



COLORADO

Sciences & Life Sciences Achievement

STUDENT ACHIEVEMENT

NAEP Grade 8	CO	U.S. Avg.	State Rank
Science Average, 2005	155.1	147.1	14
Science, 2005 (% at or above "proficient")	34.8%	27.3%	12
Life Sciences Average, 2005	155.6	148.2	15

ACT	CO	U.S. Avg.	State Rank
Science Average, 2008	20.4	20.8	39
Biology, 2008 (% of students ready for college level)	25%	28%	36

AP	CO	U.S. Avg.	State Rank
Science Scores, 2008 (% with a score of 3 or higher)	52.7%	55.4%	33
Science Exams, 2008 (Exams as % of all H.S. grads)	12.3%	10.5%	10
Biology Scores, 2008 (% with a score of 3 or higher)	45.3%	49.8%	34
Biology Exams, 2008 (Exams as % of all H.S. grads)	5.0%	4.6%	17

SCIENCE TEACHER QUALITY and PROFESSIONAL DEVELOPMENT

	CO	U.S. Avg.	State Rank
Science Teachers with Major in Assigned Field, 2003–04 (% , Grades 7–12)	78%	77%	19
Science Teachers Certified, 2006 (% , Grades 7–8)	68%	N/A%	17
Biology Teachers Certified, 2006 (% , Grades 9–12)	94%	88%	16

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

Senate Bill 08-133, signed into law by Governor Bill Ritter in May 2008, established the **Teach Colorado Grant Initiative** to give financial incentives to college students to enter the teaching profession and thereby increase the number of teachers in high-need areas, including, but not limited to, mathematics, science, special

CO STATE SCIENCE STANDARDS & REQUIREMENTS

STANDARDS PROFILE

- Most recent update of K-12 Science Standards: **2007**
- Revision currently underway: **2009**
- Scientists provided input in developing standards
- Science standards specifically mention applied laboratory or other tools for biotechnology or biosciences

BIOSCIENCE-RELATED GRADUATION REQUIREMENTS:

Biology is not required for graduation



education, English language acquisition, music, and world languages. Under this bill, the Department of Higher Education is authorized to administer a program of grants to public institutions of higher education, which in turn will create scholarships for high-ability students in approved teacher preparation programs who excel in high-need content areas and who demonstrate an interest in or commitment to teaching as a career.

Supported in part by a grant from the National Science Foundation, **STEM-Colorado/CU Teach** is designed to recruit, support, and prepare University of Colorado undergraduates to become leaders in K-12 science and math education. The program, which is modeled on the UTeach program at the University of Texas at Austin, enables interested students to try teaching in the K-12 schools early in their college program. The students are given assistance in becoming certified to teach science and math.

The Center for Science, Mathematics, and Technology Education (CSMATE) at Colorado State University (CSU) seeks to enhance science, mathematics, and technology education at the undergraduate and K-12 levels. CSMATE efforts are focused in four main areas: (1) professional development for K-12 math and science teachers; (2) development of standards-based curriculum materials in science and mathematics for undergraduate and secondary classrooms; (3) research on teaching and learning; and (4) development and testing of innovative technologies to improve teaching and learning in classroom, field, laboratory, and online environments.

The University of Northern Colorado (UNC) offers a **B.S. in biology** with an emphasis in secondary teaching. Students receive training in biological sciences content and pedagogy plus a wide range of additional support science content.

Students successfully completing the program will meet licensure requirements of the Colorado Department of Education for teaching secondary science (grades 7-12).

The UNC's **Mathematics and Science Teaching (MAST) Institute** provides leadership and coordination for projects and programs to improve mathematics and science education, within the university, the state, and nationally. MAST provides both pre-service and in-service support for math and science teachers in Colorado and throughout the Rocky Mountain region.

Aurora Community College offers hands-on-training in its biotechnology lab for middle-and high-school science and biology teachers.

The Colorado Department of Education offers an **Alternative Teacher Licensing Program** and a **Teacher-in-Residence Program** that allow individuals with a bachelor's degree and 30 or more semester hours in a content area to receive a teacher's license and complete additional coursework during a 1- or 2-year period.

Experiential Learning and Outreach

UNC's **Frontiers of Science Institute** is a week-long summer science program that seeks to give students a better understanding of recent developments in science and the nature of scientific investigation and to encourage them to consider careers in the sciences.

The **University of Denver** offers a 2-week engineering program that includes a biomedical engineering component.

The **Denver Museum of Nature and Science** has a high-altitude bioscience exhibit and learning experience for middle school students.



Bioscience-focused Schools and Programs

Aurora Public Schools has an **Academy of Health Sciences and Technology** within the North Middle School for students in grades 6 through 8.

Aurora LIGHTS is a partnership of Aurora Public Schools, Community College of Aurora (CCA), and the University of Colorado at Denver focused on preparing students to pursue careers in health care. CCA offers seminars to help Aurora LIGHTS students increase their study skills, explore potential careers in health care, and prepare for the transition from the 2-year community college environment to the professional school or program of their choice. To assist students, CCA has arranged for tutors in biology, chemistry, and anatomy and physiology courses.

The **Denver School of Science and Technology (DSST)** is an open-enrollment public charter school serving middle and high school students that offers a liberal arts curriculum with a science and technology focus. All students are required to complete precalculus, 5 years of high school science, an internship, and senior project to graduate. DSST is expanding its model to a grades 6–12 program and will have full enrollment by 2010. DSST is the only high school in Denver rated “Distinguished,” and 100% of its first-year graduates have been accepted into 4-year colleges.

Castle View High School has a biotechnology academy.





Basic Skills Achievement and Other Summary Metrics

STUDENT ACHIEVEMENT

NAEP Grade 8	CO	U.S. Avg.	State Rank
Math Average, 2007	286.2	280.2	13
Math, 2007 (% at or above “proficient”)	37.4%	31.0%	12
Reading Average, 2007	266.4	261.0	17
Reading, 2007 (% at or above “proficient”)	34.6%	29.2%	15
Writing Average, 2007	160.9	154.3	6
Writing, 2007 (% at or above “proficient”)	38.2%	30.6%	6

ACT	CO	U.S. Avg.	State Rank
Percentage of Graduates Tested	100%	43%	1
Math Average, 2008	20.3	21.0	38
Reading Average, 2008	20.8	21.4	43
English Average, 2008	19.8	20.6	44

SAT	CO	U.S. Avg.	State Rank
Percentage of Graduates Tested	24%	48%	29
Math Average, 2008	570	515	13
Critical Reading Average, 2008	564	502	18
Writing Average, 2008	553	494	18

AP	CO	U.S. Avg.	State Rank
Math Scores, 2008 (% with a score of 3 or higher)	65.4%	65.2%	24
Math Exams, 2008 (Exams as % of all H.S. grads)	10.8%	8.7%	9
English Scores, 2008 (% with a score of 3 or higher)	64.1%	59.2%	22
English Exams, 2008 (Exams as % of all H.S. grads)	24.7%	18.9%	7

SUMMARY STATE EDUCATION METRICS

Selected Indicators	CO	U.S. Avg.	State Rank
High School Graduation Rate, 2005–06	75.5%	73.4%	29
Student/Teacher Ratio, 2006–07	16.9	15.5	42*
Low-income Students, 2006–07 (% of all students)	34.2%	41.6%	–
Expenditure per Student (\$), 2005–06	\$8,166	\$9,154	35

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).