



IOWA

Sciences & Life Sciences Achievement

STUDENT ACHIEVEMENT

NAEP Grade 8	IA	U.S. Avg.	State Rank
Science Average, 2005	N/A	147.1	–
Science, 2005 (% at or above “proficient”)	N/A%	27.3%	–
Life Sciences Average, 2005	N/A	148.2	–

ACT	IA	U.S. Avg.	State Rank
Science Average, 2008	22.3	20.8	5
Biology, 2008 (% of students ready for college level)	37%	28%	9

AP	IA	U.S. Avg.	State Rank
Science Scores, 2008 (% with a score of 3 or higher)	60.6%	55.4%	11
Science Exams, 2008 (Exams as % of all H.S. grads)	4.5%	10.5%	45
Biology Scores, 2008 (% with a score of 3 or higher)	57.3%	49.8%	8
Biology Exams, 2008 (Exams as % of all H.S. grads)	2.1%	4.6%	47

SCIENCE TEACHER QUALITY and PROFESSIONAL DEVELOPMENT

	IA	U.S. Avg.	State Rank
Science Teachers with Major in Assigned Field, 2003–04 (% , Grades 7–12)	81%	77%	15
Science Teachers Certified, 2006 (% , Grades 7–8)	N/A%	N/A%	–
Biology Teachers Certified, 2006 (% , Grades 9–12)	N/A%	88%	–

Note: NAEP = National Assessment of Educational Progress, AP = Advanced Placement
N/A = Data not available.

Examples of Bioscience Education Activities

Teacher Preparation and Professional Development

Iowa State University’s (ISU’s) **Biotechnology Outreach Education** Center educates teachers and students in a state-of-the art laboratory on the ISU campus. ISU extension specialists also conduct workshops for teachers throughout the state and provide free kits to teachers to use in their classrooms. During the 2007–2008 school

IA STATE SCIENCE STANDARDS & REQUIREMENTS

STANDARDS PROFILE

- Core curriculum standards, including in science, were mandated by the state legislature in 2007 and must be implemented in high schools by **2012**
- Research scientists provided input in developing standards

BIOSCIENCE-RELATED GRADUATION REQUIREMENTS:

Biology is not required for graduation



year, ISU distributed more than 200 kits and supplies to teachers. The Center also offers week-long summer workshops for teachers. Support for materials and stipends for the workshops are funded by the ISU Office of Biotechnology and the Iowa Biotechnology Association, which provides 12 awards of \$3,000 each on an annual basis.

The Board of Regents, State of Iowa, and the Iowa Legislature established the **Iowa Mathematics and Science Education Partnership (IMSEP)** in early 2007. The University of Northern Iowa leads the initiative in collaboration with the University of Iowa and ISU. IMSEP has four core programs:

- **Math and science teacher real-world internships** – Summer-long paid internships for current science and math teachers in business and industry to update skills while modernizing the curriculum.
- **Project Lead The Way® expansion** – A national pre-engineering curriculum package for middle and high school students to learn science and math through engineering.
- **Community college science, technology, engineering, and mathematics (STEM) instructor preparation and updates** – Addresses shortage of math and science instructors at community colleges by launching a special STEM community college teaching certificate program at ISU.
- **I-Teach project** – Recruits more talented and diverse candidates to math and science teaching. Offers tuition-waived courses exploring teaching, followed by paid internships in educational settings with mentors.

ISU offers **Summer Research** Internships for 7th through 12th grade biology teachers in biotechnology and genomics. Teachers complete a week-long theory and technique training workshop, after which they conduct an independent research project under the supervision of an ISU faculty member.

Iowa Central Community College (Iowa Central CC) at Fort Dodge hosts a 4-day training institute for community college and dual-credit high school instructors who teach in STEM areas. The **Iowa Central CC/Fort Dodge Animal Health-Wyeth Summer Science Teachers Institute: RxeSEARCH**, an Educational Journey, teaches concepts of STEM education using pharmaceutical research and development.

Iowa offers a **Teacher Intern** License that allows an individual who has a baccalaureate degree and meets other requirements to become a high school teacher. The program is offered by Kaplan University in Davenport.

The **Teacher Shortage Loan Forgiveness** Program is a state-funded program that will provide student loan repayment assistance to Iowa teachers repaying Federal Stafford Loans—Subsidized and Unsubsidized. This program is designed to increase the number of teachers in Iowa schools teaching in shortage areas, which includes all sciences in grades 7 through 12. The Teacher Shortage Loan Forgiveness Program is administered by the Iowa College Student Aid Commission.



Experiential Learning and Outreach

ISU holds an annual **State Science and Technology Fair** that includes workshops for teachers that focus on opportunities provided by university, college, and private science organizations to enhance student learning and research in the classroom. Student workshops focus on career opportunities in science and hands-on science learning provided by college departments. The Iowa Biotechnology Association awards \$10,000 in scholarships to the students who exhibit the best use of biotechnology in their projects. Students can

receive a scholarship of \$2,000 to use at an in-state college or university or \$1,000 to attend an out-of-state institution.

For the past 4 years, the Heartland Area 11 Education Agency has operated the **Science Education Mobile Instruction Lab**. This is an expandable, custom-built semitrailer, which opens up to a 22-student working state-of-the-art laboratory. The Iowa Biotechnology Association and several of its member companies were actively involved in the development of the lab and the creation of six laboratory modules relevant to the state’s science curriculum.





Basic Skills Achievement and Other Summary Metrics

STUDENT ACHIEVEMENT

NAEP Grade 8	IA	U.S. Avg.	State Rank
Math Average, 2007	285.2	280.2	18
Math, 2007 (% at or above "proficient")	35.2%	31.0%	18
Reading Average, 2007	267.5	261.0	12
Reading, 2007 (% at or above "proficient")	35.7%	29.2%	12
Writing Average, 2007	154.7	154.3	22
Writing, 2007 (% at or above "proficient")	31.5%	30.6%	20

ACT	IA	U.S. Avg.	State Rank
Percentage of Graduates Tested	60%	43%	23
Math Average, 2008	22.0	21.0	17
Reading Average, 2008	22.9	21.4	10
English Average, 2008	21.9	20.6	10

SAT	IA	U.S. Avg.	State Rank
Percentage of Graduates Tested	4%	48%	48
Math Average, 2008	612	515	1
Critical Reading Average, 2008	603	502	1
Writing Average, 2008	582	494	2

AP	IA	U.S. Avg.	State Rank
Math Scores, 2008 (% with a score of 3 or higher)	68.8%	65.2%	18
Math Exams, 2008 (Exams as % of all H.S. grads)	3.4%	8.7%	48
English Scores, 2008 (% with a score of 3 or higher)	67.5%	59.2%	11
English Exams, 2008 (Exams as % of all H.S. grads)	7.3%	18.9%	50

SUMMARY STATE EDUCATION METRICS

Selected Indicators	IA	U.S. Avg.	State Rank
High School Graduation Rate, 2005–06	86.9%	73.4%	3
Student/Teacher Ratio, 2006–07	13.6	15.5	16*
Low-income Students, 2006–07 (% of all students)	32.2%	41.6%	–
Expenditure per Student (\$), 2005–06	\$8,355	\$9,154	31

Note: NAEP = National Assessment of Educational Progress, AP = Advanced Placement
N/A = Data not available. * Lowest value receives highest ranking.

TABLE SOURCE NOTES:

NAEP Assessments, grade 8: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics (NCES), National Assessment of Educational Progress (NAEP), 2005; **ACT Exam:** ACT, Inc., 2008; **SAT Reasoning Test:** The College Board, 2008.

Advanced Placement (AP): Battelle analysis of data from the College Board, 2008; AP test takers as a share of high school graduates includes graduate data from U.S. Department of Education, NCES for both public (Common Core of Data) and private high schools (Private School Survey).

Science Teacher Indicators: Council of Chief State School Officers (CCSSO) analysis of State Departments of Education data on public schools, 2007; U.S. Department of Education, NCES Schools and Staffing Survey, 2003–04 as reported by CCSSO, 2007.

Summary State Education Metrics: U.S. Department of Education, National Center for Education Statistics (NCES), Common Core of Data (CCD) on public elementary and secondary education.

Note: High school graduation rates are averaged freshman graduation rates—the rate is the number of graduates divided by the estimated count of freshmen 4 years earlier. U.S. figure for share of students eligible for free or reduced-price school lunch ("low-income" students) is available for 2005–06 only (state data are for 2006–07).