



NOVEL STUDY



WORLD **Without** fish

MARK KURLANSKY

Novel Studies in the Science Classroom: Developing Science Literacy Skills

Today struggling readers face many long-term challenges and are more at risk of falling behind. However, science is a great way to engage students, no matter their background. Nitty Gritty Science has created novel studies for teachers to use in the science classroom to help bridge that gap. Novel studies help build rapport with students while supporting and fostering independent learning. In addition, we believe that using novel studies in the science classroom will expose students to different perspectives and help them understand how science vocabulary applies to so many events in their lives.

Research shows that connecting content and skills from other subjects enhances students' learning and improves their comprehension.

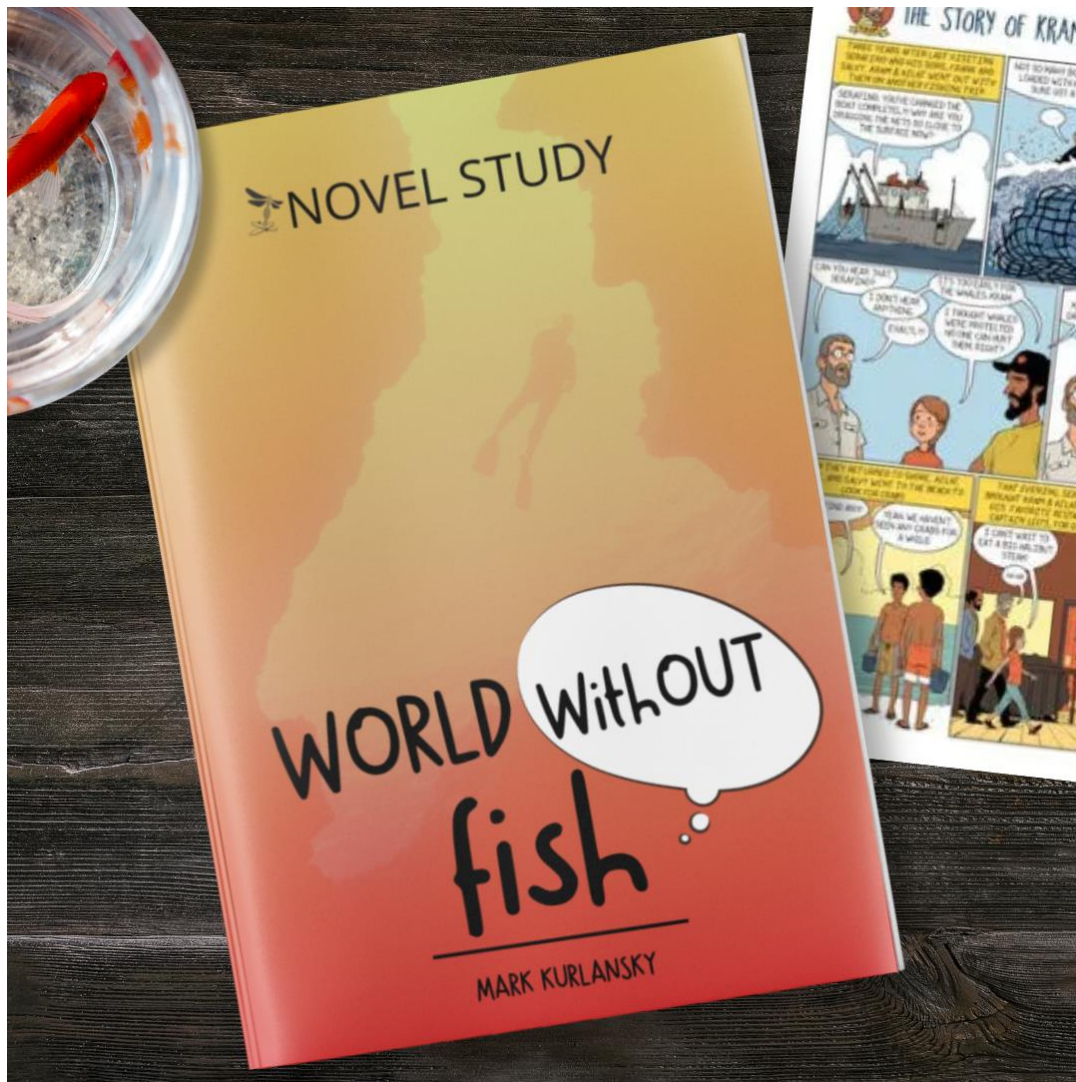
- *The literacy from reading can easily come from non-fiction and fiction novels that surround a science-related topic and are far more of a high-interest read for the majority of students than reading a textbook (Anderson & Hite, 2010; Batchelor, 2017; Coiro, 2012; Freudenrich, 2000).*
- *Science fiction novels are an excellent way to engage students in science ideas while also helping students improve their literacy skills. (Creech and Hale, 2006)*
- *Teachers can add in other readings from the internet and news articles which brings the reading level down to a more manageable level, however students are more willing to learn and spend the time to learn new vocabulary when highly engaged in what they are reading (Weinbugh et al.,2014).*

NGS novel studies heavily focus on the following:

- vocabulary
- reading comprehension
- simple research
- cross-curricular connections
- culminating final project

Students will focus on inquiry skills such as comparing and contrasting, summarizing, making inferences, cause/effect relationships, fact and opinion, and critical thinking.

Happy reading,
Erica



"Can you imagine a world without fish? It's not as crazy as it sounds. But if we keep doing things the way we've been doing things, fish could become extinct within fifty years. So let's change the way we do things!"

World Without Fish is the uniquely illustrated narrative nonfiction account—for kids—of what is happening to the world's oceans and what they can do about it. Written by Mark Kurlansky, author of *Cod*, *Salt*, *The Big Oyster*, and many other books, *World Without Fish* has been praised as "urgent" (*Publishers Weekly*) and "a wonderfully fast-paced and engaging primer on the key questions surrounding fish and the sea" (Paul Greenberg, author of *Four Fish*). It has also been included in the New York State Expeditionary Learning English Language Arts Curriculum.

Written by a master storyteller, *World Without Fish* connects all the dots—biology, economics, evolution, politics, climate, history, culture, food, and nutrition—in a way that kids can really understand. It describes how the fish we most commonly eat, including tuna, salmon, cod, swordfish—even anchovies— could disappear within fifty years, and the domino effect it would have: the oceans teeming with jellyfish and turning pinkish orange from algal blooms, the seabirds disappearing, then reptiles, then mammals. It describes the back-and-forth dynamic of fishermen, who are the original environmentalists, and scientists, who not that long ago considered fish an endless resource. It explains why fish farming is not the answer—and why sustainable fishing is, and how to help return the oceans to their natural ecological balance.

Interwoven with the book is a twelve-page graphic novel. Each beautifully illustrated chapter opener links to the next to form a larger fictional story that perfectly complements the text.

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Check out the following sample pages focusing on science vocabulary, reading comprehension, and literacy-based projects!

Teacher Guide included!

Find out what students already know.

WORLD WITHOUT FISH

Before You Read

Directions: The ocean is a fascinating habitat, home to diverse living beings. From tiny plankton to majestic humpback whales, food webs are essential for the survival of these species. How much do you already know about these intricate food web systems? Draw a line to match each word below to its correct definition.

- Carnivore An organism that eats other organisms
- Omnivore
- Herbivore
- Decomposer
- Detritivore
- Producer
- Consumer

WORLD WITHOUT FISH

WORD STUDY: Chapters 1-3

1. Fossil

Definition:



2. Population

If a population has abundant space and food and is protected from predators and disease, the population will grow exponentially.

3. Migratory

List three reasons animals migrate.

- 1.
- 2.
- 3.

5. Submarine

The prefix *sub* means _____

List two other words that have the prefix *sub*.

- 1.
- 2.

WORLD WITHOUT FISH

WORD STUDY: Chapters 2-3

7. Sunlight



Sunlight is the ultimate energy source for life on Earth.

8. Cell

List three organelles found in a cell.

- 1.
- 2.
- 3.

9. Microscope

Why was the invention of the microscope so significant?

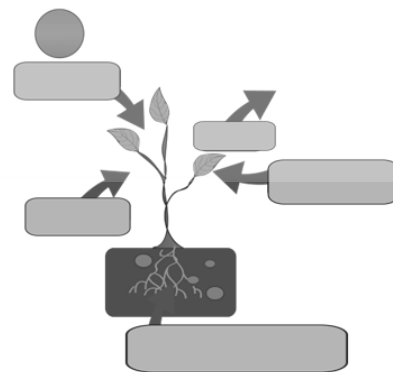
10. Chlorophyll

What is the function of chlorophyll?

11. Photosynthesis

Use the word bank to fill in the diagram showing the photosynthesis process.

- Water and minerals
- CO₂
- Energy
- Oxygen
- Glucose



Vocabulary

Reading Check: Chapters 6-7

Directions: Answer the following questions in complete sentences.

1. Why shouldn't we just stop fishing?

2. Explain the conflict between fishing and tourism.

3. What is fish farming?

4. How many pounds of farmed fish?

5. How are farmed fish raised?

Reading Check: Chapters 6-7

Directions: Answer the following questions in complete sentences.

6. What are fishing quotas? Why are they problematic?

7. What is bycatch?

8. What is happening to the Barndoor Skate?

Each section has reading comprehension questions to track student progress and understanding.

Novel Project option

WORLD WITHOUT FISH

Name: _____

Date: _____

WORLD WITHOUT FISH FINAL ACTIVITY

Background:

Seafood sourced from aquaculture and wild-caught fisheries faces an ecological challenge predominantly within wild fisheries. Overfishing, a critical concern in wild-caught seafood, occurs when fishing practices exceed the reproductive capacity of fish populations, jeopardizing their sustainability. This issue arises due to the immense demand for seafood, causing stress on marine ecosystems as certain fish species are caught faster than they can reproduce.

Wild fisheries grappling with overfishing face potential ecosystem disruptions. The depletion of specific fish populations and "relationships and species," can lead to the collapse of an ecosystem and the survival of this case.

Introduction:

You will simulate yellow goldfish and blue yellow goldfish.

Draw an example

In addition to its the fish are hard \$5 each, green \$ each.

According to wh



WORLD WITHOUT FISH

Materials: Per group of 4

- Paper plate (ocean)
- Plastic spoons (fishing pole) (1 for each group member)
- Napkin (fishing boat) (1 for each group member)
- Paper cups (1 for each group member)
- Stopwatch

Procedure:

1. At the start of the activity, put 8–10 of each color of goldfish into the ocean (paper plate). (Numbers may be Start* column of t
2. Have one group me with your spoon (f fishing poles down
3. Look at the remain species in the ocea
4. Look at the caught column. Any fish r do not count. Onc
5. Adjust the number species (color) for Also, keep in mind remains, remove t
6. Repeat steps 2–4
7. When done with a

Data Tables

Data Table 1: Fish

Orange
Green
Red
Yellow

Data Table 2: Fish

Orange (\$10 value)
Green (\$5 value)
Red (\$5 value)
Yellow (\$2 value)
Total Profit

WORLD WITHOUT FISH

Analysis and Conclusions:

1. Use the data to create a line graph showing the changes in their fish population over time. Be sure to label each access.
1. What happened to the number of each fish species in the ocean over the four years of fishing?
2. How did the fishing activity impact the populations of different fish species?
3. Were there any species that disappeared entirely from the ocean? If yes, which ones and why?
4. What would happen if fishing continued at the same rate for several more years? Predict the potential outcomes for the fish populations.
5. How did the availability of food sources affect the survival of certain fish species?
6. Reflecting on the activity, how did it simulate the ecological challenges natural ocean ecosystems face?
7. What possible solutions or strategies could be implemented to ensure sustainable fishing practices based on what you observed during the activity?



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