

# 2008 SRS MATH AND TECH NIGHT

Cool!

**FUN!**

IMAGINATION

CREATIVITY

AWARENESS

CURIOSITY

DESIGN!

Experiment!

**AWESOME!**

# MATH TABLES

## TABLE 1.FIBONACCI IN NATURE ☆

See how the Fibonacci sequence reveals itself in the real world  
Figure out the pattern to Pascal's Triangle - Fill in the blanks

## TABLE 2.APPLIED MATH - VOLUMETRIC DISPLACEMENT - DETERMINING THE VOLUME OF A SPHERE

Put a ball in a bath and find out how much space it takes...a little wet...a little fun!  
Estimate the mass of a giant snowball!

## TABLE 3.FUNKY TOPOLOGY ☆

Visit the twisted world of rubber-sheet geometry

## TABLE 4.APPLIED MATH - MECHANICAL ADVANTAGE - PULLEYS AND LEVERS

Calculate the weight. Learn how to make work easier!

## TABLE 5.CRYPTOGRAPHY

Cracking the code. Touch base with number theory before you turn ten!  
Construct a simple substitution code wheel!

## TABLE 6.PUZZLES AND GAMES ☆

Randie's Place - a variety of puzzles for young and old!

## TABLE 7.ORIGAMI - THE ART OF FOLDING PAPER ☆

Make shapes and your favorite objects from paper.

## TABLE 8.FRACTIONS AND SOUND ☆

Make sounds with a simple "string" instrument

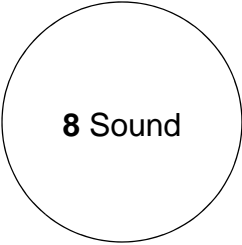
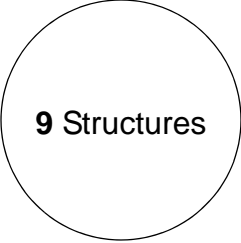
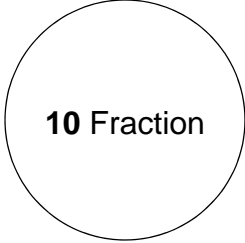
## TABLE 9.GEOMETRIC PUZZLES AND SWEET STRUCTURES ☆

Toothpicks and shapes make for some interesting brain teasers!  
Build geometric shapes and see how to use them in towers and structures.

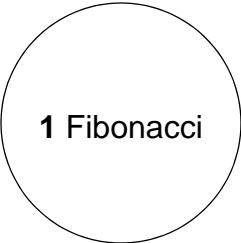
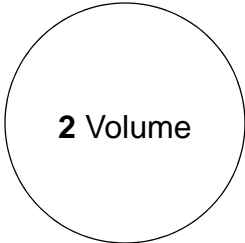
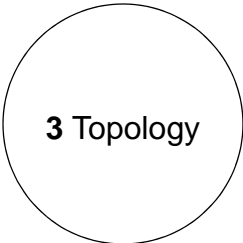
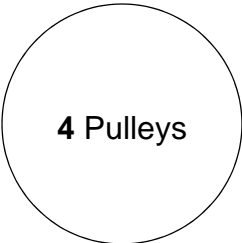
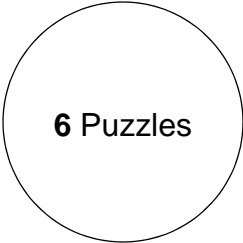
## TABLE 10.FRACTION TRAIL MIX ☆

Recipes are full of measures, fractions and ratios and are yummy, too!

☆ Activities even younger kids can enjoy



# SRS CAFETERIA



ENTRANCE



# TECH STATIONS

## STATION 1.COMPUTER INNARDS ★

Computer autopsy - see what's inside a computer and other electronics

## STATION 2.DESIGN YOUR OWN ROBOT ★

Unleash your creativity and imagination to design a robot

## STATION 3.ARTRAGE-OUS

Show off your artistic and design abilities

## STATION 4.KIDS' GALLERY ★

Create your own masterpiece with these programs from the National Gallery of Art

## STATION 5.GEOMETER SKETCHPAD

Math and geometry have never been so fun or dynamic

## STATION 6.WORLD WRITE WEB

Publish your reviews and share your knowledge with blogs and wikis

## STATION 7.VIRTUAL SCIENCE

Launch rockets, overload circuits and build your own skateboard park

## STATION 8.GOOGLE EARTH AND SKY ★

Take a virtual trip around the world and into space

## STATION 9.TRAVELER IQ

See how well you know your way around the USA and the world

## STATION 10.LAUNCHBALL

Use your problem solving and programming skills to direct a ball around obstacles

## STATION 11.POWERS OF TEN

Be astounded by length scales from light years to picometers

## STATION 12.AVERAGE, MODE AND MEDIAN

Where do you stand?

## STATION 13.CELESTIA/STELLARIUM (LIBRARY) ★

Go into warp drive through the solar system

## STATION 14.STUDENT PRESENTATIONS (LIBRARY)

Log into your P: drive and share your presentations with your parents

★ Activities even younger kids can enjoy

← 13 Celestia/Stellarium  
in Library

14 Student Presentations

12 Average

11 Powers of 10



Entrance

# TECH LAB

10 Launchball

9 Traveler IQ

8 Google Earth

7 Virtual Science

1 Computer Innards

2 Design Robots

3 ArtRage-ous

4 Kids' Gallery

5 Geometer Sketchpad

6 World Write Web

## Check It Out On Your Own

Mathematics has been vital to the development of civilization; from ancient to modern times it has been fundamental to advances in science, engineering, and philosophy. As a result, the history of mathematics has become an important study; hundreds of books, papers, and web pages have addressed the subject in a variety of different ways.

### **The Bridges of Königsberg** - <http://mathforum.org/isaac/problems/bridges1.html>

This problem inspired the great Swiss mathematician Leonard Euler to create graph theory, which led to the development of topology.

### **The Value of Pi** - <http://mathforum.org/isaac/problems/pi1.html>

Throughout the history of civilization various mathematicians have been concerned with discovering the value of and different expressions for the ratio of the circumference of a circle to its diameter.

### **Puzzling Primes** - <http://mathforum.org/isaac/problems/prime1.html>

To fully comprehend our number system, mathematicians need to understand the properties of the prime numbers. Finding them isn't so easy, either.

### **Famous Paradoxes** - <http://mathforum.org/isaac/problems/paradox.html>

In the history of mathematical thought, several paradoxes have challenged the notion that mathematics is a self-consistent system of knowledge. Presented here are Zeno's Paradox and Cantor's Infinities.

### **The Problem of Points** - <http://mathforum.org/isaac/problems/prob1.html>

An age-old gambling problem led to the development of probability by French mathematicians Pascal and Fermat in the seventeenth century.

### **Pythagorean Theorem** - <http://mathforum.org/isaac/problems/pythagthm.html>

One of the most famous theorems in mathematics, the Pythagorean theorem has many proofs. Presented here is one that relies on Euclidean algebraic geometry and is thus beautifully simple.

### **A Proof that $e$ is irrational** - <http://mathforum.org/isaac/problems/eproof.html>

A proof by contradiction that relies on the expression of  $e$  as a power series.

## History of Math

Every culture on earth has developed some mathematics. In some cases, this mathematics has spread from one culture to another. Now there is one predominant international mathematics, and this mathematics has quite a history. It has roots in ancient Egypt and Babylonia, then grew rapidly in ancient Greece. Mathematics written in ancient Greek was translated into Arabic. About the same time some mathematics of India was translated into Arabic. Later some of this mathematics was translated into Latin and became the mathematics of Western Europe. Over a period of several hundred years, it became the mathematics of the world.

There are other places in the world that developed significant mathematics, such as China, southern India, and Japan, and they are interesting to study, but the mathematics of the other regions have not had much influence on current international mathematics. There is, of course, much mathematics being done these and other regions, but it is not the traditional math of the regions, but international mathematics.

By far, the most significant development in mathematics was giving it firm logical foundations. This took place in ancient Greece in the centuries preceding Euclid. See Euclid's Elements. Logical foundations give mathematics more than just certainty—they are a tool to investigate the unknown.

By the 20th century the edge of that unknown had receded to where only a few could see. One was David Hilbert, a leading mathematician of the turn of the century. In 1900 he addressed the International Congress of Mathematicians in Paris, and described 23 important mathematical problems.

Mathematics continues to grow at a phenomenal rate. There is no end in sight, and the application of mathematics to science becomes greater all the time.

## Disciplines in Math

The history of numerals and counting.

<http://aleph0.clarku.edu/~djoyce/mathhist/numerals.html>

The history of algebra.

<http://aleph0.clarku.edu/~djoyce/mathhist/algebra.html>

The history of geometry.

<http://aleph0.clarku.edu/~djoyce/mathhist/geometry.html>

The history of arithmetic and number theory.

<http://aleph0.clarku.edu/~djoyce/mathhist/arithmetic.html>

The history of mathematical analysis.

<http://aleph0.clarku.edu/~djoyce/mathhist/analysis.html>

The history of probability and statistics.

<http://aleph0.clarku.edu/~djoyce/mathhist/statistics.html>

## **What is Technology?**

Technology is more than computers, cell phones and hybrid cars. Technology comes from recognizing human and societal needs and wants and then creating evolutionary, and sometimes revolutionary, solutions to those problems. Science and math play important roles in technology, but technology requires more than knowledge of science and math. It involves an awareness of human and societal needs, creativity and imagination, and design and experimentation. It also requires problem-solving skills along with persistence to overcome failures along the way to developing solutions for our needs. Technology has played an important role in creating solutions (and sometimes problems) throughout the years. Technology development will become even more important in the future as we seek solutions to our health, food, energy, water and security needs while protecting our environment and improving living standards throughout the world.