Competitions Promoting the Mathematical Sciences

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Abstract

Competitions provide many benefits to students and the mathematics community at large by exposing students to important mathematical ideas and practices. This poster shares examples of successfully implemented competitions.

Mathematics Competitions

The most common type of competition is a Math Bee or Math Olympiad consisting of a series of math tests. Many competitions include a team aspect for group problem solving.

Interesting additions to Math Bees

- ***Relay races*** in which the "baton" is a number from a solved problem.
- A ***math fair*** akin to the more common science fairs.
- ***Building the tallest tower*** with spaghetti and mini marshmallows.
- ***Solving toothpick problems*** in which one or more toothpick is moved from an arrangement to create a desired arrangement.
- ***Replicating an image or logo*** using functions in Desmos®.

The Amazing Race

This competition is modeled after the American reality TV show *The Amazing Race* (van Munster, 2019)

Students compete in mathematical challenges across campus to receive a clue to the next challenge location. Challenges can include physical problem solving such as finding the height of a lamppost on a sunny day or measuring out 9 ounces of water using only a 5-ounce and 6-ounce jar.

Escape Rooms or Murder Mysteries

Students compete against the clock in these competitions solving mathematical challenges. Escape rooms seek to unlock padlocks to escape the room whereas murder mysteries involve gathering and solving mathematical clues to identify the suspect.

References

Scan the QR code for the poster proposal including references and acknowledgement of graphics used.

Value

- Competitions are ***highly motivating for students*** as "overcoming a challenge is deeply rooted in human nature" (Kenderov, 2006, p. 1583).
- Competitions help ***promote favorable attitudes*** amongst students and parents (White et al, 2016).
- Competitions that incorporate a group component ***meet students' social needs***.
- Competitions ***encourage the joy of problem solving***.
- Competitions help ***identify students' mathematics ability***. This can be pivotal in course selection and career choices.
- Competitions help students ***value mathematics ability***.
- Thematic competitions ***attract a broad range of students*** who later gain appreciation for the mathematical sciences.

Data Analytics Competitions

Data analytics competitions offer the ability to connect to a subject of interest, such as ***weather forecasting*** or ***predicting genes associated with health conditions***, with the mathematical sciences.

Fantasy Sports

Fantasy sports engage students interested in athletics. Strong data analysis gives an edge over competitors. Points can be allocated as decimals or fractions to give students practice with rational numbers.

Basketball Data Analytics Battle

Previous year's statistics on the NCAA Basketball tournament in the US are provided and students analyze the data to create an algorithm which predicts teams that will do well in the tournament. Student enthusiasm builds throughout the 6 rounds of the tournament as their teams gain points.

Scan the QR code to explore the competition website which includes past data and an introduction video.

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