

EXPLORATORIUM POSTER CONTENT
AASL NATIONAL CONFERENCE
OCTOBER 2005

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WHY ARE WE HAVING MATH IN THE LIBRARY?

As seventh graders filed into the school library one Fall morning, this question was answered with anxious smiles and hopeful expectation by two educators: a middle school librarian and a seventh grade math teacher about to embark on a new collaboration.

In a series of seven learning activities throughout the school year, "math class in the library" added up to the discovery of authentic connections and application of math content, the development of vocabulary and reading comprehension, and the opportunity for students to view the library as a place where fractions and statistics rightfully reside amidst favorite books and familiar library experiences.

PROJECT DEVELOPMENT

This math/library collaboration began in Fall 2004, when seventh grade math teacher Mrs. Tina Mellish asked if there was an activity that her students could pursue in the library on a regular basis, perhaps dealing with research or learning about math in the real world. As a first year librarian, I was simultaneously excited, relieved, and a little nervous that a teacher – particularly a math teacher – wished to join me in developing a new collaboration.

I was eager to offer a meaningful opportunity for students to use resources from reference databases, and Mrs. Mellish liked the idea of connecting math concepts to life "outside the classroom." We decided that we would have students read a math-related magazine or journal article and answer reading comprehension questions, an activity that met our instructional goals and our school-wide focus on reading and writing across the curriculum. During the students' time in the library, they would also rotate through a computer session, in which they would revisit math concepts with an interactive skills review website. We would assess the students' participation and work in the library together. I would check the students' responses for accuracy and completeness with Mrs. Mellish's support, and together we would conduct a follow-up discussion either the next day or a few days later.

Through seven different lessons during the year, we adjusted the length and difficulty of the reading selections and questions, time allotted, student grouping, grading value assigned to the assessment, and the format of the follow-up discussion. We are planning to continue to teach and develop this collaboration for the 2005-2006 year.

Rebecca J. Morris
AASL Exploratorium
October 2005

FORMAT

DAY ONE

- Introduce learning tasks:
Preview article and questions
Model interactive math skills website
Explain math review or additional reading, if students have extra time
- Students read and answer questions independently. Students rotate use of the eight library computers to practice math skills on a teacher-selected website.
- Collect/check student questions.

DAY TWO

- Return graded questions to students.
- Share and discuss questions/responses.
- Teacher and librarian reflect; make improvements and plans for next meeting

TOPICS

- How auto mechanics use math
- Fractions in basketball
- Probability as related to “icing the kicker” in football
- Baseball statistics and the best player of all time
- Math, architecture, and geodesic domes
- Tipping your server in a restaurant
- Math in the production of Sponge Bob movie

STANDARDS

OBJECTIVE: The student will be able to read a math-related article and provide accurate, relevant responses to comprehension questions in writing and discussion.

PENNSYLVANIA ACADEMIC STANDARDS

READING, WRITING, LISTENING AND SPEAKING

1.2 Reading Critically in All Content Areas

- A. Read and understand essential content of informational text and documents in all academic areas

1.6 Speaking and Listening

- D. Contribute to discussions

INFORMATION LITERACY STANDARDS

INFORMATION POWER: Building Partnerships for Learning

Standard 1: The student who is information literate accesses information efficiently and effectively.

Standard 3: The student who is information literate uses information accurately and creatively.

DIFFERENTIATION

- Read articles with buddies or small groups
- Allow students with reading needs to preview
- Extend topics of interest with further explorations
- Invite alternate forms of response: oral, typed, project
- Focus upon one question or topic; examine more deeply or at a more basic level
- Tape record readings for additional listening or as an assistive resource; offer alternative media for viewing
- Encourage self-selected math topics
- Utilize teachers, university faculty or community members as expert speakers or interview subjects
- Incorporate science and social studies into math topics
- Offer articles on same topic, varied reading levels
- Vary levels of questioning in group discussion

ABOUT US

Our School: Deer Lakes Middle School

Our Students: 480 students, Grades 6-8

Our Location: Russellton, PA

Our Library: Suburban district, northeast of Pittsburgh
Staffed by one full-time professional librarian
~7,000 volumes, 8 student computers

Collaborative Partners:

Mrs. Tina Mellish, Seventh Grade Math and Pre-Algebra Teacher
6 years teaching experience

Ms. Rebecca Morris, School Librarian
1 year school library, 4 years elementary teaching

2004- 2005 Math Matters @ Your Library Resources

- Hawkins, Rob. "Bonds, The Best Ever?" Kidnewsroom. 15 August 2003.
Proquest. SIRS Discoverer. DLMS Lib. Russellton, PA. 10 November 2004.
<<http://discoverer.sirs.com>>.
- Henderson, Samantha. "Designing Women." Scholastic Math. 21 March 2005.
Searchasaurus. EBSCOHost. DLMS Lib. Russellton, PA. 31 May 2005.
<<http://www.web8.epnet.com>>.
- . "Spongebobs Per Second." Scholastic Math. 6 September 2004.
Searchasaurus. EBSCOHost. DLMS Lib. Russellton,
PA. 31 November 2004. <<http://www.web8.epnet.com>>.
- "It's Hip to Tip." Know Your World Extra. 7 November 2003. SIRS Discoverer.
Proquest. DLMS Lib. Russellton, PA. 31 March 2005.
<<http://discoverer.sirs.com>>.
- Obringer, Lee Ann. "How Tipping Got Started." How Stuff Works. 2005. 31
March 2005. <<http://www.howstuffworks.com/tipping.htm>>.
- Peterson, Ivars. "The Iced Foot Effect." Math Trek. November 2004.
Middle Search Plus. EBSCOHost. DLMS Lib. Russellton, PA.
20 January 2005. <<http://web14.epnet.com>>.
- Vaccaro, Monika. "Auto Service Techs of the 21st Century." Weekly Reader.
2003. SIRS Discoverer. Proquest. DLMS Lib. Russellton, PA. 13
October 2004. <<http://discoverer.sirs.com>>.
- Wise, Bill. "Fraction Jam." Scholastic Dynamath. January 2005.
Searchasaurus. EBSCOHost. DLMS Lib. Russellton, PA. 20 February
2005. <www.epnet8.com>.

Name _____

Vaccaro, Monika. "Auto Service Techs of the 21st Century."
Weekly Reader. 2003. SIRS Discoverer. Proquest.
DLMS Lib. Russellton, PA. 13 October 2004.
<<http://discoverer.sirs.com>>.

1. What career is described in the article?

2. Name two synonyms for this job title. (Use a thesaurus if you need to!)

3. Name two ways that math is used in this job.

4. Name another school subject or skill that this job requires. Why?

5. In the article, Ben E. Dellamo, an automotive shop owner, says,
"Techs consult continuously. No one can know everything,
but a professional can get the answer." (page 2, lines 10-11).

What does he mean? _____

Name _____ Period _____

Math Connections · Grade 7 · Mrs. Mellish / Ms. Morris

The point value for each question is listed in ().

Please see Question 6 for citation information.

1. What skills and academic degrees are required for a career as an architect? List at least four skills and degrees total. (1)

2. According to the article, “Designing Women,” what two-dimensional shape can be used to create curved surfaces, such as a dome? (1)

3. In 1947, American architect and inventor, Buckminster Fuller, invented the **geodesic dome**, pictured here. This dome is constructed of a lattice of interlocking tetrahedrons. No internal supports are needed in a geodesic dome. (2)



Define lattice: _____

Define tetrahedron: _____

4. In a geodesic dome, the tetrahedrons are made of equilateral triangles. Using your best math and artistic talents, sketch one here. Use the dictionary drawing to help you! (1)

5. The architects in the article are designing the Fulton Street Transit Center. The smallest triangular piece of the transit center's dome looks like this:

What is the perimeter? Show your work and the answer. (1)

What is the area? You may use a calculator, but you must show the equation and your answer for full credit. (1)

6. The citation for the information in Questions 3 and 4 is this:

"Dome." Funk and Wagnall's New Encyclopedia. 2005. Facts for Learning. Facts on File News Services, Inc. DLMS Lib. Russellton, PA. 31 May 2005. <<http://factsforlearning.2facts.com>>.

Write the correct citation for the article, "Designing Women," here. Pay attention to the order of the information, punctuation, capitalization, and underlines. The indentation is done for you. Use this information to help you: (3)

Original source title: Scholastic Math
Database: Searchasaurus
Database publisher: EBSCOHost
Date article was viewed: May 31, 2005
URL: <http://www.web8.epnet.com>

Name _____

Period _____ Date _____

Peterson, Ivars. "The Iced Foot Effect." Math Trek. Nov. 2004.
Middle Search Plus. EBSCOHost. DLMS Lib.
Russellton, PA. 20 January 2005.
<<http://web14.epnet.com>>.

1. The article discusses a strategy used by football coaches when the opposing team is ready to kick a field goal. What is the strategy called? (2)

2. What do coaches hope will happen when they use this strategy? (2)

3. Researchers Barry and Wood studied two seasons of NFL field goal attempts. Name two statistics or factors that they tracked. (2)

4. Look at Paragraph 7.
When the defense iced the kicker, what percent of field goals were good? (2)

5. What do Barry and Wood decide about calling a timeout before a field goal attempt – is it effective or not? (1)

6. Do you think icing the kicker is a good strategy? Why or why not? (1)

Name _____

Hawkins, Rob. "Bonds, The Best Ever?" Kidnewsroom. 15 Aug. 2003.
SIRS Discoverer. Proquest. DLMS Lib. Russellton, PA. 10 November
2004. <<http://discoverer.sirs.com>>.

1. "But is [Bonds] the most prolific all-around ball player in history?"
What does "prolific" mean here? (Use a dictionary if you need to do so!) (1)

2. This article examines how statistics affect the determination of the best baseball player in history. Name two baseball stats discussed in the article. (2)

_____ and _____

3. A batting average expresses the number of times a player hits safely compared to the number of times he appears at bat. Batting averages are determined by this equation: $number\ of\ hits \div number\ of\ times\ at\ bat = BA$.

The author says it is important to consider the number of games played when determining the best player. How does number of games played affect batting average? (1)

Let's look at batting average in math terms. If the numerator (the number of hits) stays the same, what happens to a batting average if the denominator (the number of at bats) increases? (1)

4. "Using statistics to determine the best player ever is obviously flawed and subjective." What does "subjective" mean? (1)

Why is the use of statistics subjective in declaring the best ball player of all time? (1)

5. Name another activity, place, or event for which statistics are important. (1)

How are statistics used in that setting? (1)

6. Calculate your sleeping average! Use this formula:
Number of hours you sleep \div number of hours in a day = SA

(1)

Show your equation. You can use a calculator to solve.

What is your sleeping average? _____

Name _____ Period _____

Math Connections · Grade 7 · Mrs. Mellish / Ms. Morris

1. In your own words, what is a tip?

2. T.I.P. may be an acronym for the words, "**To Insure Promptness.**" Define the words "insure" and "promptness," using a dictionary if you need to do so.

insure: _____

promptness: _____

3. What does "to insure promptness" mean when we are talking about tipping and restaurants?

4. According to the "Tips for Tipping" chart, what percent of the bill should you leave for above average service?

Which amount should you use to figure out the tip: the total **before** tax or the total **including** tax?

5. Your restaurant check adds up to \$21.37. The service was excellent. Using the guidelines from the article, how much tip should you leave? Show your work below for full credit.

Solution: _____

Excerpt from "How Did Tipping Get Started?"

A tip, or gratuity, is a small amount of money given voluntarily as a token of appreciation for a service rendered. According to Webster's Dictionary, the word "tip" is also considered by many to be an acronym: T.I.P. - "To Insure Promptness" or "To Insure Prompt" service. We tip our servers as a way of thanking them for good service. We might also leave a very low tip, or no tip at all, as a signal that the service was terrible.

But how did tipping get started in the first place? Why don't employers just pay their employees a regular wage and increase their prices to make up the difference? In some places, they do, but so many of us (especially in the U.S.) are so accustomed to leaving a tip for good service that we end up leaving our servers money anyway -- sometimes embarrassing them in the process! In places where tipping is expected, it is usually done in order to encourage the best service possible from servers.

There are several theories about where tipping came from. George Foster, a professor of anthropology at U.C. Berkeley, researched tipping in the early 1970s and found that the word "tip" or "gratuity" often was associated with "drink money," seeming to imply that the customer was buying the server a drink to have later as a way of saying thanks for the good service. Foster's theory was that the customer was trying to prevent making the server envious of his own ability to sit, drink, and be served.

Another theory follows the use of the word "tip" in the 17th century. The word was used as a verb to mean "hand it over" or "to give." This follows suit with the stories of feudal lords throwing gold coins as "tips" to the peasants in the street to ensure their own safe passage.

The TIP acronym we mentioned earlier, "to insure promptness," has been said to come from 16th century coffee houses in England. This idea is challenged, however, because some say acronyms weren't even used until the 1920s.

Obringer, Lee Ann. "How Tipping Got Started." How Stuff Works. 2005. 31
March 2005. <<http://www.howstuffworks.com/tipping.htm>>.

Excerpt from "It's Hip to Tip!"

Tips for Tipping

- In most cases, leave a **tip** of 15 percent of the bill before tax. (To figure 15 percent, read the chart below.)
- If the service is above average, leave a 20-percent **tip**. (Figure 10 percent of the bill and then double that amount.)
- If the service is below average, leave a smaller **tip**. Explain to the server what you did not like about the service.
- Base your **tip** on the quality of the service, not on the quality of the food.

15 Percent? Go Figure!

Here is one step-by-step way to figure 15 percent of a restaurant bill:

1. Look at the check's total before tax. Round up the total to the nearest dime. (For example, if the check is \$8.77, round up to \$8.80.)
2. Figure 10 percent of the total by removing the last zero and moving the decimal point one space to the left, (in this case, \$.88, or 88 cents)
3. Take half that number to get 5 percent of the total. (\$.44)
4. Add those two numbers (\$.88 + \$.44) to arrive at your 15-percent tip total. (in this case, \$1.32)

"It's Hip to Tip." Know Your World Extra. 7 November 2003. SIRS Discoverer.
Proquest. DLMS Lib. Russellton, PA. 31 March 2005.
<<http://discoverer.sirs.com>>.

Mrs. Mellish's Top Five Sites for Middle School Math Skills

<http://www.iknowthat.com> (Try "Fishy Fractions!")

<http://www.coolmath.com/>

<http://www.saab.org/mathdrills>

<http://www.aaamath.com>

<http://www.learnalberta.ca/Launch.aspx?content=/content/mesg/html/math6web/math6shell.html>
(We like "Spy Guys!")