

Maths Camp in Australia



A detailed look into the design and implementation of math camps abroad

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Content

- Grant Proposal and Contact
- Camp Structure
- Problem Development
- Execution of the camp
- Alternate Objectives
- Reflection

NSF Grant

- Supplemental grant to TEAM-Math MSP funded by NSF's Office of International Science and Engineering <http://www.nsf.gov/div/index.jsp?div=OISE>
- TEAM-Math is an organization which funds professional development for K-12 teachers in east Alabama, in cooperation with the Math Education Department of Auburn University.

Basic Structure of the Camp

- Friday
 - Get to camp by 5pm
 - Opening activities as whole camp
- Saturday
 - Two worlds before lunch and one after lunch
 - Night activities involving orienteering
- Sunday
 - Theory/Proof wrap-up of worlds

Camp Objectives

- Isolate students from standard classroom environment
- Introduce math through open ended problems
- Encourage students to problem solve and conjecture
- Excite students about mathematics



Problem Development

- Find accessible theorem
- Create real world application of problem
- Organize examples and open ended questions which lead students to discovering conjectures
- Provide tools to engage students

Theorem

Theorem: for any n-gon there exists a point set S of at most $\left\lfloor \frac{n}{3} \right\rfloor$ which can guard all points of the n-gon.

- **Guarding:** a point set S guards a polygon P if for every point p of P, there exists a point s of S such that the segment ps is contained in P.

Problem

- Surveillance camera system

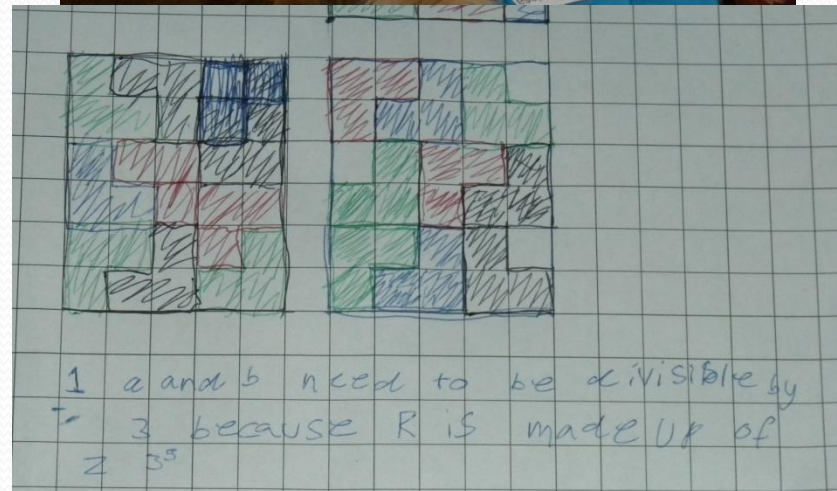


Example Questions Used

- What is the minimum number of cameras needed for shapes you have drawn?
- How many cameras will you need to guard an H-shape, E-shape, etc?
- Can you make a shape with X walls which needs Y cameras to guard it?

Other Worlds

- Bouncing Billiard Ball
 - Ball leaves a corner pocket and bounces at 90 degrees.
 - Which pocket will it fall? How many walls does it hit?
- L-shape Tilings
 - Can an $X \times Y$ grid be tiled with L-shaped tiles
 - What values of X and Y work?



Other Activities While in Australia

- Observe local schools
- Talk with teachers about Inquiry Based Learning
- Hold teacher workshops
- Compare educational system with US system
- Create connection between students in each country

