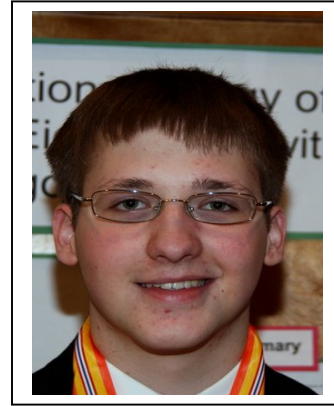


# From the 2010 Science Fair Winner Matthew Bauerle



Dear Entrants of the 2011 Flint Regional Science Fair

$K(A,b)=[b \quad A^*A]$   $A = QTQ$   $x$  minimizes  $\|Ax-b\|$  is the language of mathematics, my favorite tool in science. I'm always fascinated in the ways math can be used: from calculating the efficiency of the blades of a wind turbine, to analyzing the stability of a skyscraper. Don't be scared off by the fancy notation. You use math and algorithms everyday. When planning moves in chess your mind automatically applies a kind of genetic algorithm. You try various move sequences in your mind, eliminating silly plays and changing and combining the best strategies to decide your next move. Even if your project is biological or engineering based you can still use nature's computers. Instead of crunching numbers, enzymes crunch corn into ethanol and wooden models of bridges provide a hands-on rather than a computationally complicated way to solve the structural equations. Like it or not, math is always there even when you aren't studying for the next big math test.

While science and mathematics may be forever entwined, never forget that it is your attitude that makes the most impact on your success. What kind of grade am I going to get if I work on a difficult and intricate topic if I have no motivation for it? Have fun with your project, but be sure to follow all SRC regulations. In other words, try not to pick an insanely difficult one that you will end up hating. Do shoot high though. If you pick an engineering project, strive for innovation. If you go for plant sciences, be thorough. If you eat up mathematics like candy, work for originality. The cost of failure is nothing compared with the thrill of success.

As you've likely heard, never give up (if a project suddenly turns dangerous or unethical immediately stop your research). When something fails or you feel like things are all messed up, success is just around the corner!

I would especially like to encourage the current 8th graders to compete in the senior division next year. There are lots of prizes and opportunities available: bonds, scholarships, the \$200 Intel computer science award, and of course the all expense paid trip to ISEF (which is lots of fun!). All finalists also get the opportunity to attend the Michigan Science and Engineering Fair. Start early, work hard and succeed!