

What IB does not like – be careful with these!

- Fibonacci sequence in nature. (Paweł Ż.)
- Mathematics and art - Julia & Mandelbrot set. (Piotr N.)
- złota i plastikowa liczba w architekturze Starożytnego Egiptu (Kasia K.)

Sciences: Physics (kinematics, mechanics), Chemistry, Biology:

- Analysing the techniques of Russian and Chinese ice skaters (by measuring the flight line, deviation, speed, position before the jump) in loop jump and comparing it with the results (Nadia C.)
- Modelling the aerodynamics of different types of boats. Advantages and disadvantages of different types of boats. (Mateusz G.)
- Motion of fluids (Naviera-Stokesa equation) (Alek K.)
- Describing the electrons mathematical nature (Kuba W.)
- Projectile motion (different dimensions, difference between the motion in vacuum and with air resistance) (Alek K.)
- Calculating the Universe- expressing physical things using mathematical language. (Zosia W.)
- fractals in biology (DNA, heart rates and sound) (Kasia K.)

Economics:

- Measuring income inequality in Rwanda (Marisa K.)
- Modelling economic inequalities (Gini coefficient). (Paweł Ż.)
- The Gini coefficient; How to model economic inequality (Dominika K.)
- Leasing. Sequences in use (Dominika K.)
- Economics models - probability and game theory (Alek K.)
- The prisoner's dilemma. Game Theory in economics (Dominika K.)
- Detection of financial manipulation with the use of Benford's Law (Alek K.)
- Choosing the best investment by calculating return on investment of possible scenarios (Marisa K.)

Modelling:

- Is there a correlation between the length of the rallies and matches won in tennis games? (Maja M.)
- Human population growth (Basia M.)
- Modelling population growth e.g. in China (Karolina G.)
- Does hitting the square on the backboard in basketball, always guarantee a shot? (Modelling +Probability) (Maja Ś.)
- Magic square' in basketball. What are the chances of not scoring the point after hitting the magic square? (Mateusz G.)
- The occurrence of lungs and large intestine tumours in relation to peoples' age, sex and social status within 60 years from now. (Kuba W.)
- The impact of difference of distance from earth to Venus on women mathematical skills (Nadia C.)

- Prosecutor's fallacy and similar cases of statistical analysis in the judicial system (Kuba S.)
- The occurrence of cataract and age related macular degeneration in relation to age and inhabited geographical latitude. (Kuba W.)
- Modelling a graph of Meme Man.(picture enclosed) (Kuba S.)
- Is linear arrangement of planets possible and if yes, when will it happen? using mathematic skills in finding information (Nadia C.)
- Mathematical modelling of infectious disease (or compartmental models in epidemiology) (Maja Ś.)

Probability, statistics, game theory:

- Bluffing in Poker - probability and game theory (Alek K.)
- Binomial distributory (*distribution?*) in testing ESP (Extrasensory perception) abilities. (Zosia W.)
- Bayes' theorem (applied to some real-life events) (Karolina G.)
- Estimating the number of car crashes in Warsaw (Marisa K.)
- Statistics of students result on exam. Who scores better boys vs girls?(Statistics +Probability) (Maja Ś.)
- Explanation and application of Birthday paradox (Mateusz G.)
- Why gambling will make you bankrupt? On roulette and other bet-based games. (Piotr N.)
- Solving the magic square (Basia M.)
- Is there a method to always win Tic- Tac- Toe? (Maja M.)
- How many sudoku games can be created (Basia M.)

Mathematics in life:

- Exploring different voting systems (Is there a fair voting system? Arrow's theorem) (Karolina G.)
- Mathematics in professional horsemanship. (Zosia W.)
- Mathematical structure of Cheops Pyramid (Maja M.)

Other ("pure maths"):

- Proving Ramanujan's constant (Kuba S.)
- The Chinese postman problem as mathematical problem of graph theory. (Paweł Ż.)
- Non Euclidean Geometry - Torus or Mobius Strip (Alek K.)
- Sierpinski triangle and Pascal triangle. (Piotr N.)
- Resolving Zeno's "Achilles and the Tortoise" paradox (Karolina G.)
- Pentafla i inne gwiazdy magiczne wzór na rozwiązanie (Kasia K.)