

Educator Resource Guide

NUDI GILL:
POISON POWERHOUSE OF THE SEA
by Bonnie Kelso

Meet Gill, a flashy, feisty nudibranch who educates a curious young snorkeler about the fascinating and sometimes fierce lives of these “naked” ocean creatures and their marine environment.

Juvenile Fiction (informational fiction picture book)

32 Pages ~ 10 x 10

Grades K-5 ~ Ages 5+

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Key Concepts: Ocean/marine life, animal diversity, exploration, water activities, snorkeling, environmental stewardship.

About the author and illustrator: Bonnie Kelso writes and illustrates books that encourage individualism and brave creative self-expression. A graduate of the Rhode Island School of Design, she has a background in exhibit design and has worked on projects for NASA, National Geographic, and the Smithsonian Institution. She is an avid snorkeler and scuba diver who currently resides in Las Vegas, Nevada. Visit www.BonnieKelso.com to learn more about Bonnie or to inquire about classroom visits.

Using this guide:

This educational resource guide can be used by anyone interested in sharing enthusiasm about *Nudi Gill* and the fascinating ocean creatures known as nudibranchs with children of all ages. If you are a teacher, librarian, home school instructor, camp counselor, or super cool parent, grandparent or guardian, this guide is for you! Feel free to adapt the suggested learning projects and activities according to your needs, interests, time, audience, and goals.

We have done our best to provide information, discussion points, and resources that may be useful for you and your learning participants. However, website content and accessibility is subject to change. Please review all suggested resources and websites prior to sharing them in your learning environment to ensure they meet with your individual standards and contain age-appropriate content for your participants.

This guide is broken down into two primary categories: 1) learning opportunities (with associated activities) and standards for children in grades Kindergarten through second grade, and 2) activities and standards for children in the third through fifth grades. These are broad categories and there will be overlap. Please modify as you see fit. Suggested learning activities, sample worksheets and/or handouts can be found for each category and are followed by appropriate Common Core, NGSS and National Core Arts Standards. A final section detailing resources used to create *Nudi Gill: Poison Powerhouse of the Sea* can be found at the end. To inquire about additional materials, or if you have questions about this guide, please view our website at www.gnomeroadpublishing.com.

PART 1: KINDERGARTEN THROUGH SECOND GRADE

Learning Opportunity #1: Let's talk about *Nudi Gill*! (Use these questions for discussion.)

- What type of animal is Gill? Where does he live?
- What do you know about other animals that live in the ocean? How are nudibranchs the same? How are they different?
- Unlike most of his ocean cousins, Gill doesn't use a shell for protection. He tells us that he eats poisonous creatures. This helps him produce a nasty sting to avoid being eaten by a predator. It also makes him colorful and serves as a warning. This is a clever defense mechanism. What other ways do animals defend themselves?
- We learned that Gill doesn't see very well. His eyes are very different than ours! Do you remember what Gill uses to sense what is in his environment? (It's a rhinophore!) What senses do we use as humans to navigate the world other than our eyes? How about other animals, like dogs and snakes?
- Gill talks about living in harmony with the environment. What does that mean? What did his snorkeler friend do to help? What can you do to help the environment?
- What did the snorkeler put on to "become a fish"? What safety devices do you use in the water?
- Gill said there are over 3,000 types of nudibranchs in the world. Look at that page in *Nudi Gill: Poison Powerhouse of the Sea* and discuss how the nudibranchs are different? How are they similar?
- Each nudibranch has a unique scientific name. For example, Gill is based on a nudibranch known as *Chromodoris annae*. Some also have nicknames based on the way they look, such as Blue Dragon or Sea Bunny. What names would you give the nudibranchs in *Nudi Gill: Poison Powerhouse of the Sea*?

Suggested Activities ~

Decorate your own reef!

- The author has provided a print-out (found on the website) to decorate using your favorite art supplies. Don't forget to label the different creatures who make their home in and around the coral reef. Share with others.

Create and name your own nudibranch!

- Draw or paint your own nudibranch on a sheet of paper or posterboard. You can also use the nudibranch template or sock puppet activity provided by the author (found on the website). Don't forget to label the parts of the nudibranch and give it an official name (and nickname!). Share with others and tell them what your nudibranch likes to eat, how it communicates, and how it defends itself.
- For younger participants, use the nudibranch template and a paper plate. See <https://nontoygifts.com/paper-plate-ocean-craft/> for inspiration!

Snorkel Gear Fun!

- Want to see what it's like to become a fish? Use the cut-out sheet to decorate your own snorkel gear (found on the website)!

Nudibranch Recycle Art!

- One way we can help nudibranchs is to remove trash from our oceans and recycle what we use on land. Find items around your house, school, or community that are no longer being used and can be donated or taken to a recycling center. You can save some of these items to make a nudibranch collage! (Examples may include old magazines and papers, straws, missing buttons, stickers, scrap cloth, gift bags, and ribbons.) Using discarded boxes, cut out squares (or circles!). Get your glue and recyclables ready. Now create a nudibranch scene out of these materials. You can do this individually or in groups.
- For younger participants, make a nudibranch coffee filter suncatcher. See <https://alittlepinchofperfect.com/ocean-animal-coffee-filter-craf/> for inspiration! Use the nudibranch template to create your own nudibranch of recycled paper or old magazines.

Animal Compare & Contrast!

- As a group, write a list of all the facts you learned about nudibranchs after reading *Nudi Gill: Poison Powerhouse of the Sea*. Here are some questions to get you started:
 - Where does a nudibranch live?
 - What color is a nudibranch?
 - What does a nudibranch eat?
 - Does a nudibranch have lungs or gills?
 - Does a nudibranch have a shell?
 - How does a nudibranch protect itself?
- Now choose your favorite animal. Write a list next to your nudibranch list to see how your animals are the same and how they are different. Don't forget to draw a picture!

Select Applicable Standards ~

Common Core ELA

- Kindergarten: RL.K.1, RL.K.4, RL.K.10, RI.K.1, RI.K.3, RI.K.10, W.K.2, W.K.8, SL.K.2, SL.K.5, SL.K.6, L.K.6
- First Grade: RL.1.1, RL.1.7, RI.1.1, RI.1.2, RI.1.3, RI.1.4, SL.1.2, L.1.5.C
- Second Grade: RL.2.7, RI.2.3, W.2.8, SL.2.2, L.2.5.A, L.2.6

Next Generation Science Standards (NGSS)

- Kindergarten: K-LS1-1, K-ESS2-2, K-ESS3-1, K-ESS3-3
- First Grade: 1-LS3-1
- Second Grade: 2-LS4-1

National Core Art Standards

- Kindergarten: VA:Cr1.1.K, VA:Cr2.1.K, VA:Cr2.3.K, VA:Cr3.1.K, VA:Re7.2.K, VA:Re8.1.K
- First Grade: VA:Cr1.1.1, VA:Cr2.1.1, VA:Cr2.3.1, VA:Cr3.1.1, VA:Re7.2.1
- Second Grade: VA:Cr1.1.2, VA:Cr2.1.2, VA:Cr2.3.2, VA:Cr3.1.2, VA:Re7.2.2

Learning Opportunity #2: Let's talk about the writing process!

- The author had to do a lot of research to write this story in order to include lots of facts about nudibranchs. But even though it is loaded with facts, this story is fictional. What is the difference between fiction and nonfiction? Why isn't this story classified as nonfiction?
- All those facts had to be verified (meaning, someone had to make sure they were true). How do we know if something is true? How does it differ from an opinion? What types of sources do we need to look at to verify a fact?
- The illustrator has a lot of experience as a snorkeler and diver. She has seen nudibranchs in their environments all over the world. This helped her make artwork in the book that could capture her excitement about these creatures. Go back and look at the illustrations in *Nudi Gill: Poison Powerhouse of the Sea* and discuss the details you see and how they support the words in the story. You can ask some of the following questions:
 - WHO or WHAT is it about?
 - WHERE does it take place?
 - WHEN does it take place? (For example, during the day or night?)
 - WHY or HOW does the main character do something?
- Including facts and details in a story often results in learning or using new vocabulary. What are some of the words you heard for the first-time reading *Nudi Gill: Poison Powerhouse of the Sea*? (For example: nudibranch, flotation device, gastropod, algae, microplankton, crustacean, predator, gills and cerata, rhinophore, egg ribbon, and harmony.)
- The story ends when Gill says goodbye to his snorkeler friend. When she leaves, she takes something with her. What is that? Why do you think the author included this scene in the book?

Suggested Activities ~

Vocabulary Match and Crossword!

- Find the printable vocabulary matching sheet and crossword for participants to fill out and show understanding of *Nudi Gill* concepts (found on the website).

Nudibranch Research Project!

- Take a look at the “Bonnie’s Picks” handout of her top 10 nudibranchs you can learn about. Or, find out about 10 fascinating nudibranchs here: <https://oceanconservancy.org/blog/2019/04/11/10-photos-sea-slugs-will-blow-ocean-lovin-mind/>
- Have participants divide into groups (or work individually) and choose a nudibranch. Groups will work together to answer questions about their chosen nudibranch. Have participants write down their answers and present to other groups. (You may browse additional websites with information about nudibranchs found at the end of this guide. Please review these sites before participants use them.)
 - The following research questions are provided with consideration for age appropriateness and attention spans of participants at these grade levels. Please modify as you see fit.
 - What is the name of your nudibranch? What is its scientific name?
 - What does your nudibranch look like? How big is it?
 - What part of the world does it live in?
 - What does it eat?
 - Does it have predators? How does it defend itself?
 - How long does it live (what is its life span)?
 - Share one fun fact about your nudibranch.

Write your own Animal Story!

- Have you had experience learning about an animal just like the author of *Nudi Gill* has? What did you learn? What else would you like to learn? Now go find that out! Construct a fictional or informational story using these facts. Don’t forget to add some of the details in the illustrations!
 - To help get started, make sure to include:
 - A main character (WHO or WHAT);
 - The setting or environment (WHERE);
 - A beginning, middle and end (WHEN); and
 - The interesting facts (HOW and WHY)!

Act like a _____!

- Gill’s snorkeler friend shows us what it takes to “become a fish” on the first page of the book. Have you ever tried snorkeling or scuba diving? These water activities can be a lot of fun, but they need to be done safely and with trusted adults. What activities do you like to do? Draw a picture like the one the illustrator made of Gill’s friend, but of yourself doing that activity and identify the setting, equipment, utensils, or supplies you would need to act like a _____. For older participants, write about what you have drawn.
 - Examples might include activities like football, dancing, cooking, biking or hiking, camping, gymnastics, wood working, boating or geocaching.

Select Applicable Standards ~

Common Core ELA

- Kindergarten: RL.K.1, RL.K.3, RL.K.4, RL.K.7, RL.K.10, RI.K.1, RI.K.2, RI.K.3, RI.K.4, RI.K.6, RI.K.7, RI.K.8, RI.K.10, W.K.2, W.K.8, SL.K.2, SL.K.3, SL.K.4, SL.K.5, SL.K.6, L.K.6.
- First Grade: RL.1.1, RL.1.3, RL.1.7, RI.1.1, RI.1.2, RI.1.3, RI.1.4, RI.1.6, RI.1.7, RI.1.8, W.1.2, W.1.3, W.1.8, SL.1.2, SL.1.4, SL.1.5, SL.1.6, L.1.6.
- Second Grade: RL.2.1, RL.2.3, RL.2.7, RI.2.1, RI.2.3, RI.2.6, RI.2.7, W.2.2, W.2.7, W.2.8, SL.2.2, SL.2.4, L.2.6.

Next Generation Science Standards (NGSS)

- Kindergarten: K-LS1-1
- First Grade:
- Second Grade: 2-LS4-1

National Core Art Standards

- Kindergarten: VA:Cn10.1.K, VA:Cr2.3K, VA:Re7.2.K
- First Grade: VA:Cr1.2.1, VA:Cr2.3.1
- Second Grade: VA:Cn10.1.2, VA:Cr1.2.2

PART II: THIRD GRADE THROUGH FIFTH GRADE

Learning Opportunity #1: *Let's Talk About Oceans, Diversity and Defenses!*

- Over 3000 types of nudibranchs have been identified throughout the world, but this number continues to grow as new ones are discovered and catalogued. Can you name the world's oceans? What about other major bodies of water? See if you can identify them on a map (and don't forget to find where you live, too).
- Gill shows us other members of his nudibranch family, so we know they come in all shapes and sizes. Why do you think that is? (Hint: Could it have to do with the many places they live throughout the world? Gill says he is what he eats. Would a nudibranch in the waters off Australia have a different diet than a nudibranch off the coast of Mexico?) We know that nudibranchs habitats are diverse, so naturally . . . they are too!
- What did you learn about Gill's defense strategy in the book? He isn't the only one to use bright colors and chemical defenses in the ocean. Can you think of other animals and fish that do this, too? What are other ways ocean creatures use to protect themselves or warn off predators?
- Let's go one step further! Can you identify land animals that do these things, too? Why is a defense strategy effective for one animal but maybe not for another? What does the environment an animal lives in have to do with the strategies an animal might use?

Suggested Activities ~

Storyboard an Ocean Creature

- Want to write and illustrate a book like *Nudi Gill: Poison Powerhouse of the Sea*? You can start with storyboarding your idea! Individually or in a group, choose an ocean creature you would like to know more about. You can make a list of questions you want answered about your creature first, and then head to the library (or the internet) to do research. If you are having problems coming up with questions, think of the information Gill shared in the book and see if you can find out the same about your creature. Then put together your research to share with others. (Helpful tip: If you don't want to create your own art, print out photos to go with your facts and paste them into your storyboard, book, or trifold presentation.) Don't forget to list the resources used!

Compare and Contrast!

- Take your storyboard (or general research skills) one step further. Sharpen your analytical skills by creating a Venn Diagram using what you have learned about nudibranchs and at least one other ocean creature. Share with others what you have learned about each species – how they are alike and how they are different – and how they interact with the world around them.

Make your own vocabulary crossword!

- Reading is a great way to increase vocabulary. Did you learn new words while reading *Nudi Gill: Poison Powerhouse of the Sea*? If so, what were they? How about from your research? Now make a list of some of these words and create a crossword puzzle for others using this link: <https://www.puzzle-maker.com/CW>. Go one step further and make a matching game with definitions.

Select Applicable Standards ~

Common Core ELA

- Third Grade: RL.3.1, RI.3.1, RI.3.5, RI.3.7, W.3.2, W.3.7, W.3.8, SL.3.1, SL.3.3, SL.3.4, SL.3.6.
- Fourth Grade: RL.4.1, RI.4.1, W.4.2, W.4.7, W.4.8, W.4.9, SL.4.1, SL.4.2, SL.4.4.
- Fifth Grade: RL.5.1, RI.5.1, RI.5.7, W.5.2, W.5.7, W.5.8, W.5.9, SL.5.1, SL.5.2, SL.5.4, SL.5.5.

Next Generation Science Standards (NGSS)

- Third Grade: 3-LS1-1, 3-LS2-1, 3-LS3-1, 3-LS3-2, 3-LS4-2, 3-LS4-3
- Fourth Grade: 4-LS1-1, 4-LS1-2
- Fifth Grade: 5-LS2-1

National Core Art Standards

- Third Grade: VA:Cr.3.1.3
- Fourth Grade: VA:Cr1.2.4

Learning Opportunity #2: Let's Make a Difference!

- We learn that Gill doesn't live long in captivity, which means he needs to stay in the ocean. He depends on a healthy ocean environment to survive and thrive. What types of things can impact this environment? (Hint: What did Gill mean when he mentioned living in "harmony"?)
- Gill's snorkeler friend does something before she leaves. What is it? What are things humans can do to ensure Gill's environment stays safe and clean? What about other creature habitats throughout the world – what can we do to keep those safe and clean? What about your own?
- Getting people to take part in activities that make or keep environments safe and clean may require you to be persuasive. What does it mean to be persuasive? How do you go about being persuasive? (Hint: The author of *Nudi Gill* shared facts and made these interesting. Do you think that was helpful in persuading you to help a creature like nudibranchs?)
- What is the difference between a fact and an opinion? Does being persuasive rely on facts, opinions, or both?

Suggested Activities ~

A Call to Action!

- What is something that matters to you or that you would like to see done to improve the world? You can work individually or in groups by using facts, logic and communication tools (speaking, writing, or art), to make an argument for or against something in a persuasive manner. Write out your arguments and present your ideas to others and ask for feedback. Do you feel you were persuasive? Why or why not?

Create Solutions!

- Just like Gill's snorkeler friend, we can all make the world better by taking small steps to help out with a problem. Look around your local environment to identify an area that might need help. (For example, trails, parks, rivers, lakes, beaches, forests, wetlands, etc.). What is one thing you can do to make a difference? Working individually or in groups, use your research skills to identify what others have done to improve similar situations. Construct a written plan based on your research and creative brainstorming that would help the problem you have identified. What steps (criteria) will need to be part of your plan/solution? Take it one step further and implement your plan. If you are in a classroom or other learning environment, report back to others on what you did and what can be done in the future. Talk about what are possible limits (constraints) on existing solutions and what could be done differently. Don't forget to take pictures or video for your presentation!

Select Applicable Standards ~

Common Core ELA

- Third Grade: RL.3.1, RL.3.6, RI.3.1, RI.3.6, W.3.1, W.3.2, W.3.7, W.3.8, SL.3.1, SL.3.3, SL.3.4, SL.3.6.

- Fourth Grade: RL.4.1, RI.4.1, W.4.1, W.4.2, W.4.7, W.4.8, W.4.9, SL.4.1, SL.4.2, SL.4.4.
- Fifth Grade: RL.5.1, RI.5.1, RI.5.7, W.5.1, W.5.2, W.5.7, W.5.8, W.5.9, SL.5.1, SL.5.2, SL.5.4, SL.5.5.

Next Generation Science Standards (NGSS)

- Third Grade: 3-LS4-4
- Fourth Grade: 4-ESS3-1
- Fifth Grade: 5-LS2-1, 5-ESS3-1, 3-5-ETS1

NUDI GILL: POISION POWERHOUSE OF THE SEA
~ SELECTED BIBLIOGRAPHY MATERIALS ~

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- Silen, Andrea. "Nudibranch." [online] (2015-2021). National Geographic Partners, LLC. Available at: <https://kids.nationalgeographic.com/animals/invertebrates/facts/nudlbranch> [Last accessed 15, April 2021.]
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- Professional Association of Diving Instructors (PADI). Project Aware Conservation Program. Available at: <https://www.padi.com/conservation>
- Sea Slug Forum. Available at: <http://www.seaslugforum.net>
- Ocean Conservancy. Available at: <https://oceanconservancy.org>
- National Aquarium, Baltimore, MD. Available at: <https://aqua>

Websites with more information about nudibranchs:

- <https://www.ouroceanandyou.com/nudibranchs>
- <https://www.sirendivinglembongan.com/magical-world-of-nudibranchs/>

Websites with more information about our oceans:

- <https://oceanservice.noaa.gov/kids/>
- <https://www.natgeokids.com/nz/category/discover/animals/sea-life/>
- https://seasmartschool.com/blog?gclid=Cj0KCQiA4OybBhCzARIsA-Icfn9kKNUB4KFukGzPvyKOFhECgWjDxMUN7GDOd5KtBCpB82dHFN_D4ossaAr-3EALw_wcB

NUDI GILL
Top Ten Species List
(Bonnie's pick)

1. Blue Dragon (*Glaucus atlanticus*)



These are especially cool because they are pelagic and feed on jellyfish.

2. Sea Lemon (*Peltodoris nobilis*)



Fun name and cute as a button!

3. Hopkin's Rose (*Okenia rosacea*)



These are fun because of their bubblegum pink color.

4. Sea Bunny (*Jorunna parva*)



These have become really popular because of their cute fluffy appearance.

5. Spanish Dancer (*Hexabranchus sanguineus*)



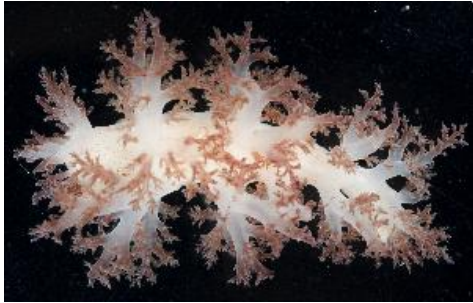
Probably the most well-known nudibranch. Also they can grow really big!

6. NUDI GILL (*Chromodoris annae*)



A species I modeled GILL after. They are unique because they lay flat egg ribbons.

7. (Dendronotus rufus)



These closely resemble the food they eat.

8. Sea Clown (Triopha catalinae)



These are fun because they also come in reverse coloration. (Orange with white spots.)

9. Blue Dragon (Pteraeolidia ianthina)



Same nickname as #1, but long and serpent-like. They are cool because they can farm hydroids and photosynthesize like a plant.

10. (Dirona albolineata)

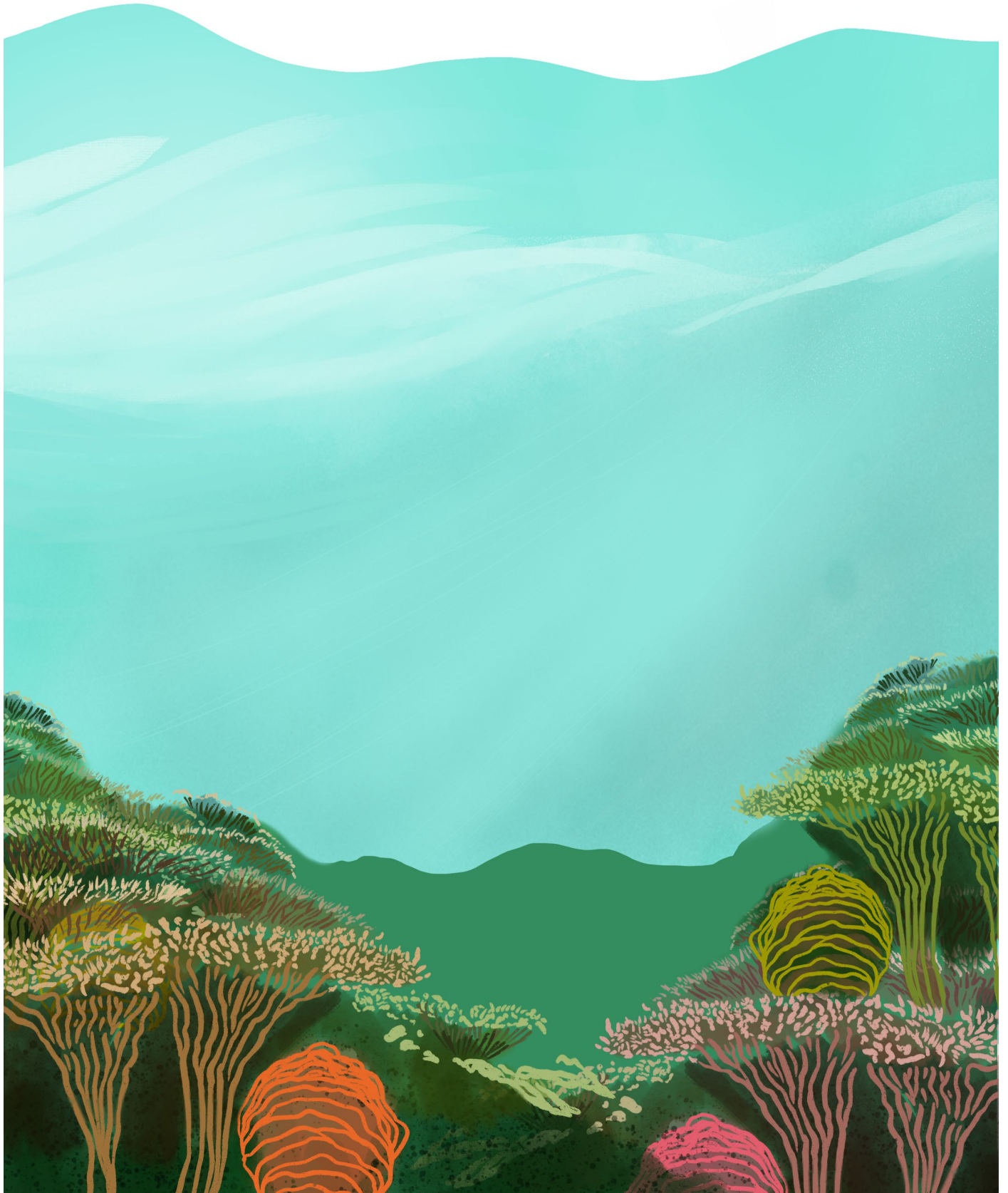


These have unusually translucent flat-shaped cerata.

**Nudi
Gillr**

Create A Coral Reef

Use the cut-outs or draw your own!

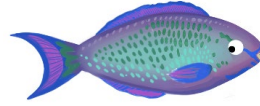


Create A Coral Reef

Cut out the characters for your reef.



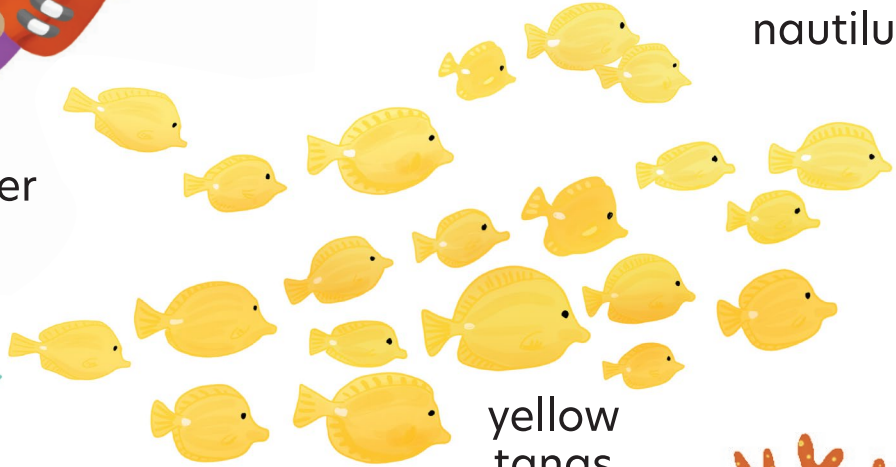
snorkeler



parrotfish



nautilus



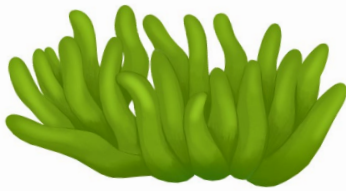
yellow tangs



hard coral



soft coral



anemone



nudibranch



clam



sea snail



sea sponge



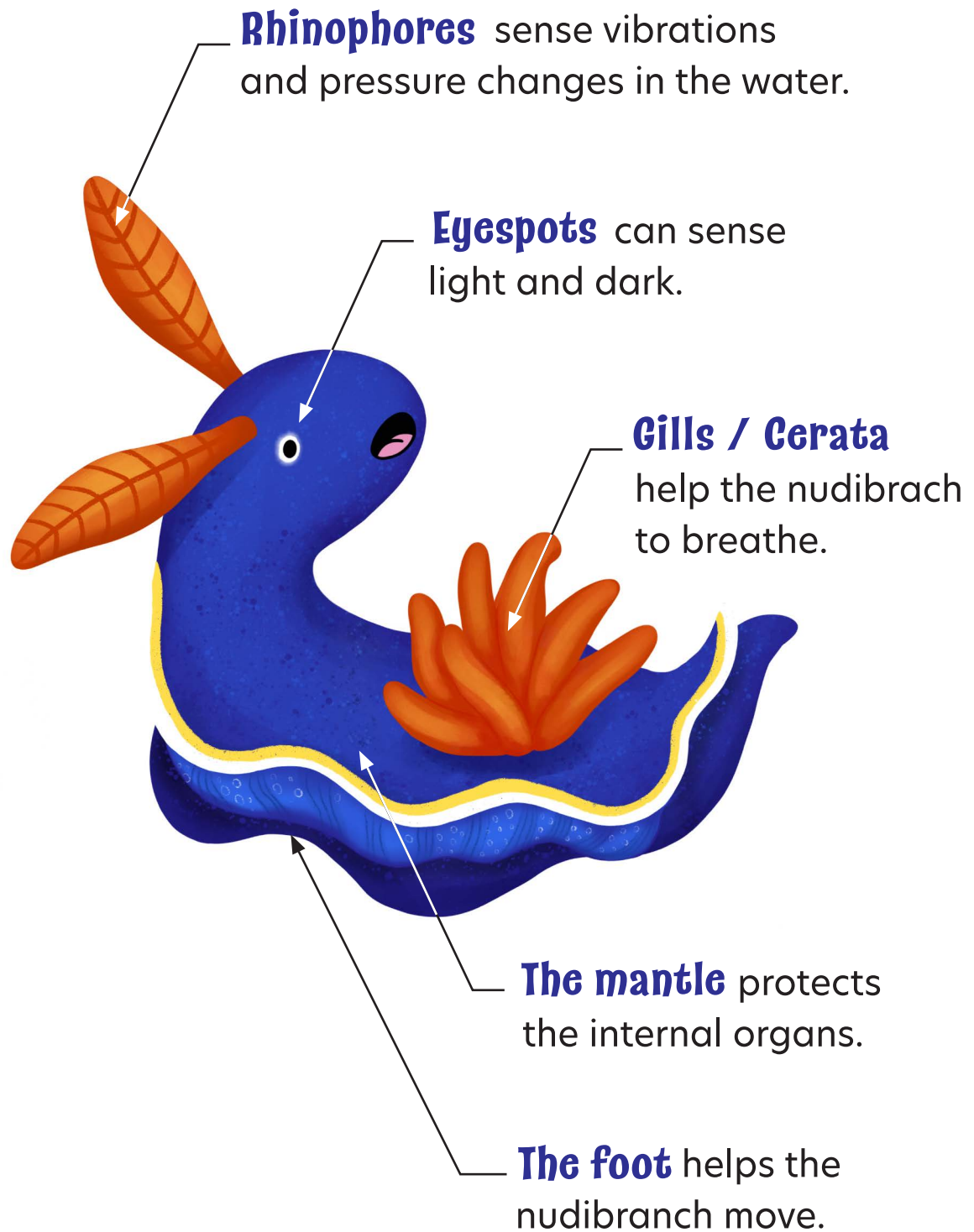
gnome

Nudi
Gillr

Character Cut-outs



Learn the parts of a nudibranch!



Nudibranch Parts

What are the different body parts of a nudibranch? What purpose does each part serve?



**Nudi
Girl**

**It takes a lot of gear
to become a fish!**



Dress your beachgoer for a snorkeling adventure!

**Nudi
Gir**



fins

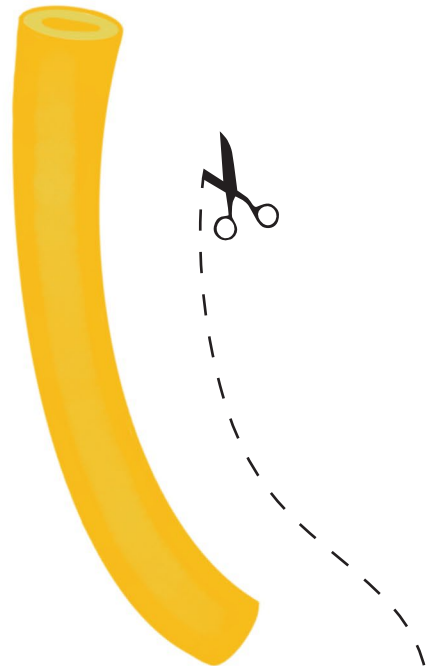


**mask and
snorkel**

floatation device



life vest



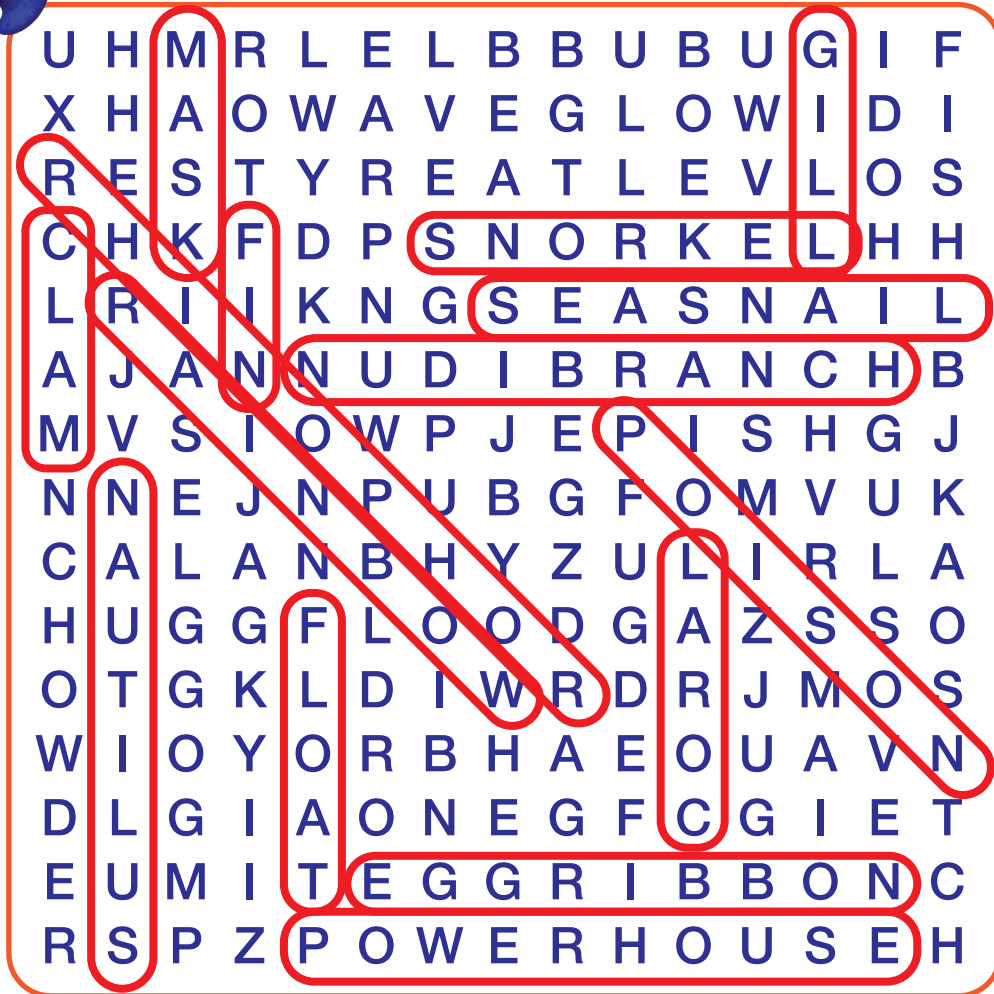
Cut out your snorkeling gear.

Nudi Gilr

ANSWER
KEY



Word Search



nudibranch
nautilus
snorkel
clam
poison

float
coral
gill
mask
fin

rhinophore
powerhouse
egg ribbon
sea snail
rainbow



Try to find the 9 bonus words, too!

Nudi Gilr

BONUS
KEY



Word Search

U H M R L E L B B U B U G I F
X H A O W A V E G L O W I D I
R E S T Y R E A T L E V L O S
C H K F D P S N O R K E L H H
L R I I K N G S E A S N A I L
A J A N N U D I B R A N C H B
M V S I O W P J E P I S H G J
N N E J N P U B G F O M V U K
C A L A N B H Y Z U L I R L A
H U G G F L O O D G A Z S S O
O T G K L D I W R D R J M O S
W I O Y O R B H A E O U A V N
D L G I A O N E G F C G I E T
E U M I T E G G R I B B O N C
R S P Z P O W E R H O U S E H

nudibranch
nautilus
snorkel
clam
poison

float
coral
gill
mask
fin

rhinophore
powerhouse
egg ribbon
sea snail
rainbow



Try to find the 9 bonus words, too!

Nudi Gilr



Word Search

U H M R L E L B B U B U G I F
X H A O W A V E G L O W I D I
R E S T Y R E A T L E V L O S
C H K F D P S N O R K E L H H
L R I I K N G S E A S N A I L
A J A N N U D I B R A N C H B
M V S I O W P J E P I S H G J
N N E J N P U B G F O M V U K
C A L A N B H Y Z U L I R L A
H U G G F L O O D G A Z S S O
O T G K L D I W R D R J M O S
W I O Y O R B H A E O U A V N
D L G I A O N E G F C G I E T
E U M I T E G G R I B B O N C
R S P Z P O W E R H O U S E H

nudibranch
nautilus
snorkel
clam
poison

float
coral
gill
mask
fin

rhinophore
powerhouse
egg ribbon
sea snail
rainbow



Try to find the 9 bonus words, too!

Nudi Gill

Whoa!
What are you?