Study Guide for Teachers

Red Sneaker Productions

MathsAmazing

presented by
Young Audiences New Jersey & Eastern PA
(866) 500-9265
www.yanjep.org

ABOUT THE PROGRAM

Math is a doorway through which students can find a world that is fun, astonishing, and inspirational. This engaging program invites students to dive into the sometimes intimidating subject of math with the same passion they might join a soccer or video game. And it's funny!

Combining theatre, humor, and science, this multimedia program fascinates young minds and inspires students to realize that math is an amazing part of the real world.

LEARNING GOALS

- To excite audiences while educating students in an enriching environment on concepts that may be difficult to understand otherwise.
- To exhibit key moments and characters in the history of mathematics.
- To demonstrate important details necessary to comprehend difficult mathematical concepts.
- To exhibit the versatility of theatre with related concepts in mathematics.

BACKGROUND INFORMATION FOR STUDENTS

We are not math experts. We both struggled with math in school. Our approach is one of wondering about how amazing math can be—how it is a part of almost everything we experience in our day-to-day lives. As Albert Einstein, one of the most famous mathematicians in the world said, "Imagination is more important than knowledge."

Among the many concepts *MathsAmazing* brings to life are

- Archimedes' bathtub eureka moment on calculating the volume of an irregular object.
- The Fibonacci sequence.
- How to get rich on pennies a day with geometric progression!
- 3,4,5 triangles using the amazing rope of 12 knots.
- Math riddles and paradoxes.
- Thales discovering the Law of Proportion by measuring the shadow of the Great Pyramid.
- And a little Abbott and Costello on multiplication and division.

BEFORE THE PROGRAM

1. Ask your students if they find mathematics to be a daunting subject. Try to find out why. Do they think it's exciting? How do they feel the study of mathematics could be improved?
2. Discuss some of the mathematical concepts that will be discussed in the performance. Do any of these concepts interest your students? Topics can include the Fibonacci sequence, the Golden Mean, the Law of Proportion, Zeno's Paradox, and geometric progression.
3. Ask your students if they think the arts are compatible with mathematics. Discuss how the two concepts might be related.
4. Ask students whether they have seen live theatre. If so, discuss their reactions. Discuss the difference between live theatre and television or film (including proper audience behavior).

FAMOUS MATHEMATICIANS

Albert Einstein
Apollonius
Archimedes
Aristotle
Blaise Pascal
Brahmagupta
Carl Gauss
David Hilbert
Euclid
Galileo Galilei
Hippocrates
Isaac Newton
Jacob Bernoulli
Johannes Kepler
John von Neumann
Kurt Godel
Leonardo Fibonacci
Niels Abel
Pierre de Fermat
Pythagoras

AFTER THE PROGRAM

1. Explore the various mathematical concepts that were discussed in the performance. Pay careful attention not only to the history of these concepts, but also to the science involved. Here are some possible activities:
   - Measure the height of some object outside the school by measuring its shadow.
   - Find the flaw in the math of the Abbott and Costello 7 x 13 = 28 sketch.
   - Bring daisies into class and count the petals, proving that they are all Fibonacci numbers.
   - Bring sunflowers, pine cones and artichokes into class and study the perfect spirals.
   - Do the displacement experiment with different objects and compute their exact volumes.
2. Have your students research a famous mathematician and create a report to present to the class. Ask them for a brief history of the mathematician's life, what they were famous for, and how their advancements in the mathematical community are still relevant.

SELECTED MATHEMATICAL CONCEPTS

Displacement

Calculating the Volume of an Irregular Object

The Fibonacci Sequence

Geometric Progression

Zeno's Paradox

Fermat's Theorem

The Law of Proportion

ARTIST INFORMATION

Founded by David Zucker and Richard McElvain, Red Sneaker Productions is dedicated to providing quality theatrical experiences to students through in-school assembly performances.