



# MINNESOTA

## Sciences & Life Sciences Achievement

### STUDENT ACHIEVEMENT

NAEP Grade 8	MN	U.S. Avg.	State Rank
Science Average, 2005	158.2	147.1	8
Science, 2005 (% at or above "proficient")	39.3%	27.3%	7
Life Sciences Average, 2005	159.2	148.2	8

ACT	MN	U.S. Avg.	State Rank
Science Average, 2008	22.5	20.8	2
Biology, 2008 (% of students ready for college level)	40%	28%	2

AP	MN	U.S. Avg.	State Rank
Science Scores, 2008 (% with a score of 3 or higher)	55.4%	55.4%	28
Science Exams, 2008 (Exams as % of all H.S. grads)	8.2%	10.5%	29
Biology Scores, 2008 (% with a score of 3 or higher)	49.9%	49.8%	25
Biology Exams, 2008 (Exams as % of all H.S. grads)	3.6%	4.6%	28

SCIENCE TEACHER QUALITY and PROFESSIONAL DEVELOPMENT	MN	U.S. Avg.	State Rank
Science Teachers with Major in Assigned Field, 2003–04 (% , Grades 7–12)	89%	77%	3
Science Teachers Certified, 2006 (% , Grades 7–8)	99%	N/A%	5
Biology Teachers Certified, 2006 (% , Grades 9–12)	100%	88%	1

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

## Key Organization(s) Promoting Bioscience Education

The **Alley Institute** is the 501(c)(3) educational affiliate of the LifeScience Alley BIO association. Among its other activities, the Alley Institute administers the BioGENEius Challenge, an annual research competition for students in grades 9-12 serving a 12-state region with sponsorship from Sanofi-Aventis.

## MN STATE SCIENCE STANDARDS & REQUIREMENTS

### STANDARDS PROFILE

- Most recent update of K-12 Science Standards: **Prior to 2005**
- Next scheduled update: **2009**
- Current draft standards for K-12 include an extensive Life Science Strand under which grades 9-12 address "social, economic and ecological risks and benefits of biotechnology, including selective breeding, genetic engineering, food irradiation, antibiotic use and medical technologies"

*Minnesota Academic Standards in Science, Nature of Science and Engineering, Draft 2, November 2008*

### BIOSCIENCE-RELATED GRADUATION REQUIREMENTS:

One unit of biology is required

38% of 6th–9th graders and 43% of 10th–12th graders met "proficient" level under No Child Left Behind Adequate Yearly Progress test

The state is administering end-of-year exams in life sciences as of 2008



## Examples of Bioscience Education Activities

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### Teacher Preparation and Professional Development

The **Summer Science Discovery Program for Teachers at the College of Biological Sciences (CBS) of the University of Minnesota** offers free graduate credit in eight separate courses for elementary and secondary teachers.

Through the **Science Education Partnership for Greater Minnesota (specifically northwest Minnesota)**, the College also places undergraduate students in rural K-12 classrooms and provides teacher training at the Itasca Biological Station and Laboratories.

The CBS offers a **2-week workshop in plant science for K-6 teachers** at the St. Paul campus and the Minnesota Landscape Arboretum. Costs are covered by a grant from the Minnesota Office of Higher Education's Improving Teacher Quality Program.

Several bioscience projects were funded among the \$1 million in grants awarded in 2007 by the Improving Teacher Quality Program.

### Experiential Learning and Outreach

Under the Science Education Partnership (above), students in grades 6-12 across northwest Minnesota are brought to the Twin Cities campus.

### Bioscience-focused Schools and Programs

Arlington High School in St. Paul includes a **BioSMART "house"** for medical and health sciences including courses in biotechnology, anatomy, physiology, and microbiology and a summer academy.

Minnesota's system of charter schools includes an **Academy of BioScience** and a **Medical Academy**, and 10 schools in all are claimed to have significant bioscience focus areas.



## Basic Skills Achievement and Other Summary Metrics

### STUDENT ACHIEVEMENT

NAEP Grade 8	MN	U.S. Avg.	State Rank
Math Average, 2007	291.9	280.2	2
Math, 2007 (% at or above "proficient")	43.1%	31.0%	2
Reading Average, 2007	268.2	261.0	8
Reading, 2007 (% at or above "proficient")	36.6%	29.2%	9
Writing Average, 2007	155.9	154.3	20
Writing, 2007 (% at or above "proficient")	32.1%	30.6%	18

  

ACT	MN	U.S. Avg.	State Rank
Percentage of Graduates Tested	69%	43%	16
Math Average, 2008	22.6	21.0	8
Reading Average, 2008	23.0	21.4	9
English Average, 2008	21.9	20.6	10

  

SAT	MN	U.S. Avg.	State Rank
Percentage of Graduates Tested	9%	48%	35
Math Average, 2008	609	515	2
Critical Reading Average, 2008	596	502	2
Writing Average, 2008	579	494	3

  

AP	MN	U.S. Avg.	State Rank
Math Scores, 2008 (% with a score of 3 or higher)	68.3%	65.2%	19
Math Exams, 2008 (Exams as % of all H.S. grads)	9.3%	8.7%	15
English Scores, 2008 (% with a score of 3 or higher)	67.1%	59.2%	14
English Exams, 2008 (Exams as % of all H.S. grads)	13.8%	18.9%	30

### SUMMARY STATE EDUCATION METRICS

Selected Indicators	MN	U.S. Avg.	State Rank
High School Graduation Rate, 2005–06	86.2%	73.4%	4
Student/Teacher Ratio, 2006–07	16.2	15.5	38*
Low-income Students, 2006–07 (% of all students)	31.0%	41.6%	–
Expenditure per Student (\$), 2005–06	\$9,159	\$9,154	22

**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).

