Math Club 5

- Math Club for Grades 4 – 6
- Develop creative problem-solving skills.
- Students participate in two competitions
  - MathCON
  - New York Mathematics League (NYML)
- Introduce advanced mathematical concepts in probability, combinatorics and codes and ciphers.
- Students immerse in mathematics by working on an investigative project.

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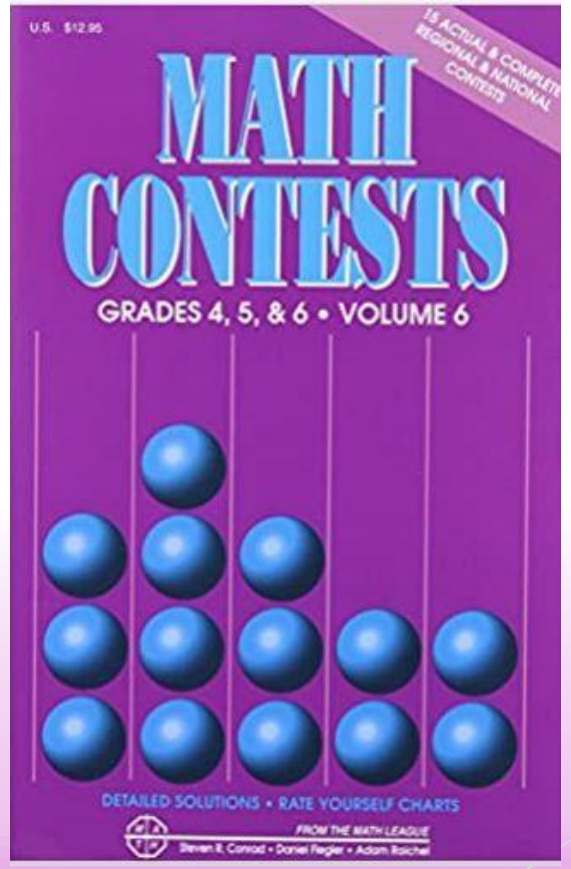
MathCON Competition

- Contests for Grades 4, 5 and 6.
- Students take Online Weekly Practice Tests at home (total 16).
- Practice problems in-class.
- Contest Format
  - Online, during Club Hours, in February
  - 32 multiple-choice questions
  - 45-minute duration
  - Calculator is permitted
- All Math Club students are invited to participate.
- A small number of students (top 1%) are invited for the Final Round.
- The Final Round is held in-person, in Chicago, in April.

Math League Competition

- Contests for Grades 4, 5 and 6.
- Online Practice Tests.
- Practice problems in-class
- Contest Format
  - Online, during Club Hours
  - February (Grade 6) and April (Grades 4 and 5)
  - 32 multiple-choice questions
  - 30-minute duration.
  - Calculator is permitted
- All Math Club students are invited to participate.



Advanced Math Concepts - Probability

- Counting principles, permutations, combinations, partitioning.
- Basic probability concepts.
- Bernoulli and binomial trials.
- Experiments with dice and coins.
- Experiments illustrating law of large numbers.
- Story of Jacob Bernoulli.

ARTIS CONJECTANDI
PARS PRIMA,
Complectens
Tractatum Hugenii de Ratiociniis
in Ludo Aleæ,
Cum Annotationibus
JACOBI BERNOULLI.

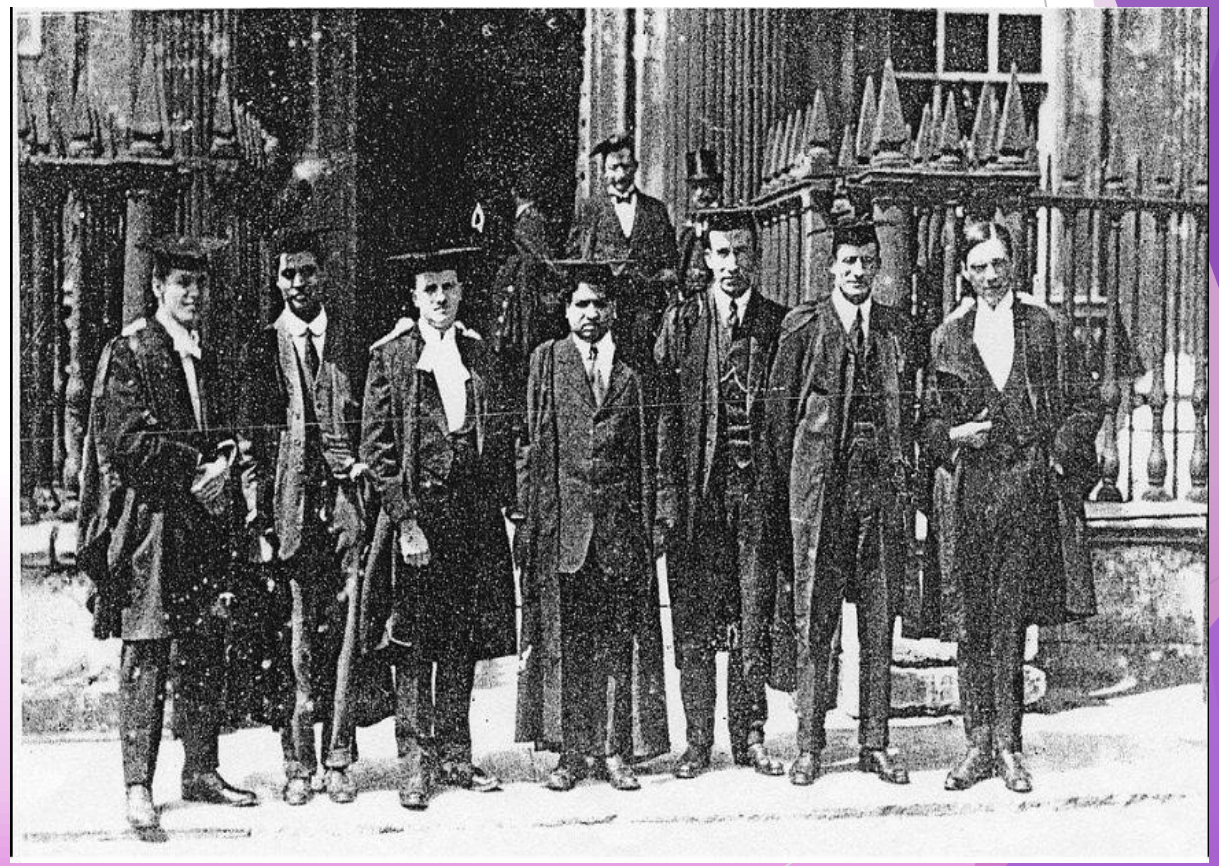
CHRIST. HUGENII
ad
FRANC. SCHOOTENIUM
Præfatio.

CUm in editione elegantiſſimorum ingenii Tui monumentorum, quam præ manibus nunc habes, Vir Clariſſime, id inter cætera Te ſpectare ſciam, ut varietate rerum, quarum tractationem inſtituiſti, oſtendas quàm latè ſe protendat divina Analytices ſcientia, facilè intelligo etiam illa plurimùm propoſito Tuo inſervire poſſe, quæ de Aleæ Ratiociniis

A con-

Advanced Math Concepts – Codes and Ciphers

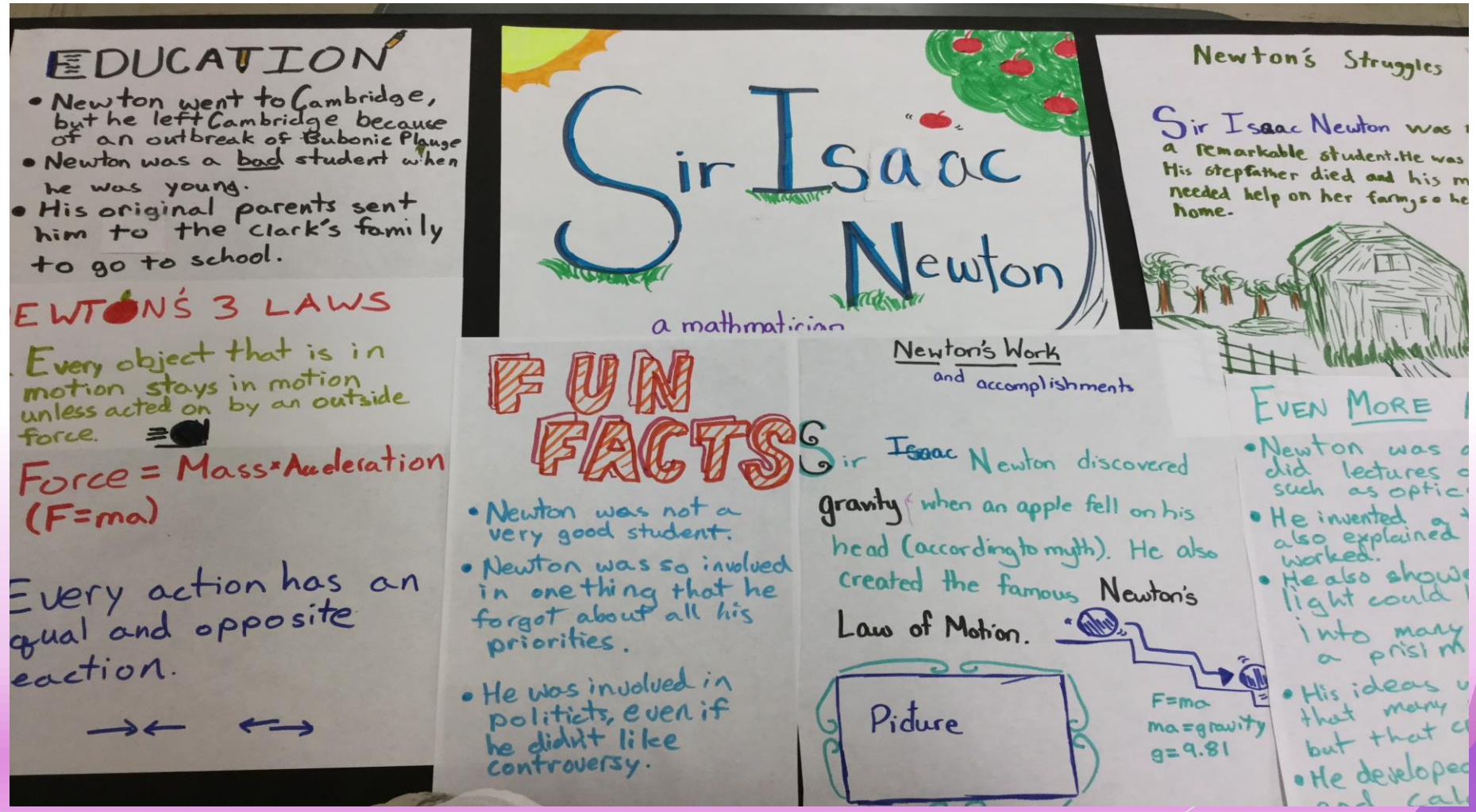
- Reduce numbers modulo a positive integer.
- Convert numbers from decimal to base-26.
- Kids-RSA: middle school version of encryption and digital signature.
- Story of Ramanujan



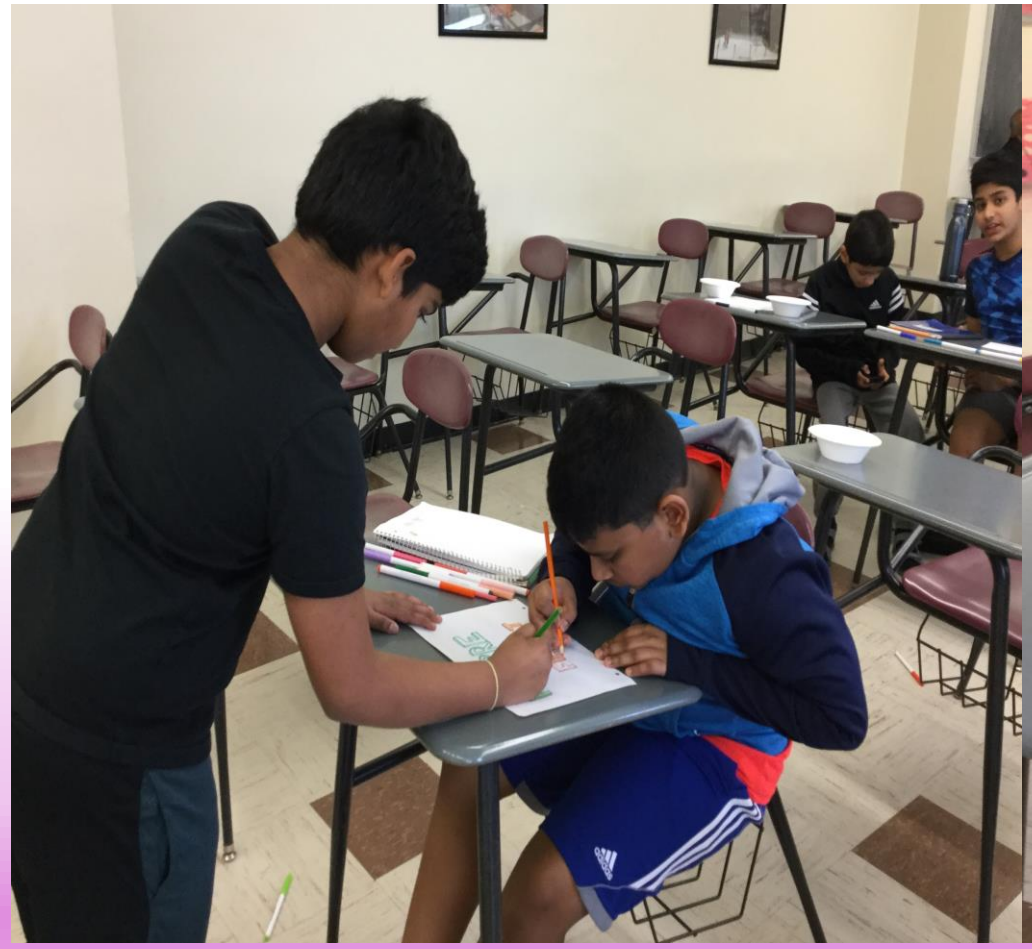
Investigative Projects - I

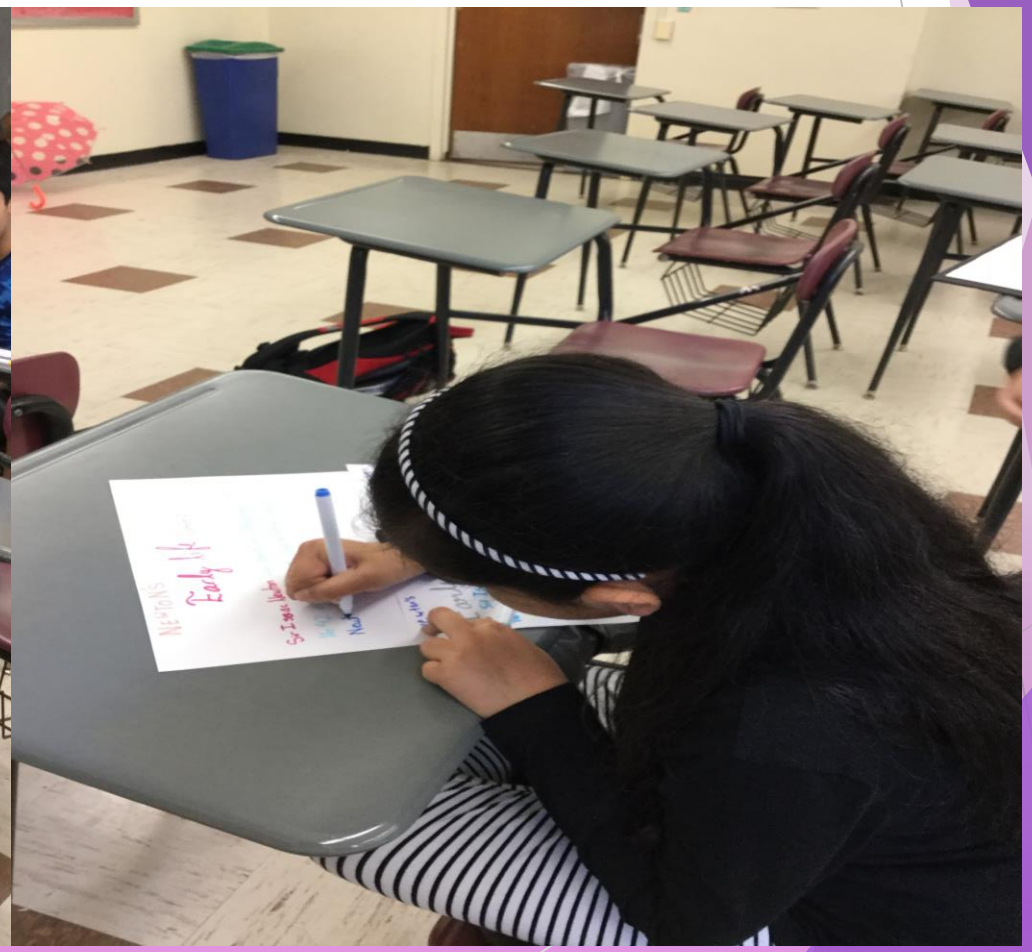
- Investigate and prepare a presentation on a mathematical concept or the life of a famous mathematician.
- Students work in teams of two or three.
- Students present their work to the class. Parents and families are invited.

Investigative Projects - II

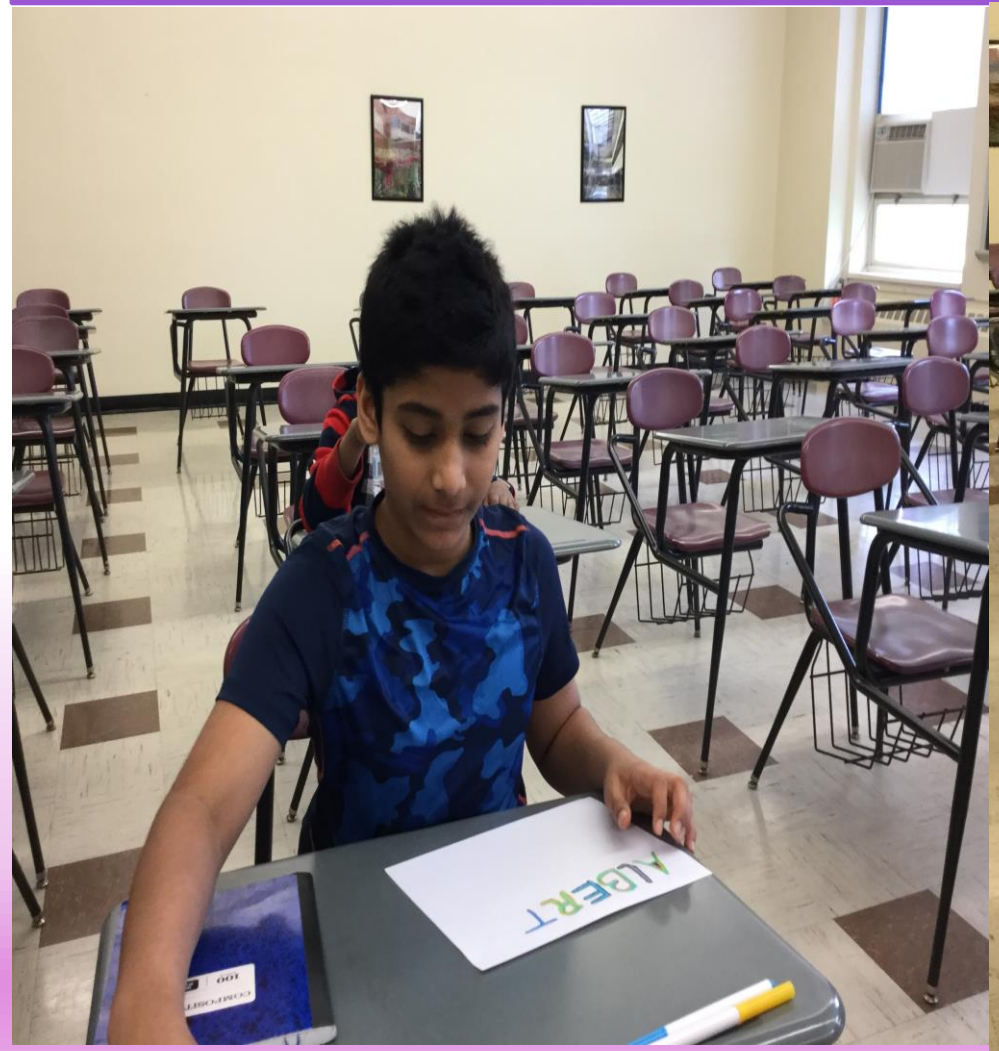


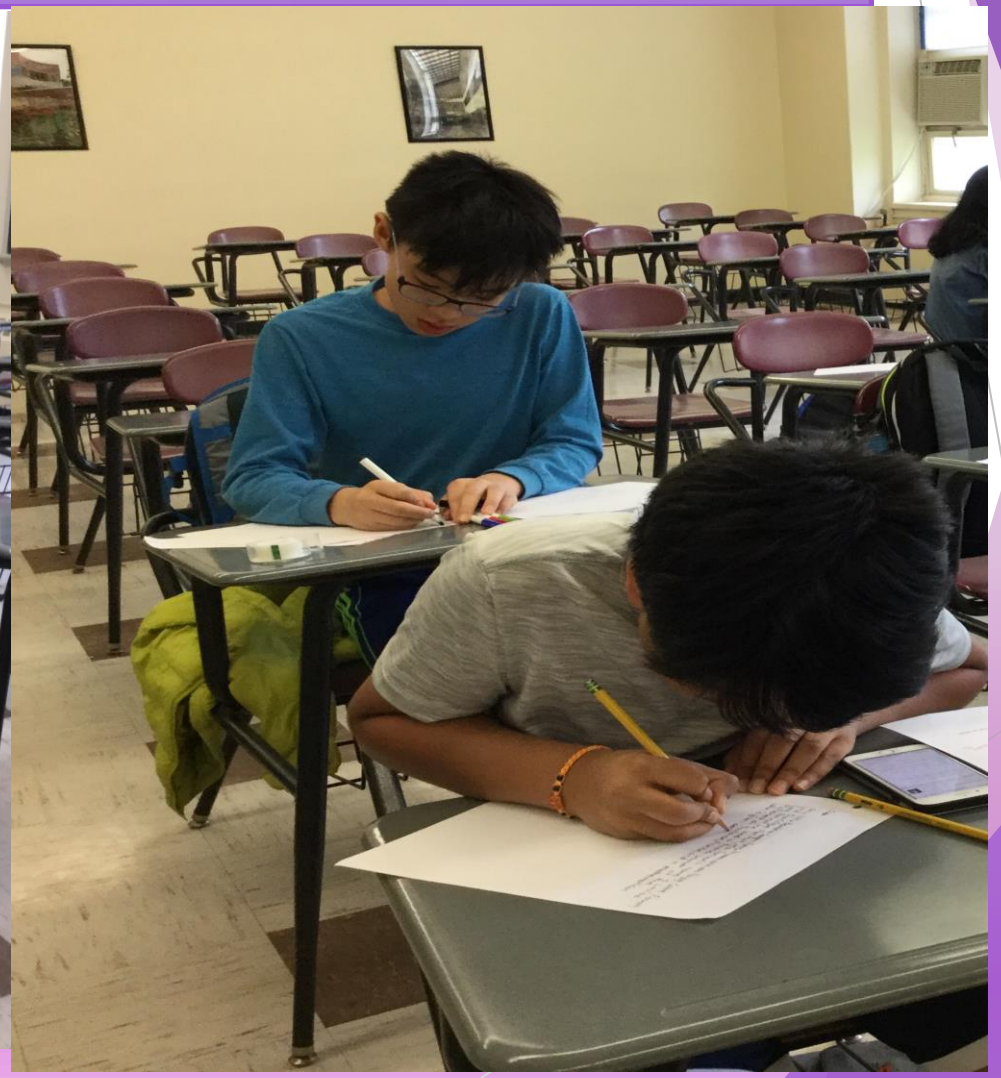
Investigative Projects - III



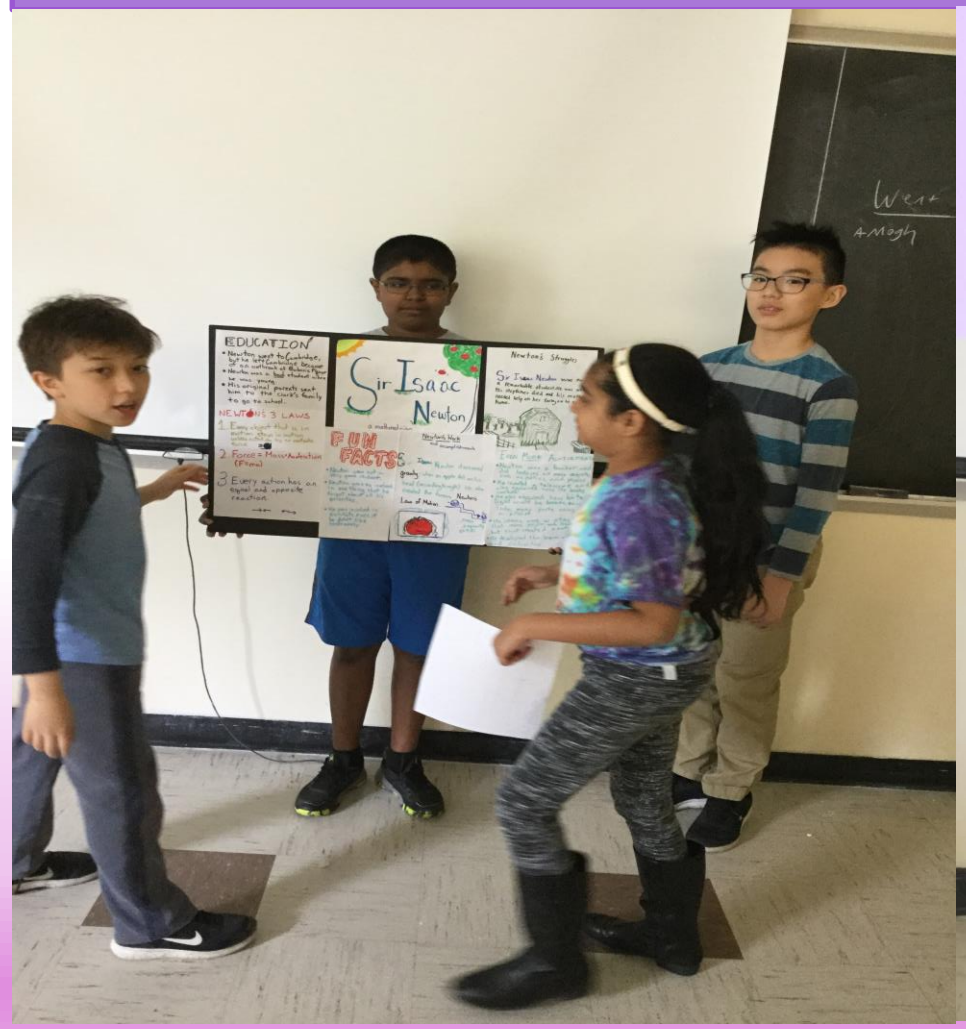


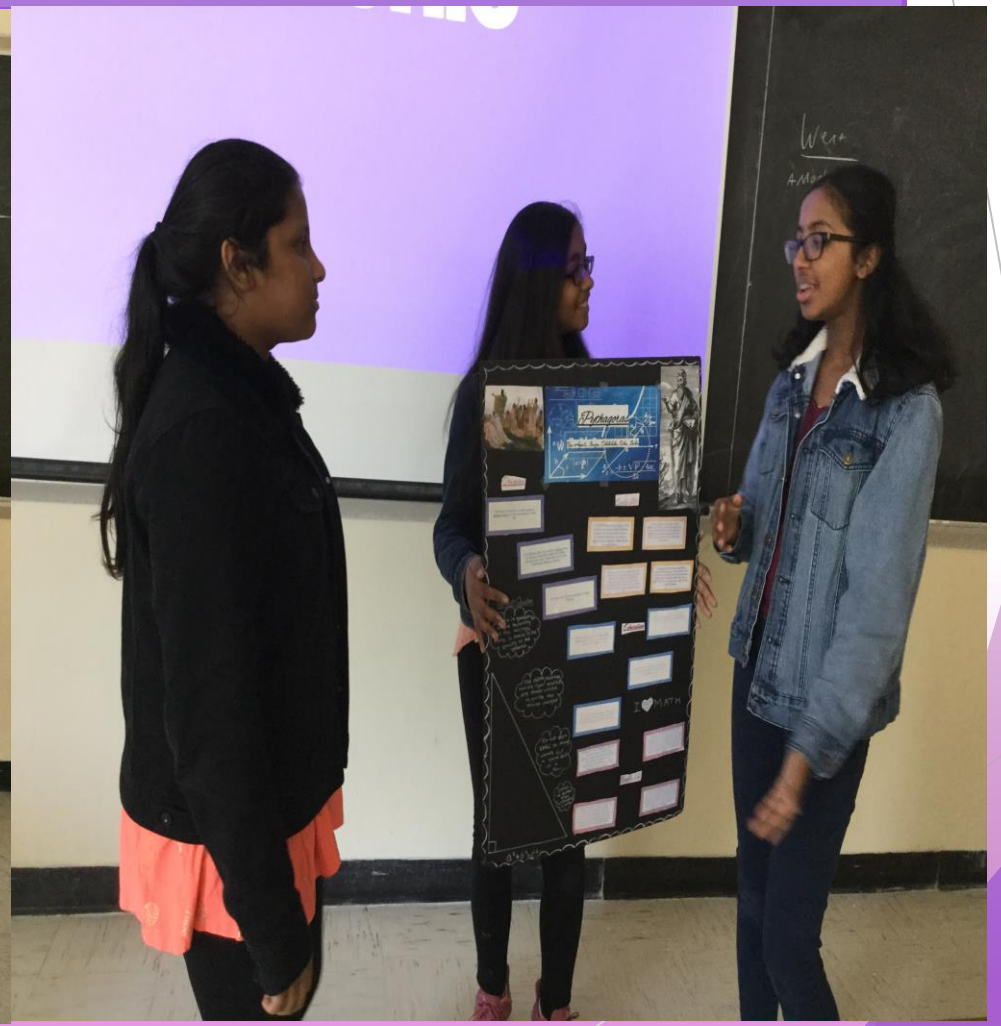
Investigative Projects - IV



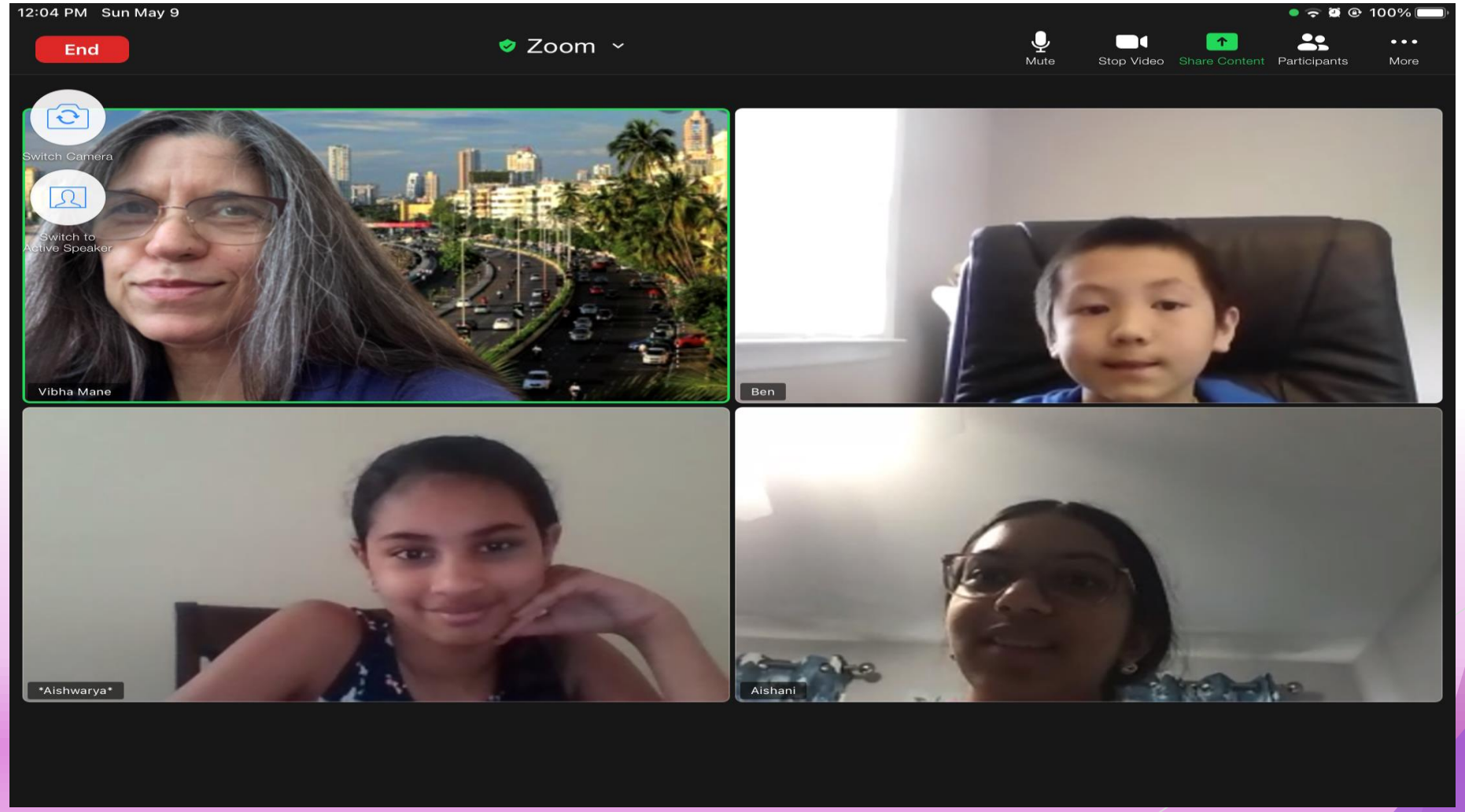


Investigative Projects - V





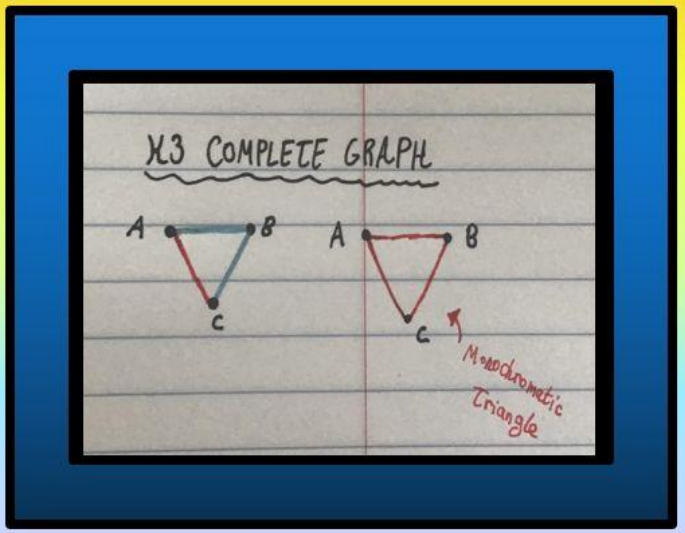
Investigative Projects - VI



Investigative Projects - VII

Complete Graphs - K3

In a K_3 complete graph, there are three vertices. Each point is connected by an edge to every other vertex. The graph to the right has a complete graph and a monochromatic triangle. A monochromatic triangle is a triangle that is created in the same color. The rightmost triangle is a monochromatic triangle and was created using red, only one color. The left triangle is not a monochromatic triangle and is created in both red and blue. In K_3 graphs, it is possible to avoid a triangle in one color - monochromatic triangle.

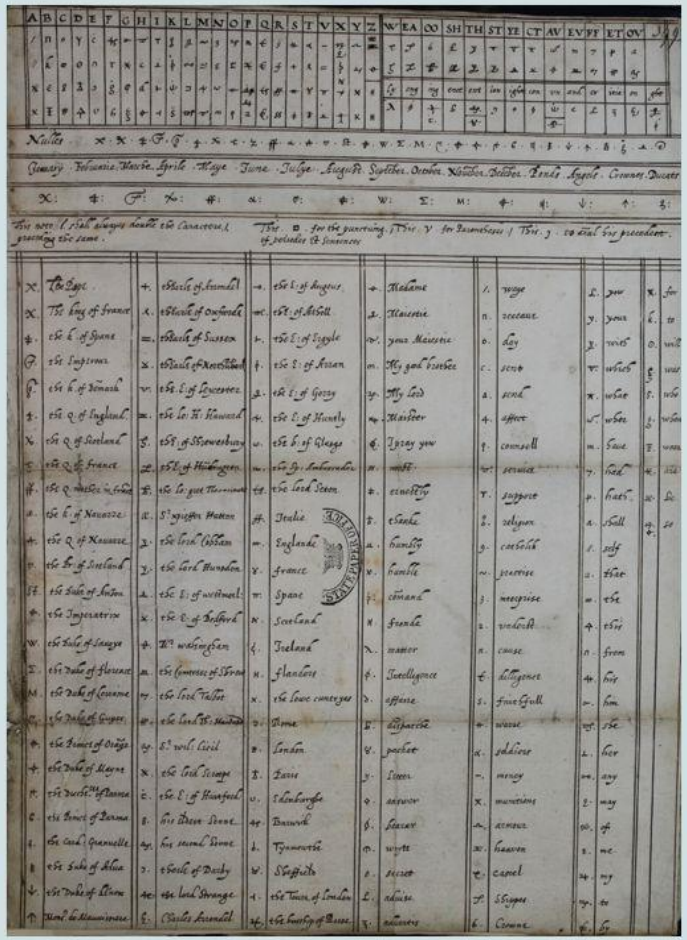


Investigative Projects - VIII

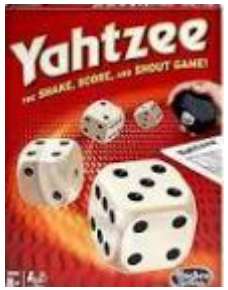
History of Cipher

Cryptography and Cipher.
The earliest known records of cryptography is around 1900 BC. The Egyptians carved hieroglyphs onto a wall of a tomb.

Around 486 BC in Ancient Greece, Spartan warriors would carry scytales to send messages in the battlefield so their enemies wouldn't know what there were doing or saying.



Fun Stuff – Games



Fun Stuff – Movies