

SCIENTISTS IN THE FIELD

WHERE SCIENCE
MEETS ADVENTURE

DISCUSSION AND ACTIVITY GUIDE

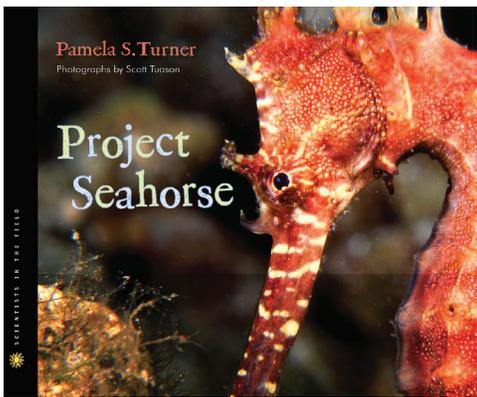
Project Seahorse

by Pamela S. Turner Photographs by Scott Tuason



About the Series

Project Seahorse is part of the award-winning Scientists in the Field series, which began in 1999. This distinguished and innovative series examines the work of real-life scientists doing actual research. Young readers discover what it is like to be a working scientist, investigate an intriguing research project in action and gain a wealth of knowledge about fascinating scientific topics. Outstanding writing and stellar photography are features of every book in the series. Reading levels vary, but the books will interest a wide range of readers.



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About the Book

Seahorses, a unique and charming species, are experiencing serious problems. Habitat losses and overfishing among other issues, have put them in danger. Pamela Turner describes Project Seahorse, an organization of scientists and committed conservationists working to protect seahorses while preserving the livelihood of local fishing families in the Philippines.

About the Author

Pamela S. Turner has written three other books for the Scientists in the Field series including, *The Frog Scientist*, which was a ALA Notable Book for Children, and an Orbis Pictus and National Green Earth honor title, and won the Cybils Young Adult Nonfiction award. *Project Seahorse* was an NSTA Outstanding Trade Science Book. Turner has written about science and nature for many years, winning prizes and acclaim for her ability to present accurate information that is easy to understand and fun to read.

About the Photographer

Scott Tuason is a diver and conservationist, and is the travel editor for *Rogue* magazine. He lives in the Philippines with his daughter and a menagerie of rescued cats and dogs.

Pre-Reading Activities

Pick a local product you purchase, or come to a class consensus about a popular common local product. List all the natural resources and all the people involved in bringing this item to sale in your community. Trace the journey of this product or, as the book discusses, count the “onion layers” that your product generates. List the factors that either prevent your product from worldwide demand or allow it to have such.

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Think about projects you have done at home or school or in clubs. What steps were involved in completing your project? Look at this project or one in which you are very familiar. Write down the steps or factors that made this project successful or the steps that you would have taken to improve this project (or both).

Discussion Questions

Define the word haven in personal terms. What is a haven, and how important is it for people or plants or animals? Can a haven include competing interests such as predator and prey?

Why is a carnivorous plant not an animal? Why is a coral polyp not a plant?

Speculate on the nature of your neighborhood, state, and country if human males gave birth to babies. What would be some of the more obvious changes we would notice?

What is the role of compromise when establishing environmental policy while trying to maintain economic viability? If it comes to being able to feed our families or protect a threatened species, how should government respond? What happens to people when a resource they depend upon is not protected, and then the resource disappears? Are there certain economic standards or environmental standards that should NOT be subject to compromise?

What sort of everyday actions have layers of impact that ripple through families, neighborhoods, cities, states, and countries, and out into the big wide world?

Shell shops around the country used to sell thousands of dried seahorses of all sizes (and some may still). How do people change long-standing traditions and habits? How would we begin to change habits in this country so that we no longer purchase elephant ivory, undersized seahorses, or jewelry made from threatened sea creatures?

Many animal collecting methods, such as trawling, gill nets, blast-fishing, and others have a high incidence of collateral damage, often killing many creatures that have little commercial value. What responsibility does government have for regulating the method of animal collection, and what

responsibility do we have as consumers of these products?

Applying and Extending Our Knowledge

On page 10 we read, “*Not every fisher is willing to make this kind of sacrifice. Many still collect seahorses. There are fewer seahorses on this reef than there used to be because too many have been taken from the sea. Overfishing is a problem not just for seahorses but for many other kinds of fish.*” Seahorses are collected for medical reasons, for home aquarists, and for trinkets purchased by the tourist trade.

- Make a class or school inventory of all items that classmates wear, use, keep as pets, or consume that come from animals. Include food animals consumed. Try to be specific with the animals listed—list the kind of fish, reptile, or mollusk. Don’t forget to include accessories, belts, shoes, jewelry, and other personal effects that may come from animals. Once this list is complete, graph the animals involved from the most common to the least common. Are any of the animals the class uses in danger? Prepare a presentation, either online or in poster form, summarizing your class findings.
- The quote above refers to the fisher Digoy releasing a seahorse that he has caught and could sell to put food on his family’s table. It is clear that Digoy has sold other seahorses. Present an argument for both releasing and capturing this seahorse. The text does NOT provide any detail about the species, size, gender, or reasons for letting this seahorse go, which should factor into how the argument is formed.

Common Core Connection

CCSS.ELA-Literacy.W.7.1 Write arguments to support claims with clear reasons and relevant evidence.

CCSS.ELA-Literacy.W.7.7 Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.

CCSS.ELA-Literacy.SL.7.5 Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

CCSS.ELA-Literacy.RH.6-8.7 Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

- Create a picture glossary of the forty different seahorses

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found in the world (bonus points for finding forty and extra bonus points for finding more than forty).

- Indicate which ones are found in the area that Digoy lives.
- Include scientific name, common name, range, animal description, size range, habitat description, diet, and any noteworthy facts (about behavior or endangered status, etc.).
- In looking at the list of seahorses, which ones are most commonly found? Why is so little information available on some of the seahorse species?
- Pick several different species of seahorse and imagine they are in a horse race. Pretend that you are the sportscaster announcing the progress of the seahorses. Broadcast the race. Make sure to use physical descriptions of the various seahorses in your race to justify either their moving ahead or dropping back in the pack.

Common Core Connections

CCSS.ELA-Literacy.W.7.7 Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.

CCSS.ELA-Literacy.SL.7.5 Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

CCSS.ELA-Literacy.RH.6-8.7 Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

CCSS.ELA-Literacy.RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

CCSS.ELA-Literacy.SL.7.6 Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 7 Language standards 1 and 3 here for specific expectations.) Photographs, videos, or maps with other information in print and digital texts.

On page 17 and 18 we learn that seahorses are collected and “sold live for public and home aquariums. Most would not live long: seahorses are very difficult to keep in captivity.”

- Several aquariums around the country, such as the Monterey Bay Aquarium in California, the National Aquarium in Baltimore, and the Aquarium at Scripps Institution of Oceanography (among many others) are breeding

various species of seahorses. Contact one of these organizations that is keeping seahorses in captivity and ask for information on the challenge of keeping seahorses alive. Ask them their opinion on whether individuals should attempt to keep seahorses in their homes. Make sure to ask which species of seahorse each aquarium has experience trying to raise and if they think their efforts to raise seahorses in captivity help seahorses in the wild. Ask whether or not some species of seahorses cannot be raised in captivity. Present your communication to the class. There are many aquariums that keep seahorses; it may be possible for each student to contact a different aquarium, depending on the number of students in the class.

Common Core Connections

CCSS.ELA-Literacy.W.7.1b Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.

CCSS.ELA-Literacy.W.7.7 Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.

CCSS.ELA-Literacy.W.7.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

CCSS.ELA-Literacy.SL.7.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-Literacy.SL.7.5 Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

CCSS.ELA-Literacy.RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts.

The seahorse is described (page 20) as a “weird” animal. Part horse, part monkey, part kangaroo, and all fish, this creature does not seem to fit in any animal family. It lives in the ocean, wears a “suit of flexible armor,” does not have scales, and swims oddly.

- Have students select three different animals from three different animal families. Combine favorite features of each animal to create an animal that is a fish, but one that has characteristics of the other three animals. Write a story, comic book, graphic novel, or series of annotated pictures showing what attributes your creation has

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and how those abilities allow it to remain a fish that is able to survive.

- Using these three animals, create a diagram that shows how they are different and how they are similar to a fish.
- Seahorses are fish, but as the author says, they are very weird fish. Find an encyclopedia entry that has a diagram or picture with labels that defines for readers what we mean when we use the word fish. Replace the picture or diagram with a picture or drawing of a seahorse. Redo the labels and rewrite the entry to explain to readers why these animals are indeed fish.
- Write a Kipling-style “Just So” story for young students about the seahorse that incorporates how it got its prehensile tail, pouch, and horselike face. Your story should answer some of the questions scientists have about this animal, such as why the male hatches the eggs. Or, use your story to explain why science knows so little about certain types of seahorses. Keep in mind that scientists are often asked why some people recommend using dried seahorses for medicinal purposes.
- Design an interpretive dance or a light show or a skit with your class to provide students with a glimpse of what it is like to be a seahorse. Set your dance to music. Make costumes and design the lighting. Write poetry and do a performance designed to share with an audience the life of various types of seahorses. Produce program notes that share with your audience the science behind your various interpretations. For inspiration, you may wish to take a look at Graeme Base’s *Sign of the Seahorse: A Tale of Greed and High Adventure in Two Acts*.

Common Core Connections

CCSS.ELA-Literacy.W.7.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

CCSS.ELA-Literacy.W.7.7 Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.

CCSS.ELA-Literacy.RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

CCSS.ELA-Literacy.W.7.3 Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.

CCSS.ELA-Literacy.SL.7.6 Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when in-

dicated or appropriate. (See grade 7 Language standards 1 and 3 here for specific expectations.)

CCSS.ELA-Literacy.W.7.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

We read on page 39 Digoy’s statement, “We need something to protect the fish. Especially the young fish.” The author says also on page 39, “Digoy’s commitment is very important. Protected areas don’t stay protected very long unless people living nearby, such as Digoy, see them as a good thing. The local people are the ones who must guard the reserves and provide the grassroots political support that will keep them closed to fishing.”

- Prepare a mock trial of a fisherman who travels into the closed Handumon Marine Protected Area to collect seahorses to feed his family and pay some unexpected medical bills. You may wish to have a few students serve as local reporters, foreign reporters, and reporters from various organizations such as PETA that have very different perspectives.
- Explore the meaning of “grassroots political support” in context with Handumon Marine Protected Area. Find an analogous situation close to where you live. Come to a consensus about how to improve the situation in your area. Create a political support plan that you are able to implement. Take some small step to improve the situation, either as a school or class or individual.

Common Core Connection

CCSS.ELA-Literacy.W.7.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

CCSS.ELA-Literacy.W.7.7 Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.

CCSS.ELA-Literacy.SL.7.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others’ ideas and expressing their own clearly.

CCSS.ELA-Literacy.W.7.3 Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.

CCSS.ELA-Literacy.W.7.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

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The book says that about 96 million people live on 4,000 of the 7,107 islands in the Philippines.

- Have students compare this area to their state. Make an overlay that shows the Philippine Islands. Take this overlay and project it on a United States map that includes your state. How much area do these islands contain? If these islands were compressed and were put in their state, how much of the state would it encompass?
- Research the more than 3,000 islands that are not populated. What are these islands like?
- Compare the geography, landforms, climate, habitats, and other elements of the Philippines to the region in which you live. Prepare an online presentation or an illustrated report showing the similarities and differences.

Common Core Connections

CCSS.ELA-Literacy.W.7.7 Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.

CCSS.ELA-Literacy.RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

CCSS.ELA-Literacy.W.7.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

CCSS.ELA-Literacy.W.7.6 Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.

CCSS.ELA-Literacy.RH.6-8.7 Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

Amanda Vincent did not intend to study seahorses. She planned to study politics and language in college. In fact, she says that she “*managed to avoid science until her last year in high school.*” (p. 15). Yet here she is today with a Ph.D. and heavily involved in the study and conservation of seahorses.

- Share with classmates what you predict happened in Vincent’s senior biology class that inspired her to become a seahorse scientist.

- Discuss things that inspire you enough to change your behavior. What circumstances would motivate you to decide on a career in science?

Common Core Connections

CCSS.ELA-Literacy.W.7.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

CCSS.ELA-Literacy.SL.7.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others’ ideas and expressing their own clearly.

CCSS.ELA-Literacy.SL.7.1a Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

Other Websites to Explore

Seahorses

animals.nationalgeographic.com/animals/fish/sea-horse
Information and photographs about seahorses from National Geographic.

Nova – The Kingdom of the Seahorse

www.pbs.org/wgbh/nova/seahorse

A companion website for Nova’s program *The Kingdom of the Seahorse*, which aired in 1997. Site provides additional information on Amanda Vincent’s research and on seahorses, along with photographs of many different types of seahorses.

Guide created by: Ed Spicer, curriculum consultant, and Lynn Rutan, retired middle school librarian, now reviewer and blogger at *Bookends: the Booklist Youth Blog*

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