

Curriculum Connections for *NINJAS, PIRANHAS, AND GALILEO*

By Greg Leitich Smith
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Science Content Standards: 5-8

Ninjas, Piranhas, and Galileo has broad curriculum connections, particularly in the Sciences. It may be used to address 3 of the 7 Content Standards in Science that underlie the *National Science Education Standards* as published by The National Academies of Sciences (1995). <http://books.nap.edu/html/nses/html/6d.html>

CONTENT STANDARD A: Science as Inquiry

As a result of activities in grades 5-8, all students should develop

- Abilities necessary to do scientific inquiry
- Understandings about scientific inquiry

CONTENT STANDARD C: Life Science

As a result of their activities in grades 5-8, all students should develop understanding of

- Structure and function in living systems
- Regulation and behavior
- Populations and ecosystems

CONTENT STANDARD G: History and Nature of Science

As a result of activities in grades 5-8, all students should develop understanding of

- Science as a human endeavor
- Nature of science
- History of science

Ten Thematic Strands in Social Studies

Ninjas, Piranhas, and Galileo also may be used to address 4 of the Ten Thematic Strands in Social Studies that underlie the NCSS (National Council for the Social Studies) Standards as published in *Expectations of Excellence: Curriculum Standards for Social Studies*(1994). <http://www.socialstudies.org/standards/2.0.html>

STRAND IV. Individual Development and Identity

Social studies programs should include experiences that provide for the study of individual development and identity.

STRAND V. Individuals, Groups, and Institutions

Social studies programs should include experiences that provide for the study of interactions among individuals, groups, and institutions

STRAND VI. Power, Authority, and Governance

Social studies programs should include experiences that provide for the study of how people create and change structures of power, authority, and governance.

STRAND X. Civic Ideals and Practices

Social studies programs should include experiences that provide for the study of the ideals, principles, and practices of citizenship in a democratic republic.

Standards for the English Language Arts

Ninjas, Piranhas, and Galileo also offers many curriculum connections in the Language Arts. It may be used to address 6 of the twelve standards as published in *Standards for the English Language Arts* by the NCTE (National Council of Teachers of English) and the IRA (International Reading Association) (1996). <http://www.ncte.org/standards/standards.shtml>

Standard 1

Students read a wide range of print and non-print texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.

Standard 5

Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.

Standard 6

Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language, and genre to create, critique, and discuss print and non-print texts.

Standard 7

Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data

from a variety of sources (e.g., print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience

Standard 8

Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

Standard 12

Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

National Standards for Music Education

Finally, *Ninjas, Piranhas, and Galileo* also offers curriculum connections in Music content through its many references to the music of Bach and the use of music in botanic experimentation. The novel may be used to address 3 of the 9 standards as published in *National Standards for Arts Education* by the MENC (The National Association for Music Education) (1994). <http://www.menc.org/publication/books/standards.htm>

Standard 7

Evaluating music and music performances.

Standard 8

Understanding relationships between music, the other arts, and disciplines outside the arts.

Standard 9

Understanding music in relation to history and culture.

Curriculum Summary

Science content standards may be addressed in relation to the scientific experimentation theme in *Ninjas, Piranhas, and Galileo* as well as through study of piranha food preferences, cruelty to animals, and the general botanic inquiry regarding the effects of varying environmental influences when raising plants. Music curriculum ties arise from this last inquiry as well as study of the effect of Baroque music on humans. In addition, many of the Social Studies strands and Language Arts content standards can be addressed when working with the social, cultural, and judicial themes in the novel.

Find Out More

About the Author: Students may wonder what life experiences led Greg Leitich Smith to write a novel with strong science and judicial themes. Read more about him at www.gregleitichsmith.com.

About Galileo Galilei: Thoroughly explore the topic of Galileo at the Rice University hypertext site entitled *The Galileo Project* at <http://es.rice.edu/ES/humsoc/Galileo/> and at the Institute and Museum of the History of Science, Florence, Italy page at <http://galileo.imss.firenze.it/museo/b/egalilg.html>.

About Johann Sebastian Bach: Find everything from biographies and a timeline to midi files of Bach's music at the J.S. Bach Home Page <http://www.jsbach.org/>.

Hands-on Activities

Newsweek's Got it Covered!: In the novel, we learn that the Peshtigo School Student Court has been featured in *Newsweek* magazine as a model program. Provide students with the opportunity to become familiar with *Newsweek* in print by providing back issues of the magazine from the library media center or donors. Visit the magazine website http://www.msnbc.com/news/NW-front_Front.asp as well as the *Learning with Newsweek* website http://www.msnbc.com/news/NW-LEARNING_Front.asp. Once students are familiar with the editorial style of the magazine, ask them to write a cover story on the school, focusing on its long history, offering either a positive or negative slant on its many particulars in the areas of education, socialization, and ethics. [For help in teaching journalistic skills, visit the *New York Times Learning Network* "Daily Lesson Plan" on Journalism <http://www.nytimes.com/learning/teachers/lessons/journalism.html>] **Should we do more than Newsweek?**

Peshtigo School Student Court Makes the News: Having studied *Newsweek* and its editorial style, ask students to write a follow-up article to the original Peshtigo School Student Court article published there. This time, the article will focus on the Students of the Peshtigo School v. Brandenburg trial. Encourage students to produce sidebars about the personalities involved, including Honoria Grob, Public Defender, Goliath Reed, Attorney General, and Elias Brandenburg, Defendant. Once final copies of the article are produced, students may exchange articles and create letters to the editor in response to each other's articles. [For further assistance in teaching journalism and writing in general, consult *Free to Write: A Journalist Teaches Young Writers* by Roy Peter Clark (Heinemann 1995)]

Metaphorically Speaking: In the love letter that Shohei sent to Honoria on behalf of Elias, he ended with a metaphor: *Will you be the helium in my balloon?* Honoria assumes this note is from Goliath Reed who frequently uses metaphor during Student Court speeches, such as *balancing the scales of justice toward public safety*. Encourage students to write creative metaphors such as Shohei's. Clever illustrations will bring the metaphors to life and tap into the talents of

artistically gifted students. When complete, create a PowerPoint presentation to share with other classes.

Order in the Court: Author and attorney Greg Leitich Smith did not invent the idea of student courts for *Ninjas, Piranhas, and Galileo*. In fact, there are student courts operating across the country, including Tanglewood Middle and Mauldin High Schools in Mauldin, South Carolina <http://www.thestate.com/mld/state/4648127.htm> and in two Minneapolis schools, Webster Open School and Four Winds Elementary School <http://www.ojp.usdoj.gov/eows/studentcourt.htm>. Ask students to do some reading about school courts. The American Bar Association has produced a bulletin entitled *Youth Court: A National Movement* by Paula A. Nessel <http://www.abanet.org/publiced/tab17.pdf> which will offer them an overview of the movement of teen courts in general.

Once they are grounded in the topic, compile a list of potential cases that the Peshtigo School Student Court might have tried since its inception. Begin by brainstorming the behaviors that lead students to trouble in middle schools, including situations in their own school. Consider reading *Nothing But the Truth* by Avi (Flare 1993) as you undertake this activity.

[You may want to contact The Louisiana Center for Law and Civic Education Lending Library at (800) 421-5722, ext. 129 and request the loan of *Minneapolis Webster Open School Student Court*, a draft of the mission statement and procedures for a student court http://www.lsba.org/lce/html/lceLendingLibrary_Items.asp?typecode=E]

Heretically Speaking: Invite students to investigate the charges of heresy against Galileo Galilei in regards to his assertion that the earth revolved around the sun. Begin by reading *Galileo* by Paul Mason (Heinemann 2001), *Galileo Galilei: Inventor, Astronomer, and Rebel* by Michael White (Blackbirch 1999), and 1997 Caldecott Honor Book *Starry Messenger* by Peter Sis (Farrar Straus & Giroux 1996). Then visit the Rice University hypertext site entitled *The Galileo Project* at <http://es.rice.edu/ES/humsoc/Galileo/> and the Institute and Museum of the History of Science, Florence, Italy page at <http://galileo.imss.firenze.it/museo/b/egalilg.html>. When students have sufficient background knowledge, stage the trial against Galileo, borrowing techniques from *Ninjas, Piranhas, and Galileo* and remaining true to his conviction and sentencing.

Three Heads Are Better Than One: Elias's sister Anna conducted the best science fair project in the history of Peshtigo School involving three-headed planaria. Honoria became fascinated by the project and posed a series of questions about it to Elias. Supply your students with planaria and invite them to conduct regeneration experiments and perhaps to answer Anna's questions on page 18. Planaria for study are available from Science Kit & Boreal Laboratories <http://www.sciencekit.com/>. More planaria information is available at *The Planarian Home Page* <http://ourworld.compuserve.com/homepages/GIsenberg/planaria.htm>.

The Green Thumb Print: The Peshtigo School Atrium Garden is more than just a setting detail in *Ninjas, Piranhas, and Galileo*. It plays a pivotal role in the action of the story. Author Greg

Leitch Smith based the garden on the Lincoln Park Conservatory in Chicago. After reading more about the Conservatory <http://chicago.citysearch.com/feature/14888/> and paying close attention in the novel to the structural details (such as the wrought-iron gate and the koi pond) as well as the botanical details of the garden, create a landscape design accompanied by a botanical guide to the plants included, such as hurricane and cabbage palm, coromandel plant, Abyssinian banana tree, chenille plant, avocado, and orchid. Visit the library media center to research these plants in botanical field guides and reference books.

Faster than the Speed of Light: The plant experiment that Elias conducted (and that Shohei failed to conduct) made use of Wisconsin Fast Plants. Begin by learning more about Fast Plants online <http://www.fastplants.org> and ordering them for your classroom. Once the class has read about Fast Plants, invite them to try to duplicate Elias' experiment in order to obtain experimental confirmation of Elias' results. The Fast Plants website offers extensive instructions for growing your plants. Be sure to use the scientific method (which Shohei did not do!) in conducting your experiment. Try the *NASA SciFiles* site for a better understanding http://whyfiles.larc.nasa.gov/text/kids/Research_Rack/tools/scientific_method.html. [An excellent and more sophisticated discussion of scientific method for teachers to consult is *Experimental Science Projects: An Intermediate Level Guide* <http://www.isd77.k12.mn.us/resources/cf/SciProjInter.html>] Remember, as Elias says, "One of the prime commandments of modern science [is]: *Thou shalt obtain experimental confirmation.*"

To Cheat or Not to Cheat, That is the Question: Even after studying the scientific method, students may still feel that Elias was cheating to repeat Johann Christoph's science fair project. Discuss this question as a class. Then, invite students to write a persuasive essay arguing for or against Elias as someone who was merely cheating (or, alternately, was a slacker taking the easy route to his science fair project). **Remind students that a well-structured persuasive essay must have at least three arguments to support the claim (or thesis) and two supporting examples or pieces of evidence for each argument.** ← I'm not sure I completely agree with this ☺ You'll find an excellent persuasive essay outlining tool on the web at <http://members.shaw.ca/mrs.armstrong/Persuasive%20Essay%20Outlining.html>.

Bach and the Brain: Dr Erich Brandenburg, Elias's father, has a PhD in both music and physics. When Elias hears his father playing Bach's music on his cello, he knows there is trouble brewing, as does his dog, Beastmaster VII. However, it is possible that Elias misses some fine opportunities to improve his grades when he heads for cover!

With your students, read more about Bach in *Introducing Bach* by Roland Vernon (Chelsea House 2000), online at the *J.S. Bach Home Page* <http://www.jsbach.org/>, and in reference books in the library media center. Then invite students to listen to Bach's music. [Visit the library to borrow CD's if they are not in your personal collection, or visit websites with Bach midi files <http://www.jsbach.org/websites.html>.]

Next, introduce students to the brain research that reveals a link between increased learning and Baroque music. Share *Music and the Brain* by Laurence O'Donnell <http://www.epub.org.br/cm/n15/mente/musica.html>. Ask students to conduct an experiment, using the scientific method. As in the planaria research, refer to the *NASA SciFiles* site for a better understanding http://whyfiles.larc.nasa.gov/text/kids/Research_Rack/tools/scientific_method.html. Test the hypothesis that learning improves when studying takes place while listening to the music of Bach. Record and compare results.

Piranha Prohibition: As author Greg Leitich Smith relates in his Author's Note, piranhas are illegal in his home state of Texas. Luckily for Honoria (whose science fair question is *Can you teach a piranha that he'd rather eat a banana than flesh?*), they are not illegal in Illinois. . Read *Piranhas* by Prof. Manolito-Pinkguni (Chelsea House 1998) and then visit the library media center to learn more about piranhas. Students can also read more about this argument, and see whether their state outlaws piranhas, online at *The Law and Piranhas* by Frank Magallanes http://www.angelfire.com/biz/piranha038/Laws_and_Piranhas.html. You might also consider asking a Fish and Game Department Warden to come speak on the topic.

After students complete their research, ask them to weigh both sides of the issue, and then, using a Pro/Con Scale graphic organizer, available on the Freeology site http://www.freeology.com/graphicorgs/homeframes/proconscale_home.html, decide individually and as a class whether piranhas should be illegal in this country.

The Chicken-Fried-Steak Debate: Freddie Murchison-Kowalski, the head of the Peshtigo School Union of Students Concerned about Cruelty to Animals, put together and posted on school bulletin boards a list of "101 Ways to Kill a Person with Chicken-Fried-Steak" as a protest against inhumane treatment of cattle, hormones in beef, cholesterol, and the school cafeteria. In addition, she created the Gloriana Biddulph Memorial Science Fair animal rights pledge, based on allegations of cosmetic companies' treatment of rabbits, auto companies' treatment of monkeys, and testing the effect of geese on jet engines. Invite students to investigate whether these allegations are true; research the use of animals in medical and scientific research; research cruelty to animals and animal rights; and then create either Freddie's 101-item list or her animal rights pledge; also invite students to debate whether, and to what extent, animals should be used in research. Consider using the four volume reference set, *Exploring Animal Rights and Animal Welfare* (Greenwood 2002). You might also want to consult or sign up to receive American Humane's Animal News Center newsletter <http://www.anc.org/newsletter/>

The O'Leary Legend: Shohei O'Leary says, "But we live in Chicago, and our name is O'Leary. As in the cow and the fire." Mrs. Kate O'Leary's cow had a fabled role in The Great Chicago Fire (October 1871). Investigate the theories about the Great Chicago Fire in Jim Murphy's 1996 Newbery Honor book, *The Great Fire* (Scholastic 1995) and online at the Chicago Historical Society website <http://www.chicagohs.org/fire/oleary/>. [Hint, look for the name Peshtigo in your research!]

Crossing Cultures: Discuss Shohei's dilemma with his parents who want to immerse him in all things Japanese because he is an adopted Japanese-American boy living in an Irish family. As a follow-up to this discussion, stage a debate about this topic: Do cross-culturally adopted children need to be exposed to the ancestral culture of their birth parents? Students may want to use Shohei's experiences in their arguments as well as personal experiences. Also consider sharing Michelle St. Martin's article, *How Important is Racial/Cultural Identity?* <http://preconception.com/resources/articles/transracialpt2.htm> to enrich student discussion and debate.

Ikebana: In her effort to provide Japanese cultural experiences for Shohei, Mrs. O'Leary teaches her son and his friends ikebana, a form of Japanese flower arranging. With your students, learn about ikebana online at the *Ikebana* website <http://www.jinjapan.org/kidsweb/virtual/ikebana/ikebana.html>. Then try your hands at moribana or heika in your classroom (locate someone in the community to visit your classroom and share his or her knowledge, if possible) or virtually at *Virtual Ikebana* <http://www.jinjapan.org/kidsweb/virtual/ikebana/virtual-ikebana.html>. [Note: you will have to install Shockwave plugin on your computer