



Becoming *Environmentally* *Literate* Citizens

— Susan L. Groenke and Randall Puckett —

The RAFT technique (Santa 1988) is a writing strategy that helps students understand their **Role** as a writer, the **Audience** they will address, various **Formats** for writing, and the expected **Topic** or content. Figure 1 lists examples for each of the categories.

To implement this technique, a science teacher might assign a topic such as genetic cloning to the class. The class would then brainstorm different people and/or objects associated with the topic to get ideas for “roles” or perspectives students could write from and “audiences” students could write for. The teacher and students could also brainstorm different kinds of genres, or writing formats (e.g., a letter, poem, or journal entry), that students could use to write about the topic. Then students could choose a role or perspective, the audience they will address, and the format in which they will write from the brainstormed lists.

*Students use
the RAFT
writing strategy
to address land
development issues*

FIGURE 1**Examples for each category in a RAFT writing assignment.**

Role	Audience	Format	Topic
<ul style="list-style-type: none"> ◆ Inventor/scientist ◆ Historian ◆ Journalist ◆ Person living during a particular time period ◆ Victim ◆ Animal/object 	<ul style="list-style-type: none"> ◆ Community ◆ Jury ◆ President ◆ Boss/superior ◆ Family/parents ◆ Fictional character ◆ Self 	<ul style="list-style-type: none"> ◆ Poem ◆ Editorial ◆ Newspaper article ◆ Letter ◆ Interview ◆ Diary/journal ◆ Political cartoon ◆ Party invitation ◆ Resume 	<ul style="list-style-type: none"> ◆ Issue relevant to classroom study or unit/lesson focus ◆ Issue relevant to text/time period ◆ Personal interest

For example, after conducting research on genetic cloning, one student could choose to write as one of the scientists responsible for discovering that genetic cloning is possible. The student could address the president in a letter requesting funds to support further research, or the student could write a diary entry, imagining the ethical and moral issues the scientist grapples with as a result of the discovery. Resources for including the RAFT strategy in various other science disciplines are found in Figure 2.

Creating environmentally literate citizens

We used the RAFT strategy with our 11th-grade vocation-track environmental science students because we saw its potential in helping us shape our students as the environmentally literate citizens the North American Association of Environmental Education (NAAEE) imagines them to be: thoughtful, skillful, and active citizens in a democracy who can make informed environmental decisions that consider future generations.

Environmental citizenship, the NAAEE asserts, cannot be developed through a “fact-by-fact, piece-by-piece examination of our environment,” but rather through a sophisticated understanding of interconnected systems. Accord-

FIGURE 2**Resources providing science-related RAFT topics and resources.**

Internet sites

- ◆ **RAFT Writing Strategy**

<http://web.grps.k12.mi.us/academics/5E/raft.html>

Provides examples of various roles, audiences, and formats for writing about cells in the high school science classroom. Also includes a generic graphic organizer.

- ◆ **Come Aboard a RAFT!**

www.geocities.com/writingprocess/rafts.htm

A technology-enhanced interactive RAFT format. Science topics include conservation, junk food, and outer space.

- ◆ **RAFT—Role/Audience/Format/Topic**

www.somers.k12.ny.us/intranet/reading/RAFT.html

Provides an example of taking the perspective of a desert inhabitant (e.g., cactus, nomad, camel).

- ◆ **Strategies for Reading Comprehension**

<http://curry.edschool.virginia.edu/go/readquest/strat/raft.html>

Provides a blank RAFT form for download.

- ◆ **Instructional Strategies Online**

<http://olc.spsd.sk.ca/DE/PD/instr/strats/raft>

Provides a generic rubric.

Books

- ◆ **Classroom strategies for interactive learning** (Buehl 2001).

Provides examples of various roles, audiences, and formats for writing about the following topics: digestive system, evolution, ozone layer, the Sun's role in plant growth, how yeast works in bread, effects of smoking, and prenatal nutrition. Also provides a “role definition matrix” that students can use to brainstorm how their roles connect to the topic.

- ◆ **Subjects matter: Every teacher's guide to content-area reading** (Daniels and Zemelman 2004). Provides examples of various roles, audiences, and formats for writing about radioactivity.

- ◆ **Real reading, real writing: Content-area strategies** (Topping and McManus 2002).

Provides examples of various roles, audiences, and formats for writing about the first successful vaccination in 1796. Also provides a revision strategy, an editing checklist, and an example of student work.

ing to the NAAEE, environmentally literate citizens understand that the interrelated, dynamic systems we create—our societies, political systems, economies, religions, cultures, and technologies—affect the total environment. NAAEE, in its *Learning Guidelines* (2006), states that environmental citizens should be able to:

- ♦ articulate a position on an environmental issue (Strand 3.2.A.1)
- ♦ recognize diverse cultural views about humans and the environment (Strand 2.3.B.2)
- ♦ analyze how the actions of businesses or community groups may have environmental consequences (Strand 2.3.A.2)
- ♦ explain current and historical environmental issues in terms of political and economic ideas (Strand 2.3.C.4)
- ♦ evaluate the cumulative effects of human actions on a specific species or environmental system, such as a stream or a watershed (Strand 2.4.A.4)
- ♦ explain the importance of place to human identity (Strand 2.4.B.2)
- ♦ identify links among issues, for example, the

FIGURE 3

The Retail-Giant RAFT.

Role	<ul style="list-style-type: none"> ♦ Wetland conservation group president ♦ Sports association parent whose kids play on teams ♦ Member of the Puckett family (owners of a local fruit farm) ♦ High school band member who sells the Puckett fruit for band trips ♦ Local retired person on a limited income who shops at the Puckett farm ♦ Girl scout troop member who uses the apple sales for fund-raisers and always visits the corn maze in fall ♦ Local high school dropout who needs a job to support three children ♦ City council member ♦ Building supply owner or builder with Retail-Giant contract ♦ Local Retail-Giant manager
Audience	Local community
Format	Letter to the editor of a local newspaper
Topic	<p>A 50-acre streamside tract of undeveloped land contains a 10-acre wetland that is upstream of the local water supply plant. A local conservation group owns the wetland.</p> <p>The tract also has a 10-acre soccer/baseball/softball complex that is widely used by the children of the town and owned by the town sports association, a nonprofit group.</p> <p>The Puckett family has operated an organic sustainable farm on the other 30 acres for years. They have an award-winning peach and apple orchard that supplies local people with quality, tasty fruit at low prices. The Pucketts donate 20% of their fruit to local charities and school groups to sell as fund-raisers.</p> <p>The Puckett farm also grows a special organic corn crop that draws people from miles around. The crop is fertilized from the chickens raised on the Puckett farm, which feed on the corn. The Puckett cornfield becomes a corn maze in the fall, offering low-cost entertainment for many. The Pucketts want to keep their land and continue to farm it.</p> <p>Retail-Giant wants to build a new super-sized mega store on this 50-acre tract of land. The Retail-Giant developers say the store will provide employment for 500 people; however, these jobs will only pay slightly more than minimum wage. The local town government supports the idea, as it wants to get the millions of dollars in sales tax per year, which is currently going to a nearby city where another Retail-Giant is located. [In Tennessee, counties and cities may add another 1.5% to 2.75% to the state sales tax. For example, Maryville adds 2.25% in addition to state sales tax of 7%. Maryville reports over 9 million in sales tax revenues for fiscal year 2006.] A commercial builder and a building supply store owner are both city council members who have contracts with the Retail-Giant development division. They have swayed the government to take the land by the power of eminent domain to give it to Retail-Giant to build the store.</p>

relationships among traffic congestion, poor air quality, and suburban sprawl (Strand 2.4.E.3).

We believe the RAFT writing strategy can help meet these standards in the environmental science classroom, as it:

- ◆ helps students make connections between prior and new knowledge, and among inter-connected concepts, and provides a context for thinking deeply about a topic;
- ◆ occupies a middle ground between standard, dry essays and free-for-all creative writing (Topping and McManus 2002);
- ◆ encourages personal engagement, which can make informational writing more powerful as students have an opportunity to share an opinion or viewpoint that may broaden others' viewpoints;

- ◆ provides students choices in their writing assignments (we believe student choice increases their motivation to write and quality of text production);
- ◆ encourages students to think beyond the classroom; and
- ◆ is flexible, as teachers and students can develop any number of writing possibilities adjusted for skill level and rigor.

The Retail-Giant RAFT

We took advantage of these RAFT qualities in designing the Retail-Giant RAFT (Figure 3) to meet the NAAEE standards that guide our teaching. In developing the RAFT on the topic of wetland and farmland development for retail use, we facilitated connection-making and deep, reflective thinking about the interconnectivity of human actions and the environment. Helping students realize

FIGURE 4

Assessment rubric for Retail-Giant RAFT.

Criterion	Points awarded/Points possible
I. Content	
Articulate a position on an environmental issue (wetland development for retail use) from the perspective of someone affected by the issue	60 points total
Position articulated (wetland should or should not be developed and reasons provided)	____/20
Perspective clear (it is easy to understand whose perspective is shared)	____/20
Specific details supporting perspective of writer (at least two supporting details provided)	____/10
Use of content-specific vocabulary (use words we have talked about in class: wetland, conservation, organic, sustainable, community, land tax, eminent domain)	____/10
II. Format	
Write a letter to the editor of a local newspaper (follow conventions of letter to the editor)	40 points total
Brevity (most newspaper editorials are 200 or fewer words)—keep it short and sweet	____/10
Most intriguing details provided to grab attention	____/10
Polite, informative tone—you want the editor to read it!	____/10
No misspelled words or incorrect punctuation	____/10
	Point total: ____/100

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that the land development issue can be viewed from different perspectives—and understanding what frames of reference and cultural values influence those perspectives—allows them to view the world with a depth necessary for understanding such interconnected systems as human interaction and the environment.

For the purposes of our RAFT assignment, students chose a role or viewpoint of someone who would be affected by the development of a wetland/family farm into a site for a Retail-Giant, a retail shopping center. We assigned the audience (the local community) because we wanted students to articulate a position on the land development issue.

We chose a letter to the editor format (a letter students would write to the editor of their local newspaper about the issue) because it is usually written to offer an opinion or response to a local event/issue in an effort to inform and persuade other readers to agree. This format gives students practice with a tool

we consider pivotal in developing an environmentally literate citizenry: A letter to the editor can generate local media and public attention on an issue, educate the public, stir up a debate, or put elected officials on the spot. Perhaps most importantly for the classroom, letters to the editor are “short and sweet” and potentially less threatening to students who may not view themselves as strong, successful writers.

The topic chose us: A local wetland and family farm was being developed into a retail shopping center in our community at the time of this assignment. We hoped the local relevance of the assignment would help students engage in and take ownership of the issues involved with land development for retail use. The NAAEE explains that beginning “close to home” in the environmental science classroom helps students build connections with, explore, and understand their immediate surroundings. The sensitivity and skills needed for this local connection then provide a base for moving out into larger systems and broader issues.

Students' letters

Because students chose from the range of roles we provided, their responses varied dramatically and showed diverse perspectives. One student chose to write from the perspective of a single mother and high school dropout. She explained in her letter to the editor, “I know...the Puckett farm has been there as far back as I can remember but I can't raise my daughter on fruit. She needs diapers, wipes, clothes...Retail-Giant employees get 10% off all merchandise.” The “single mother” pointed out some of the economic implications and what she viewed as benefits involved with the development of land for retail use.

Taking on the role as local manager of the new Retail-Giant, another student identified economic benefits of the development as well. He wrote:

I think you should think about the people who need the jobs to feed their family. I understand about the loss of the local community. But we are gladly paying for the land through a high land tax. With this money, the city can fix roads and build a new sports center...And unlike the Puckett family, we have more fruits, as well as many other kinds of food...We also sponsor local charities.

One other student presented a different economic reality, however, when she wrote as a retired citizen on a limited income: “The Puckett farm allows me to get good quality food for a cheap price. They also donate some of their crops to charities, which helps people in need get food.” This “retired citizen” also seems to un-

derstand the importance of place to human identity, as she referred to the changes in personal and community identity that occur with changes to land use: "I am able to enjoy watching my grandchildren play soccer. Seeing the smiles on their faces really gets to me. It makes me remember the wonderful summers I spent on those same fields as a child, laughing and playing." This citizen also referred to the traffic that will result from the development, and links the loss of the recreational area and farm to obesity—"people will possibly...stop exercising"—and improper nutrition—"if people cannot get the fruit they need."

Writing as a member of the local Girl Scout troop, a student explained in her letter that their troop "will no longer get to sell the Puckett Family apples, get to play in the corn maze in the fall, and will lose touch with the community." She wrote, "If we don't have our apples and the corn maze, we will lose touch with the community. We need their support and we work for them. The community is the biggest reason we have a troop." This student understood how the Puckett farm plays a role in shaping personal and community identity.

Writing as a Puckett family member, another student put a human voice on the issue: "The land is all I have. We use our land for good things, growing crops and raising animals. We already have a Retail-Giant down the road. What gives you the right to take my land?"

And finally, one student, writing as a concerned community citizen, understood "runoff from the parking lots would damage the environment." He explained, "The runoff is the most important factor...the oil leakage poisons the soil." Another student writing as a concerned community citizen understood the threat to the wetland the Retail-Giant imposes. He wrote:

A wetland is a habitat to many animal species. To cut down the trees and fill in the water would be like destroying the homes of thousands of families. Many of these animals need the wetland and would die without it. The wetland is their home and it is also a great place to study animals in their natural habitats. Tell me, would you want someone to destroy your home?

Assessing the RAFT

Using the rubric we designed (Figure 4, p. 25) around our standards-based goals for the RAFT assignment, we read and scored the letters. Overall, we felt students' letters demonstrated their ability to articulate a position on an environmental issue from the perspective of someone affected by the issue. We also felt students' use of content-specific vocabulary and specific reasons supporting their perspectives on the issue showed their ability to connect prior knowledge they had learned in previous units of study on land use to a specific, "close to home" issue. We also felt confident about students' editorial writing abili-

ties, and encouraged many students to send their editorials to the local newspaper.

As confident as we felt about how much students had learned and what they were able to do, however, we wondered if we could do more to help students link individual parts to a system's "whole" picture. We realized we could have asked students to sit on a panel, presenting their different viewpoints to the class. This would have allowed every student to hear the multiple perspectives and thus perhaps consider the complexity and tensions surrounding the issue of land development in ways that solely writing a letter—from one perspective—did not encourage.

After hearing the multiple perspectives, we could have asked students to begin thinking about how a decision about land development could be made that best meets everyone's needs. This would allow us to link local economic issues to larger global influences, to consider future and distant consequences, and to assess different types of costs and benefits and their values, such as loss of clean air and water as a result of development. It would also allow us to raise awareness about the health and environmental benefits of choosing locally grown, organic produce over produce sold at large retail supermarkets that is often bred for long shelf-life (not always for taste or nutrition), and wastes more of Earth's resources as it requires packaging, refrigeration, and travel from farm distribution point to store. In short, we learned a lot, too, as we "RAFTed" with our students toward environmental literacy and citizenship.

The RAFT strategy has the potential to help students connect prior and new knowledge, to write in a rich context, and to develop literacy skills that will serve them far beyond the classroom. The RAFT technique deserves a place in any science classroom. ■

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