

# Math Club 5

- ▶ Math Club for Grades 5 - 7
- ▶ 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.

Instructor: Vibha Mane  
Mobile: 631-682-1710  
Email: mane@schoolnova.org

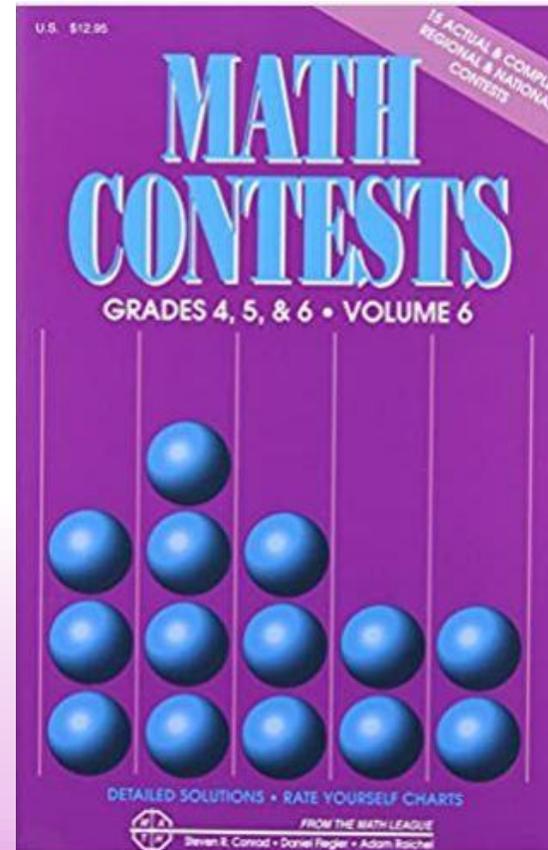


# MathCON Competition

- ▶ Contests for Grades 4 - 7.
- ▶ 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
  - 50-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 May.

# Math League Competition

- ▶ Contests for Grades 4 - 7.
- ▶ Online Practice Tests.
- ▶ Practice problems in-class
- ▶ Contest Format
  - Online, during Club Hours
  - February (Grade 6 & 7) and April (Grades 4 & 5)
  - 32 multiple-choice questions
  - 30-minute duration.
  - Calculator is permitted
- ▶ All Math Club students are invited to participate.



# MathCON Competition High Scorers in SchoolNova Newsletter

## MATHCON



**VIBHA MANE**  
*SchoolNova Math Teacher*  
*Adjunct Faculty, Department of Electrical and Computer Engineering*



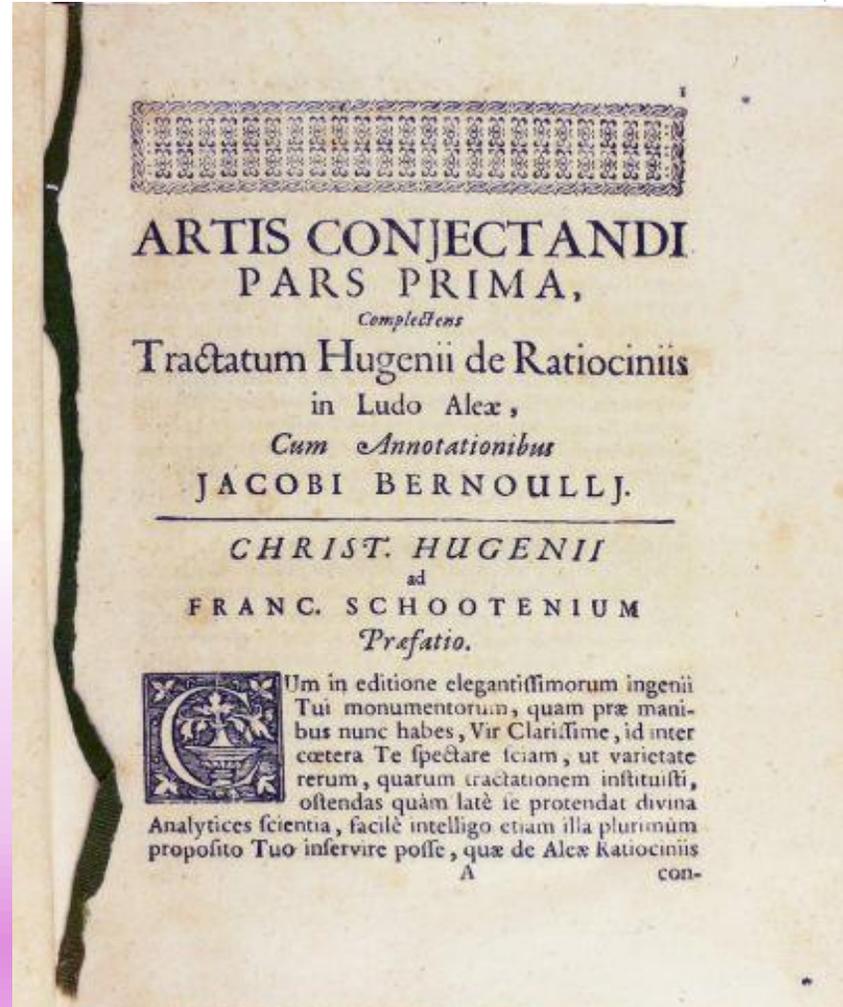
**MathCON** is a nationwide Math Competition open to all students in grades 4 through 12. Over 250,000 students, from 50 US states and Canada, participate in this competition. This year 8 students from Math Club 5 participated in the First Round Online Competition, in grade levels 4, 5 and 6.

MathCON	Grade	National PCTL*
Jude Badawi	4	96%
Saanvika Reddy	5	94%
David Goldberg	5	93%
Mayukh Mazumdar	6	92%
Robert Zhang	6	89%

\*The percentile is calculated separately for each grade level

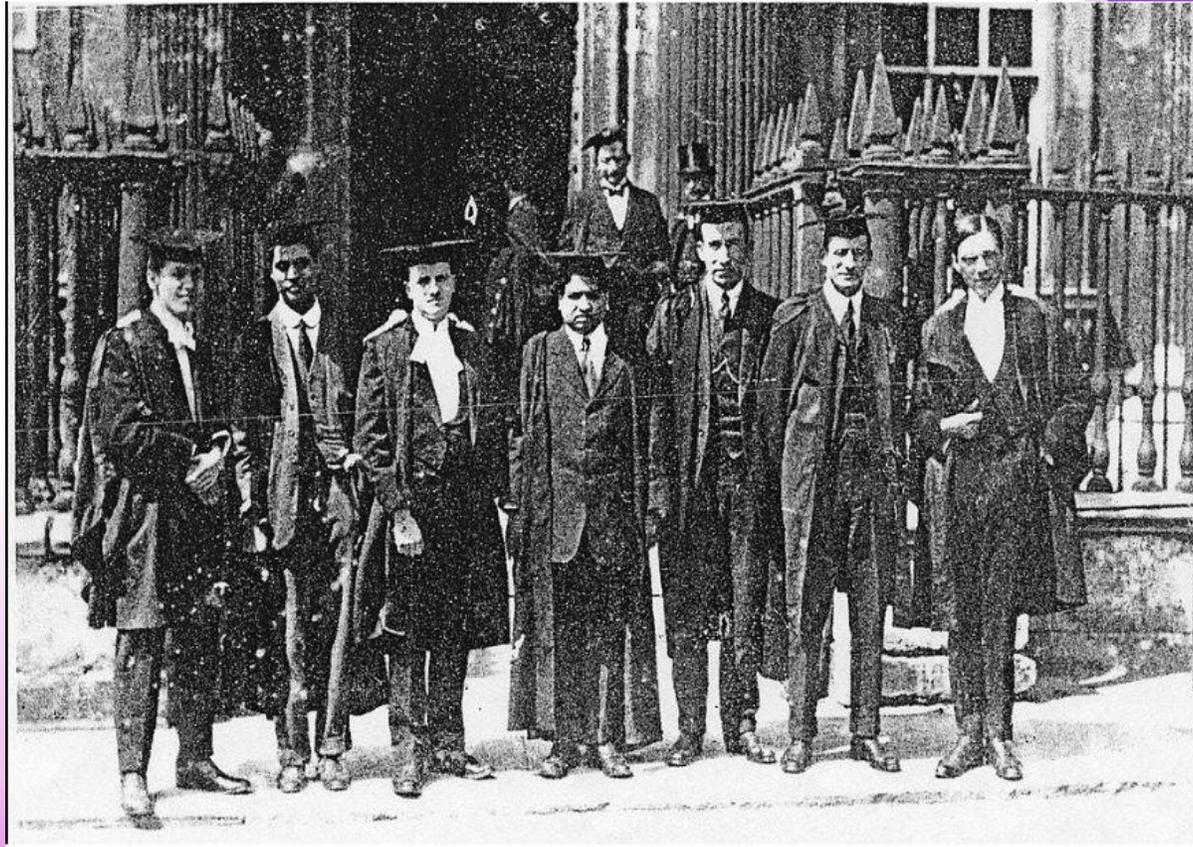
# Advanced Math Concepts - Probability

- ▶ 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.



# 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

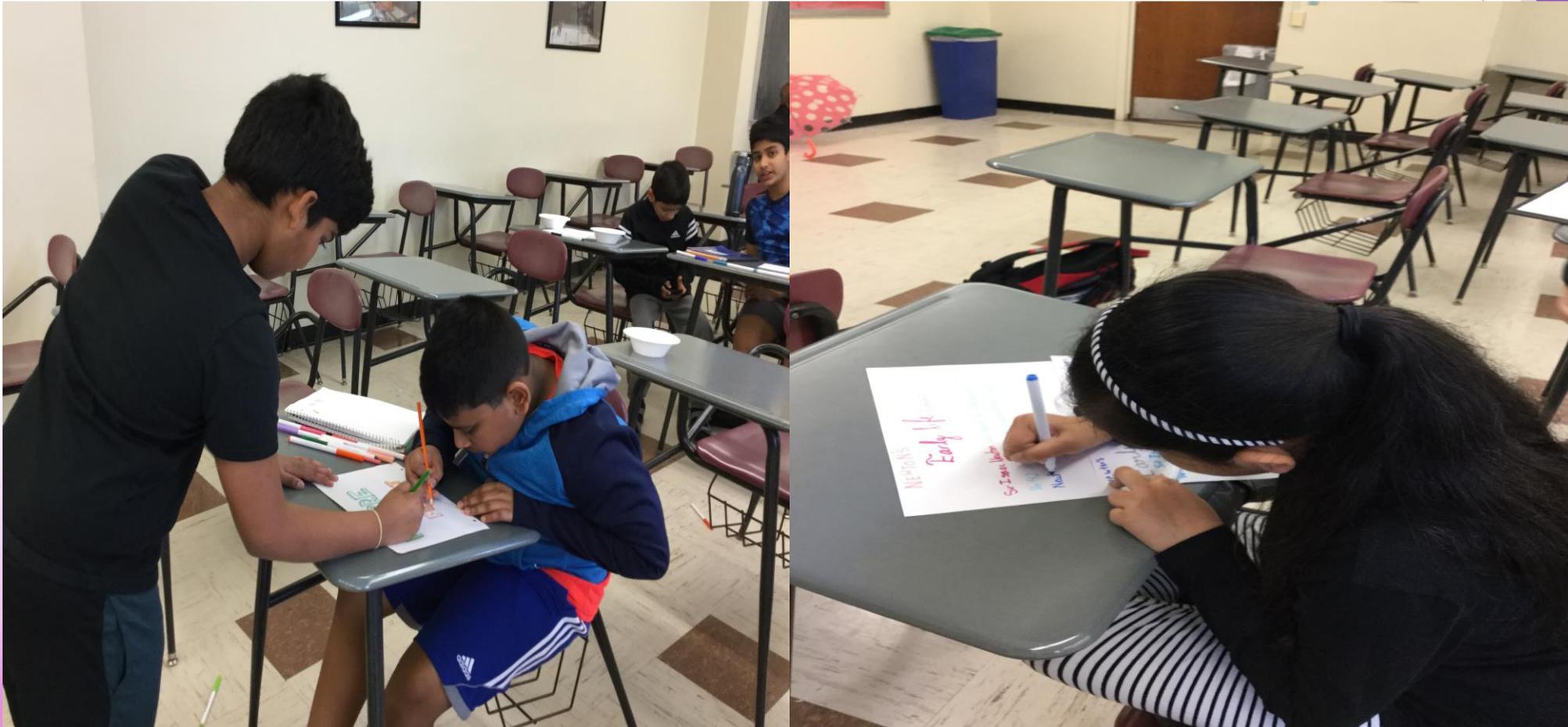


# Investigative Projects - I

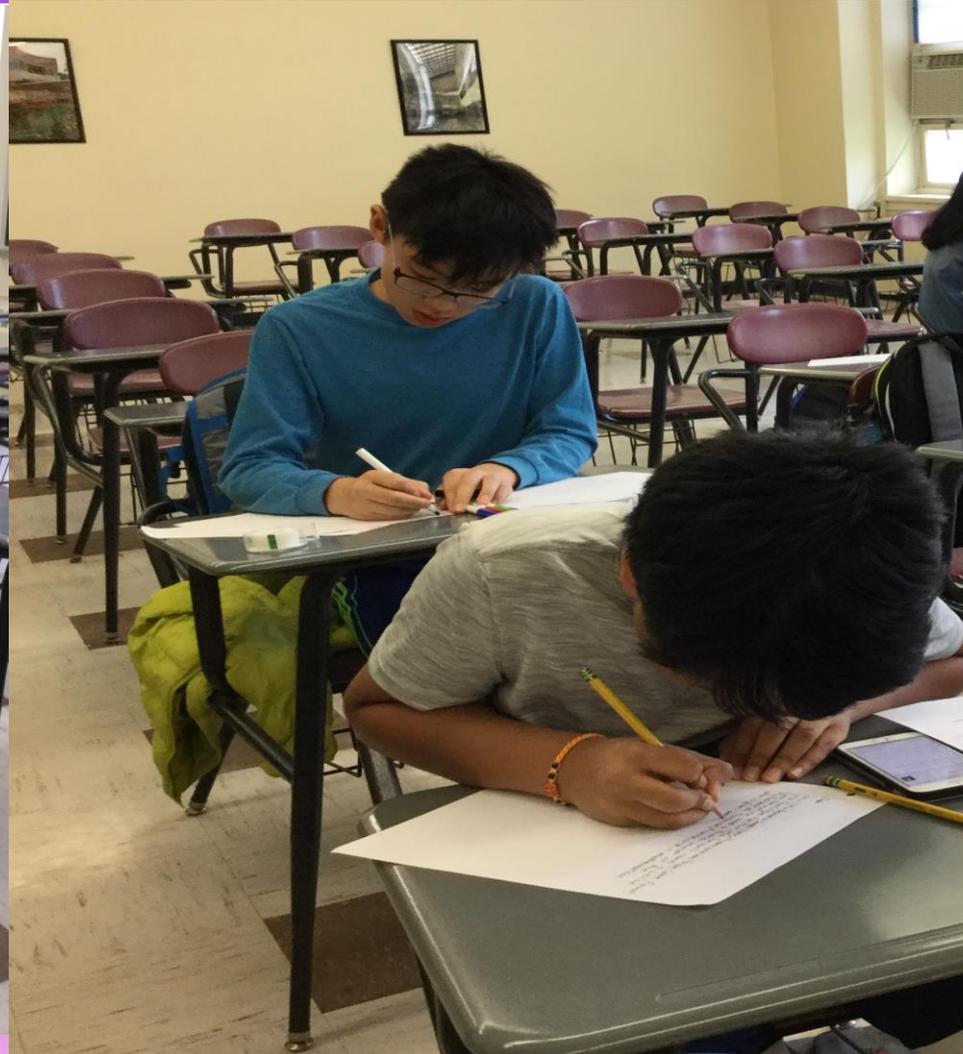
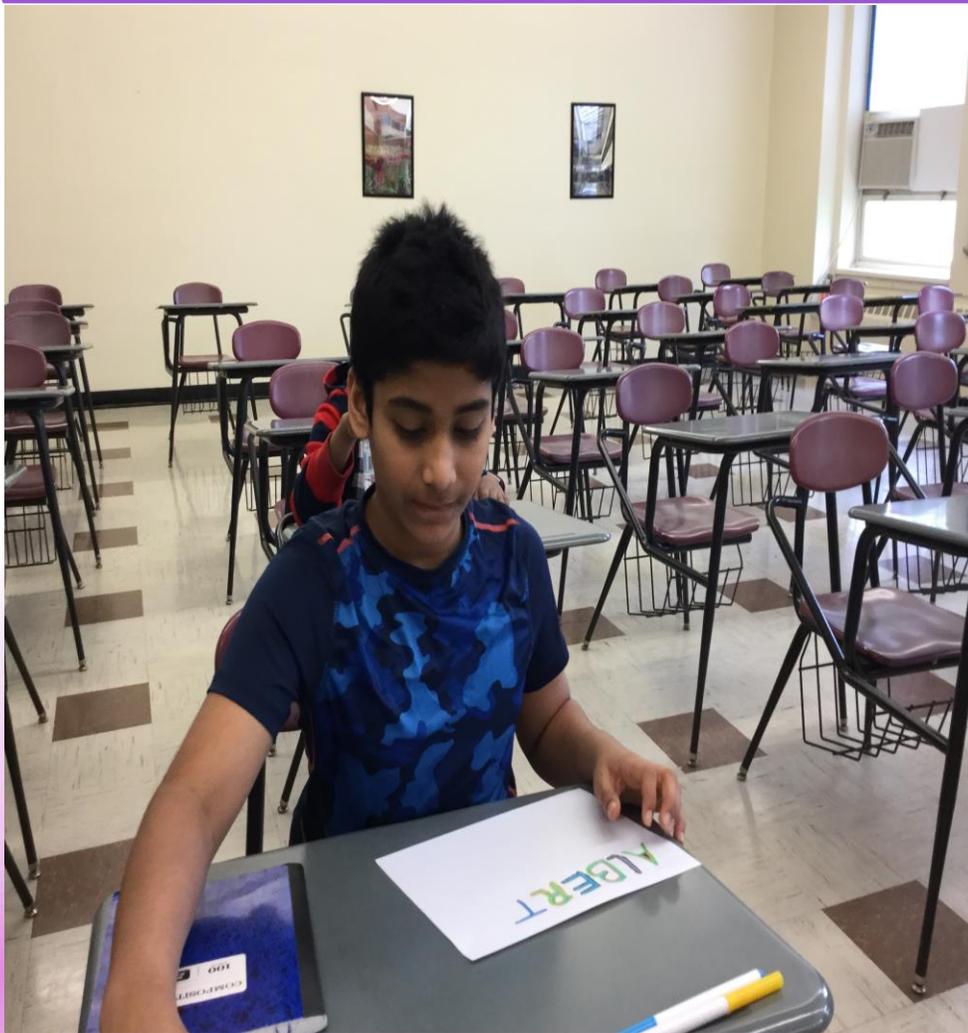
- ▶ Investigate and prepare a presentation on a mathematical concept or the life of a famous mathematician.
- ▶ Students work in teams of two or three.
- ▶ Students present their work to the class. Parents and families are invited.



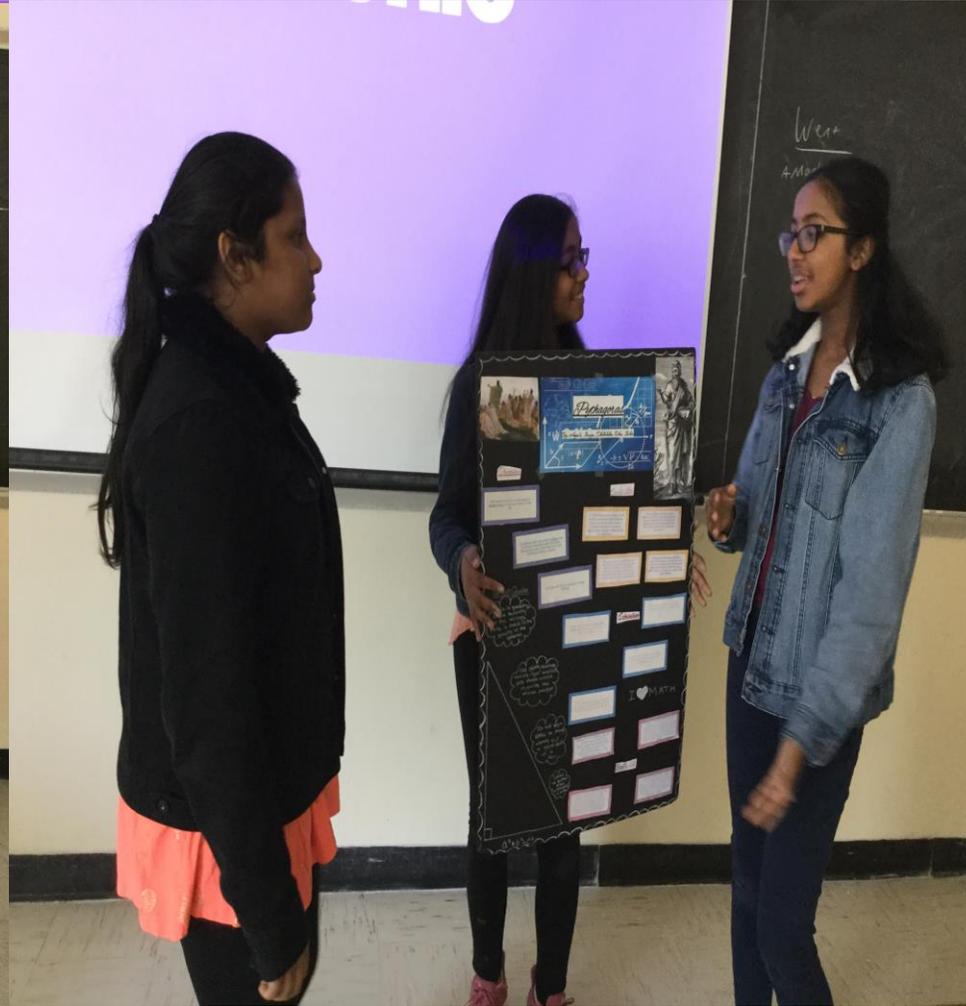
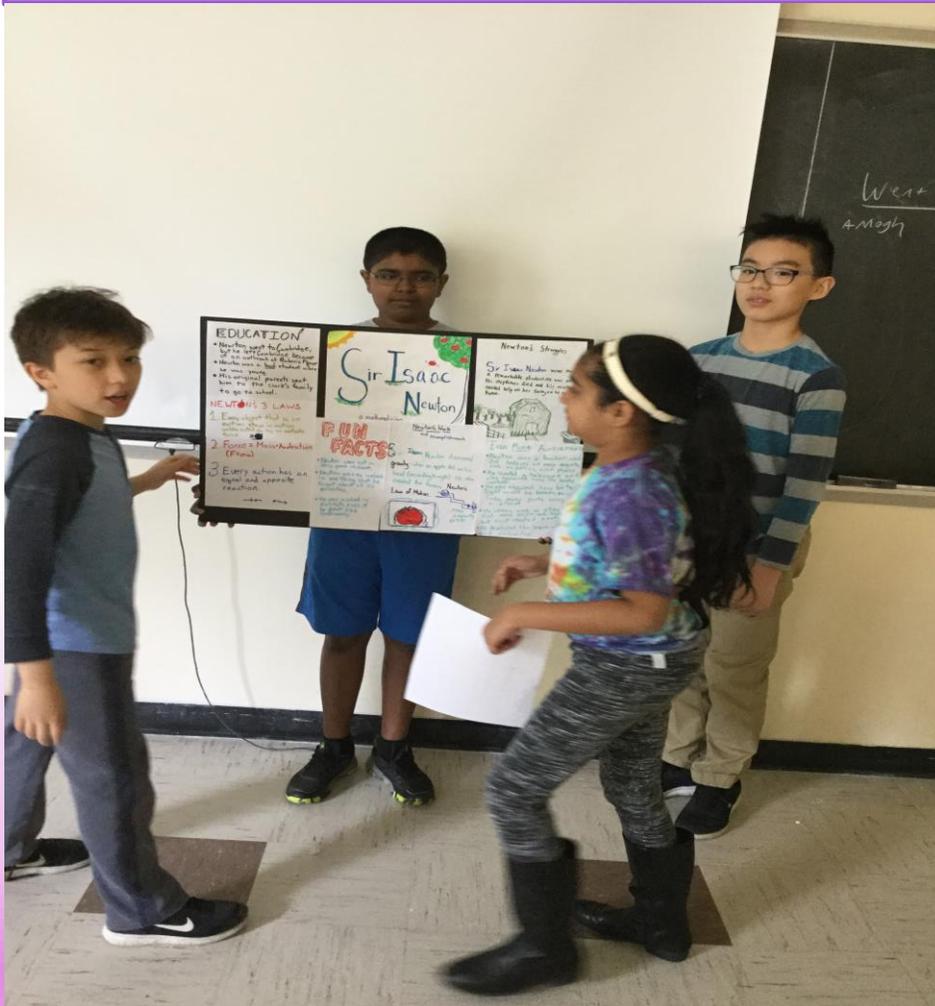
# Investigative Projects - III



# Investigative Projects - IV



# Investigative Projects - V



# Investigative Projects - VI

12:04 PM Sun May 9

End Zoom

Mute Stop Video Share Content Participants More

Switch Camera

Switch to Active Speaker

Vibha Mane

Ben

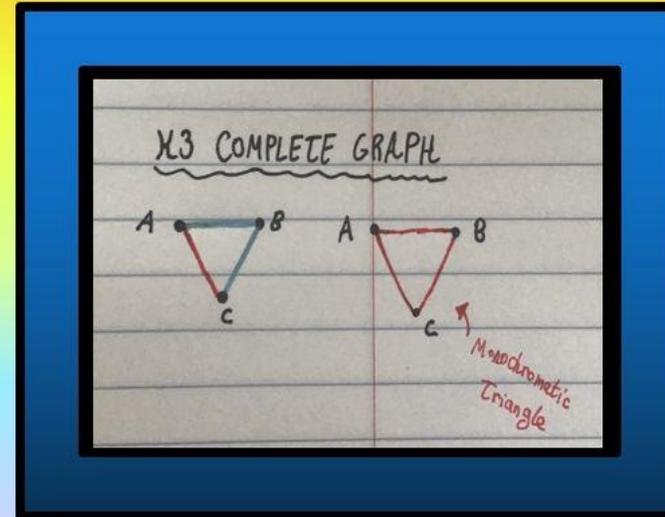
\*Aishwarya\*

Aishani

# Investigative Projects - VII

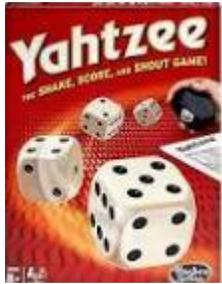
## Complete Graphs - $K_3$

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.





# Fun Stuff - Games



# Fun Stuff - Movies

