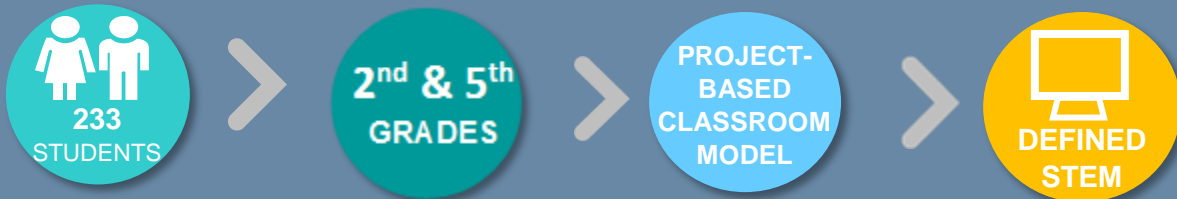


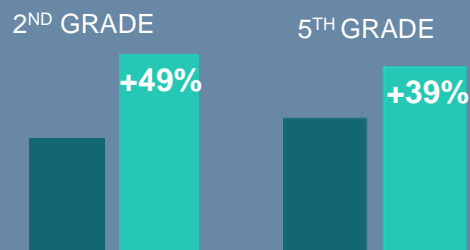
# Study Shows Defined STEM has a Positive Impact on Student Learning Outcomes

## QUICK FACTS:



## KEY FINDINGS:

### IMPROVED TEST SCORES



FEMALES  
OUTPERFORMED BY

**+41%**  
in 2<sup>nd</sup> Grade

Source: MIDA Learning, LLC, 2016

## THE CHALLENGE

When a large suburban school district in Illinois, \*Grouse Point, transitioned to the Next Generation Science Standards they decided to incorporate project-based learning (PBL) in the form of Defined STEM into several of their elementary science classes. The purpose was to determine Defined STEMs viability in helping students' master science and associated standards. More specifically, district administrators were interested to determine if the implementation of a Defined STEM project-based learning (PBL) environment in science class made a difference in students' problem solving abilities when compared to students in a traditional classroom setting.

## THE STUDY

MIDA Learning Technologies was commissioned to conduct a year-long (2015-2016 academic year) study on Grouse Point's 2<sup>nd</sup> and 5<sup>th</sup> graders. The study focused on answering two questions:

- 1.) Does Defined STEM influence classroom instruction and student engagement?
- 2.) What impact does a project-based learning environment in science class have on students' ability to problem-solve?

Participants included 116 second graders and 117 fifth graders. All students in the control group received standard district approved science curriculum and traditional teacher delivery with no project-based learning applied. In the experimental group, teachers implemented a project-based science curriculum; Defined STEM. Post-test assessments were designed to ascertain students' ability to be successful in problem solving and also measured progress on the three traits expressed in the Common Core Mathematical Practices.

“Students’ questions and discussions evolved and they became better problem solvers.”

*A participating 2<sup>nd</sup> grade teacher*

## THE FINDINGS – TEACHER FEEDBACK

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Teacher interviews and surveys revealed that a great deal was gained from the pilot year of Defined STEM implementation. They overwhelmingly echoed the fact that they thought the pilot was a success.

Comments from the teachers specifically regarding student behaviors were very informative. Defined STEM teachers said the kids were very engaged and enjoyed the hands-on cooperative learning.

“It was fun watching the kids’ interactions- their questions and discussions evolved into more in-depth ones and they became better problem solvers” said a participating 2<sup>nd</sup> grade teacher.

Fifth grade teachers said their students enjoyed Defined STEM a lot. “They loved working together, hands on, talking through problems and trying to problem solve together. Students didn’t look at it as learning – they were having fun. They also had a sense of accomplishment when they saw what they had done.”

## THE FINDINGS – DATA ANALYSIS

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Analysis of standardized assessments and project tests revealed that for both grades (2<sup>nd</sup> and 5<sup>th</sup>), the experimental group that utilized Defined STEM outperformed students in the control group who had not been exposed to Defined STEM and the project-based learning environment. The 2<sup>nd</sup> grade PBL and Defined STEM users achieved +49% higher scores than those that were in a traditional direct-instruction classroom. The 5<sup>th</sup> grade group who used Defined STEM outperformed the control group by +39%.

Results also indicated that the females outperformed males significantly at the second grade level and slightly at the 5<sup>th</sup> grade level.

In the end, these findings are consistent with a body of research that shows that project-based learning helps students understand concepts more deeply and perform better on a wide range of assessments.