
**DES MOINES PUBLIC
SCHOOLS POWER UP
ACCELERATED MATH
PROGRAM**

**ART OF PROBLEM
SOLVING
CASE STUDY**



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OVERVIEW & APPROACH

Beast Academy as Math Enrichment

In her first year as Supervisor of Gifted and Talented Education for Des Moines Public Schools (DMPS), Jolene Teske began an effort to increase the rigor of the district's accelerated math program. She started at the elementary level in year one, with the goal of growing the program vertically into higher grade levels over time. In her planning, Teske researched what some similarly large, diverse urban districts were doing to tackle the challenge of increasing math rigor. She was introduced to Art of Problem Solving (AoPS) and the Beast Academy elementary curriculum during a summer conference and liked what she heard.

Then, when she returned to Des Moines, she discovered a math teacher in the district had already been using some of the secondary-level AoPS materials with advanced students and was very enthusiastic about them. Teske reached out to AoPS, and they recommended she arrange a visit to a district in Minnesota where she could observe a standout accelerated math program in person. What she saw was an especially high level of problem solving and engagement among students using Beast Academy, a rigorous online elementary math curriculum that is presented in an appealing graphic novel style.



IMPACT

Jolene then decided to bring Beast Academy to Des Moines as a math enrichment option. Gifted and Talented consultants in 11 of the district's 38 elementary schools began piloting the program with advanced math students in the 2018-19 school year.

Before long, the impact of Beast Academy was evident in a number of ways:

- **Greater conceptual understanding:** Students using Beast Academy soon exhibited greater conceptual understanding of math. While working through the material, students were thinking about why they were doing the problem in addition to trying to solve it.
- **Improved collaboration skills:** Teachers and the district's gifted education consultants noticed that students were particularly successful with Beast Academy when working in small groups, a model that fosters sharing, collaboration, and communication.
- **Standards alignment:** In some classrooms, students worked on Beast Academy lessons that directly correlated to the specific standards the rest of the class was working on at that time. In other classrooms, they followed the Beast Academy curriculum straight through, even though it proceeds through the standards in a different order.
- **Notable results at Findley:** The Principal at Findley Elementary School, Barb Adams, who is also a former math teacher, immediately recognized the potential of Beast Academy to energize her school's accelerated math program. After 10-12 weeks of using Beast Academy (from



mid-January to late April), **58% of the students who participated had larger gains (beyond normal growth) on Measures of Academic Progress in math from winter to spring than they had from fall to winter** (see chart below). These same students spent 50% more time on Beast Academy during this time period, compared to their peers. This data suggests a correlation between time spent on Beast Academy and success on the MAP math test.

IMPACT

“The great thing about Beast Academy is that it promotes team-talk and team thinking. That's not typical in instruction in mathematics. Beast brings about discussion with students and students learn from each other. It teaches students how to think mathematically, but also how to bring in problem-solving skills as adults. It provides the framework, structure, and motivation for students to learn from each other as well as from the material.”

JOLENE TESKE

- **AoPS for secondary students:** In addition to deploying Beast Academy for elementary students, one math instructor at Central Academy had been using AoPS Online courses as part of his advanced math curriculum at the secondary level. AoPS Online offers courses for motivated learners in grades 5-12, in everything from prealgebra to calculus, and much more. In hopes of upping the rigor for even more students, Teske intends to expand the use of AoPS Online to the “Prep Academy” program, which serves 7th graders from traditionally underserved populations who might not otherwise have the opportunity to be in a rigorous, academic environment. It is the hope that after succeeding with the AoPS curriculum, participating students will then find engagement with math and qualify for the district’s 8th grade Academy for accelerated students.



FUTURE OUTLOOK

Expanding programs for Gifted and Talented students

By using Beast Academy, DMPS has successfully been able to add a significant level of rigor to its accelerated math program. The district plans to expand its implementation of Beast Academy in the 2019-20 school year by adding more grade levels at participating elementary schools, while introducing several more to the program.

The expansion will also include extending the use of AoPS materials to the 7th and 8th grade students at Central Academy and other middle schools in the district. Gifted and Talented consultants and teachers plan to track student progress throughout the year and share successes, challenges, and results in the spring.



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