Math in the Margins: Writing across Curricula into Community Heritage

Counting sheep/when you’re trying to sleep
Being fair/When there’s something to share
Being neat/When you’re folding a sheet
That’s mathematics!

—Tom Lehrer, “That’s Mathematics”

These lyrics from the song “That’s Mathematics” remind us that our daily tasks and pleasures don’t sort themselves into “English” or “Math.” Satirist Tom Lehrer is an accomplished writer and mathematician whose career has poked and pushed curriculum boundaries since the 1950s. He joins a long history of writers such as Lewis Carroll, Andrew Marvell, and Jorge Luis Borges who’ve shared their cross-curricular fascination with interested readers. When we work in schools every day, we wish the same kind of fascination for our students.

Pushing curricular boundaries can sometimes show us more than we thought we could see, and that’s what’s happened to us: two English teachers, two math teachers, and 86 students. In the following pages, our team wants to offer a glimpse of our work and invite you to think with us about where we might take it next. Our project is about learning to be comfortable with the uncomfortable. And, with the more confident identity that offers us, Bonnie begins by pushing one of the English teacher’s syntactic rules. Our “we” will shift for a few paragraphs into “I.” And then we’ll return.

A Mathematics Memoir

When I was a high school junior, obsessed with folk music, romantic poets, and the school newspaper, my math teacher told me it was time to give up. I’d asked him what was imaginary about imaginary numbers. “How can we really use them if they’re imaginary?” I wondered. I already knew that math hadn’t fit my “learning style,” though I didn’t have the words for it, and I was honestly hoping for an exciting twist on this concept that linked imagination and math. A story? A context? A symbol? Hence, my question.

Mr. Bee had summoned me to the front of the room where he stood at the intersection of his chalkboards. I was alone, embarrassed, longing to make a connection. The white dust lay in parallel rivulets along the edges of his wooden chalk trays.

“Bonnie, you have reached your peak in mathematics.” I looked up. Mr. Bee’s Adam’s apple bounced in motion with his silk bowtie. Perfectly symmetrical. A kind of x-axis against the y-axis between his nose and his mouth. “Bonnie, you will go no further!” I shuffled back to my seat, and from then on, his over-chalked blackboard was a blurry fog. I failed Algebra II.

Although I’d never been a successful test-taker (and never would be), I was a solid, post-Sputnik, middle-class suburban kid, good enough at other things, so I decided to be an English teacher. I invented a future to avoid another math class until four decades later when I took statistics for a PhD.

The culture of school math—its artifacts, its language, its rituals and behaviors—had turned
me off, though over time I learned to analyze test scores, interpret graphs, teach and administer curricula, and solve complex problems regularly. I had limited myself, based on what one math teacher told me, in one small moment, in one small corner of one small classroom. I denied an important “other”—the culture of mathematics—and its value—because I had to define myself under a cloud of disapproval. It was a deeply critical moment as my adolescent self was forming an identity. In retrospect, I understand that it was both a crisis and an opportunity—as such moments are.

Identity-forming instances like the one I describe are so complex and invisible that we overlook them when they happen to our students. They appear as failure, defensiveness, or, at the worst, indifference. It’s no wonder we don’t recognize them, even in ourselves. I don’t blame Mr. Bee. Somehow, we understand that kids will finish a school year knowing more than they did when they began, even if their scores are low or we give them failing grades. We know it might take decades for them, or us, to understand what they learn exactly, or what we’ve actually taught them.

About Cross-Curricular Correspondence

Imagine two classfuls of American high school students, separated by 1,500 miles and profound differences in local cultures (East Coast urban, “I’m from Colombia in South America and the beach is cold and pretty awesome when it snows,” and Midwestern rural, “We party here in Iowa, but we party in fields and barns”), as they correspond and collaborate—in writing—between their geometry classes—with observations such as these:

• My favorite thing to do is txt ppl, ALL DAY EVERY DAY!! My record is 11,196. That’s ONE DAY. I love it !!!!!

Yes, high school students. Yes, math classes. Yes, writing. In the snippets above, you see urban and rural American high school students in math classes, writing in an extracurricular context. The project is refreshing in its simplicity. You see authentic voice, specific detail, precise language, what English teachers want to require in students’ writing. You see small samples of narration, description, argument, and comparison. You might say that these math writers are meeting English standards.

The current idea of Common Core State Standards challenges both math and English. Concerns about “college and career readiness” of high school students inform our initiatives and influence our testing protocols. And although we sometimes feel unheard, teachers’ perspectives and voices are important contributions to these public statements. The “Framework for Success in Postsecondary Writing” is a collaborative effort between actual college and K–12 writing teachers (NCTE, WPA, NWP 2011) to define what, exactly, are the intellectual and practical ways writing teachers want their students to learn, inside and outside school, across disciplines and technologies, despite or in concert with required measurements. The “Framework” is a response to the most recent standards activity; it articulates eight “Habits of Mind.”

What we’ve seen in this project supports those habits of mind. Eighty-six very different kids in very different places and their two math teachers, in partnership with one another, sharing basic curricular goals, can put a creative, local, and eloquent spin on a set of national standards—and create a sense of community they didn’t know they could have.

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mathematics. And the partnership crosses the curriculum and reverberates over 1,500 miles.

**About Partnerships**

Businesses and industries issue constant pleas for people who can collaborate, but neither our curricula nor our classrooms are set up for discovery and creation through informal talk and writing. Tests and standards, whether they’re local, regional, or national, regularly sort students, teachers, schools, and entire communities. And so having a passion for partnerships becomes a serious puzzle and an exciting challenge—even inside our own disciplines (Sunstein and Caszatt-Allen; Sunstein and Chiseri-Strater; Sunstein and Hunsicker; Sunstein, Mapes, and Munley). How do we handle collaboration of thought? What are the boundaries for individual achievement in a world that measures individuals but claims to value collaboration? Who owns the score? The credit? What can you measure? How do we know who actually solved a problem? Is group work a kind of cheating?

Our collaboration begins with professional confidence about composition and math, but with questions about their relationship. Two experienced geometry teachers agree on three basic curriculum elements: (1) Congruence and Similarity, (2) Coordinate Geometry, and (3) Shapes and Measurement. Deidra F. Baker, a 15-year veteran of two high schools, is the sole math teacher at Keota High School in Keota, Iowa, and Arthur W. Hunsicker is a long-time teacher and ten-year veteran of the math department at Revere High School, an urban district near Boston, Massachusetts. Rossina Zamora Liu, PhD student, writer, and English teacher herself, joins the team. The deal is this. The research will not “intervene”: no extra testing, no preplanned materials. We simply want the students to connect in any way they and their teachers, Arthur and Deidra, can manage. As researchers, Rossina and Bonnie as English teachers, the language dimension is most intriguing. Snippets of the students’ dialogue and writing show important concepts forming. “I have to understand proportion in my job making coffee in a paper cone at Dunkin’ Donuts.” “Learning how to drive, I need to know angles so I can park.” “I work on a MINK farm and they are mean animals . . . if you don’t know what a mink is, look it up on Google.” “When I skateboard in the city park, I am practicing arcs in geometry.” From these exchanges about the local culture, the work evolves into an effort to measure the circumference of the earth (as Eratosthenes did in ancient Greece) by looking at shadows in each town—on the two schools’ parking lots in the noonday sun, drawn from the national Noon Day Project effort (Center for Innovation in Engineering and Science Education). Calculating percentages of time they spend doing what they do during a typical day, students create circle graphs as illustrations, share them with one another, and begin to see parallels in their lives as American high school students. In our final assignment, the Postcard Memoir, students construct photo essays based on photographs and drawings of geometry in their own natural and made environments.

Our work draws from the then current mathematics curriculum standards (2000). The NCTM Standard # 2 for High School Geometry “Math as Communication” states: Students need to be able to express mathematical concepts both orally and in writing, to

- organize and consolidate their mathematical thinking through communication;
- communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
- analyze and evaluate the mathematical thinking and strategies of others;
- use the language of mathematics to express mathematical ideas precisely.

The description continues this way:

As students are asked to communicate about the mathematics they are studying—to justify their reasoning to a classmate or to formulate a question about something that is puzzling—they gain insights into their thinking. In order to communicate their thinking to others, students naturally
Bonnie S. Sunstein, Rossina Zamora Liu, Arthur W. Hunsicker, and Deidra F. Baker

reflect on their learning and organize and consolidate their thinking about mathematics. Students should be encouraged to increase their ability to express themselves clearly and coherently. As they become older, their styles of argument and dialogue should more closely adhere to established conventions, and students should become more aware of, and responsive to, their audience. The ability to write about mathematics should be particularly nurtured across the grades. By working on problems with classmates, students also have opportunities to see the perspectives and methods of others. They can learn to understand and evaluate the thinking of others and to build on those ideas.

Here’s the standard in action. Pat, an urban student, reads a math problem about circular irrigation. Because he’d been corresponding with the students in Iowa, he pictures a farm field that needs water. He has a context for the problem, and the problem deepens for him. He wonders about the unequal distribution of water from rotating pipes in a grid. What difference would smaller pipes or larger pipes make? He asks Arthur a day later. He’s thinking like an engineer, about maximum efficiency of water pipes. We agree that Pat is also thinking as a citizen, concerned about his correspondents in Iowa.

Our “distance” partnership offers the opportunity to learn new technologies, but also to experience old ones. For several months, the two classes exchange paper and pencil letters and drawings in fat manila envelopes via the US mail. As children of the digital age, this is a novel, tactile medium. Many students tell us that these are the only letters they’ve ever received.

We arrange Skype sessions, about one every two weeks. There are conversations and calculations about, for instance, the shape and volume of silos in Iowa and gas tanks near the Boston airport. Students talk about the symmetry in deer antlers and the geometric designs they found in mall logos. Thinking about geometry in their communities and sharing with one another, students put their math knowledge to work and teach others about their place-based identities. In the process, they gain immeasurable insights into their own and each other’s cultural heritage.

Our students found ways to identify and define problems in their everyday lives, as well as communicate with precision, to their distant partners, and in the process reexamined themselves. Some students jumped three proficiency levels in their test scores. Neither teacher had seen that before. “Huge” is how the director of guidance described it at one school. Do we attribute it to the project? We can’t tell for sure. We merely observed.

About a Community: “The Gang of Four”

It’s May 2011, two years after we began this pilot project. In about two weeks, Mike and his classmates will graduate from Keota High School, but today he, along with a few others, sits in Deidra’s classroom, visiting with us one final time. Their senior class trip to New York City is in a couple of days. For many of them, this will be their first time navigating a city. Until now, their primary exposure to urban culture (besides television and movies) has been through their exchanges with Revere High School. A few wanted to change their destination to Boston.

We remind them about these letters, showing them our folders of their work. “Tell us what you think of them now,” we say. After a few minutes, the boys chuckle and glare at each other.

“You guys are laughing,” we say. “Why?”

“Yeah. They’re funny—these letters.” Face covered in hands, Mike blushes.

“The gumboots? Did you get to that part yet?” we ask.

“Man, I can’t believe you wrote all that, Mike,” his friends say. “You made us look like a bunch of backward hillbillies. They probably all think we do eat skunk and porcupine!”

Over the course of the project, Mike and three Revere students—Larry, Charles, and Marvin—whom we call the “Gang of Four,” had a friendly but vigorous rivalry. Mike’s letters were purposeful stereotypes about “country” life, written by a proud young farmer who celebrated non-urban ways of life. In one of the letters to Larry, he wrote: “In these parts we ain’t got no movie box. I used a transistor radio for entertainment. But usually, I keep myself entertained easily outside in my pickup truck. It’s got a doohickey on the top for deer. Every day, them deer are in my way so I get my 4-10 and knock them beasts down.”

Anyone who knows Mike, including his teacher Deidra, knows that the language and word
choices on the page do not reflect his everyday speech and vocabulary. Neither does the harsh sarcasm. But, he “performed” these letters, positioning himself with his distant Revere friends and enacting a persona he imagined they expected.

At over six feet tall and rather husky, he wears the Future Farmers of America T-shirt proudly, a black jersey with gold print. “I raise hogs and cattle,” he’d said in his first letter to Revere. “I grow corn and soybeans. I love my truck . . . a Ford, of course.” In the letter, he also shared his knowledge of tractors and combines and of farming. “We are late in getting fieldwork done this year because of all the rain. It will probably snow before we get it all done.” It was an earnest message, one that sought to connect with peers. “Things I like to do in my spare time are mud-running with my truck and four-wheeler, do some fun farm work, and hang out with my girlfriend.” For Mike, this was the life he knew and valued. It was the life he assumed his peers in Revere could relate to—not one that they would mock.

And they wouldn’t have, we don’t think, were it not for the fact that what Mike shared was also drastically different from what they were accustomed to. Like Mike, they aligned themselves to the familiar, defining themselves according to an identity that was theirs—in this case, “urban.” In a response to Mike’s letter, for instance, Marvin said he hated “country stuff” and animals and farms. “I like anything that has to do with a city. I’ll never live in a place with cows or corn. I feel bad for you guys. That’s from the heart.” At first read, the message sounds insulting, but a closer look also suggests that it was less about Mike than it was reflective of him, Marvin.

Initial posturing, like all first meetings, tends to revolve around impressions. “Well, Mike was just being Mike,” said Deidra when she saw what he’d written. “He dropped all of his activities and became ‘the dude’ . . . he whines, ‘no one comes to cheer for me while I’m working on the farm.’ His siblings all left—so he’s responsible for working with his dad on the farm.” Farming is at a big crossroads, she reminds us, a fact recently documented on a PBS special. Less than 2% of America’s farms feed 90% of the world, and she comments that Mike was deeply moved by that.

Marvin, the “city” person, juxtaposed his community to that of Mike’s rural culture, one that he stereotyped as old-fashioned with limited access to the more “evolved” outside world. Once an Italian and Jewish immigrant enclave, Revere is an ethnically diverse community along the shoreline, just outside of Boston. Surrounded by multicultures and multi-terrains, Marvin can go to the beach one day, then take a subway into Boston the next—or go in his car (not truck)—and enjoy fine dining where, according to his letter to Mike, “I eat normal stuff like chicken.” But Marvin has an epiphany as he’s writing to the rural students and thinking about his contemporary world: “Oh, I eat what you grow!”

What all three of the boys do not realize in their mocking critiques of the other, of course, is just how similar the day-to-day lives of many American high school students in working-class communities are. But they begin to see similarity in the circle graphs that both Mr. Hunsicker and Ms. Baker assign (see fig. 1 for examples). Their week-days consist of going to school, playing or watching sports, and hanging out with friends. And, like most teenagers, they say they love to eat, sleep, and watch television. The core of their daily lives, like that of most American teenagers in working-class families, is the same. What differs between them are the variants of their participation in rural and urban ways of living, those which create and sustain their cultural and identity definitions, which fuel the vigorous exchange within the Gang of Four, and which eventually allow them to experience, process, and embrace self and other.

About a Fifth Student: Alex’s Narrative Arc

Alex’s story, like the story we hope for all students, is a story with what nonfiction writers call “a perfect arc.” It oscillates. It twists. It turns. And above all, it exemplifies—maturity in perspective and revelation about self and other.

His first letters offered palpable stereotypical performance, packed with details like, “In Massachusetts, we use light bulbs, not candles like you guys . . . I hope I am not scaring you with my technology. We don’t date our cousins. We also use toilets, not buckets. We use toilet paper, not leaves.” In these letters, Alex positioned himself as an American teenager from the city, someone with access to technology and all the modern-day accom-
modations that urban life affords. He wanted to appear “normal” because to be otherwise would be to be “foreign,” “un-American.” Pressure to fit in is common enough among adolescents, let alone one born in another country.

An immigrant, Alex is the 15th child in his family. He came to the States when he was nine years old, where, according to an essay he wrote in English class and one he later shared with us, “coming to America as an immigrant was tough. My father had to go through much difficulty trying to adapt to the new lifestyle. Currently he is a flower salesman who works in the streets selling flowers, a very strenuous and demanding job, especially during the winter.” Until that essay, Alex had spoken little of his father’s job to others, admitting, “Over the past years of my high school education, I was embarrassed about my financial situation. Financially my parents cannot afford a penny to my college education.”

Although we cannot verify that the math-writing partnership enabled Alex to write this essay
a year later for his English class, we do recognize with confidence the similarities in the essay with that of what he had shared with Keota students, particularly in subsequent correspondences. These exchanges reflect, we think, both Alex’s process of writing as well as his process of discovery. As we pursue his letters, we see an evolution in tone, starting with no greeting, to “What’s up homies,” to “Dear Buddy.” The letter below, in particular, contrasts nicely with the first one he composed about light bulbs and toilet seats.

Dear Buddy,

I really like where you from. Someday I want to travel there and check out the country. My family grew up in a farm and I know a lot about living in a farm. Every summer I travel to Morocco and I go to my family’s farms and spend a couple of days there. I came to America when I was 9 years old with my mom. After one year my 3 sisters and a brother caught up to us. Living in a farm in Morocco was the life . . . the way they got milk, grew crops, and different animals. How is it down there for you guys?

Alex’s writing discovery came about, in part, when he worked on a Venn diagram assignment (see fig. 2), one in which he was asked to look for intersections between the “natural” and “made” environments. On one side, he listed houses, schools, cars, buses. On the other side, food, plants, trees, people, animals, water. And in the intersecting space, he listed “soccer field” and “farm.” Alex is a successful soccer player; he recognized that his “place of peace” was his grandfather’s farm in Morocco.

Students sink into stereotype as they position themselves to write across this gap, with humor, irony, sarcasm, play, and Alex, like many teenagers, does that with unfamiliar tasks. But as our contact continues and time goes by, the students’ understandings of one another’s surroundings become nuanced, curious, and engaging. They expanded their views of themselves and one another “beyond the five-minute universe,” a term Deidra likes to use.

We chose not to use test scores as formal indicators of growth in this project. We are comfortable to report informally that in Alex’s ongoing conversation with us, he indicates his commitment to completing a college degree. We cannot prove that his growth was a result of our project. But Alex’s confidence with language, his willingness to apply his personal background to his school experience, his increased interest in his distant correspondents, and his school successes measured in grades and scores are observable and documentable features of his three years in high school. We observed and documented many such students’ experiences in our project, and we’re proud of what we see.

About the Geometry Teachers

At the end of the first school year, Deidra writes, “I feel re-energized . . . reminded that teaching kids how to learn—learn math, learn writing, learn they are important people, learn that their thoughts count, learn that learning is important, learn how to learn, and learn to be open-minded! I’m amazed at how much math and writing have in common . . . both require thinking about audience, explaining your thinking, and seeing process as more important than product. . . . Without this project, those connections may not have happened, or I might have made them, or they would have been surface level for the kids. We don’t know.”

A year after Deidra’s visit to Boston, Arthur remembers, “We pause at an intersection across from her hotel. It is twilight, and our walk has meandered from Faneuil Hall. ‘What do you do about postulates,’ she asks? I’m finishing the final assignment for a refresher course in Euclidean geometry, considering alternate strategies to demonstrate that
a quadrilateral with opposite congruent sides will be a parallelogram. I remember Deidra’s question and my inadequate response. I imagine a different answer, ‘Good question, Deidra. But first, what exactly do you mean by a postulate? I wonder if our texts use the term in quite the same way.’”

Over time, Arthur and Deidra become partners in both pedagogical and mathematical thinking, and it happens through thousands of emails. Like their 86 collective students’ experience, this collaboration between geometry and writing shows them that two “languages” can work well together.

**Why Can’t We Stop Them?**

At a conference of English teachers, we proudly describe the letter exchanges in a PowerPoint presentation. We illustrate with photographs, charts, and some pretty strong words from the students’ writing. Afterward, a member of the audience waits politely to speak to us. She furrows her brow; we can see she’s annoyed. “Why didn’t you stop them?” she asks. “This is just plain nasty. These students are insulting each other, just feeding into stereotypes they already have. How can you let them write that way?”

We’ve delighted in these students’ honesty of language and growth of understanding, seeing that they’ve seized this opportunity to speak authentically. We’ve wondered if kids write better, if not just as well, when they’re not in English classes. They were engaged in mathematical thinking, and in learning about another way of life. They’d learned much about their own community, demonstrated it to a very different “other,” and while focusing on their differences, discovered their commonalities. We could see their growth. Why would we want to stop them?

In fact, we want to continue and expand this project. It involves important writing, fluid reciprocity, many perspectives, two very different places, and at least three kinds of collaboration. It enhances curriculum in two disciplines (at least), brings standards to life without feeling mechanical, and offers high school and college teachers and particularly high school students new communities of partners.

What does it tell us? We don’t yet know. We hope our project will be a foundation for a larger, outreach-based professional development program for other partnerships of teachers in Summer 2014. Like our students, we strayed outside our own academic comfort zones. And as we review our mounds of data, these are the thoughts we have now:

- Differences between schools (and students—and subjects) allow for reflective discourse and active, meaningful engagement.
- “Writing across the Curriculum” isn’t an “add-on” any more than “service learning,” “place-based learning,” “community engagement,” or “social justice education” are. It is simply what experienced, engaged teachers do when we want students to find—and share—evidence of what we teach them to see in their own worlds.
- We don’t intend for our students to “invent” great works of math or literature, but we do want them to “invent” language that gives them access to their questions about all subject areas, no matter what content areas raise the questions.
- English teachers don’t hold control over students’ words any more than Bonnie’s high school math teacher owned her right to learn math.

**Bonnie Returns to Mr. Bee: “We” Return to the First Person Singular**

Fifty years after Mr. Bee sent me back to my seat, I read a book that offers me a context for the question I asked back then. In *Imagining Numbers*, Professor Barry Mazur considers what it means to imagine the square root of –15 and how that compares to imagining “the yellow of a tulip.” He crosses back and forth between his passion for poetry and for mathematics as he “imagines imagining.” I find another collection of essays, poems, and stories titled *Imaginary Numbers: An Anthology of Marvelous Mathematical Stories, Diversions, Poems, and Musings* (Frucht). The table of contents includes some of my favorite writers and others I never knew who are primarily mathematicians. But I don’t find a specific discussion of imaginary numbers. And so I ask myself, *Are all numbers products of the imagination?* What is the place of math in history, literature, and folklore? And then I remember Tom Lehrer’s “That’s Mathematics.”

I am delighted to see that others have asked the same question I did about imaginary numbers...
and spent professional lifetimes answering them. My decision to become an English teacher really did happen that day in that dusty corner, but I’ve revised it after 50 years. After all this time, I’ve come to understand that people who excel in one field may actually do it because of their ability to perform in other fields, and I realize I’ve always wanted that for my students. At 16, I couldn’t have guessed that I’d ever imagine a bridge over what I thought was a divide between Math and English, and that two teachers and 86 students in Iowa and Massachusetts would build one. Little did I know how we would mature across the curriculum, over three years and 1,500 miles, with a nuanced sense of identity and community heritage for ourselves, and an understanding of the community heritage of others.

**Works Cited**


Bonnie S. Sunstein is a professor at the University of Iowa, where she directs undergraduate Nonfiction Writing and English Education and publishes books, essays, and poems most often about teaching, research, and writing. Her award-winning Field-Working: Reading and Writing Research is in its fourth edition. She’s been a fellow of the Woodrow Wilson Foundation, the Smithsonian, and the National Endowment for the Humanities. She has served NCTE in many capacities, most recently as Policy Advocate and on the steering committees for the National Day on Writing and the Norman Mailer Writing Awards. Email her at bonnie-sunstein@uiowa.edu. Rossina Zamora Liu is a writer with an MFA from the University of Iowa Nonfiction Writing Program, a writing instructor in UI’s Nonfiction writing program, the Iowa Link for “underprepared” college students, and Kirkwood Community College. She is a PhD candidate in Language, Literacy, and Culture and has published extensively about Vietnamese/American cultural practices and the teaching of writing. Email her at rossina-liu@uiowa.edu. Arthur W. Hunsicker is teacher of Mathematics and Literacy Coach at Revere High School in Revere, Massachusetts, an urban district just north of Boston. He has worked as a science and math teacher for more than 30 years in two countries and three states, and has an interest in the development of curriculum materials from studies and programs at Hofstra, Tufts, Worcester Polytechnic Institute, Gordon College, the University of Iowa, and Lesley University. He studied and taught Rhetoric and Speech Communication at Pennsylvania State University. He may be reached at ahunsicker@revere.mec.edu. Deidra F. Baker teaches mathematics at Keota Jr. Sr. High School in Keota, Iowa, and formerly taught at Iowa City High School. She has been the recipient of STEM grants, mathematics research grants, and alumni awards. She has presented at many local and regional conferences. A 2012 Iowa finalist in the PAEMST (Presidential Award for Excellence in Mathematics and Science Teaching), she is also the 2012 recipient of the Robert Yager Educational Accomplishment Honor. Email her at deidra.baker@keota.k12.ia.us.

**READWRITETHINK CONNECTION**

Lisa Storm Fink, RWT

The ReadWriteThink.org Strategy Guide “Preparing Students for Success with Reading in the Content Areas” shares ways to determine the level and type of support content-area teachers should provide students to prepare them for effective discipline-based reading. http://www.readwritethink.org/professional-development/strategy-guides/preparing-students-success-with-30516.html
### APPENDIX. Overview of the Project with English “Habits of Mind”

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<tr>
<th>What's the math assignment?</th>
<th>What's English about math?</th>
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| **Letter exchanges about math**<br>Students write letters to each other about math and self. Who are you? What role does geometry play in your life? | Students form a two-year relationship learning about self and other through pen-pal exchanges. Habits of Mind:  
- Curiosity – the desire to know more about the world  
- Engagement – a sense of investment and involvement in learning  
- Persistence – the ability to sustain interest in and attention to short- and long-term projects |
| **The spider problem**<br>Students figure out the shortest distance to get a spider from one wall to a fly on the opposite wall (at different heights). | Students discuss words and the meaning of words, analyzing their choices through process and discussion. Habits of Mind:  
- Flexibility – reflect on choices they make in light of context, purpose, and audience  
- Engagement – find meanings new to them or build on existing meanings as a result of new connections |
| **The pole problem**<br>Students discuss and calculate the length of a pole stuck in the mud (from 1946 algebra book). | The problem is related to both space and time. Students discuss the 50-year-old historical math problem in contemporary context (a pole sticks in rural and urban mud!). Habits of Mind:  
- Metacognition – the ability to reflect on one’s own thinking as well as on the cultural processes and systems used to structure knowledge  
- Flexibility – reflect on choices they make in light of context, purpose, and audience  
- Engagement – find meanings new to them or build on existing meanings as a result of new connections |
| **The concrete block problem**<br>Students investigate the relationship between volume and weight (e.g., given the dimension of a concrete block, how much more would it weigh if it were filled up?). | Students reflect on their process—they write descriptions of the project and then they reflect on it. Habits of Mind:  
- Metacognition – the ability to reflect on one’s own thinking as well as on the cultural processes and systems used to structure knowledge  
- Flexibility – reflect on choices they make in light of context, purpose, and audience  
- Engagement – find meanings new to them or build on existing meanings as a result of new connections |
| **The tile problem**<br>Students diagram and consider choices for the size of tiles needed to cover the area of Deidra’s kitchen (i.e., how many different ways to tile a floor?). | Students rely on multi-modal forms of expression as tools of learning and discovery and talk about their decisions. Habits of Mind:  
- Metacognition – the ability to reflect on one’s own thinking as well as on the cultural processes and systems used to structure knowledge  
- Flexibility – reflect on choices they make in light of context, purpose, and audience  
- Engagement – make connections between their own ideas and those of others  
- Creativity – the ability to use novel approaches for generating, investigating, and representing ideas; use methods that are new to them to investigate questions, topics, and ideas |
| **Tessellations in a CD cover**<br>Students design their own CD covers using tessellations (i.e., repetitive patterns) that fill a plane. | Students literally think “inside” and “outside” the box when discussing their choices of geometric patterns. Habits of Mind:  
- Metacognition – the ability to reflect on one’s own thinking as well as on the cultural processes and systems used to structure knowledge  
- Flexibility – the ability to adapt to situations, expectations, or demands  
- Engagement – make connections between their own ideas and those of others; act on knowledge that they have discovered  
- Creativity – use methods that are new to them to investigate questions, topics, and ideas; evaluate the effects of their creative choices |

*continued*
Math in the Margins: Writing across Curricula into Community Heritage

APPENDIX. Overview of the Project with English “Habits of Mind” continued

<table>
<thead>
<tr>
<th>The Noonday Project</th>
<th>Students participate in global website based on ancient efforts, documenting measurements of their location, comparing and sharing their location in the world.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students measure the circumference of the Earth by comparing the lengths of shadows taken the same time of day in Keota and Revere (first used by Eratosthenes over 2000 years ago, now available as Internet collaboration site).</td>
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</tr>
<tr>
<td>Habits of Mind:</td>
<td>- Curiosity – the desire to know more about the world; seek relevant information and recognize the meaning and value of that information; conduct research using methods for investigating questions appropriate to discipline</td>
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<td></td>
<td>- Metacognition – the ability to reflect on one's own thinking as well as on the cultural processes and systems used to structure knowledge</td>
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<td>- Engagement – make connections between their own ideas and those of others</td>
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<td>- Creativity – use methods that are new to them to investigate questions, topics, and ideas; evaluate the effects of their creative choices</td>
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<th>The circle graphs</th>
<th>In looking at the proportion of time spent on daily activities, students realize the common features of their lives as American high school teenagers, regardless of where they live.</th>
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<td>Students show their daily routine in the form of circle graphs, calculating the percentage of time spent per activity.</td>
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<td>Habits of Mind:</td>
<td>- Engagement – make connections between their own ideas and those of others</td>
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<td>- Openness – examine their own perspectives to find connections with the perspectives of others</td>
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<td>- Curiosity – the desire to know more about the world; seek relevant information and recognize the meaning and value of that information; conduct research using methods for investigating questions appropriate to discipline</td>
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<th>The “mathatar”</th>
<th>Students write reflections and identify the reasons they chose the shapes for their “mathatars.”</th>
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<td>Students create “avatars” based on geometric shapes.</td>
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<th>The “postcard memoir”</th>
<th>With disposable cameras, students experiment with multimodal forms of expression, creating verbal portraits to accompany their snapshots.</th>
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<td>Students photograph geometry in the “natural and made” environments and write portraits of their culture for each other.</td>
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<td>Habits of Mind:</td>
<td>- Curiosity – the desire to know more about the world</td>
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<td>- Engagement – a sense of investment and involvement in learning</td>
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<td></td>
<td>- Persistence – the ability to sustain interest in and attention to short- and long-term projects</td>
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</tbody>
</table>

English Journal Edwin M. Hopkins Awards

The English Journal Edwin M. Hopkins Award is awarded biennially to authors of the best article published in English Journal during the two previous volume years. This award is given to recognize authors not eligible for the Kate and Paul Farmer Awards. It is named for Edwin M. Hopkins, author of the lead article in the first issue of the English Journal, a former professor of rhetoric and English language at the University of Kansas, member of the first Board of Directors of NCTE, and co-author of the first NCTE constitution.

The winner of the 2012 award is Lauren Esposito for “Where to Begin? Using Place-Based Writing to Connect Students with Their Local Communities,” March 2012, Vol. 101.4. Honorable Mentions are Merrilline Lundahl for “Teaching Where We Are: Place-Based Language Arts,” January 2011, Vol. 100.3; and Cynthia Messer for “Parenting a Child with Special Needs: A Teacher’s Journey toward Discovery about Disability and Identity,” November 2010, Vol. 100.2.