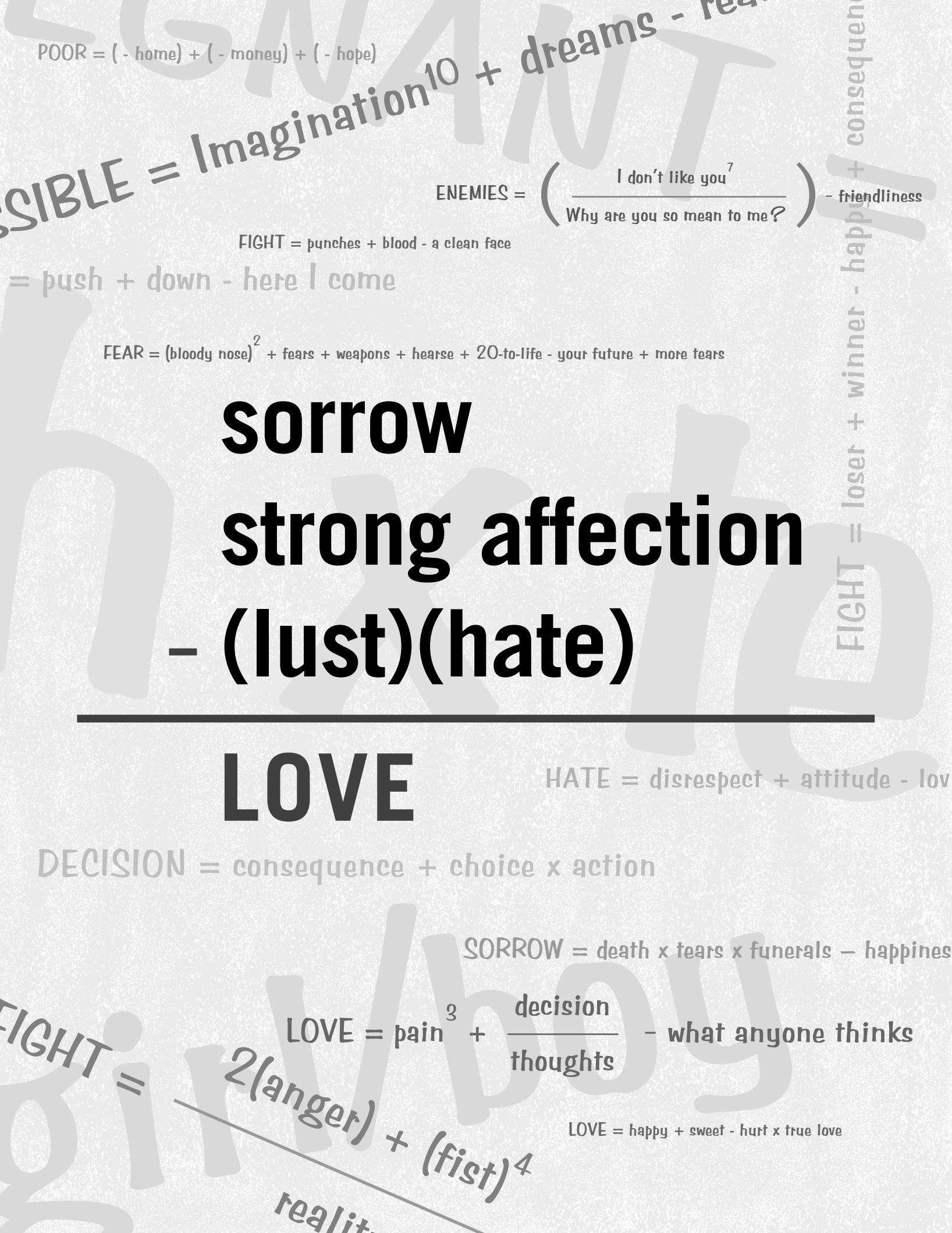
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= push + down - here I come
FEAR = (bloody nose)^2 + fears + weapons + hearse + 20-to-life - your future + more tears
sorrow
strong affection
- (lust)(hate)
LOVE
HATE = disrespect + attitude - lov
DECISION = consequence + choice x action
SORROW = death x tears x funerals - happines
LOVE = pain^3 + decision / thoughts - what anyone thinks
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LOVE = happy + sweet - hurt x true love
FIGHT = loser + winner - happ + consequen

The Crown Experiments

Conversations Between Words and Numbers

AMANDA LEIGH LICHTENSTEIN WITH LUKE ALBRECHT

"Step One: Walk toward yourself."
— Khari, 8th grade

THIS IS AN ESSAY on rule-making and rule-breaking. Before you start, divide this essay in half. Circle the words that begin with the first letter of your last name. At the beginning of each paragraph, snap three times and remember who you were as an eighth-grader. Each time you read a sentence that moves you, shout out loud. Ready to begin?

There it is—the sensation of giving and receiving rules, a series of directions, procedures meant to inform experience. Were you inclined to balk or obey? Who breaks, makes, and bends the rules? How do rules influence what we think? In the spring of 2008, we set out to explore these questions during a residency with a class of eighth-graders at Crown Community Academy in Chicago, Illinois. The ten-week residency was sponsored by Project AIM (Arts Integration Mentorship), a program of the Center for Community Arts Partnerships at Columbia College Chicago that matches teaching artists with public school teachers to foster new connections across disciplines. The residency we designed drew on my experiences as a poet and teaching artist, and Luke Albrecht's experience as a middle school math teacher, and led us to the Wild West of arts integration—the crossroads where math, poetry, and theater come together. For ten weeks we transformed our classrooms into word and number laboratories, borrowing from the language of poetry, mathematics, and improvisation to devise a series of cross-disciplinary "experiments."

Our work drew inspiration from two sources: a group of writers and mathematicians known as OULiPO ("Ouvroir de littérature potentielle," or "workshop of potential literature"), and the work of Gianni Rodari, Italy's "patron saint of children" and the author of the influential book, *The Grammar of Fantasy*. The members of OULiPO, founded in the

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Luke Albrecht *has taught at Crown Community Academy on Chicago's West Side for the last seven years. He has his National Board Certification in middle school mathematics. For the last three years he has co-taught with poet/teaching artist Amanda Lichtenstein in arts/mathematics integrated units with Project AIM: Center for Community Arts Partnerships, Columbia College Chicago.*

In that uncharted space between words and numbers, the students wrote with heightened sensitivity, curiosity, and playfulness. In our language laboratory, we could turn the world upside down and study the stars as glowing numbers in the sky.

1960s by writer Raymond Queneau and mathematician François Le Lionnais, sought new structures and patterns to spark original ideas for both writers and mathematicians. They believed that mathematical rules and constraints in the creative process acted as "keys to unlock the doors to the unconscious and to release the visual and verbal poetry of collective creativity." Rodari, in *The Grammar of Fantasy*, insisted that "the imagination has its own rules," and that it is only through making, playing with, bending, and breaking the rules that children come to understand themselves and their world.

Conversations Between Words and Numbers

Each of our workshops was organized around a single language experiment. On the first day, we asked the students to generate ten words associated with the idea of "rules." Words like *promise, commitment, participate, community, function, discipline, oath,* and, most importantly, *power*, soon crowded the board. In subsequent sessions, we investigated the ways in which rules, translated across disciplines, often produce surprising results. We discovered, for instance, that rule-making itself is a kind of poem, and that having to break or bend rules given or received calls attention to the absurdity and joy of being alive.

Since we were designing this residency as part of a US Department of Education Arts-in-Education grant named Translations: Multi-Directional Learning in the Arts, Literacy, and Math, we wanted to make sure that students would continually draw audacious connections between math and poetry throughout the residency.

I'll be honest: the poetry sometimes suffered in our weekly experiments. Obliging constraints is only as satisfying as one's disdain for the rules that bind. The notion of being set free by the creation of new structures only works if one already feels bound by old structures—which was not always the case with these eighth-graders, who were still learning the rules. But even though the poems were not always works of art, the students' attempts at creating and devising original rules helped generate a true shift in their thinking. In that uncharted space between words and numbers, the students wrote with heightened sensitivity, curiosity, and playfulness. In our language laboratory, we could turn the world upside down and study the stars as glowing numbers in the sky.

The Experiments

Our first experiments invited students to approach familiar math concepts in new ways. In the following experiment, for instance, we asked students to "square" their own names. *So, what is a name, squared?* That was the next question posed to the curious eighth- graders. We got blank faces in return. To help the students make the connections we sought, Luke began this poetry lesson with a math review.

"What does it mean for something to be squared?" he asked. A confident student got up and drew a square on the board, referring to her knowledge of base times height. "That's right," Luke encouraged, "so what would it be like to square a name?" Confusion persisted.

"Okay," I said, "let's start with your own name. Let's count the number of letters and use that number to determine the constraints for this poem."

Khari offered up his number, "My name's got five letters in it!"

"So—what would it be like to write a poem that's five squared?" I asked.

Luke jumped in to remind them of the algebraic

equation x^2 = x **times** x. Everyone pondered his statement. Then I asked, "Well, what are the basic components of a poem—what makes a poem?"

"Words, lines…" Shiara offered.

"Right!" I exclaimed, "So, let's say for Khari, he has five letters in his name, he writes a poem that has five lines, and five words per line?" Lightbulbs went on in their heads. Exclamations of "Ohhhh! I get it!" erupted around the room as the students set to work calculating their own names-squared poems.

Experiment: Names Squared

Rule: *Count the letters in your name and write a poem that is equal to that number in both lines and words per line.* (Your Name)^2 = a poem of x # of words per line and x # of lines, where x = # of letters in your name.

KHARI (5)
When I think of me,
I think proud and free.
Love, faith, and belief is
a part of you and me.
Don't cry—your hopes fly.

DENISHA (7)
I really don't know what to do.
This whole thing has me feeling blue.
I feel like I'm about to cry
but I'm holding the tears back in
my eyes. What's wrong with me, I
say to myself as I hold my
tears. Then I think I'm going away.

Who knew this would be the perfect moment to teach eighth-grade students about *enjambment*? A few students approached me and said, "Ms. Amanda, I can't do mine—I can't say what I want, because I can only write a certain amount of words per line!" I explained what it meant to "enjamb" a phrase, carrying on a thought from one line to the next to meet a particular set of demands according to function or feeling. In this case, they had to practice using enjambment in a poem in order to correctly execute the rules. Many who resisted the constraints were surprised to find that they really liked what they wrote. One mentioned relief that we hadn't told them what to write about, just how to write it.

During the residency we were lucky to meet with Scottish teaching artists on an exchange with Columbia College Chicago. Elly Goodman, a theater artist from the Citizen's Theatre Group in Glasgow, taught us an engaging theater warm-up called "1, 2, 3," in which partners repeat the series "1, 2, 3" back and forth until a steady rhythm is established. Next, players substitute a clap for the number 1, substitute a snap for the number 2, and substitute a mutually agreed-upon action or word for number 3. We had so much fun with this seemingly simple but ultimately complex theater game that we decided to turn it into a poetry exercise. The exercise we designed played off our understanding of "substitutions." As Luke explained, "We have this idea in mathematics. Just as a clap becomes a concrete representation of the number in the theater game, in our exercise, the poem becomes a verbal representation of a numeric pattern."

Experiment: 1, 2, 3

Rule: *Pick three words and write them until you are told to stop. Then change your first word, keep the rest the same, and continue to write until you are told to stop. Then change the second word, and continue to write until you are told to stop. Continue like this until the third word is changed and you are told to stop writing.*

By KEWON P.

free police station
free police station

stay police station

stay police station
stay in station

stay in station
stay in the game

stay in the game

By KEWON P.

dead hate forgotten

dead hate forgotten
tears hate forgotten

tears hate forgotten
tears die forgotten

tears die forgotten
tears die before laughter

tears die before laughter

By JASMINE H.

love hurts slow

love hurts slow
falling hurts slow

falling hurts slow
falling happens slow

falling happens slow
falling happens fast

falling happens fast

We realized only after we experimented with this form that we were exploring a kind of thinking similar to that used to craft the perfect villanelle or sestina; students had to think both strategically and fantastically in the very same moment of creation. They could pick any three words or phrases to begin, but had to think fast and move forward so as not to "get in the way" of their own imaginations.

After eight weeks exploring the ways in which poetry and math intersect, our efforts still felt somewhat hit or miss. That's until we came across the work of Craig Damrauer, a contemporary artist who created a body of poems called "New Math." In these poems, Damrauer arranges words in the patterns of mathematical equations to create definitions of complex ideas.

Our students really liked these two (reprinted courtesy of Craig Damrauer):

BLACK EYE = EYE + STORY

$$\text{JUSTICE} = \frac{\text{WHAT THE PUBLIC THOUGHT}}{\text{WHAT THE JURY DID}}$$

After all our experiments with absurdist rule-making, breaking, and bending, it was this sort of translating between poetry and math that fascinated the eighth-graders most. While at first Damrauer's equations confused them, the students quickly saw they could use their knowledge of algebraic language to get at the meaning of Damrauer's word equations. This inspired them to write their own poems/equations, defining complex relationships drawn from their own life experiences. In this experiment, Luke insisted that the students give as much weight to the math of the equation as to the words. For instance, when they were writing their poems, he asked them to take into account the rules regarding order of operations when solving a mathematical equation. Our students used the mnemonic "Please Excuse My Dear Aunt Sally" to remember the rules for simplifying a mathematical expression: Parenthesis, Exponents, Multiplication and Division, Addition and Subtraction. Students were asked to keep in mind that these rules would influence how their poems were read. Here was an experiment that married form and structure with heart and meaning.

Students had to think both strategically and fantastically in the very same moment of creation.

Experiment: "New Math" Equations and Translations

Rule: *Arrange words in a mathematical equation to define a concept, an idea, or a state of being.*

NICOLE S.

$$\text{FEAR} = (\text{bloody nose})^2 + \text{fears} + \text{weapons} + \text{hearse} + \text{20-to-life} - \text{your future} + \text{more tears}$$

$$\text{ENEMIES} = \left(\frac{\text{I don't like you}^7}{\text{Why are you so mean to me?}}\right) - \text{friendliness}$$

LEROY C.

$$\text{FIGHT} = \frac{2(\text{anger}) + (\text{fist})^4}{\text{reality}}$$

$$\text{IMPOSSIBLE} = \text{Imagination}^{10} + \text{dreams} - \text{reality}$$

SABRINA F.

$$\text{POOR} = (\text{ - home}) + (\text{ - money}) + (\text{ - hope})$$

JASMINE H.

$$\text{LOVE} = \text{pain}^3 + \frac{\text{decision}}{\text{thoughts}} - \text{what anyone thinks}$$

DEANDRE F.

$$\text{SORROW} = \text{death} \times \text{tears} \times \text{funerals} - \text{happiness}$$

We loved this experiment so much that we took it a step farther by translating our equations into poems. Rodney volunteered his equation as a starting point:

$$\text{MISERABLE} = \text{Lonely}^{21} - \text{Friends}^{19} + \text{nothing to do}$$

"So, what's the story of this equation? Where's the poem?" we asked. Everyone took a long hard look at Rodney's equation, grappling with all the component parts. One student suggested it was about 21 lonely little boys on 21st street and 19 lonely little boys on 19th street (in Chicago's Lawndale neighborhood). "What about them, what do you see?" Luke quickly warned against making direct reference to real gang issues in the neighborhood, because of a zero tolerance policy at the school regarding the presence of gangs on school grounds, so we mythologized the story of two "gangs" who share nothing in common except their collective loneliness. Here's what we came up with as a group:

21 lonely little boys
19 lonely little boys
Just standing there
Daydreaming
Nothin' to do
21 bored little boys
Sitting by trees for shade
19 bored little boys
Walking around for shade
All they have is loneliness
In common. Hate
Over getting along,
Friendship over argument,
Violence over violence
Violence over violence
Equals zero.

In the middle of our brainstorming session, Demario said suddenly: "This equation sort of reminds me of 'zero pairs'!" Demario, who hardly ever participates, was making a fascinating cross-disciplinary connection between the story on the board, his own knowledge of tension between gangs in his neighborhood, and his knowledge of algebra.

"What's 'zero pairs'?" I asked, fascinated.

Luke explained that zero pairs is a mathematical rule—"the idea is that if you add a pair that itself equals zero, then you have added nothing to the equation, but now you have more pieces to move around to get a solution." This rule was invented by mathematicians to assist with solving equations. "A zero pair cancels itself out, but it might actually build onto an equation to help find a solution," Luke explained.

We began to see how "zero pairs" in mathematics was the perfect metaphor to describe gang life. Two gangs are always trying to cancel each other out. Luke made a sobering point: "The ultimate result of zero pairs is always nothing." The class nodded in total understanding. We had arrived at the center of the place where poetry and math intersect, a place that, in this particular moment, offered us a new way to see and understand a complex social issue.

At the Crossroads of Math and Poetry

Metaphors like "zero pairs" abound in the language of mathematics, and mathematical logic speaks loudly in the language of poetry. Rule-making and breaking in either discipline calls on the maker to understand and challenge complex constructs and concepts. And while Surrealists and OULiPO-ists propelled us forward in thinking about what is gained from this approach, it was a difficult task to convey this to eighth-graders, let alone inspire further investigation. It's not satisfying to break rules if you haven't yet mastered them; and it's not always exciting to abandon structures if you have few to start with in the first place. Still, what catapulted us forward in our experiments was a cross-disciplinary desire to understand human life in all its complexity. An eighth-grader knows the push and pull between form and feeling, function and dysfunction, relationship and solitude—probably better than anyone.

When we asked the students to reflect on what the experiments had taught them, they responded with astute insight. Rodney, who always strove to find that balance between "cool" and "engaged," wrote, "*Life has made some difficult rules to face and some can be challenging. All rules are made for many reasons. Some are meant to be ignored…*" Tatyana, an outspoken and talented performer philosophized, "*Life's rules can be absurd and you can't just go along with these rules. You must speak your mind and try to make your own. In this class, I realized that sometimes rules are just impossible to follow so your only other option is to make your own or break the rules to form a new one.*" Carnail, one of the shyest boys, believed that *"[m]aking rules is something that has to be done to have balance in our society. Rule-breaking or bending disrupts the balance…."* Shiara, a passionate poet, wrote, *"I have to deal with rules regardless of how I feel about them. Without rules, my life would be inside out. This workshop has taught me when or when not to question certain rules."* And finally, Tyrell, ever-present, pointed out: *"Rule-making is easy—it's rule-breaking that is hard because of all the consequences."*

During a workshop when students were asked to devise their own set of rules to exchange with fellow classmates, Khari decided that his directions would begin as follows:

Step One: Walk Toward Yourself.

What did that mean exactly? Khari leaned over and whispered, "Shhhh, I don't want anyone to know what that means—'cuz I want the other person to have to figure it out what that means. But I'll tell you—." When he felt no one was listening, he explained: "Well, what it means is first thing you gotta do is walk to a mirror and take a look at yourself. Then the poem will come from there." I nodded, loving the explanation. *Yes, I thought. What a great rule for living:* Step One: Walk toward yourself.

What catapulted us forward in our experiments was a cross-disciplinary desire to understand human life in all its complexity. An eighth-grader knows the push and pull between form and feeling, function and dysfunction, relationship and solitude—probably better than anyone.

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