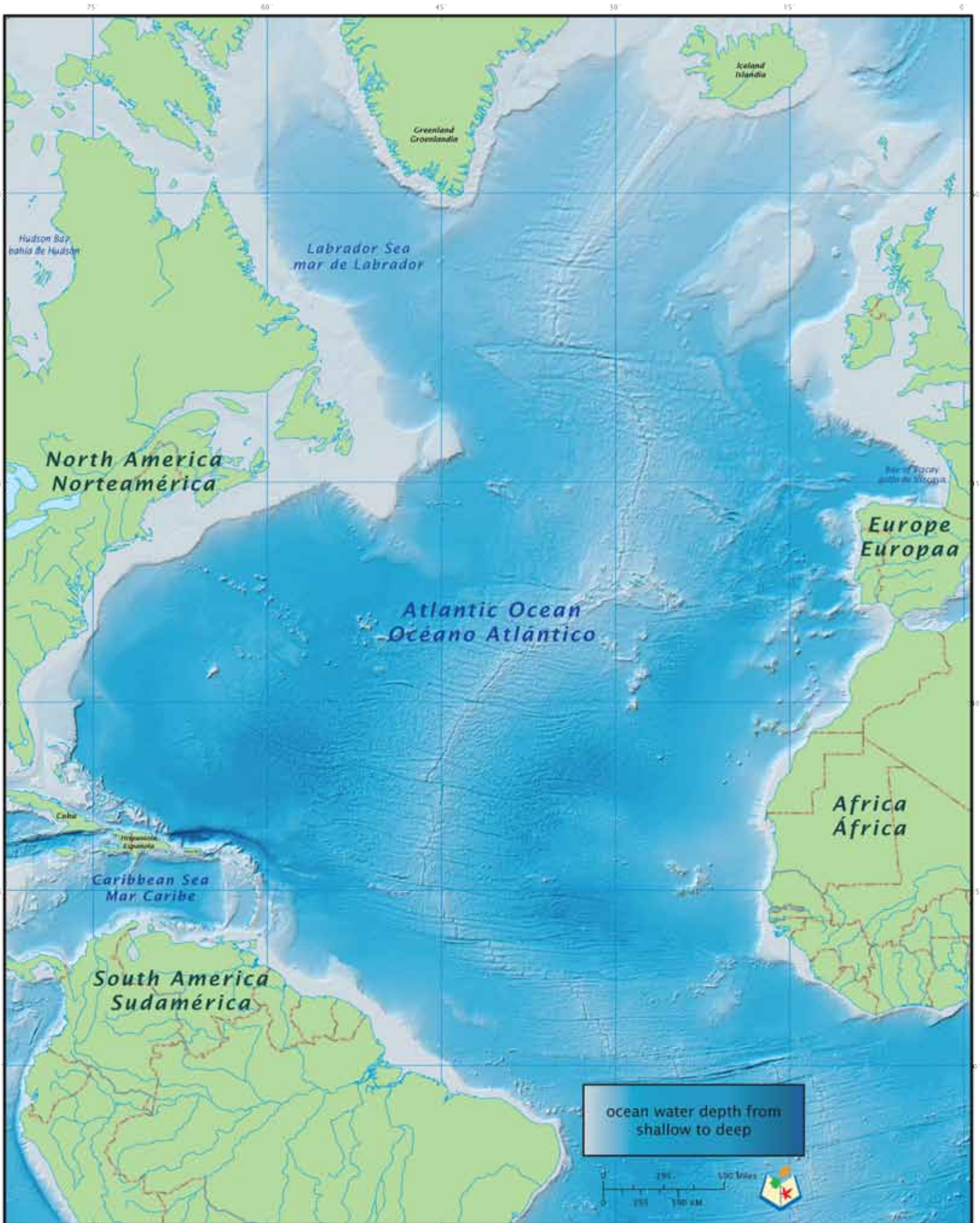
Appendix B—Venn Diagrams

Compare and contrast the shallow ocean where you might swim to the deep ocean where some of these animals live: type of water, amount of sunlight, plants/algae, types of animals, pressure



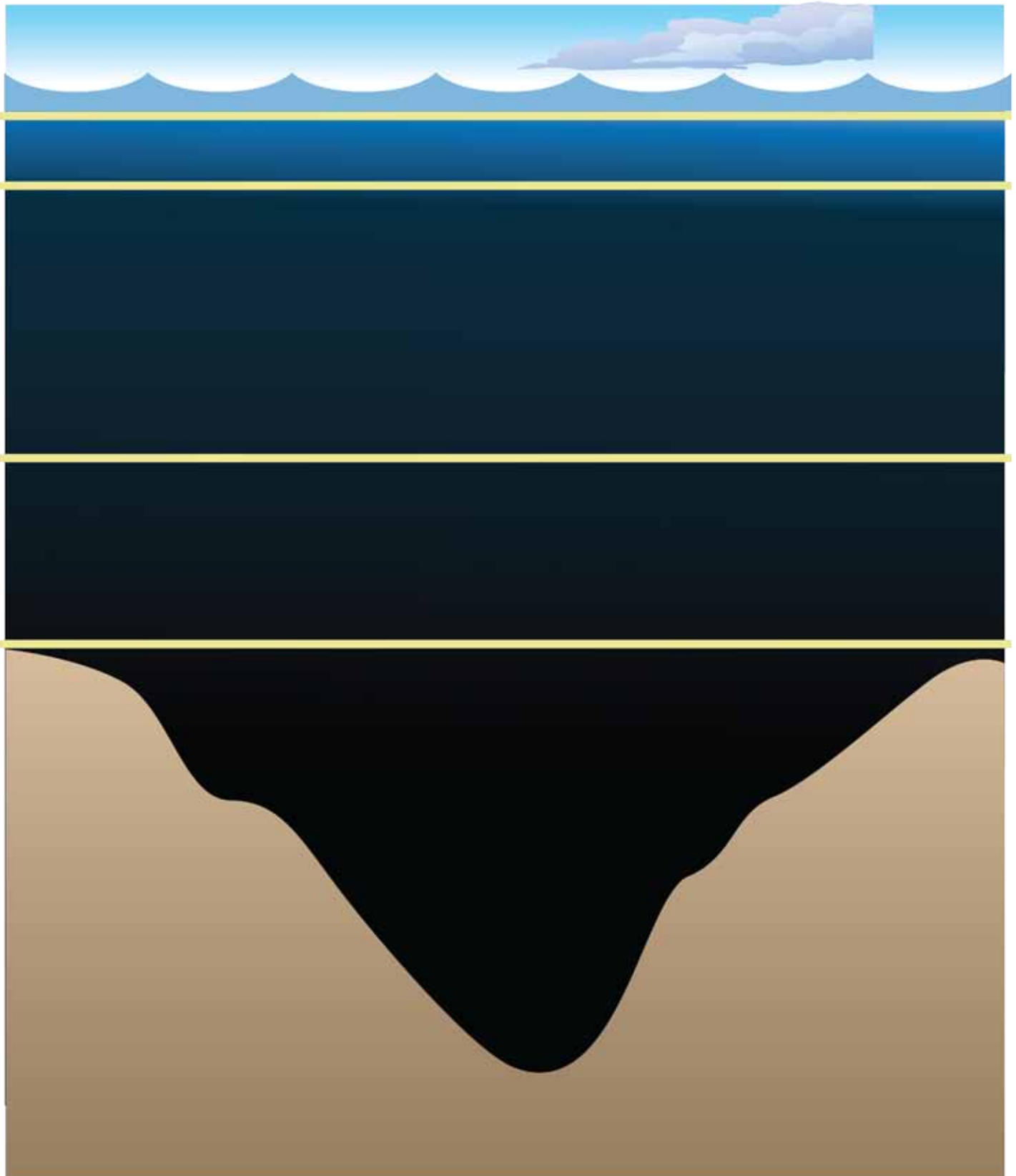
Compare and contrast two different animals in the books: how do they see, catch food, prevent becoming food, at what depth and ocean zone might they be found, etc.







Appendix D—Ocean Zones



Appendix F—Vocabulary Cards

algae

anemone

anglerfish

binocular

bioluminescence

bubble

clownfish

cocoon

**cookiecutter
shark**

coral

crustacean

deep sea

descend

dive

fins

fish

frilled

glow

goo

habitat

hagfish

**headlight
fish**

inky

jellyfish

light

lure

marine

marlin

moray eel

mucus

pelican eel

photophore

photosynthesis

plankton

polyp

predator

pressure

prey

pteropod

sand

sargassum

sea level

seaweed

slime

spookfish

sunlight

surface

tentacles

twilight

undersea

underwater

**vampire
squid**

viperfish