9-11-2009

# Math and Me [9th grade]

McKinley Rich
*Trinity University*

# UNDERSTANDING BY DESIGN

## Unit Cover Page

Unit Title: Math and Me

Grade Level: 9th

Subject/Topic Area(s): Algebra I/Geometry

Designed By: McKinley Rich

Time Frame: 2 weeks (5 days on an A/B schedule)

School District: NEISD

School: ISA

School Address and Phone: 1400 Jackson Keller Rd., San Antonio, TX 78209
210-442-0402

**Brief Summary of Unit** (Including curricular context and unit goals):
The purpose of this unit is to have students question and analyze their opinions about mathematics. Students, particularly in math, have very strong perceptions of themselves as a learner. These self-perceptions have many different roots, and in this unit students will analyze the origin and perpetuation of such perceptions. Through a series of articles and some moments of self-reflection, students will look for answers to the questions: "What perceptions do I have about **math**?" and "What **has shaped** and **will continue to shape** my perceptions about math?".

While this is unlike 99% of math units, I believe that in order for students to be successful in math, they must understand that they are capable and competent enough to complete problem-solving tasks. And so, we must give students an opportunity to reflect upon **their** history in mathematics and let them address any negative pre-conceived ideas they have about math or their abilities as a mathematician.

**Unit: Math and Me**

**Grade: 9th**

## Stage 1: Desired Results

### Understandings

*Students will understand that…*
*Students hold personal perceptions about math based on prior experiences and the context in which they learned it*
*Students have pre-determined perceptions about their ability and confidence to do math*
*Their perceptions can be changed*
*Math is a creative problem-solving field that everyone can and must be able to do*

### Essential Questions

- What perceptions do I have about **math**?
  - What perceptions do I have about my mathematical **ability**?
- What **has shaped** and **will continue to shape** my perceptions about math?

| **Knowledge** | **Skills** |
|---|---|
| *Students will know…*<br>What factors affects one's perceptions about mathematics | *Students will be able to…*<br>*Analyze cultural and personal perceptions of mathematics.* |

## Stage 2: Assessment Evidence

**Performance Task:**

Students will be asked to create a résumé of their mathematical skills. They will be asked to highlight their strengths in math. Students will be asked to write a summary of each math course they have taken since high school as well as any other skills that they possess to make them a good mathematician. As a cover page, students will include a short history about how their perceptions of their mathematical experiences are changing and will be changed.

**Other evidence:**

*(quizzes, tests, academic prompts, self-assessments, etc.*
*note – these are usually included where appropriate in Stage 3 as well)*

## Stage 3: Learning Activities

**Day 1: Introduction**

1. **Unit:** Math and Me
2. **Lesson:** Introduction to Perceptions about Mathematics (EQ: 1)
3. **Objective:** The student will be able to gain an understanding of his/her own previous experiences in mathematics classrooms.
4. **Materials and Resources:**
   - Math History Questionnaire (see attached)
   - Coloring utensils
   - Blank paper
   - 3 articles attached (*Math in the News: Is U.S. Culture Crushing Potential Mathletes?, Survey: Jobs that use math rank highest in satisfaction,* and *The Math Gender Gap Explained)*
5. **Introduction:**
   **Anticipatory Set:** Show Mythbusting Math Teachers Video

This is the first day in a 9th grade Algebra I class. After an ice breaker the students will begin by taking a Questionnaire about their mathematical experiences (12-15 min). Next the students will be given the task to "Draw a picture of a math teacher". The students will be given about 20 minutes to complete this task, and the students will be allowed to share informally about the attributes they have included in the drawing. During this time, the teacher will be reviewing the students responses to the last question on the questionnaire and will use that information to determine which article to give the students.

6. **Teaching New Material:** (20 min)
   The teacher will now put students into reading groups and will pass out the articles to the different students. Each group will focus on a different question that they will present next class.
7. **Homework:** Finish the article and answer the included question.

**Day 2: Perceptions about Math**

1. **Unit:** Math and Me
2. **Lesson:** Perceptions about Mathematics (EQ: 1 & 2)
3. **Objective:** Students will be able to make hypotheses about where their perceptions about mathematics come from. Students will be able to recognize certain aspects that might affect their perceptions about mathematics.
4. **Materials and Resources:**
   - 3 articles that were previously used
   - Poster Paper
   - Markers
   - Post-it Notes
5. **Introduction:** Students will begin with a warm-up problem solving question: *Suppose two days ago was Sunday. What day of the week will 365 days from today then be?* Explain your answer in detail.
6. **Teaching New Material:** (70 min):
   Students will use the Spontaneous Lecture model to demonstrate their understanding of the articles. Students will be placed in groups based on the article they read and will be asked to create a poster that summarizes the article using words, pictures, and/or symbols. Students will be give 15-20 minutes to create their poster and then will have 5 minutes to present their findings. Since there are only 3 articles and this could potentially leave about 8-10 students in each group, the teacher can split up members of each group to create separate posters and presentations. This will allow for different ideas to emerge from the articles.

   After the presentations have occurred and students have listened to the summaries of each article, the groups of students will create one final poster with the answer to the following questions:

   Gender Gap: What can we do to promote gender equality in math?
   Cultural Differences: How does culture affect our perceptions about math?
   Jobs in Math: Why are math professions ranked the highest in career satisfaction?

   After students have created their posters they will post them around the room and the

students will spend the last 15 minutes of class using the Gallery Walk protocol to further their understanding of the questions. The teacher will provide each student with 4-6 post-it notes that they will use to comment and ask questions on the posters.

7. **Check for Understanding**
   The last 5 minutes of class will be spent de-briefing the protocol process and students will take an exit slip that uses the 3-2-1 strategy answering the following statements:
   a. Name 3 things you learned about our world
   b. What are 2 questions you still have
   c. Name 1 thing you learned about yourself

**Day 3: Perceptions about Myself**

1. **Unit:** Math and Me
2. **Lesson:** Perceptions about Myself (EQ: 1)
3. **Objective:** Students will analyze their perceptions and the origin of their perceptions about mathematics.
4. **Materials and Resources:**
   - Colored Pencils
   - Blank Paper
   - Multiple Intelligence Quiz
   - Poster Paper
   - Post-It Dots
   - Games/Puzzles
   - Mathematical Résumé assignment and rubric
5. **Introduction:**
   Students will begin the day by drawing a picture of themselves as a mathematician. They will be given about 10-15 minutes to complete this task.
6. **Teaching New Material:** (15 - 20 min.)
   After students have completed their picture the teacher will begin with some Deductive logic puzzles. The teacher will be the scribe the students will ask the teacher yes/no questions to solve the riddles that are posed.
7. **Guided Practice:**
   The students will be given the opportunity to choose what puzzles, games or activities they would like to engage in. The teacher will tell the students that they can play as many or as few games as they would like as long as they are actively involved in some kind of activity. They will choose from the following:
   - Logic Puzzles
   - Sudoku
   - Brain Teasers
   - Hand Held puzzles
   - Jigsaw Puzzles
   - Monopoly
   - Scrabble
   - Mensa Books
   - Optical Illusion puzzles

   **** During this time the teacher should make observations about the choices that

students are making to further understand what interests the students possess and what times of puzzles they enjoy and find most valuable.

8. **Independent Practice:**
   After the students have had time to play the games each student will be given a Multiple Intelligence Quiz and will be asked to calculate their scores and create an individual graph for their intelligences. Then, as a class, students will create a poster that includes all students' top 4 intelligences on the graph using Post-It Dots.
9. **Homework:** Students will be asked to interview their parents and/or a family member about their perceptions of mathematics.

**Day 4: Reflection of their Perceptions**

1. **Unit:** Math and Me
2. **Lesson:** Reflection on parental perceptions and introduction to performance task(EQ: 1 & 2)
3. **Objectives:** Students will reflect upon their parents'/families' perceptions about mathematics and will begin their performance task.
4. **Materials and Resources:**
   - Blank Paper
   - Poster Paper
   - Markers
   - Examples of Résumés
5. **Introduction:**
   In groups the students will compile their responses from their family interview into a poster that displays common responses and perceptions. The students will present any trends or findings they have about their families' responses.
6. **Teaching New Material:**
   To introduce the Performance Task, groups of students will be given 3 examples of rubrics and will be asked to analyze each one. Students will develop answers to the following questions:
   - Which one is the best? Why?
   - Which one is the worst? Why?
   - What information do all 3 have in common?
   - What information is missing from any of the résumés?
   - What stands out to you?

   After students have had time to assess the résumés in groups, the teacher will distribute the rubric to the project and ask students to re-address their answers to the questions above. (i.e. "According to the rubric is this one still the best/worst?")
   Finally, the teacher will answer any questions that the students are still having about the project and the students will have time to work on their own résumés.
7. **Guided Practice:** The teacher will give an example of his/her mathematical résumé and give students a description of why each piece was included in the résumé.
8. **Independent Practice:** The students will begin to work on their individual résumés in class. They can seek feedback from their peers or teacher, and can ask clarifying questions as they face challenges in the project.
9. **Homework:** Students will work on their résumés

**Day 5: Work Day on Résumé**

1. **Unit:** Math and Me
2. **Lesson:** Work Day on Résumés
3. **Objective:** Students will work on their mathematical résumés in class.
4. **Materials and Resources:**
    - Computers
    - Examples of Résumés
5. **Independent Work Time:** Students will use this class to finish their mathematical résumés and ask any clarifying questions. Make sure to encourage students to refer to their rubric to make sure that they have completed all tasks.
6. **Homework:** Finish mathematical résumé and cover page.

**Day 5: Reflection of Personal Perceptions**

1. **Unit:** Math and Me
2. **Lesson: Reflection of Personal Perceptions**
3. **Objective:** Students will reflect upon their personal perceptions by re-addressing some of the original questions posed in this unit.
4. **Materials and Resources:**
    - Blank Paper
    - Markers
    - Poster Paper
5. **Introduction:** Students will turn in performance task and then will be asked to answer the following questions on their own sheet of paper:
    - What is Math?
    - How do you view yourself as a mathematician?
    - How have your perceptions changed about math?
    - What can you do to continue reflecting upon your perceptions about math?
6. **Guided Practice:** Students will complete a silent chalk talk in response to the question: How can we, as a class and as individuals, change our own and our cultures perceptions about mathematics?
7. **Check for Understanding:** As a culminating activity each student will draw a picture, or write a letter to himself that describes how he will continue to challenge his own perceptions about mathematics.

# Mathematical Résumé

**DUE DATE: September 8 (A Day), September 9 (B Day)**

In hopes of solving the economy's problems, ISA is looking to send several representatives in the field of mathematics to the Annual Conference for Mathematical Economics. In order to get accepted, you must submit a resume of all of your mathematical strengths, skills and accomplishments. You must include a cover letter that outlines why you think you would be the best representative for the job. Keep in mind the conference is just looking for good thinkers! ISA is looking for several representatives who are reflective about themselves as mathematicians. We are not looking for the student with the highest grade in math, we are looking for the students who are willing to learn, problem-solve and have a positive attitude about math. In your application you must include:

- A cover letter (see example and rubric) outlining your mathematical experiences, positive and negative. Be sure to include any perceptions you have about mathematics as well as any ways that you are using to change any negative perceptions you have about math.
- A mathematical resume (see example and rubric) that includes descriptions of each math class you have taken in middle school, as well as any strengths, skills and development opportunities you have had in mathematics.

Once you have completed both parts listed above, you will be able to submit your application to go to the conference!

**Rubric for Mathematical Résumé**
**(60 pts. Max)**

| | Exceeding Expectations (100%) | Meeting Expectations (80%) | Approaching Expectations (60%) | Total Points |
|---|---|---|---|---|
| Quality and Accuracy (25 pts. Max) | Résumé displays accurate information about past mathematical courses. Résumé includes detailed information about information acquired in each course. Résumé gives a clear picture of the student and expounds upon students skills and accomplishments. Résumé provides a clear and accurate picture of ALL aspects of the student. | Résumé displays information about past mathematical courses. Résumé includes some information about the knowledge acquired in each course. Résumé gives a somewhat clear picture of the student and gives some detail of the student's skills and accomplishments. | Résumé displays information about past mathematical courses. Résumé includes limited information about the knowledge acquired in each course. Résumé fails to give a clear description of the student and gives very little detail about the student's skills and accomplishments. | Pts: _____ |
| Clarity and Presentation (25 pts. Max) | Résumé is professionally written and contains very few grammatical and punctuation errors. Résumé uses professional language and is easy to read. Résumé is neatly organized and is a high quality representation of the student's work. Presentation of the résumé is professional. | Résumé is somewhat professionally written and contains several grammatical and punctuation errors. Résumé uses some professional language and is easy to read. Résumé is neatly organized and is a quality representation of the student's work. Presentation of the résumé is somewhat professional. | Résumé is not professionally written and contains many grammatical and punctuation errors. Résumé fails to use professional language and is difficult to read. Résumé is somewhat organized but is not high quality student work. Presentation of the résumé is somewhat professional. | Pts: _____ |
| Concept (10 pts. Max) | Résumé includes creative elements while still maintaining a professional structure. Student adds their own personality to the résumé in a tasteful and professional fashion. Résumé is directly aligned to the task at hand. | Résumé includes some creative elements while still maintaining a professional structure OR Résumé includes several creative elements that take away from the professional structure. Résumé is somewhat aligned to the task at hand. | Résumé includes no creative elements, OR the creative elements completely detract from the professional nature of the résumé. Résumé is not aligned to the task at hand. | Pts: _____ |

Total Points: _____

**Rubric for Cover Page**
**(40 pts. Max)**

| | Exceeding Expectations (100%) | Meeting Expectations (80%) | Approaching Expectations (60%) | Total Points |
|---|---|---|---|---|
| Quality and Accuracy (15 pts. Max) | Cover Page gives an accurate description of the student's background in mathematics. Cover page includes both positive experiences and learning experiences in mathematics. Cover page is reflective in nature and gives information about the student's past, present and future perceptions about mathematics. | Cover page gives a somewhat accurate description of the student's background in mathematics. Cover page includes some personal experiences in mathematics. Cover page is somewhat reflective and provides some information about the students' past, present and future perceptions about mathematics. | Cover page does not give a clear description of the student's background in mathematics. Cover page includes limited personal experiences in mathematics. Cover page has limited reflection included within it and provides little information about the students perceptions of mathematics. | Pts: _____ |
| Clarity and Presentation (15 pts. Max) | Cover page is professionally written and includes very few grammatical errors. Cover page is written within a professional structure and includes all elements that are necessary for a cover page. Cover page is easy to understand and captures the reader's attention. It is creatively written but the creativity does not detract from its professional nature. | Cover page is somewhat professionally written and includes several grammatical errors. Cover page contains a few errors in its professional structure. Cover page is easy to understand but does not capture the reader's attention. It is somewhat creatively written and does not detract from its professional nature. | Cover Page is not professionally written and includes many grammatical errors. Cover page contains several errors in its professional structure. Cover page is difficult to understand and doesn't capture the reader's attention. It is somewhat creatively written, but detracts the reader from its professional nature. | Pts: _____ |
| Concept (10 pts. Max) | Cover page is creative in nature while still maintaining professional elements. Cover page is cohesive and contains a clear picture of the student. Cover page is neatly organized and easy to follow. | Cover page is somewhat creative in nature but loses some of its professional elements. Cover page is somewhat cohesive and gives a fairly clear description of the student. Cover page is somewhat organized and easy to follow. | Cover page shows little creativity and lacks several professional elements. Cover page lacks cohesiveness and gives an unclear description of the student. Cover page is somewhat organized and easy to follow. | Pts: _____ |

Total Points: _____

Name: _____Date:_____

Period:_____

# Your Math History Questionnaire

1. What is Math?

2. On a scale of 1-10 (1 = very little confidence, 10= extremely confident) how confident are you in a math classroom? Why?

3. How successful were you in your middle school math classes?

4. What is one great moment you remember from a math class?

5. What is one scary or negative moment you remember from a math class?

6. What is the first word you think of when you hear the word MATH?

7. How much to you like to read? (Circle one)

   A little bit  A lot  A TON!!!

**Survey: Jobs that use math rank highest in satisfaction[1]**
**By Monica Young**
**Winston-Salem Journal April 2009**

Crunch the numbers and math-based jobs are the top three overall when it comes to career satisfaction, according to the latest survey published by JobsRated.com.

JobsRated.com ranked 200 professions by analyzing stress, work environment, physical demands, income and outlook. The Web site explained that it assigned specific numerical data per job, per category to determine the most accurate results.

Professor Stephen Robinson, the chairman of the math department at Wake Forest University, said he was "surprised a bit" to see mathematician ranked as the top job.

Actuaries, listed second on the JobsRated list, use mathematical tools such as statistics to analyze, assess and measure risk. Typically associated with insurance companies, actuaries may be also used by various businesses and governmental agencies.

The third top job, according to the list, was statistician.

"I've seen actuaries at the top of similar lists for years, but this is the first time I've seen mathematicians. That's a broad job," Robinson said.

What makes mathematical-oriented fields so desirable is not adding, subtracting or even computing. Robinson, who claims that the only calculator he owns is at home for handling the bills and checkbook, said that math really isn't arithmetic.

"It's problem solving," he said. "People say ‘math whiz' like we have a third lobe to our brains. Instead, we are able to be creative thinkers. We like solving puzzles and find them intriguing. When you get to the core of people who choose math, there is a sense of having a puzzle to solve and the feeling of conquering those puzzles can be addictive."

He said he sees a common theme in the 30 to 50 math majors that Wake Forest graduates each year. Robinson said that they share a common tenacity and a willingness to overcome ambiguity while enjoying the problem-solving process. Many WFU math graduates pursue graduate degrees in business, law and medicine.

Unlocking processes defines the study of math more than computations, Robinson said.

---

[1] Young, M. *Survey: Jobs that use Math Rank Highest in Satisfaction.* Wiston-Salem Journal. April 2009. http://www2.journalnow.com/content/2009/apr/03/survey-jobs-that-use-math-rank-highest-in-satisfac/

Jim Toole is the managing director of the life and health division for the Winston-Salem office of the consulting firm MBA Actuaries. Toole said he first saw actuaries ranked high when he began in the field in 1987. Toole, with more than 20 years in the business, said he can see why math-related careers do so well.

His job entails analyzing the socioeconomic consequences of risk.

"I very much like my job. It has good stability, little stress and a good salary. I think I have it pretty good," Toole said. "My job has given me a huge launching pad to travel the world and rub shoulders with some pretty interesting people."

Toole's job as an actuary requires math and problem solving but also strong communication skills, a key difference with many other math-oriented jobs.

Robinson said he made sure that his students saw the survey done by JobsRated.com.

"It's common for people to refer to mathematicians in a well-worn stereotype. Actually, there really are all sorts of people who are in math. Math can provide a platform for so many careers," Robinson said.

**Question for Understanding:**

Why are math professions ranked the highest in career satisfaction?

**Sharon Begley: The Math Gender Gap Explained**[2]

Even the most hidebound male chauvinists have been forced to admit that girls are as good at math as boys, on average. Boys no longer start outperforming girls at age 12 or 13, as they did as late as the 1970s; in the U.S., high school girls now take calculus at the same rate as boys; tests mandated by No Child Left Behind show that girls have reached parity with boys in math achievement through high school; and tests of complex problem-solving (which NCLB doesn't measure) find that girls have now pulled even with boys through 12th grade on this skill, too.

But the stereotype that females lack the innate ability to match males at the highest levels of math lives on. A new study comes as close to burying it as anything yet.

In a paper posted this evening in the Proceedings of the National Academy of Sciences, researchers describe analyzing data on the highest level of math achievement. These problems are not multiplication calculations, not even second derivatives; they're more like calculating the necessary relationship between N and epsilon for a uniform continuity proof. There are certainly hints that more males than females have what it takes to excel at math, "and there is an ingrained belief among very well-educated people that [the idea of superior math achievement among males] is true," says Janet Mertz, professor of oncology at the University of Wisconsin, Madison . In the U.S., men earn 70 percent of the Ph.D.s in the mathematical sciences, though that's down from a high of 95 percent in the 1950s. No female has ever won the Fields Medal, math's Nobel Prize. A study of mathematically precocious young people finds that boys outnumbered girls 2.8-to-1 in 2005, though that was down from 13-to-1 a quarter-century before, UW psychology professor Janet Hyde and Mertz report in PNAS.

"On average, girls have reached parity with boys in the United States and some other countries, and the gender gap at the high end is closing," says Hyde.

The question, then, is what accounts for the disparity in math geniuses. Here, international data are crucial. In the U.S., tests typically show that, among students scoring in the 99th percentile for math achievement, boys outnumber girls 2-to-1. But that's only among white students. Among Asians in the U.S., girls outnumber boys very slightly, as they do in Britain, Iceland and Thailand. That suggests that males' superior math ability does not hold true across the world, which is always a strong clue that social and cultural forces are involved.

"We concluded that the main reason many fewer females than males excel in math in most countries is not lack of innate ability or 'intrinsic aptitude' but gender inequality," says Mertz. "Nations with greater gender equality typically have a smaller math gender gap." (Gender equality, as measured by economists, reflects the number of women holding political office, the difference in men's and women's pay and the like, and is calculated by the World Economic

---

[2] Begley, S. *The Math Gender Gap Explained.* Newsweek. June 1, 2009. http://blog.newsweek.com/blogs/thehumancondition/archive/2009/06/01/sharon-begley-the-math-gender-gap-explained.aspx

Forum. The U.S. currently ranks 31st, with northern and western Europe dominating the top spots.) That suggests that the root of gender disparity in math is sociocultural factors, not anything unchangeable that girls are born with. Society either sends a message that girls can excel at math, that they will be rewarded for doing so—or it doesn't.

Gender equality also comes into play with what's called the "greater male variability hypothesis." This is the idea that then-Harvard president, and now White House advisor, Larry Summers was referring to in the infamous 2005 speech in which he posited that the dearth of women among Ivy League math departments and other top echelons of the field reflected a lack of "intrinsic aptitude" and, in addition, "the variability of aptitude." The last is a technical term for the idea that there are a greater number of males who are math dunces—but also a greater number who are math geniuses, while girls are clumped in the muddling middle.

Mertz and Hyde looked for evidence of this imbalance—more boys than girls at the extremes of math ability—in international data, too. Again, they found that in some countries as many girls as boys score above the 99th percentile, and in others more girls than boys are extreme math dunces or math geniuses. In both cases, countries with as many or more girls at the upper extreme tend to be those with the greatest gender equality, such as Germany and the Netherlands. If the greater male variability in math performance that Summers cited as an explanation for the low numbers of women among math geniuses is not ubiquitous across the world, then "the occurrence of greater male variability and scarcity of top-scoring females in many, but not all countries .. . must be largely due to changeable sociocultural factors," the scientists write, "not immutable, innate biological differences between the sexes." If the differences were innate, they should show up in every culture.

For anyone who still believes that innate factors explain the math gender gap, as I wrote last year, look at countries with a common gene pool. East Germany regularly sent many more girls than West Germany to the International Mathematics Olympiad by margins of 5-to-0; Slovakia sent more girls by a margin of 3-to-1; Korea topped Japan by 6 to 0. As I wrote then, "It's hard to see that as anything but the result of the starkly different social and other environmental forces in each country, not intrinsic biology."

**Question for Understanding:**
What can we do to promote gender equality in math?

## Math in the News: Is U.S. Culture Crushing Potential Mathletes?[3]

Earlier this month, the New York Times ran an article about the dearth of U.S. students with strong skills in mathematics. While this is not quite a revelation, it is made more timely by the recent release of a study that looked at data from Putnam exams, International Mathematical Olympiads, and data from other programs meant to nurture younger students in mathematics.

The data is troubling because not only does it show that Americans are getting trounced on the international stage, but it shows that when we do excel, it's often because of imported values from the countries that are trouncing us in the first place.

This leads to an important question: Is American culture to blame? Why do our students simply not perform as well?

Indeed, most people interviewed seem to think that culture is, if not the primary cause, certainly a guilty party. Simply put, mathematics is held in a much higher regard in other countries. Consider this explanation of the perception of mathematics in China:

> Dr. Feng says that in China math is regarded as an essential skill that everyone should try to develop at some level. Parents in China, he said, view math as parents in the United States do baseball, hockey and soccer.
> "Here everybody plays baseball," Dr. Feng said. "Everybody throws a few balls, regardless of whether you're good at it, or not. If you don't play well, it's O.K. Everybody gives you a few claps. But people don't treat math that way."

If we want to tackle this problem, looking for solutions from the cultural side shouldn't hurt. There are many negative perceptions that keep math out of the cultural consciousness, not least of which is the idea that somehow mathematics is meant to be tedious, difficult to understand, and without application. If other countries can highly value mathematics, see the use for it, and believe that anyone can achieve a certain level of mathematical sophistication with due diligence, surely America can as well.

Of course, getting our culture to that point will require serious work. However, certainly there must be some baby steps that will help us along the way. With that in mind, here are some suggestions that may help bring U.S. culture and mathematics into a more harmonious relationship.

**1. Get a mathematician on the Wheaties box.**

The analogy between math and sport is certainly a rich one. Both require hard work and discipline in order to excel. Both should be included in any child's education. And both attract people to their summer camps.

---

[3] ***Math in the News: Is U.S. Culture Crushing Potential Mathletes?***
***http://mathgoespop.blogspot.com/2008/10/math-in-news-is-us-culture-crushing.html***

At the same time, there is quite a wide cultural divide that is perceived between these two groups. Athletes are put on pedestals (literal and metaphorical), and their toned physiques are heralded as the pinnacle of human achievement. They are also widely regarded for their dedication, their determination, and nobody questions their hygiene. Sadly, the same cannot be said for mathematicians.

To combat this inequality, why shouldn't it be the case that top performers from both fields should be able to have their face on a Wheaties box? Certainly breakfast is the most important meal of the day for both athletes and mathletes - we should emphasize this point by highlighting the achievements of mathematicians on the orange box we all know and love.

**2. Put a mathematician on The Simpsons.**

Sure, The Simpsons doesn't hold quite the cultural sway that it used to, but its longevity shows that it has carved out an enduring place for itself in our culture. It is still quite popular, and has its share of devotees, and for this reason many people still pay attention to what it has to say, even if it may have been eclipsed by other series (animated or otherwise) in recent years. In this respect, it is a bit like the Hillary Clinton of prime time television.

Therefore, it stands to reason that having a mathematician lend their voice to an episode of The Simpsons, if handled in the right way, certainly couldn't hurt to flip the cultural perception of mathematics on its head. The Simpsons has featured hundreds of guest stars: celebrities, heads of state, authors, athletes ... the list goes on. Moreover, a move to bring in a mathematician would not be entirely unprecedented - Stephen Hawking has made not one, but two guest appearances on the show, and although he is a physicist rather than a mathematician, it would not be such a huge leap to move from a guest star of the former occupation to a guest star of the latter.

Of course, we could give the show the benefit of the doubt, and assume that despite their best efforts, producers have been unable to find mathematicians who would be willing or able to participate. Should this be the case, I am willing to humbly submit myself for such duties. I believe I am able to shoulder the tremendous responsibility that such an opportunity would entail.

**3. Endorsements.**

How do athletes and celebrities become cultural icons? Certainly their abilities take them far, but would Tiger Woods be as well known without his lucrative contract with Nike? Would Michael Jordan have been as successful without his deals with McDonalds, Coca-Cola, Hanes, and most importantly, Ball Park Franks? Would Gary Coleman be where he is today without Cash Call? I think not.

Given all of this success, there's no reason why academics shouldn't be able to dip into the same pot. You just got tenure at a major university? Well congratulations, here's a contract with Gatorade. Solve the twin prime conjecture? Then you get to sport the 2009 Saturn Astra!

Of course, it's a slippery slope to begin mixing economic incentives with academic achievements. But it certainly would help propel academics, and mathematicians in particular, into the spotlight.
Ok, so I'm (mostly) kidding about the above suggestions. But this disparity between our cultural views of mathematics compared to the views of other countries really is troubling, especially as we look towards a future that demands more and more technical sophistication from its populace. Bringing mathematics out of the cultural doghouse requires more transparency on our part, so that people can see why mathematics is important, and it also requires a better educational foundation, so that students see math as something beautiful and widely applicable, rather than some draconian set of rules, the knowledge of which was rendered obsolete with the creation of the calculator.

With the right resources, we can turn this perception around. Until then, be on the lookout for any chance to defy the stereotype that math isn't worth knowing. Every little bit helps, and every little bit will be needed.

**Question for Understanding:**
How does culture affect our perceptions about math?

# Multiple Intelligences Inventory



Note: This is not a test - it is a snapshot in time of an individual's perceived MI preferences.



**Part I**

Complete each section by placing a "1" next to each statement you feel accurately describes you. If you do not identify with a statement, leave the space provided blank. Then total the column in each section.

**Section 1**

_____ I enjoy categorizing things by common traits
_____ Ecological issues are important to me
_____ Classification helps me make sense of new data
_____ I enjoy working in a garden
_____ I believe preserving our National Parks is important
_____ Putting things in hierarchies makes sense to me
_____ Animals are important in my life
_____ My home has a recycling system in place
_____ I enjoy studying biology, botany and/or zoology
_____ I pick up on subtle differences in meaning

_____ TOTAL for Section 1

**Section 2**

_____ I easily pick up on patterns
_____ I focus in on noise and sounds
_____ Moving to a beat is easy for me
_____ I enjoy making music
_____ I respond to the cadence of poetry
_____ I remember things by putting them in a rhyme
_____ Concentration is difficult for me if there is background noise
_____ Listening to sounds in nature can be very relaxing
_____ Musicals are more engagingto me than dramatic plays
_____ Remembering song lyrics is easy for me

_____ TOTAL for Section 2

**Section 3**

_____ I am known for being neat and orderly
_____ Step-by-step directions are a big help
_____ Problem solving comes easily to me
_____ I get easily frustrated with disorganized people
_____ I can complete calculations quickly in my head

_____ Logic puzzles are fun
_____ I can't begin an assignment until I have all my "ducks in a row"
_____ Structure is a good thing
_____ I enjoy troubleshooting something that isn't working properly
_____ Things have to make sense to me or I am dissatisfied

_____ TOTAL for Section 3

**Section 4**

_____ It is important to see my role in the “big picture” of things
_____ I enjoy discussing questions about life
_____ Religion is important to me
_____ I enjoy viewing art work
_____ Relaxation and meditation exercises are rewarding to me
_____ I like traveling to visit inspiring places
_____ I enjoy reading philosophers
_____ Learning new things is easier when I see their real world application
_____ I wonder if there are other forms of intelligent life in the universe
_____ It is important for me to feel connected to people, ideas and beliefs

_____ TOTAL for Section 4

**Section 5**

_____ I learn best interacting with others
_____ I enjoy informal chat and serious discussion
_____ The more the merrier
_____ I often serve as a leader among peers and colleagues
_____ I value relationships more than ideas or accomplishments
_____ Study groups are very productive for me
_____ I am a “team player”
_____ Friends are important to me
_____ I belong to more than three clubs or organizations
_____ I dislike working alone

_____ TOTAL for Section 5

**Section 6**

_____ I learn by doing
_____ I enjoy making things with my hands
_____ Sports are a part of my life
_____ I use gestures and non-verbal cues when I communicate
_____ Demonstrating is better than explaining
_____ I love to dance
_____ I like working with tools
_____ Inactivity can make me more tired than being very busy
_____ Hands-on activities are fun
_____ I live an active lifestyle

_____ TOTAL for Section 6

**Section 7**

_____ Foreign languages interest me
_____ I enjoy reading books, magazines and web sites
_____ I keep a journal
_____ Word puzzles like crosswords or jumbles are enjoyable
_____ Taking notes helps me remember and understand
_____ I faithfully contact friends through letters and/or e-mail
_____ It is easy for me to explain my ideas to others
_____ I write for pleasure
_____ Puns, anagrams and spoonerisms are fun
_____ I enjoy public speaking and participating in debates

_____ TOTAL for Section 7

**Section 8**

_____ My attitude effects how I learn
_____ I like to be involved in causes that help others
_____ I am keenly aware of my moral beliefs
_____ I learn best when I have an emotional attachment to the subject
_____ Fairness is important to me
_____ Social justice issues interest me
_____ Working alone can be just as productive as working in a group
_____ I need to know why I should do something before I agree to do it
_____ When I believe in something I give more effort towards it
_____ I am willing to protest or sign a petition to right a wrong

_____ TOTAL for Section 8

**Section 9**

_____ Rearranging a room and redecorating are fun for me
_____ I enjoy creating my own works of art
_____ I remember better using graphic organizers
_____ I enjoy all kinds of entertainment media
_____ Charts, graphs and tables help me interpret data
_____ A music video can make me more interested in a song
_____ I can recall things as mental pictures
_____ I am good at reading maps and blueprints
_____ Three dimensional puzzles are fun
_____ I can visualize ideas in my mind

_____ TOTAL for Section 9

**Part II**

Now carry forward your total from each section and multiply by 10 below:

| Section | Total Forward | Multiply | Score |
|---|---|---|---|
| 1 | | X10 | |
| 2 | | X10 | |
| 3 | | X10 | |
| 4 | | X10 | |
| 5 | | X10 | |
| 6 | | X10 | |
| 7 | | X10 | |
| 8 | | X10 | |
| 9 | | X10 | |

**Part III**

Now plot your scores on the bar graph provided:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 100 | | | | | | | | | |
| 90 | | | | | | | | | |
| 80 | | | | | | | | | |
| 70 | | | | | | | | | |
| 60 | | | | | | | | | |
| 50 | | | | | | | | | |
| 40 | | | | | | | | | |
| 30 | | | | | | | | | |
| 20 | | | | | | | | | |
| 10 | | | | | | | | | |
| 0 | Sec 1 | Sec 2 | Sec 3 | Sec 4 | Sec 5 | Sec 6 | Sec 7 | Sec 8 | Sec 9 |

**Part IV**

Key:
Section 1 – This reflects your Naturalist strength
Section 2 – This suggests your Musical strength
Section 3 – This indicates your Logical strength
Section 4 – This illustrates your Existential strength
Section 5 – This shows your Interpersonal strength
Section 6 – This tells your Kinesthetic strength
Section 7 – This indicates your Verbal strength
Section 8 – This reflects your Intrapersonal strength
Section 9 – This suggests your Visual strength

Remember:

- Everyone has all the intelligences!
- You can strengthen each intelligence!
- This inventory is meant as a snapshot in time - it can change!
- MI is meant to empower, not label learners!

# YOUR NAME HERE

Current: One Main Street 2 ? San Antonio, Texas 78209 ? (210) 555-5555 ? student@trinity.edu
Permanent: Two Main Street ? San Antonio, Texas 85255 ? (480) 555-5555

## EDUCATION

**Master of Arts in Teaching**
**Secondary Education**
Trinity University – *San Antonio, Texas*
Anticipated May 2008
GPA: 0.0 (current)

**Bachelor of Arts in Chemistry**
**Magna Cum Laude**
Trinity University – *San Antonio, TX*
May 2007
GPA: 0.0

## CERTIFICATION

Texas Standard Teaching Certificate, Physical Science (Grades 8-12) Anticipated May 2008

## PROFESSIONAL EXPERIENCE

**Internship, International School of the Americas** – *San Antonio, TX* 2007 – Present
Perform all teaching duties in 10th grade Chemistry Pre-AP: planning, teaching, assessing students, and managing classroom. Develop and teach a unit for nine weeks of lead teaching. Communicate with parents through phone calls, e-mail and parent-teacher conferences. Participate in sophomore team, math and science department, and ISA faculty meetings. Co-plan and lead sophomore team trip to Zacatecas, Mexico. Facilitated ninth-grade student group on expeditionary freshman team trip to Heifer Ranch in Arkansas.

**High School Field Seminar, Lee HS and International School of the Americas** – *San Antonio, TX* Fall 2006
Observed science classes in biology, chemistry, physical science, and physics in two high schools. Conducted study of high school principal through observing, interviewing, and shadowing.

**Science Teaching Practicum, International School of the Americas**– *San Antonio, TX* Spring 2005
Provided mentoring and enrichment for high school students in science. Conducted a child study of a 10th grade student through observing, interviewing, and shadowing.

**Science Teaching Practicum, Jackson Middle School**– *San Antonio, TX* Fall 2004
Conducted observations in middle school science classes. Collected data on adolescent interests and compared with research on child development.

**Trinity University Department of Chemistry, Peer Tutor** – *San Antonio, TX* Fall 2005- Spring 2006
Tutored general chemistry and first semester organic chemistry for Trinity chemistry students for 10 hours per week. Attended chemistry class sessions and held office hours.

**Hand in Hand, Participant and Coordinator** – *San Antonio, TX* Fall 2003-Spring 2006
Coordinated a high school mentoring program at Fox Technical High School (SAISD) through Trinity University Volunteer Action Community. Mentored at-risk student for three years from 10th grade through graduation.

## PROFESSIONAL DEVELOPMENT

Critical Friends Group participation (monthly) Fall 2007- Present
District-wide professional development for science teachers – *NEISD* August 2007

## CHEMISTRY RESEARCH EXPERIENCE 2005-2007

Researched chemistry with three different Trinity Chemistry professors during summers and school year. Worked on computational organic chemistry, synthetic organic chemistry, and laboratory curriculum for introductory chemistry course.

## ACHIEVEMENTS AND HONORS

Phi Beta Kappa Honor Society
Kappa Delta Pi International Education Honor Society
Robert Noyce NSF Scholar (2006-2008)

**SKILLS:** Proficient in Word, Excel, Powerpoint, Gradespeed, teacher web, on-line attendance, TI-83, Lab ware probe, general chemistry research instruments (NMR, UV-Vis Spectrometer, GC/MS, HPLC, CE)

*References available upon request from the Department of Education, Trinity University, One Trinity Place, San Antonio, TX 78212*

# YOUR NAME HERE

1 Main Street, San Antonio, Texas 78212 Phone: (210) 555-5555 email: student@trinity.edu

OBJECTIVE To obtain an elementary teaching position in a community where I can foster a love of learning, inquiry, and creativity.

## EDUCATION

**Master of Arts in Teaching, Elementary Education** (anticipated) May 2008
Trinity University, San Antonio, Texas Cumulative GPA: 0.0

**Bachelor of Arts in Humanities and English, Minor: Spanish** May 2007
Trinity University, San Antonio, Texas Cumulative GPA: 0.0

## PROFESSIONAL EXPERIENCE

**Teaching Internship**, *Hawthorne Academy, San Antonio, Texas* Fall 2007-Spring 2008
Completed an intensive, year-long teaching internship at a Title I school. Crafted and implemented lesson plans, and graded assessments throughout the year.

**Teaching Students with Special Needs Practicum,** *The Winston School of San Antonio* Fall 2006
Completed a 30-hour practicum course consisting of observation and some direct participation with special needs students.

**Co-teacher for "Problems in Education" Freshman Seminar,** *Trinity University* Fall 2006
Led a small group of first-year college students in investigating the field of education over the course of a semester.

**Elementary Grades Field Seminar,** *Hawthorne Academy, San Antonio, Texas* Fall 2005
Completed a semester-long field seminar in a third grade classroom. Observed students, planned, and implemented a unit.

**Elementary Grades Practicum,** *Walzem Elementary School, San Antonio, Texas* Spring 2005
Observed and interacted with students in a semester-long practicum in a pre-first classroom. Completed a child study.

**High School Grades Practicum,** *International School of the Americas, San Antonio, Texas* Spring 2005
Observed and tutored students in a semester-long practicum in a sophomore English class. Completed a student study.

## RELATED WORK EXPERIENCE

**Part-Time Personal Care Attendant,** *Home of Karen French, San Antonio, Texas* *2005-2008*
Worked as personal attendant, showering, dressing, driving, and assisting a quadriplegic woman in San Antonio.

*Volunteer Counselor*, **Camp C.A.M.P, Center Point, Texas** ***Summer 2005***
Helped lead 17-22 year-old young women with disabilities at a special needs camp. Duties included lifting, feeding, bathing, and dressing, as well as planning and executing spirit activities.

**Part-Time Personal Attendant**, *Home of Olivia Martino, San Antonio, Texas* 2004-2006
Served as a personal care attendant for an autistic young woman. Duties included driving, cooking, basic teaching, and supervision.

**Tutor**, *Southwest Preparatory Academy, San Antonio, Texas* 2005
Tutored at-risk high school students in math, language arts, and social studies at an alternative high school.

## AWARDS, ACTIVITES & VOLUNTEER EXPERIENCE

| | |
|---|---|
| Organized a book drive and created a new library at the San Antonio Boys and Girls Club | 2007 |
| Secured a $500 Walmart grant to purchase clothes and supplies for Hawthorne Academy | 2007 |
| *Trinity Review*, five poems and one painting published in the campus literary journal | 2005, 2007 |
| Received Trinity University Award for Achievement: *Volunteer Scholar Award* | 2007 |
| Awarded Outstanding Senior in Education, Trinity University | 2007 |
| Kappa Delta Pi (Education Honor Society), President & Member | 2006-2007 |
| Student Representative to the Quality Enhancement Plan Committee at Trinity University | 2006-2007 |
| Named to National Dean's List | 2006 |
| Awarded Distinguished Service to the Community Certificates (APO) | 2005, 2006 |

# YOUR NAME HERE

Local: 384 Treeline Park #1625 ? San Antonio, Texas 78209 ? 210/555-5555 ? student@trinity.edu
Permanent: 100 Main Street ? Anytown, Texas 76034 ? 817/ 555-5555 ? student@alumni.trinity.edu

*OBJECTIVE* ***English Language Arts or Spanish teaching position in a public high school.***

*EDUCATION*

**Master of Arts in Teaching, Grades 8-12** May 2008 (anticipated)
Trinity University, San Antonio, Texas GPA: 0.0

**Bachelor of Arts in English and Spanish, Summa Cum Laude** May 2007
Trinity University, San Antonio, Texas Cumulative GPA: 3.90

**Study Abroad, Universidad de Salamanca, Spain** GPA: 0.0 Spring 2006

**CERTIFICATION** Texas Standard Teaching Certificate: English Language Arts 8-12, Spanish 6-12 (anticipated)

**PROFESSIONAL EXPERIENCE**

Lee High School, North East ISD – San Antonio, Texas Fall 2007-Spring 2008, Spring 2006

**Internship**

Planned and co-taught three preparations during an 8-month internship: English II Pre-AP, Spanish I and Spanish III. Developed disciplinary units for English II Pre-AP and Spanish I for a 9-week period of lead-teaching. Created and implemented performance-based assessments, rubrics, and student self-evaluations. Participated in team, level, department and ARD meetings. Examined student performance data with level and developed a plan for vertical curriculum alignment. Communicated with students' families by phone and in person. Traveled with students from ISA on an expeditionary learning experience to Zacatecas, Mexico.

***Field Seminar***

Completed a 24 hour field rotation in Spanish classrooms of all levels. Conducted action research around the question of language acquisition and acculturation of native speakers of Spanish.

International School of the Americas, North East ISD – San Antonio, Texas

***Independent Study/ Practicum*** Spring 2007

Applied student-centered learning and adolescent development theory to the completion of a child study. Provided academic enrichment and shadowed an eleventh-grade student with limited English during a 25 hour field placement.

***Spanish Tutor*** Spring 2007

Provided individualized instruction and created supplemental materials for a Spanish II student twice weekly.

***TAKS Writing Tutor*** Spring 2007

Provided differentiated writing instruction to eleventh-grade students. Focused on personal narrative and short response. Examined individual student work and discussed how to fulfill criteria on TAKS writing rubric.

Trinity University – San Antonio, Texas

***Writing Tutor, Department of English*** Spring 2005, Fall 2005

Edited and revised papers for students from various academic departments during individual conferences. Discussed strategies for improving writing style, developing mechanical skills, and articulating critical ideas.

***Peer Tutor*** Fall 2005, Fall 2006

Facilitated seminars on Music, Politics, and Persuasion and Current Issues in Education for first year students.

Jackson Middle School, North East ISD – San Antonio, Texas Fall 2004

*Practicum*

Observed and taught for 25 hours in a seventh-grade reading and an ESL classroom.

*SKILLS*

- Spanish proficiency in reading, writing, listening, and speaking
- Computer proficiency in Word, Excel, PowerPoint, Gradespeed, teacher web, district mainframe/databases, PhotoStory, and MovieMaker

*PROFESSIONAL DEVELOPMENT*

- Participated regularly in a Critical Friends Group, a professional learning community at Lee. Fall- Spring 2007
- Received training in curriculum, school policies, and procedures during teacher inservice week. August 2007
- Traveled on a faculty retreat to civil rights sites in Alabama with the International School of the Americas and developed interdisciplinary curriculum around the theme of justice to be taught during a student trip in the fall.

**HONORS AND ACTIVITIES**

- Honor Societies: Phi Beta Kappa, Kappa Delta Pi, Sigma Tau Delta, Sigma Delta Pi
- Published in the *Expositor*, Trinity University's journal of academic prose (Spring 2006)

# MCKINLEY W. RICH

Current: 2605 Princeton Dr. ? Flower Mound, Texas 75022 ? (972)-724-9266 ? mrich@neisd.net
Permanent: 2605 Princeton Dr. ? Flower Mound, Texas 75022 ? (214)- 924-6499

## EDUCATION

**Texas High School Diploma**
Flower Mound HS – *Flower Mound, TX*
Anticipated June 2003
GPA: 3.95 (current)

**Completion of Middle School**
Max Abbott Middle School – Fayetteville, *NC*
June 1999
GPA: 4.0

## CERTIFICATION

High School Math Wizard — Anticipated June 2003

## MATHEMATICAL EXPERIENCE

**Geometry –** *Fayetteville, NC* — August 1999-present
Performed all assignments that Mrs. Nicholson gave to me. Mastered the properties of Polygons, parallel and perpendicular lines, volume and surface area. Received help when I didn't understand the material that was being covered and asked a lot of questions.

**Algebra I** – *Fayetteville, NC* — August 1998-June 1999
Performed all assignments that Ms. Matthews gave to me. Learned how to apply functions to real-life situations. Learned how to problem solve and ask questions. Learned how to work in groups cooperatively. Was a group leader in my classroom.

**Pre-Algebra -** *Fayetteville, NC* — August 1997-June 1998
Performed all assignments that Ms. Jackson gave to me. Presented a lot of problems on the board and taught other students how to solve equations. Asked a lot of questions when I didn't understand. Learned how to use fractions, percents and proportions to solve problems.

**6th grade math** – *Fayetteville, NC* — August 1996 – June 1997
Performed all assignments that Ms. Fox gave me. Learned how to read word problems and how to solve them using mathematics. Developed my problem-solving skills and learned how to complete my work independently. Learned how to develop questions on my own and began solving problems without help.

## MATHEMATICAL DEVELOPMENT

| | |
|---|---|
| Tutoring sessions with my teachers | Fall 1996- Present |
| Tutoring sessions with my friends | Fall 1996 – Present |
| Math Competitions UNCG | October 1998 |

## MATHEMATICAL RESEARCH EXPERIENCE — 2005-2007

Researched the history of mathematics and why it is important to learn. Developed conclusions based on the information collected and found that I must be able to complete basic math skills to continue to be successful in life.

## STRENGTHS

Hard-working, diligent, enthusiastic, have a desire to succeed. Enjoy all types of problem solving.

***SKILLS:*** *Enjoy solving problems and working collaboratively and proficient in Word, Excel, Powerpoint, and on the TI-83-84 graphing calculator.*