Math & Science— It's All Elementary

A Historic Mathematical Voyage

Have you ever sat in a very small space with lots of people? How about 101 other people, with all of their "stuff" and may even some of their pets? And what about sitting there, like that, for 65 days? That was how the English people we know of today as the Pilgrims set sail back in the year 1620!

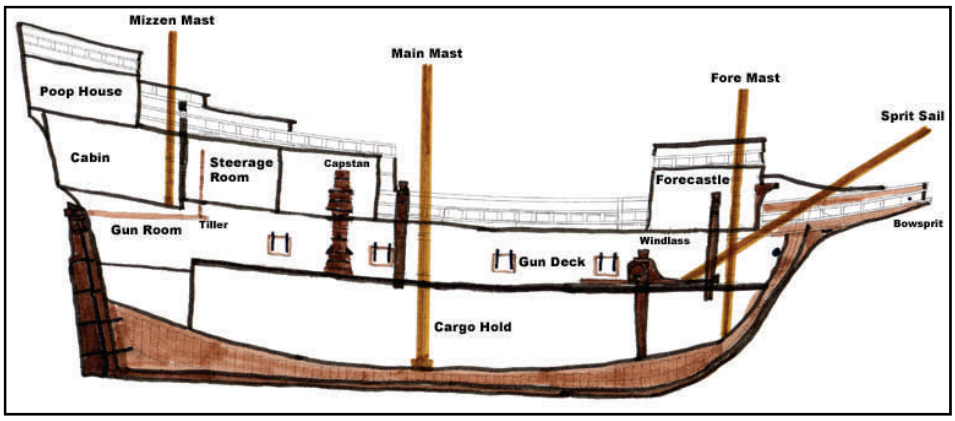
The first leg of the trip began on July 22, 1620, when 46 Pilgrims sailed from Holland to England. They traveled in a 60-tun ship named the Speedwell. This was one of two ships purchased to make the long journey from England to the New World on September 6, 1620. After two attempts at setting sail for the New World, however, a troublesome and leaky Speedwell had to be left behind. The Mayflower could not carry all of the passengers, so some people had to be left behind as well.

The Mayflower carried 102 passengers consisting of: 50 men, 20 women, and 32 children. It also carried a crew of about 30 men. The ship was under the command of Captain Christopher Jones. It had 3 masts, or sails, and weighed 180 "tuns"! In the 17th century, this "tun" of measurement was different than we know today, when we think of 2,000 pounds equaling a ton. A t-u-n was actually a large barrel or cask used for storing liquids and was equal to 265 gallons. The size of a ship such as the Mayflower was measured in terms of how many of these barrels could safely be carried. The Mayflower was capable of carrying 180 of these large barrels fully loaded. So, although the living quarters may have been cramped, the Mayflower, in fact, was one of the larger merchant vessels of her day, measuring 90 feet in length and 26 feet in width.

By some accounts the Mayflower has been called "dull", but for its time, it was anything BUT dull. The ship crossed to the New World in 66 days, which averaged about 2 miles per hour. Ad when it returned to England, it made the trip in 31 days, which would haven given it an average speed of 3 miles per hour on the same route, so the Mayflower did a fine job for its day!

Although two adults perished on the journey, two children were born. So, despite fierce storms, strong winds, and unfavorable living conditions, the Mayflower transported 102 passengers safely to Provincetown, Massachusetts on November 11, 1620.

(Harcourt "Classroom Chronicle", Vol. 2, Issue 3, Nov. 2006)



Sherman I.S.D.

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Check out the math activities related to A Historical Mathematical Voyage on page two!

Inside this issue:

Mayflower Math!

Use the feature article to have students work in cooperative groups to solve the following:

- By how many were the crew members outnumbered by the passengers?
- By how many do the children outnumber the women?
- Make a bar graph of the passengers and crew by category: men, women, children, crewmen.
- What is the difference between all of the men on board compared to the total number of women and children.
- By today's standards if 2,000 pounds equals a tun/ton, calculate how much this 180 tun/ton vessel weighed in pounds.
- If the Speedwell weighed 60 tons and the Mayflower weighed 180 tons, how much heavier was the Mayflower?
- The Mayflower's journey was 66 days, and it traveled about 2 miles an hour. Approximately how many miles in all did they travel?

(Harcourt "Classroom Chronicle", Vol. 2, Issue 3, Nov. 2006)

More Math Mayflower Questions:

A surprising number of children emigrated on the Pilgrim ship, nearly one third of all passengers. Give each student 32 beans to represent the Pilgrim children and have them use them to solve the following problems:

- When the weather was calm, children could run free on the upper deck. If 13 children were above deck, how many were below deck?
- There were no bathrooms on the Mayflower. Washing was done with seawater up on deck. If 9 children rose early to wash, how many were still sleeping?
- There were 21 boys on the ship. How many girls? Help students to calculate the ratio boys:girls in their ship's logs. How does the ratio compare with the numbers in your class?
- Measure the length of your classroom. Is it larger than the Mayflower?
- Measure the length of the school parking lot. How many Mayflower ships could fit along its length?
- Measure the length of the school gymnasium. Find the difference between its measurement and the Mayflower.
- The Mayflower passengers and crew spent 66 days at sea. Convert this number into weeks and minutes.
- How many days have you been in school this year? Is the number greater or less than 66 days?
- During which season did the colonists spend their first night in Plymouth? Why might this have been difficult for them?

(2001 Scholastic, Inc.)

Check this out!

The History Channel will present a special 3-hour documentary, "*Desperate Crossing: The Untold Story of the Mayflower*," airing on November 19 at 8:00 PM.

MTR: Mathematics TEKS Refinement

This fall I attended the workshops for the K-5 Mathematics TEKS Refinement. These workshops focused on specific changes in the mathematics TEKS for each grade level and effective instructional strategies for teaching those changes. We now have some very good information and activities to use in our district. The measurement strand was particularly helpful. Such as:

Reasons for using nonstandard units:

• *Allows the student to focus directly on the attribute being measured: For example, when measuring area of an irregular shape, covering the region with lima beans as the unit will produce a differentb measurement for the area than covering the region with square tiles as the unit. Each unit covers area however, and the resulting discussion with the students can highlight what it means to measure area.*

• *Allows the magnitude of the numbers to be kept reasonable: For example, the measures of length can be kept smaller even when measuring longer distances by choosing a larger unit.*

• *Prevents conflicting objectives during introductory lessons: For example, is the lesson about measuring volume or is the lesson about understanding cubic centimeters?*

• *Allows students to see the need for standard units.*

Reasons for using standard units:

• *Convention of society: The student must develop familiarity with standard units and understand appropriate relationships between them.*

• *Ease of use after the measurement concept has been developed.*

Some of the information from these sessions has already been sent out to everyone. There are more lessons and clarifications if you are interested. Just let me know what your needs are.

The Twelve Days of Math

On the first day of Christmas my teacher
gave to me a test on fact families.

2nd day --- 2 ways to skip count
3rd day --- 3 subtraction questions
4th day --- 4 adding doubles
5th day --- 5 pop quizzes
6th day --- 6 number sentences
7th day --- 7 homework problems
8th day --- 8 odds and evens
9th day --- 9 word problems
10th day -- 10 snapping cubes
11th day -- 11 dot plates

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"No Significant Learning Occurs Without a Significant Relationship"

—Dr. James Comer

Critical mass is the percentage of people that has to buy into an idea or product before it spreads rapidly. What we see in schools is this: When more than 40 percent of the student population is low-income, it's not unusual in those schools to get a student culture where it's not "cool" to achieve.

It is amazing that people think you will get learning without relationships of mutual respect. You won't. It's the primary motivator for learning.

If there is mutual respect between a student and a teacher, these three things are present: No. 1: insistence. No. 2: high expectations. No. 3: support. Support is the "how-to-get-it-done" piece. Students will know you respect them when those pieces are there.

—Ruby K. Payne

Components of an Effective Lesson

The Five E Instructional Model

In order to impact student achievement an effective lesson must ensure that students are actively engaged and reflecting upon their learning. This refection should help them make sense of their activities and provide opportunities to use, extend, and apply what is learned. In order to reach greater depth when learning something new or understanding something familiar includes making sense of both our prior experiences and knowledge gained first-hand from new explorations. The Five E Instructional Model (Bybee, et al 1989) provides such a model.

- **Engage:**

Initiates the learning task. The activity should make connections between past and present learning experiences, and anticipate activities and organize students' thinking toward the learning outcomes of current activities.

- **Explore:**

Provide students with a common base of experiences in which current concepts, processes, and skills are identified and developed.

- **Explain:**

Focus students' attention on a particular aspect of their engagement and exploration experiences, and provide opportunities to demonstrate their conceptual understanding, process skills, or behaviors. This phase also provides opportunities for teachers to introduce a concept, process, or skill.

- **Elaborate:**

Expand and extend students' conceptual understanding and skills. Through new experiences, the students develop deeper and broader understanding, more information, and adequate skills.

- **Evaluate:**

Encourage students to assess their understanding and abilities and provide opportunities for teachers to evaluate student progress.

Everyone who emails Stacy the secret password "Elementary Rocks!" by Nov. 10 will be placed in a drawing for math & science trade books & other goodies!