



**Award-winning<sup>1</sup> student enrichment and teacher professional development program for Illinois schools**  
by the Illinois Mathematics and Science Academy®



[www3.imsa.edu/programs/fusion](http://www3.imsa.edu/programs/fusion)

***The Illinois Mathematics and Science Academy*** provides an award-winning<sup>1</sup> enrichment program, **IMSA FUSION**, serving 4-8<sup>th</sup> grade students who are talented, interested and motivated in mathematics and science. IMSA FUSION partner schools are provided with curriculum, lab kits and ongoing teacher professional development and support for the annual delivery of two units of *hands-on, minds-on* science, technology, engineering and mathematics (STEM). FUSION works with teachers in a co-taught setting to refine and develop inquiry-driven teaching strategies. Students attend weekly after-school or elective course sessions with their IMSA trained teachers at their school. Teachers participate in Pedagogy, Orientation and Planning Workshops, along with Unit Workshops, for 5-6 days of face-to-face and online professional development each year. Students are provided with 64 hours of engaging STEM experiences throughout the year. FUSION schools also enjoy exciting field trips, guest speakers, STEM Research and Career Webinars, FUSION Parent Events and Online Problems of the Month.

### **FUSION Program Goals**

1. Maintain and increase student interest, involvement and literacy in science and mathematics;
2. Enhance the knowledge and skills of teachers in science and mathematics;
3. Stimulate excellence in schools' science and mathematics programs across Illinois;
4. Help increase access to programming for students who are historically underrepresented in mathematics and science or in areas of the state that are under-resourced in STEM opportunities.

### **Program History and Target Schools**

IMSA FUSION originated at the request of the Illinois General Assembly in the 2000-2001 academic year with seven school sites in Illinois. FUSION currently has over 110 programs across the state. To date, IMSA FUSION has served nearly 14,000 students. IMSA FUSION is recognized among the top programs in the nation by Change the Equation, *STEM Works*, a corporate-led initiative to identify and expand effective STEM teaching and learning to best prepare for a powerful and diverse STEM pipeline for the global future. One important goal of the FUSION program is to increase access for students historically underrepresented or underserved in STEM opportunities. As such, low income, minority students in urban and, or rural school districts are targeted for program participation. Reaching this population will be an ongoing priority and focus for FUSION.

---

<sup>1</sup> IMSA FUSION was selected as one of the "Best Practice" K12 STEM Education programs in the nation in 2006 and 2010 by the Bayer Corporation's *Making Science Make Sense* initiative for our "proven track of helping girls and underrepresented minorities to participate and achieve in STEM." FUSION is also nationally recognized, as of June 2012, as a leading, effective STEM program by the *Change the Equation STEM Works* initiative.

## The FUSION Experience

Each IMSA FUSION school partner works with 20 4-5<sup>th</sup> and, or 30 6-8<sup>th</sup> grade students and two teachers, a math specialist and a science specialist. If partner school funding permits, a site coordinator joins the FUSION teachers to help plan and oversee program events and activities. IMSA FUSION staff and regional site support staff develop curriculum, deliver professional development, and provide coaching and mentoring to teachers and administrators for the effective delivery and implementation of the program at each partner site. FUSION employs IMSA's recognized core competency of designing, developing and delivering curricular materials and teaching approaches that are competency-driven (standards-based and challenging), problem-centered ("real world"-focused), inquiry-based (student-led and exploratory) and integrative (connected). Activities used in the IMSA FUSION program are designed to intrigue and engage students, and to ignite their interest in math and science. Students benefit from an array of unforgettable learning experiences ranging from rocket launches, wind turbine building and bridge creations to simulated landfills and oil spill clean-ups, self-made kaleidoscopes and leaping origami frogs. Curricular units span topics from Nanotechnology, Forensics, Electricity, Engineering, Chemistry, Biotechnology, Tectonics, Secret Codes, Chaos Theory, The Electromagnetic Spectrum, and more!

FUSION traditionally serves partner schools as an after-school initiative, and is offering a newly developed program model as a "hybrid" elective course. Moving FUSION into the school day schedule offers increased sustainability for schools by reducing their costs to run the program, while improving and increasing the reach and retention of FUSION students and teachers in partner schools.

## *IMSA FUSION has a proven impact on both teachers and students*

Evidence of Student Impact	Evidence of Teacher Impact
<ul style="list-style-type: none"> <li>▪ 81% of FUSION alumnae take advanced coursework in math in high school, and attain an average grade of 85% in these courses</li> <li>▪ 60% take "rigorous" math coursework according to a national high school transcript study (2011)</li> <li>▪ 70% of FUSION alumnae take advanced coursework in science in high school and attain an average grade of 87% in these courses</li> <li>▪ 61% take "rigorous" science coursework according to a national high school transcript study (2011)</li> <li>▪ 87% of teachers and principals report an increase in FUSION students' math interest; 74% report an increase in FUSION students' math achievement</li> <li>▪ 91-93% of teachers and principals report an increase in FUSION students' science interest; 80-82% report an increase in FUSION students' science achievement</li> <li>▪ 63% students report that FUSION improves and increases their content knowledge and academic performance in math, science</li> </ul>	<ul style="list-style-type: none"> <li>▪ 84% of FUSION teachers report use of FUSION instructional skills/resources in their classrooms;</li> <li>▪ 65% of FUSION teachers report change in their instructional practice</li> <li>▪ 93% of principals report that FUSION curriculum is aligned to state standards in both math and science</li> <li>▪ 96% of teachers report that FUSION curriculum is aligned to state standards in both math and science</li> <li>▪ Student communication, analysis of information, active learning in math/science have increased in FUSION teacher classrooms from 54% in 2008 to 64% in 2010</li> <li>▪ 54% of FUSION lessons show significant connections to real-world issues</li> <li>▪ 72% of FUSION sessions incorporate complex, multiple STEM concepts</li> <li>▪ 50-75% of FUSION teachers/principals indicate increase in teacher leadership and professional development</li> <li>▪ 57% of FUSION teachers facilitate internal professional development for colleagues</li> </ul>

IMSA FUSION is currently partnered with Indiana University's Center for Evaluation and Education Policy (CEEP) for the research and evaluation of our program. FUSION is committed to offering high-quality STEM programming for Illinois schools.