CHAPTER

3

WRITING *WITHIN* THE DISCIPLINES

Of the many eloquent and compelling definitions of what it means to write, the most insightful might have been expressed by Gloria Park many years ago, "Writing is a way of knowing."

An expanded analysis of writing comes in the College Board's report, *The Neglected R:* "If students are to make knowledge their own, they must struggle with the details, wrestle with the facts, and rework raw information and dimly understood concepts into language they can communicate to someone else. In short, if students are to learn, they must write" (2003, p. 9).

Colleen Zenner

Students in Colleen Zenner's high school science class jot down notes to organize their thinking before beginning a project.

Unfortunately, writing is still often overlooked in many subjects, even in some English Language Arts (ELA) classes, as the drive to *cover* content supersedes the need to *understand* content through writing. When writing is incorporated, it is often used as assessment rather than as a process for deepening learning. Furthermore, teachers of content areas do not see themselves as writing teachers—and often not as writers.

When asked to get on board with the school's new writing initiative, for example, a high school science teacher expressed frustration that she was expected to have students write lab notes in complete sentences with proper punctuation. "I want students to accurately jot down what they observe and not flower up their reports with metaphors or spend valuable time trying to figure out if a word needs to be capitalized," she explained. A math teacher spoke up in agreement, noting that he would be fine with having students interpret a graph in writing but didn't want them to write a poem about algebraic equations. Finally, one teacher said what everyone was thinking: "We have our own content to teach and we hardly have enough time to cover that—now we're supposed to teach writing? Isn't that a part of the English curriculum?"

In the past, the answer to that question would have been an unequivocal "yes," but recent research challenges the assumption that writing should be taught primarily in ELA classes. The reason? Writing varies so much from one discipline to the next that it is hard to define *good writing* as we may have done in the past. In fact, Arthur Applebee and Judith Langer (2013) point out that "the skills and strategies that work well for writing in an English class may not lead to effective writing in other subjects" (p. 7). Writing, as well as reading, is now understood to be rooted *within* the content areas, not across them.

Benefits of Writing Within the Disciplines

While writing has been a mainstay in social studies and ELA classes for years, we are now discovering the immense benefits of writing in math and science. Judy Willis, neurologist and teacher, has been championing the value of writing for some time because of its positive effects on learning and, amazingly, the brain itself. She recently wrote

> when it comes to math and science, writing brings more than literacy and communication advantages. The practice of writing can enhance the brain's intake, processing, retaining, and retrieving of information. Through writing, students can increase their comfort with and success in understanding complex material, unfamiliar concepts, and subject-specific vocabulary. When writing is embedded throughout the curriculum, it promotes the brain's attentive focus to classwork and homework, boosts long-term memory, illuminates patterns, gives the brain time for reflection, and when well-guided, is a source of conceptual development and stimulus of the brain's highest cognition. (Willis, 2011; originally published 2011© Edutopia.org; George Lucas Educational Foundation)

According to Willis (2011), writing is one of the most valuable practices teachers can use to further deep learning and creativity while supporting academic, social, and emotional intelligence. If there is a learning elixir, it may well be writing.

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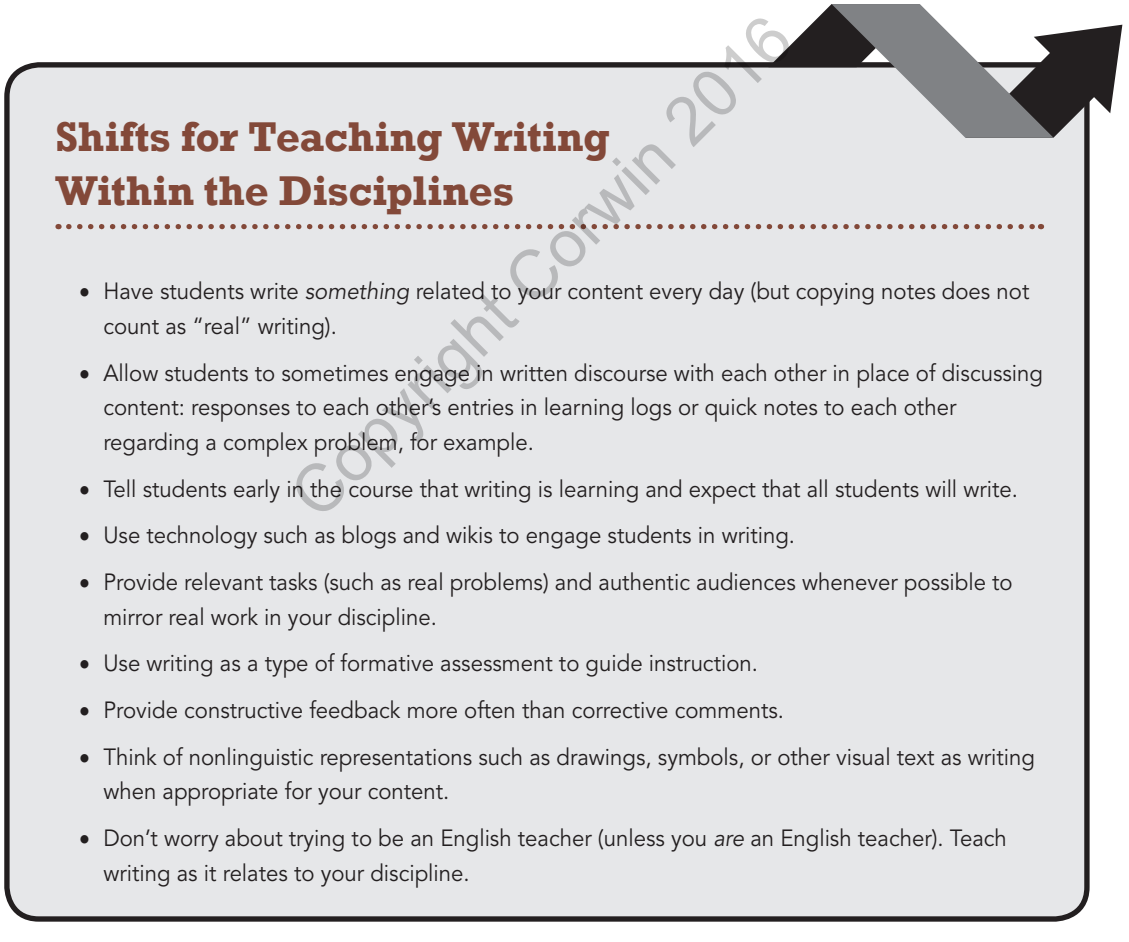
Shifts for Teaching Writing Within the Disciplines

Just as we looked at shifts for teaching reading within the disciplines, there are concrete shifts teachers can make to support content through writing. Applebee and Langer's (2013) groundbreaking work on writing instruction in the disciplines provides four important challenges that

relate specifically to the Common Core, next generation, and state standards—and many apply to the practice of writing:

- Maintaining a rich and broad curriculum
- Avoiding formulaic approaches to the teaching of writing
- Teaching argument well
- Embedding literacy in work appropriate to the discipline (p. 179)

I would include other, fairly easy changes teachers can make to take advantage of the magic of writing that are listed in the shaded box below.



Shifts for Teaching Writing Within the Disciplines

- Have students write *something* related to your content every day (but copying notes does not count as "real" writing).
- Allow students to sometimes engage in written discourse with each other in place of discussing content: responses to each other's entries in learning logs or quick notes to each other regarding a complex problem, for example.
- Tell students early in the course that writing is learning and expect that all students will write.
- Use technology such as blogs and wikis to engage students in writing.
- Provide relevant tasks (such as real problems) and authentic audiences whenever possible to mirror real work in your discipline.
- Use writing as a type of formative assessment to guide instruction.
- Provide constructive feedback more often than corrective comments.
- Think of nonlinguistic representations such as drawings, symbols, or other visual text as writing when appropriate for your content.
- Don't worry about trying to be an English teacher (unless you *are* an English teacher). Teach writing as it relates to your discipline.

Teaching writing is similar to teaching reading: Each discipline has something different to offer students, and they need to experience writing from every academic angle. How does writing vary among the disciplines? Let's look at each one individually.

Writing Within Science

Traditionally, science writing has been limited to copying notes (or taking notes as a teacher lectures) and creating lab reports, which often are so formulaic that the writing is rote, requiring little thinking. Most often, as noted earlier, writing has been used as a method to test recall of information, not necessarily as a way of building knowledge or making sense of growing understandings. As one student said of her recent writing experience in ninth grade, "We copied notes from each other. We just needed to have something from each chapter in our notebooks."

In classes where writing is used as a tool for thinking and understanding, science teachers incorporate a variety of practices to motivate students to write reflectively and thoughtfully each day. Many use interactive notebooks or science journals where students do more than answer questions; they draw illustrations or charts, write about observations, or engage in written dialogues with another student "scientist." Such tools might include vocabulary charts where students conceptualize key terms through illustrations or connections, or they might even write stories about processes. One chemistry teacher redesigned the lab report so that students were better able to engage in thoughtful analysis by responding to the following questions:

- What do you see?
- And after data collection,
  - What do you think now?
  - What do you believe?
  - What does it mean?

The teacher extended the lesson by asking students to reflect through the question "Why do you care?" (Nachowitz, 2013, p. 107).

Characteristics of Writing Within Science

Scientific writing has the following characteristics:

- Technical, precise vocabulary is essential.
- Accuracy and exactness are favored over elaboration or craft.
- Verbs such as *demonstrate* are often changed to nouns such as *demonstration*.
- Observations are often written in bullet points, lists, or phrases.
- Sentence fragments or questions may be turned into complete thoughts only if the goal is to communicate.
- Passive voice is preferred, such as "The result was determined to be" in place of the active voice used in ELA classes, such as "I determined that . . ."
- Words may be minimal, used in conjunction with illustrations, charts, drawings, or data.
- Communication of ideas is clear and often systematic.
- Correctness is paramount but "overclaiming" is suspect.
- Descriptions of natural phenomena or the exploration of problems that have no definite solution may seem "wandering" or disorganized, especially when written as observations.

Students who learn to write in science must have many opportunities to engage with content, generate questions, reflect on new learning, and use writing as a tool for thinking.

Writing Within History and Social Studies

Social studies as a discipline has always valued writing as a way of interpreting, organizing, and clarifying the many dimensions of the subject. In fact, a position statement from the National Council of Social Studies (NCSS; 2008) states clearly that "Challenging social studies instruction makes use of regular writing." Students are expected to analyze and synthesize material across texts in writing, as evidenced by the document-based questions that dominate social studies curricula and tests.

Perhaps the most significant deterrent to writing within social studies is the push to cover so many topics, but, again, the NSSC encourages that key concepts and themes be developed in depth and that teachers "not diffuse their efforts by covering too many topics superficially" (2008). Such depth requires many forms of writing.

Forms of Writing Within History and Social Studies

The many creative and varied forms of writing that are available to social studies teachers may include the following:

- Response journals for current events, topics of study, or primary-based documents
- Timelines with accompanying narratives or illustrations
- Research on topics to expand and communicate new learning
- Summarization and synthesis of events from multiple sources
- Investigations of events and writing from a certain time period
- Biographical reports
- Interviews with experts in your field (see pages 132–134 for more information)
- Graphic organizers or essays that show comparison/contrast, cause/effect, major event/contributing factors, or sequence of events
- Argumentative essays defending a position based on evidence
- Short stories or other creative writing based upon historical events
- Writing for social justice causes
- News articles, song lyrics, speeches, or diaries created during a particular time period in history

There is no one way of writing in social studies because the topics and genres are so broad, as we see in the shaded box on page 19. Especially in this discipline, teachers can utilize writing every day in some form as students reinforce and internalize their understanding of history and social studies.

Writing Within Math

Math is a bit trickier when it comes to literacy because math "language" is composed of representations and symbols.

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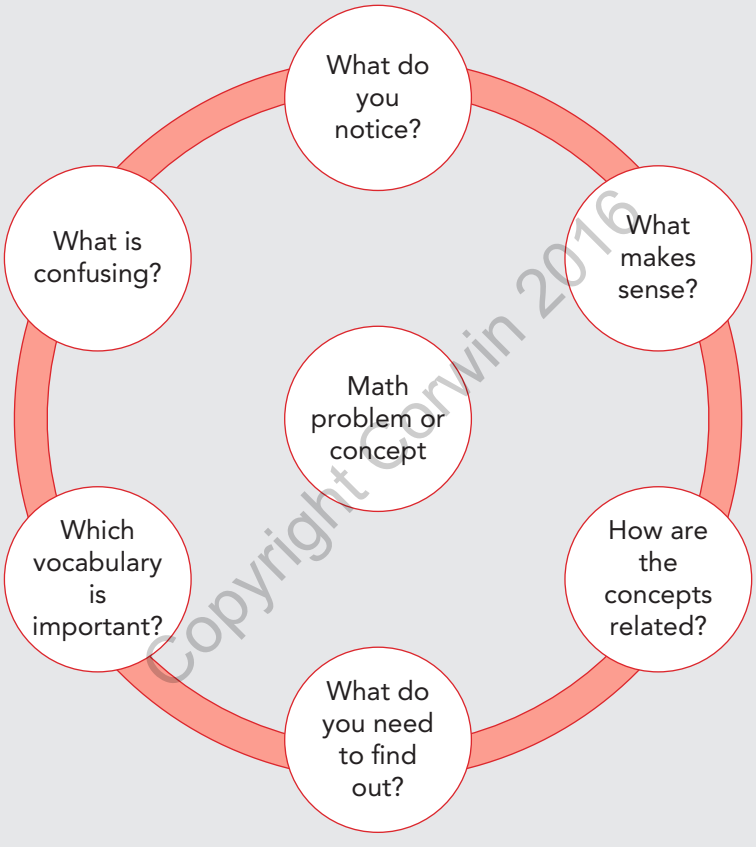
For that reason, there is very little writing in most math classrooms, though there is strong evidence that when students explain their thinking through writing in math classes, they deepen conceptual understandings (Mastroianni, 2013).

The most common writing application in math is the open-ended response question, which may resemble multiple-part word problems where students explain, justify, describe, estimate, or analyze mathematical calculations. They may also be asked to persuade others of their reasoning or adapt math to real-world situations where they create a plan or explain a construction. Often, a prewriting activity, such as the one in Figure 3.1, is useful so students can think through the process before beginning the writing. After prewriting, students may be ready to address a prompt similar to the following: Explain how you will solve the problem. Include reasons, supporting details, and examples when appropriate.

Tina Reckamp, middle school math teacher, created a website to help other teachers promote the use of literacy in math. She calls it "Read Math, Write Now." See Spotlight on Math on page 70 for her suggestions for helping teachers incorporate writing into math curricula.

Figure 3.1

Prewriting Prompts for a Math Problem or Concept



Spotlight on Math

Tips for Incorporating Literacy Into Math

Contributed by Tina Reckamp

- Provide a picture/visual that corresponds to the writing prompt or concept you are currently teaching.
- Try the "less is more" strategy: Students are given a small writing space such as a quarter sheet of paper. Have them fill up the entire small space which seems less intimidating than a whole sheet of paper.
- Use a math word wall to help with vocabulary.
- Treat math story problems just as you would a story. Identify characters and main ideas in the math story. This makes it much easier for kids to talk and write about math.
- Incorporate math pen pals/letter writing. Students share ideas about math with students in another math class or another content-area class within the same school.
- Be okay with writing just to write. Sometimes, students write about their goals for the quarter, reflections on their work, or even a "Dear Teacher" letter. Ongoing writing is essential in creating literacy in math.
- Let students respond to one another. After having them write for several minutes about a prompt, ask students to swap writing notebooks with a classmate and respond in some way, such as adding an additional idea to their peer's notebook, writing about whether they agree with their partner's reasoning and so on. The students now have an audience for their writing, which provides motivation.
- Utilize two-column writing when appropriate. Options with this are limitless. Students divide their paper into two columns with a vertical line. On one side, they might record main ideas of the section and on the other questions about the ideas—or key math

words on one side and a rating of their understanding of the words on the other.

- Provide problems along with their answers and have students justify why the answer is correct or incorrect.

Tina Reckamp

Tina created an activity where students write on small note pads using new vocabulary words. Classmates respond with "I agree" or "I disagree" and state why. They then pass their pads back to the original writer. Tina hangs the pads on the wall for all of her students to see.

Writing Within ELA

It may seem redundant to address writing in ELA since writing seems synonymous with the discipline itself, but a national survey conducted by Applebee and Langer (2013) found that while students may write more in ELA classes than in other disciplines, the writing often does not emphasize problem solving and inquiry or engage students in

Teaching students how to write well by focusing on context, purpose, and audience prepares them for the demands of a timed essay in ways that stilted practice simply cannot.

extended writing projects. You can guess the type of instruction commonly found in many ELA classes: writing in preparation for high-stakes testing. Unfortunately, this approach not only limits students' range of writing opportunities but creates formulaic approaches that are counterproductive to learning through writing.

Many ELA teachers contend that they are the only ones left to address the test-taking genre, and that may be true, but a focus on disciplinary writing across all content areas will better prepare students for standardized tests than isolated test prep in ELA classes. And there really is little evidence to show that such instruction improves test scores. In fact, teaching students how to write well by focusing on context, purpose, and audience prepares them for the demands of a timed essay in ways that stilted practice simply cannot.

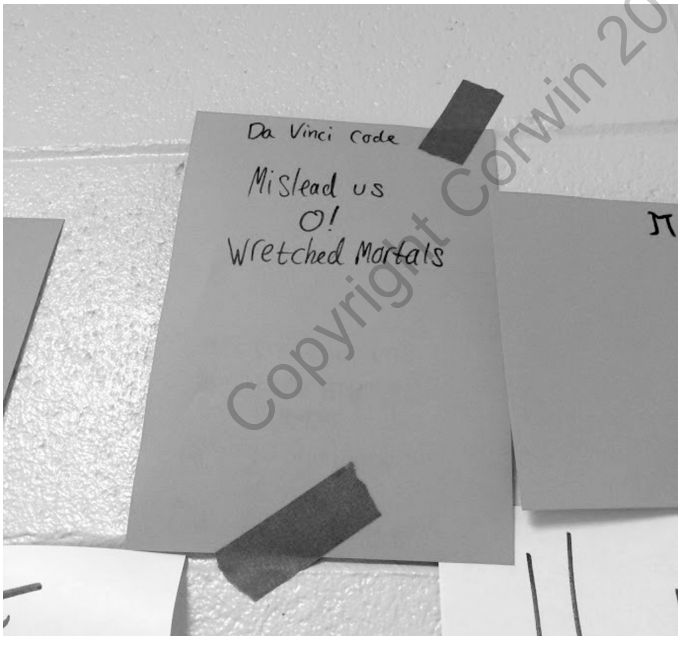
Exemplary Practices for Writing in ELA

Exemplary practices for writing in ELA include the following:

- Engaging in the workshop approach where the process of writing is integrated in all writing instruction
- Providing solid mentor texts and analyzing good writing to show students some of the moves that effective writers make; asking students to try imitating these moves
- Teaching students how to provide effective peer feedback (see Figure 3.2)
- Allowing time for students to respond to one another's writing and for revision of their own work
- Organizing study and writing around big ideas and essential questions
- Engaging students in a wide variety of writing genres and tasks
- Focusing on content overcorrectness
- Explicitly teaching students how to generate ideas, organize thoughts, and write with clarity
- Avoiding formulaic writing—and that includes the five-paragraph essay, which is a contrived construct for most "real" writing
- Encouraging writers through positive, targeted, and timely feedback

Spotlight on ELA (With a Beam of Math)

Imagine students writing for disciplinary purposes in every subject, every day, immersed, as most standards envision, in a wide variety of writing in all sorts of genres. In fact, it's hard to believe that students could possibly meet the CCSS and other standards' goals of developing compelling and complex pieces of writing that inform and persuade when they have little experience "wallowing" in words, experimenting with how different phrases create different effects, or feeling the satisfaction in having created a piece of writing that hits its mark. Students must try on the many types of writing required in each discipline in order to become fluent and confident writers capable of manipulating language to serve their purposes.



Katherine Schmitt

Katherine Schmitt, high school English teacher, celebrates Pi Day (March 14) by having her students write piku instead of haiku. She says, "Whereas a haiku is written in 5-7-5, a piku is written in 3-1-4. I asked them to write a piku of a book they have read." She then hangs all of the pikus on her classroom wall.

Questions (and Answers) About Writing Within the Disciplines

One of the reasons that I don't assign more writing is that I simply don't have time to grade 150 essays a week on top of the work students produce for my content. Any advice?

Students must try on the many types of writing required in each discipline in order to become fluent and confident writers capable of manipulating language to serve their purposes.

Where did we get the idea that every word students write has to be assessed, assigned a grade, and duly recorded to create a score that somehow reflects the writing worth of a student? Writing, as the National Council of Teachers of English (NCTE) (2008) maintains, "is not created by a singular, linear process; it cannot be taught, like bike riding, as a single skill; it changes with shifting technologies . . . it takes many forms; and it cannot be assessed effectively in a single sitting" (p. 3).

NCTE further argues that writing assessment is most effective during the context of instruction (in other words, when students are writing) and by utilizing a "carefully organized system of classroom documentation of student learning, through portfolios or other methods of collecting student work samples" (p. 6). Allow students to choose from among their many writing samples the one or two they want to turn into a full essay—and give them plenty of time to revise with lots of ongoing feedback from you and their peers. (See the next question regarding feedback.)

And while you're at it, consider a holistic grade on some compositions. Once again, NCTE (2008) comes to our rescue and helps us understand why all of our time *should not* be spent meticulously correcting students' writing: "Current research suggests that a holistic approach to instruction and assessment will give students the tools they need to develop as writers. A holistic approach sees writing as a multidirectional and multifaceted activity and attempts to teach and assess the many disparate aspects of writing in a connected fashion" (p. 4–5).

The most important thing I can say in answer to this question is that students should have many, many opportunities to write—with reduced pressure on the teacher to formally assess each piece of writing. Since writing is a process that develops over time and in response to different disciplinary purposes, back away from grading writing, especially daily writing, as much as possible and focus on engaging students in the process. Think in terms of rewarding effort and encouraging students

to take the intellectual risks needed to think deeply through writing. Remember, they are writing to learn.

I know that I should offer feedback when students write, but I'm not really sure how to do that. How does feedback differ from comments I make when I grade students' papers?

First, feedback is usually given during the process of writing so that it can be used by students to improve their writing before producing any kind of final draft. Such timely feedback functions as a type of formative assessment (used to monitor student learning), which helps teachers understand where students might need help and then provide additional instruction. In contrast, grades on completed papers are a form of summative assessment (used to evaluate learning) and are given after the fact. Corrective comments that students see for the first time when their papers are returned to them is like someone helpfully recommending a good mechanic after you've spent thousands of dollars having your car repaired—and it's still sputtering. You need advice when you're engaged in writing, not when it is too late.

I like to think of feedback as comments you would make to an adult in the field who asked your advice on a piece of writing.

- Is the piece clear?
- What more is needed?
- What works well?
- Has the writer accomplished his purpose?

Try to avoid telling the student what to do; instead, ask questions, explain why you are confused, amazed, or want more details and let her do the work of revising the piece based on your comments and the comments of peers, who should also be providing feedback.

See Figure 3.2 for examples of feedback that may be helpful as students rework their writing.

Should I always use a rubric?

In real-world writing, we write for a purpose, not for a rubric; and those purposes will vary widely, such as writing for understanding, analysis, persuasion, reflection, narration, or simply to communicate. Sometimes,

Figure 3.2

Sample Prompts for Providing Feedback to Student Writers (by Teacher or Peer)

1. The best part of your paper is . . . I like it best because . . .
2. Why did you choose to (go about solving the problem in such a way, place this concept first, include this piece of evidence)?
3. What more could you tell me about . . .
4. I'm confused by this . . .
5. I was wondering . . .
6. Have you considered . . . ?
7. I noticed _____ and thought _____.
8. I have a question about this . . .
9. Could you include more data to convince your readers . . . ?
10. It really made sense when you explained . . .

a rubric narrows students' writing and thinking by artificially focusing the student on isolated components of writing. There is a place for rubrics, for example when students are writing an explanation of a process and they need to include specific steps for the process to be correct and complete. We also want to make sure students know what is expected and that they address the learning target. At other times, however, especially when writing is being used to reflect, learn, or understand, a rubric may not be appropriate, as the purpose involves exploration rather than a perfect end product.

It's better to think in terms of what the piece of writing needs to convey in order to be effective rather than always matching it to a rubric. If you do use a rubric, talk students though each part of the rubric and allow them to have a voice in what should be included in the tool. The process of having students decide what is important in a specific piece of writing sometimes turns out to be more valuable than the rubric itself.

Spotlight on Science

Colleen Zenner and Lauren Pennock, high school science teachers, have their students create a story about plate tectonics and follow a checklist that guides their work.

First, they provide directions:

- Write a story about plate tectonics that is creative, accurate, and helps explain to someone how the Earth is always changing.
- Include all of the items from the checklists (sample below) on each page of your story.
- Use your review sheets, unit packet, flashcards, and any other resources to help you explain the concepts.
- Create at least three characters that will journey through your story of plate tectonics.

Following are samples of some of the checklists and questions (with associated values) that students must address within the story to gain a total of 140 points:

- Characters with descriptions and illustrations (9 points)
- Introduction of character (3 points)
- Introduction of storyline (3 points)
- Conclusion to the storyline (3 points)
- What are four pieces of evidence for continental drift (explained)? (8 points)
- What are two types of plates? (2 points)
- What mechanism causes plates to move? (2 points)
- Did you include a definition of the *asthenosphere*? (2 points)

Writing to learn, writing to integrate ideas or figure out why, or writing to reinforce a new concept—that IS content.

Won't the teaching of writing take time away from my content?

As you can see from the Spotlight on Science (page 77), writing is an often overlooked tool for reinforcing, expanding, and supporting content. There are many ways of incorporating writing within any lesson—a quickjot, for example, in a learning log in response to a thoughtful question or a silent discussion, where students write to each other about a problem. If you think writing means assigning a major essay every week, then it *will* take away from the content, especially in math or science. But writing to learn, writing to integrate ideas or figure out *why*, or writing to reinforce a new concept—that *is* content.

Think of writing as a sort of glue that makes thoughts stick; research shows that's exactly what it is if it's used regularly (Willis, 2011).

Okay, here's the bottom line for me. I never took a writing course in college. What if I just don't know how to teach writing?

The good news is that you don't need to be a teacher of writing. You only need to show your students how scientists, mathematicians, historians, poets, musicians, or sports writers—whoever writes in your discipline—communicate through writing. Give them lots of examples from disciplinary-related texts such as journal articles, research, and blogs, and then illustrate how experts in your field use writing to expand the content you are teaching. Look at pages 51–52, Figure 2.4, to show students how bloggers write in your discipline, for example.

And here's the best part: You can learn to become a better writer along with your students as, together, you explore the best writing in your field. If you still feel unsure, ask an ELA teacher to give you some tips and start slowly. The great thing about disciplinary literacy is that you aren't expected to become a writer or a writing teacher—just a content-area teacher who lets kids in on the secrets of how people in your discipline write while giving them the opportunity to do the same.

Spotlight on Math

Amanda Cavicchioni, an eighth-grade algebra teacher, came up with an inventive way for students to apply their knowledge of quadratic equations by asking them to teach others about the concept. "Quadratic functions is a large unit in algebra, so I developed a project for my students to review and sum up what they learned by creating a how-to book," she says. "Each student picked a specific equation and demonstrated how to solve that equation using all five methods. I thought this would be a good way to help them make connections between the different ways of solving a quadratic functions as well as making connections between quadratic functions and other kinds of functions."

Amanda Cavicchioni

A student in Amanda Cavicchioni's class shows off her book on quadratic functions.

Students also had to write about which method they preferred to use when solving and had to include a page of real vocabulary and real-world examples. When they shared their products, the students were excited about how creativity could be used in math, evidenced by the clever themes and colorful drawings that made their stories come to life. Some said afterward that the books would be a useful study tool for the test they took after the project.

Shanna Dixon, high school algebra teacher, brings in real-world examples when she teaches parabolas. "After students learn about parabolas, I ask them to find and bring in examples of the curve in everyday life. Inevitably, someone brings in a photo of the St. Louis Arch and I have them write about why it may look like a parabola but really isn't one at all."

It's been a while since I've had an English course. Do I need to correct spelling or grammatical mistakes? I'm always worried that I'll miss something.

A social studies teacher said to me recently, "How can I get my students to write? They don't even know how to capitalize proper nouns." Real writing has little to do with grammar and rules—that's just the window dressing, which, increasingly, Word programs are able to address. I know an award-winning author who never really learned the "rules" of writing—but, man, can he write. The descriptive narratives, targeted metaphors, and compelling dialogue he composes bring tears to the eyes of the most hardcore technical writer.

The real stuff of writing is being able to unravel a complex idea, express an idea of one's own, or use others' ideas.

Of course you should expect students to use the conventions of Standard English when they prepare a final draft of a formal paper, but you don't need to turn yourself into a grammar slave—or quash your students' desire to write by demanding grammatical perfection (or any other type of perfection) in the short writing they do in class. NCTE (2008) reassures us on this point when they state, "Surface-level feedback focused on grammar and spelling does not encourage students to develop their writing or thinking" (p. 4). They go on to say, "An exclusive focus on grammar instruction and grammar-related assessments can distract students and teachers from the entire range of features that constitute effective writing" (p. 5).

Here's a hint: When students write for a real audience, they are much more likely to pay attention to the mechanics of writing because they care. The real stuff of writing is being able to unravel a complex idea, express an idea of one's own, or use others' ideas, not create a grammatically correct piece that may be devoid of deep meaning.

How to Get Students Writing Within the Disciplines

1. DIFFERENTIATED LEARNING LOG

Learning logs are not the content-area notebooks so ubiquitous in the 20th century. This writing tool, which can be created either

electronically or through print, is differentiated for each learner—and is an essential tool in developing both content knowledge and independence.

How It Works

Each student's learning log is kept with her at all times during class. The log is not necessarily used to record new information because, as we know, information is available to anyone at any time with the tap of a finger. The purpose of this log is to hold ongoing reflection, analysis, evaluation, and application of new information.

Many teachers like to have students use their logs during collaborative activities such as when they participate in seminars or engage in small-group work. It is important to note that the log belongs to the student so no two will look exactly alike. Therefore, allow students autonomy regarding its organization, decoration, and, to some extent, its contents. If the teacher takes control of the "notebook," the motivation for learning diminishes.

Why It Works

Differentiated instruction (DI) is one of those phrases that everyone in education knows and most teachers strive to implement, but it frequently falls between the cracks in the mad dash to cover content. A differentiated learning log supports DI because it starts where all individualized instruction must start: with the learner. Furthermore, each student must take ownership of his own learning—and his own log—which will serve different purposes as students learn how to organize the many variables of content in ways that work for them.

Best of all, if teachers use learning logs in each discipline to show students how discipline-area writing differs, students will increase their understanding of writing overall.

Extend and Adapt

For students who have difficulty with organization, provide more structure while still leaving room for autonomy. For example, you may need to provide sample tables of contents or tell them how many "found" vocabulary words you expect on their vocabulary page by the

Figure 3.3

What Goes Into a Learning Log?

- Observations gleaned from experiments, demonstrations, primary documents, or poetry
- Formative assessment pieces such as exit, entrance, or middle-of-class quickjots (see pages 91–92)
- Questions students may have during class, while doing homework, or during reading
- Summaries of and responses to texts, experiments, videos, music, or art
- Drawings, graphs, storyboards, graphic organizers, tables
- Rough drafts of writings: essays, fiction, articles, blogs, tweets
- Rules to remember: for example, punctuation rules, order of operation, scientific processes
- Clippings or copies of article, blogs, photographs; website links
- Quotes from texts, experts, or other students
- Project ideas (especially useful for social studies and science fairs as well as interdisciplinary or independent projects)
- Narratives, journals entries
- Song lyrics related to topics
- Primary documents and analyses
- Collaborative notes from group work or projects
- Books to read
- Writing ideas
- Vocabulary pages where students records words that are new to them or used in different ways. Note: If teachers want students to record vocabulary they have assigned, this should be in a different section or on a separate page.
- T-charts for learning:
  - Confusion/Get it
  - Really?/But
  - Agree/Disagree
  - Word Used/Better Word

end of a grading period. Have students share ways of organizing learning with each other instead of insisting on only one way.

2. BELL-RINGER QUESTIONS AND ANSWERS

Bell-ringer questions prime students' brains for academic tasks, often jolting their minds away from the conversation they had in the hall before class or their intriguing plans for lunch. This type of informal writing is probably also the best type of practice for "writing for the test," as it eases writer's block and counterproductive overthinking.

How It Works

Before class, place a question on the screen—not a typical textbook question, but a question that builds background about your content and the world students inhabit, a question that requires thinking, evaluating, and making decisions, which, by the way, also encourages independence (see Figure 3.4 for examples). Students write in their learning log (either electronically or on paper) in response to the query. For this activity, students simply pen a flood of words in an effort to craft some sort of answer to a less-than-simple question. Books such as *Super Freakonomics* (Levitt & Dubner, 2009), *What If?: Serious Scientific Answers to Absurd Hypothetical Questions* (Munroe, 2014) or websites featuring the latest news in science (National Science Foundation, www.nsf.gov/discoveries), social studies (the history website at www.history.com/news/ask-history), math (the math section of Scientific American at www.scientificamerican.com/math), or Smithsonian's Tween Tribune (tweentribune.com) are great sources for questions. After discussing and modeling how to craft good questions, students can begin submitting bell-ringer questions for their classmates to address in writing.

Why It Works

An often overlooked but important part of writing is fluency, the ability to write without anxiety or fear, allowing words to flow unimpeded on the page or screen.

Fluency develops when students are provided with frequent opportunities to jot down their thinking with no assessment attached.

Figure 3.4

Sample Questions for Bell-Ringer Writing

- The Curiosity's journey to Mars cost eight billion dollars. Was that money well spent? Why or why not?
- What should the United States do to make sure contagious diseases don't spread to major cities?
- What young adult novel would you recommend be made into a movie? Why?
- Why is immigration such a complex issue?
- Explain this statistic: Ratio of seriously mentally ill people held in US state prisons and jails to those held in state psychiatric hospitals: 10:1. (harpers.org/archive/2014/06/harpers-index-362) What should be done about this problem?
- What conflict do many characters share in novels or short stories? Is it a realistic conflict based on your own experiences?
- Why do people engage in forms of rioting that bring about more harm than good to their causes?
- Cemetery space is becoming a premium in many areas, especially large cities. Should cities pass laws that allow only cremation?

Many inexperienced writers fall into the trap of sitting for long periods of time before beginning to write as they compose in their heads. They then try to capture their ideas on paper, turning writing into a mechanical process of recording thoughts instead of utilizing writing as a tool for thinking. The daily practice of writing in response to open-ended questions supports fluency and gives students ideas for future essays in addition to helping them think deeply about content-area topics.

Extend and Adapt

Follow writing sessions with a reading connection in the form of a brief read-aloud from a text related to the question, giving students

just enough to make them want to find out more on their own. Provide a link to the article or make available copies of the printed article for those who want to read about the topic. For instance, post this question in a science class that has been studying alternative fuel sources: A bus in the UK went into service that runs on an unusual type of fuel. What type of fuel do you think the bus is using? Defend your answer.

The fuel? Human waste from a sewage plant. After students express their disgust, provide the article for their reading pleasure.

An often overlooked but important part of writing is fluency, the ability to write without anxiety or fear, allowing words to flow unimpeded on the page or screen.

3. READ/THINK/RESPOND

A response differs from an analysis in that writers interpret the text through a subjective stance, making connections and bringing background knowledge as they seek to interpret the author's message. The goal is to eventually move students into analysis, but often a response is the first and best way of getting to that point. As the term implies, students react to what they are reading in any way they can, often beginning such writing with "I think" or "It seems like" in an attempt to understand the text. In some cases, the text may be so complex that students don't know how to respond, but with this low-risk activity they feel they can say *something,* opening the path for more in-depth writing later.

Math students in particular often find "a place to start" by wrestling with a problem through a response. In fact, research shows that some writing activities have a greater impact on reading comprehension than reading strategies (Lewis, Walpole, & McKenna, 2014). This may well be one of those activities.

How It Works

This activity is easy and effective.

1. Students read a short piece of complex text related to your discipline.
2. They think for a few moments about the text.
3. They write a response to the text.

As an example, let's take a letter from Queen Victoria to Mary Todd Lincoln after the death of President Lincoln, found in the Library of Congress at memory.loc.gov/cgi-bin/query/r?ammem/mal:@field(DOCID+@lit(d4363400))

Figure 3.5

Queen Victoria to Mary Todd Lincoln, Saturday, April 29, 1865 (Condolences)

From Queen Victoria to Mary Todd Lincoln,[1] April 29, 1865
Osborne.
April 29—1865.

Dear Madam,

Though a stranger to you I cannot remain silent when so terrible a calamity has fallen upon you and your country, and most personally express my deep and heartfelt sympathy with you under the shocking circumstances of your present dreadful misfortunes.

No one can better appreciate than I can, who am myself utterly broken hearted by the loss of my own beloved husband,[2] who was the light of my life,—my stay—my all,—what your sufferings must be; and I earnestly pray that you may be supported by Him to whom alone the sorely stricken can look for comfort in this hour of heavy affliction.

With the renewed expression of true sympathy,

I remain,

dear Madam,

your sincere friend,

Victoria

[Note 1 Victoria occupied the British throne from 1837 to 1901.]

[Note 2 Prince Albert, Victoria's husband of twenty-one years, died in 1861.]

Source: Courtesy of Library of Congress.

An eighth grader who often found it extremely difficult to even begin a piece of writing was told to simply read the text and write his thoughts. He wrote: "It seems like Queen Victoria was thinking more about herself than about Mrs. Lincoln." While this response is hardly a comprehensive analysis, it is a good time for the teacher to ask the student to explain his thinking. The student then wrote, "Well, the queen talked about her *heavy affliction* and how *broken-hearted* she was instead of asking Mrs. Lincoln how her heart was holding up." This student not only went back to the text, but he began moving toward a critical evaluation of the text.

This activity is especially effective for use with complex sections of the textbook, challenging poetry, or graphics that may be confusing.

Why It Works

Many times students shut down when faced with text that seems overly complex or challenging. Responding to the ideas in a text can be a nonthreatening way to help such students read actively and think about what the author is saying. While it may seem that this activity is time consuming, it is time well spent as students come to understand key components of a topic before rushing on to the next question, a practice that often compounds frustration and increases confusion.

Extend and Adapt

For students who have difficulty getting started, have them use a prewriting chart to keep their responses tied to the text instead of wandering off into tangential areas. A template might look something like the one in Figure 3.6.

4. TALK BACK

With this activity, students can enjoy doing what they do best: talking back. They can also learn the basics of argumentative writing, especially once they are writing responses fluently.

How It Works

Provide students with a provocative text, such as a blog from the *New York Times* about why medicinal marijuana should be legalized or a

Figure 3.6

Chart for Helping Students Formulate a Response

What did the author say? What was his/her message?	What in the text do you find insightful, interesting, confusing, or just plain wrong?	What do you think about the author's overall message? Why?

Huffington Post piece about children crossing the border from Mexico on top of a train, or even a new finding in science or math such as how artificial intelligence can now create magic tricks and what that might mean for the future. Have students read the text once to determine the author's stance. Then, ask them to read it again and choose a particular paragraph, sentence, claim, or idea brought forth by the author that they might question or want to think about further. In this talk-back activity, they write as if they were a colleague of the author's, asking questions, pointing out areas the author may not have thought through, or simply disagreeing with the author's accuracy or reasoning.

This procedure can also be used when students read an op-ed piece or commentary. They read (or listen to) the commentary, determine the author's point of view by noting what he says (and what he means) and then talk back by methodically refuting or agreeing with his points

The activity works best when there is some question about the topic or when the author is taking a strong, perhaps biased position. Paragraphs or sections from textbooks could be used, but opinion pieces, even from local newspapers, or letters to the editor are better suited for talking back. When a hot topic is hitting the news, YouTube videos or an online news snippet may work especially well. In any case, look for topics that represent controversial or thought-provoking issues in your discipline.

Example of a Hot-Button Talk Back

As I am writing this chapter, the trial of the Boston Bomber Dzhokhar Tsarnaev is under way. The defense maintains that he was under the influence of his brother, Tamerlan, but the prosecution is making the case that he was acting alone. Most students have siblings; many have very close brothers. They might talk back to either the defense or the prosecution about their viewpoint on this issue—after having read a text to gain background information such as the article from the *New York Times* at www.nytimes.com/2015/03/17/us/police-recall-dodging-as-marathon-bombing-suspect-ran-over-brother.html?ref=us. While this topic may elicit strong emotions, it creates an opportunity for students to learn how to express "hot" opinions in a calm, logical manner.

Example of a Talk Back in Questioning the Author

Questions help facilitate a process where students tease out their incredulity by providing reasons for their thinking, the basis of all good argumentative writing.

Recently, I read a chapter to a class of eleventh graders from the book *How They Croaked: The Awful Ends of the Awfully Famous* (Bragg, 2011) regarding Napoleon's pretty horrible death to demonstrate how voice can be used in a humorous way to inform. Immediately after the reading, a student told me that hundreds of books about Napoleon have been written (a quick Google search shows that he was exactly right) and that many authors had various hypotheses about the exact manner of Napoleon's death. "How does this author know these details about his death?" he asked. This student was, in effect, talking back to or questioning the author. It would have been an easy transition to move the class into writing by asking them to take out their learning logs and write about whether they agree or disagree with the veracity of the author's claims before looking up this information online from a credible source.

Similarly, a high school ELA student asked if Alice Walker was a credible source for her 2007 picture book titled *Why War Is Never a Good Idea*. While the book is more an example of stunning poetry than commentary, I encouraged the student to express his doubts and then asked the class to write their response to the author's ideas. Such questions help facilitate a process where students tease out their incredulity by providing reasons for their thinking, the basis of all good argumentative writing.

Why It Works

Argumentative writing starts first with argumentative thinking, and argumentative thinking begins with questioning instead of passively accepting what is read. (See Chapter 4 on Inquiry.) Embedding arguments within the topics of a discipline helps students see that argument (as well as agreement) comes organically from the study of an issue or, as Applebee and Langer (2013) note in *Writing Instruction That Works,* "Arguments and explanations within a discipline are built up out of the context of ongoing . . . conceptual learning" (p. 161).

Extend and Adapt

Once students have composed their talk-back piece, have them exchange and write back to each other, continuing the conversation or expanding

argument. Eventually, this activity could be played out in a debate or forum, but only after students have had a chance to codify their thinking through writing. Students may also want to illustrate their essays with political cartoons or conduct interviews with those who have opposing perspectives.

To make easy work of this activity, check out the *New York Times* Learning Network (learning.blogs.nytimes.com) where well-written blogs appear along with questions for student writing and excellent teacher resource materials (see Chapter 2, pages 50 and 53). As a bonus, the site also offers a "word of the day" from the text. Debate.org also offers thought-provoking questions, often with student responses included.

5. EXIT, ENTER, MIDDLE-OF-CLASS QUICKJOT

The exit slip has become a popular activity in many classes, but I don't see it used often enough to bring about the advantages it can accrue. Some teachers say that the novelty of an exit slip wears off and students begin writing less thoughtfully, which is why I encourage variations of this practice, such as an entrance, middle-of-class, or just-about-anytime quickjot.

How It Works

Provide students with a list of prompts such as those in Figure 3.7 and post them on the wall for easy access. Ask students to add to the list. At regular intervals during class, have students compose quickjots on index cards or sticky notes to hand in to you. They may also write in their learning logs or on a device that can be checked by you periodically.

Quickjots can assess student understanding, provide a pulse of the class's knowledge, or give students a chance to codify what they are learning.

Why It Works

These quickjots can be invaluable in assessing student understanding of content, taking a quick pulse of the class's knowledge, or giving students a chance to codify what they are learning. In addition, when students write often to such prompts, they learn to use metacognitive skills in deciding for themselves how and what they are learning.

This activity shifts the ownership and responsibility for learning back to the students and teaches them to monitor their own understanding for intrinsic purposes, not simply to pass a test.

Figure 3.7

Prompts for Quickjots

- What do you "get" so far?
- What do you find confusing?
- How would you report on what you just learned for an online news article or blog?
- What did the author, problem, or lesson leave out that you would have included?
- What else do you want to know?
- What one piece of the problem, lab, poem, document, or short story is most important?
- How does the piece, poem, story, or blog affect you emotionally?
- What would you tweet to highlight today's lesson?
- Do you disagree with anything you read or something someone said in class about the text or lesson? Explain.

Extend and Adapt

Use students' quickjots as springboards for longer writing pieces by asking them to elaborate on their comments when appropriate. Once students compose more in-depth pieces, they can exchange with a partner and write questions about the explanation as a way of encouraging more detail and clarification from the original writer.

6. FROM CONTENT TO STORY

Use the power of narration to help students learn content-area concepts by having them create a story around an academic topic. Such writing, called by Tom Newkirk (2014) the "mother of all modes," is "a powerful and innate form of understanding." He further argues that narration

can be used "to inform, to persuade, to entertain, to express" (p. 6), and I would add that it also creates a context for learning, engages students in writing, and reinforces important ideas in all disciplines.

How It Works

Think of topics in your content as stories; virtually all disciplines have them: weather cycles in science, sequential events in history, word problems in math, or biographies in the arts. Tracy Kalas, a middle school ELA teacher who works closely with math teachers in her grade level, came up with the idea of using mathematical vocabulary in stories that she has created, such as this one, titled "The Revolution of Literacy":

> Under the triangular roof of our angular school is an oval office where a set of ordered pairs pound out solutions to our problems. They are coefficients converging over discrete negative matters of orders of operation. Don't underestimate that this is where the chain of command rules.
>
> Clockwise, with the maximum function of power, is the principal who is not mean but midpoint between rational expression and irrational expression. At his right hand sits a fraction of his power . . .

Students love these stories and now are trying their hands at writing very creative short stories . . . in math class.

Tina Reckamp

Students in Tina Reckamp's math class write simple exit slips to help Tina keep track of their progress. She posts their sticky-note exit slips under her learning objectives at the entryway to her class.

Examples of Narrative Within the Disciplines

Following are examples of ways that content-area teachers have engaged students in narrative writing to expand content understandings and perspectives:

- Write a journal entry from one of the Little Rock Nine about his or her preparations for going to school that first day in 1957.
- Write about the journey lava takes from its inception at the earth's molten core to its eruption and eventual solidification into rock.
- Write a story about the interpretation of the Second Amendment in the year 2050.
- Choose one example of an ancient architectural creation where the engineers used the Golden Ratio within its design. Write from the perspective of the designer about how the Golden Ratio helped him create one of the world's great wonders. Provide some intrigue in the story if possible!
- Write an interview with a survivor of the Triangle Shirtwaist Fire.
- Write about the "story" behind how someone influential came to change our thinking in science, social studies, math, or poetry.

Why It Works

Children in virtually every society begin their literate lives surrounded by stories, and stories continue to influence their lives, from movies to video games to historical accounts to conversations with friends. This genre engages because it transforms dry facts into fascinating details that stick long after the lesson has ended. Take advantage of this powerful form of writing to deepen content and provide an accessible way for students to become engaged in writing.

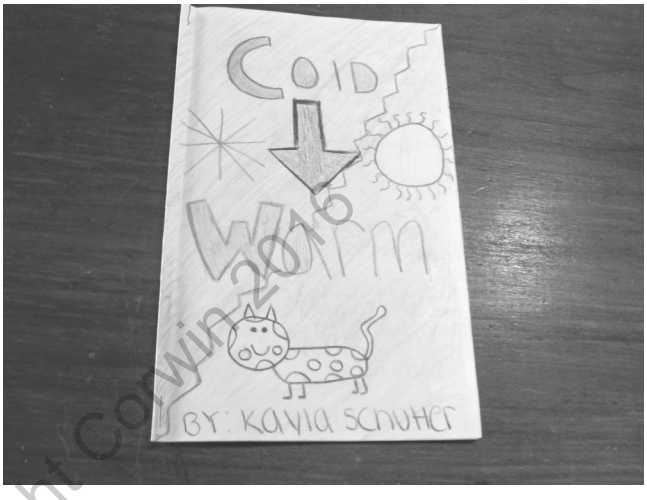
Extend and Adapt

If you have never used a strategy called RAFT (Role, Audience, Format and Topic) or it has been a while since you have utilized it in your discipline, dust it off and adapt it for your next unit. RAFT exercises lend themselves to narratives and help students understand content by approaching it in a new and creative way. See Figure 3.8 on page 96 for examples of RAFT prompts in various disciplines.

Spotlight on Science

After reading *Little Changes* by Tiffany Taylor to his group of freshman biology students, Justin Stroh had them create their own children's books about evolution and natural selection to be read to upper elementary students. His instructions included the following:

1. Create a population of organisms that is not real.
2. Describe a trait this population has and the variations of this trait in the population.
3. Discuss and illustrate the original environment of the population.
4. Create a change in the environment that will result in the population evolving over time.
5. Make sure the story demonstrates one of the three types of natural selection.



Justin Stroh

Cold/Warm booklet created by one of Justin's students about how a creature evolved to survive in a warmer climate.

Justin was pleased with the understanding of evolution that his students demonstrated through this engaging project.

7. BLOGGING IT UP

In Chapter 2, Karen Castelli, a high school sociology teacher, discusses how she uses blogs to initially interest students in her discipline through authentic reading. Karen also uses the blog format to have her students participate in writing, and she reports that their interest in writing has

Figure 3.8

Examples of RAFT Prompts in Various Disciplines

Discipline	Role	Audience	Format	Topic
ELA	Young Japanese boy living in the US during WWII	Undocumented immigrant detained in holding center	Letter	What have we done wrong?
Social Studies	Harry Truman	American people	News broadcast	Why I dropped the bomb
Science	Pancreas	Teenager	Tweet	Don't eat that Twinkie!
Math	Acute triangle	Obtuse triangle	List of grievances	Why we can't get along

Blogging can be used in any discipline to get kids exploring essential questions, investigating problems, or pondering discipline-specific topics in a safe (and engaging) space.

soared since initiating the practice, even though many of the tasks were ones students in the past may have groaned about completing with pen and paper. Students are also writing more since they are experiencing the satisfaction of writing for (and receiving feedback from) an authentic audience. Karen said, "I overheard three boys in my class comparing how many views they had on their blogs. There were 57, 80, and 114, respectively. The kid with only 57 was bummed, but I was excited!"

Blogging can be used in any discipline to get kids exploring essential questions, investigating problems, or pondering discipline-specific topics in a safe (and engaging) space that mirrors the habits of those in the field.

How It Works

Since Karen has been using blogs for several years with her students, she has worked out many of the kinks that get in the way of using this innovative tool with students. Figure 3.9 shows an adapted handout Karen provides to students to help them write their blogs.

Figure 3.9

Tips for Writing Interesting Blogs

- Create visual interest
  - Design your blog to reflect your personality. You don't have to restrict yourself to the available templates.
  - Use widgets if you want, but use them sparingly and with a purpose in mind. Don't clutter your blog unnecessarily.
  - Use images and videos, but don't steal these from other sites. Be aware of copyright issues. There are a variety of ways to find images and videos that you have permission to use. (Check with librarians as your school may pay for licenses for these resources.)
- Use a conversational tone. Try to interest the reader from the beginning.
- Use stories to relate common experiences that you and your readers might share.
- If you are a humorous person, use humor. (If this is not your style, that's okay.)
- Develop that habit of curating things that you run across or think about that might relate to your topic. (Tools such as Diigo or Evernote are good for this.)
- Your blog should be long enough to make your point, but don't overdo it. Remember that your writing should always be interesting.
- Think before you write and allow yourself to compose your entry over a period of time rather than in one session.
- Compose your entry in an offline document and then cut/paste into your online blog.
- Link to other resources and content. If you reference something you read on another blog, link to that blog and give the blogger credit.
- Read and comment on other people's blogs.
- Use a catchy title as "click bait" for your posts. It's fun to get readers from outside the classroom.

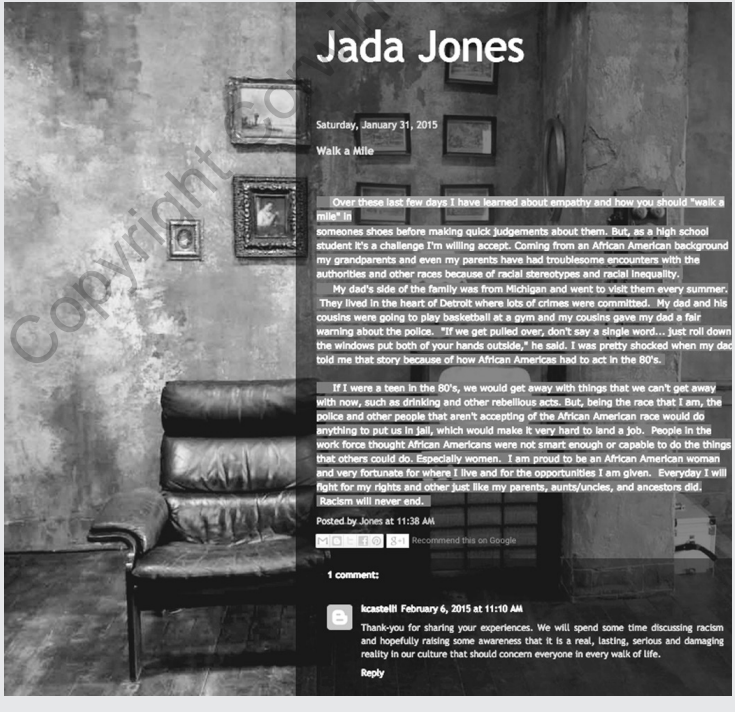
Source: Contributed by Karen Castelli.

Grading Student Blogs

Karen uses a rubric to evaluate the quality of the student's posts, but she makes sure students understand that she will not comment on every entry every week. She does, however, require students to reply to any comments that she or classmates make.

The following self-reflection tool developed by Karen helps guide students in their writing:

- Did you fully explain the concepts, terms, or ideas from class?
- Did you give a unique example or application, not an example from class?
- Did you properly refer to multiple sources from class?
- Did you explain the sources' connection to sociology in your own words?
- Did you explain the connection using your own words and referring to a source you found on your own?



Layout is courtesy of blogspot.com.

An example of a student blog in sociology and Karen Castelli's response.

Ideas for Using Blogs in Various Disciplines

- Ask students to find photographs to post and then have students respond to them creatively in ELA, analytically in science or math, or in an interpretive manner in social studies.
- Have students use blogs as publications for research or projects.
- When students create RAFT writings (see page 96), have them post their creations as blogs and respond to each other's ideas online.
- Hold blog discussions instead of conducting whole-class oral discussions.
- Use blogs as places for students to write reflective pieces after completing a project or experiment, solving a problem, or reading a text.
- Give students mentor texts from your discipline and ask them to mimic the style, organization, or voice of the writer in their blog.
- Have students use blogs to explore social justice or current events issues. Many times such discussions evolve into long-term, thought-provoking writing that students wish to publish elsewhere.

Why It Works

Blogging works for obvious reasons: It provides students with the opportunity to interact with an authentic audience that offers immediate feedback. The collaborative nature of this activity also encourages intrinsic motivation, often flowing into out-of-school literacies that hook students in ways traditional classroom study simply can't. Karen has observed the following advantages of student blogging. She finds that her students

- Move away from concerns about their "grade" as they become interested in a wider audience for their ideas
- Establish an academic community where they enjoy engaging with and learning from each other
- Increase their metacognitive skills as they compare their level of thinking and writing with those of their classmates; she says blogging promotes more realistic self-assessment

- Blossom in a safe environment, especially introverted students or those who lack the self-efficacy to engage in other classroom activities

Extend and Adapt

Work with a teacher from another (or the same) discipline, school, or space across the world in partnering classes to blog with each other regarding similar topics. If that isn't feasible, then place students in blog groups within the class for specific assignments, using the tool as an interactive place for online composing and creating.

George Hillocks, Jr. (1995), a professor who spent his long career exploring the difficulties and rewards of writing in the classroom, argued that writing cannot be defined as correct spelling or structurally perfect paragraphs devoid of meaningful content. He often said in his succinct manner that writing is the production of meaning. Students who write within the content areas learn to produce meaning in discipline-specific ways that reach past formulaic organizers, traits for writing, writing strategies, or even the activities suggested in this chapter (which are intended as scaffolds to in-depth content-area writing). The most important consideration for content-area writing is that students employ the habits of mind that experts in the field have developed (see Chapter 4, pages 118–121). Student writing must move from exercises about the content to authenticity within the content: writing that evaluates, defends, questions, constructs, and creates.

Making it Relevant

1. How many different ways of writing can you identify in your discipline? How often do you use each of these ways of writing in a two-week period? A grading period?
2. How difficult will it be for you let go of the idea that you must grade all writing? How will you change your writing assessment practices based on what you've read in this chapter?
3. What one writing activity that you've read about in this chapter can you adapt to meet your needs?

Notes:

Suggestions for Further Reading

The Best-Kept Teaching Secret: How Written Conversations Engage Kids, Activate Learning, Grow Fluent Writers . . . K–12 by Harvey Daniels and Elaine Daniels, 2013.

Literacy Lessons for a Digital World: Using Blogs, Wikis, Podcasts, and More to Meet the Demands of the Common Core by Jamie E. Diamond and Meg C. Gaier Knapik, 2014.

Minds Made for Stories: How We Really Read and Write Informational and Persuasive Texts by Thomas Newkirk, 2014.

The Neglected "R": The Need for A Writing Revolution by the National Commission on Writing in America's Schools and Colleges, The College Board (http://www.collegeboard.com/prod_downloads/writingcom/neglectedr.pdf), 2003.

Write for Mathematics by Andrew S. Rothstein, Evelyn B. Rothstein, and Gerald Lauber, 2006.

Writing Instruction That Works: Proven Methods for Middle and High School Classrooms by Arthur N. Applebee and Judith A. Langer, 2013.

Writing Now: An NCTE Research Policy Brief by the National Council of Teachers of English, 2008.