



MAINE

Sciences & Life Sciences Achievement

STUDENT ACHIEVEMENT

NAEP Grade 8	ME	U.S. Avg.	State Rank
Science Average, 2005	157.6	147.1	11
Science, 2005 (% at or above "proficient")	34.5%	27.3%	15
Life Sciences Average, 2005	159.3	148.2	7

ACT	ME	U.S. Avg.	State Rank
Science Average, 2008	22.0	20.8	10
Biology, 2008 (% of students ready for college level)	37%	28%	9

AP	ME	U.S. Avg.	State Rank
Science Scores, 2008 (% with a score of 3 or higher)	48.4%	55.4%	37
Science Exams, 2008 (Exams as % of all H.S. grads)	10.7%	10.5%	17
Biology Scores, 2008 (% with a score of 3 or higher)	45.2%	49.8%	35
Biology Exams, 2008 (Exams as % of all H.S. grads)	5.4%	4.6%	13

SCIENCE TEACHER QUALITY and PROFESSIONAL DEVELOPMENT	ME	U.S. Avg.	State Rank
Science Teachers with Major in Assigned Field, 2003–04 (% , Grades 7–12)	75%	77%	27
Science Teachers Certified, 2006 (% , Grades 7–8)	100%	N/A%	1
Biology Teachers Certified, 2006 (% , Grades 9–12)	92%	88%	17

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

Key Organization(s) Promoting Bioscience Education

The **Center for Innovation in Biotechnology (CIB)** is an industry-driven, nonprofit corporation established to catalyze the growth of Maine's biotechnology and biomedical sector by promoting the interaction of scientific excellence, commercial innovation, and business development.

ME STATE SCIENCE STANDARDS & REQUIREMENTS

STANDARDS PROFILE

- Most recent update of K-12 Science Standards: **Prior to 2007**
- Next scheduled update: **Beyond 2012**
- Research scientists provided input in development of standards

BIOSCIENCE-RELATED GRADUATION REQUIREMENTS:

Students are required to meet state standards related to life sciences

34% of Maine's high school graduates expressed interest in science, technology, engineering, and mathematics (STEM)-related careers in 2007–2008



Examples of Bioscience Education Activities

Teacher Preparation and Professional Development

The **Master of Science in Teaching (MST) program**, a joint undertaking of Jackson Lab and the University of Maine Center for Science and Mathematics Education Research, offers science and math teachers and student teachers a mentored research experience based on a hands-on, problem-solving, experimental approach. The goal of the teacher internship is to improve the quality of mathematics and science education in Maine by immersing pre-service and in-service educators in an intensive, mentored scientific research experience.

Jackson Lab also offers a year-long program that is open to all middle- and high-school science and mathematics teachers in the State of Maine. The program, **Academic Year Teacher's Sabbatical**, gives teachers a hands-on, in-depth year of learning and research to help them integrate their experience into their teaching. Teachers receive a \$22,000 stipend for a spring internship.

ScienceWorks for ME is a program of the Foundation for Blood Research designed to offer scientific equipment and professional expertise to Maine's secondary school science teachers and their students. ScienceWorks for ME supplements high-school science programs with needed supplies, lab bench knowledge, and practical curricula in immunology, molecular biology, environmental epidemiology, and neuroscience.

The **University of New England (UNE) Teacher Certification Program** is designed to allow individuals with a baccalaureate degree to obtain state certification to be eligible for a classroom teaching position.

Experiential Learning and Outreach

The Foundation for Blood Research offer several outreach programs as well as providing tours of wet-lab facilities for high school students. These include the following:

- **BiomedicineWorks** is a program that introduces evidence-based medicine (EBM) tools to explore and understand the importance of published clinical trials. Using real physicians in filmed hospital settings with scripted patient encounters, this initiative provides high school students and teachers with an understanding of how doctors learn to best care for their patients through the analysis of clinical trials.
- **EcoScienceWorks** is a National Science Foundation Innovative Technology Experiences for Students and Teachers (ITEST) project for 7th and 8th grade science teachers and students. Its major goal is to develop computer-based curriculum for the Maine laptop program that will spur student interest in computer modeling in science. In July 2007, SimBiotic Software and Massachusetts Institute of Technology's (MIT's) Teacher Education Program introduced a block-interface programming language into EcoBeaker: Maine Explorer™ that will give students hands-on experience making their own computer models in a new lab called "Program a Bunny."

Jackson Lab's **Summer Student Program** provides high school and college students with an opportunity to conduct independent research under the guidance of staff scientists. More than 2,000 students, including two Nobel laureates, have participated in the program. The Lab also has a **High School Internship Program** that enables students with a strong interest in math and science from Ellsworth and Mount Desert



Island High Schools to work “at the bench” with Jackson Lab researchers.

Maine Medical Center Research Institute (MMRCI) provides college and precollege students with an opportunity to receive an educational experience in biomedical science through its **MMRCI Summer Student Research Program**.

The **Mount Desert Island Biological Laboratory (MDIBL) High School Research Fellowship Program** is a hands-on and mentored laboratory experience for Maine high school students interested in biology, medicine, or research. MDIBL also offers a program, STEER (Short Term Educational Experiences for Research), specifically for Maine high school students interested in conducting laboratory research in the environmental health sciences.





Basic Skills Achievement and Other Summary Metrics

STUDENT ACHIEVEMENT

NAEP Grade 8	ME	U.S. Avg.	State Rank
Math Average, 2007	286.5	280.2	12
Math, 2007 (% at or above "proficient")	34.1%	31.0%	25
Reading Average, 2007	269.9	261.0	5
Reading, 2007 (% at or above "proficient")	36.9%	29.2%	7
Writing Average, 2007	161	154.3	5
Writing, 2007 (% at or above "proficient")	38.2%	30.6%	7

ACT	ME	U.S. Avg.	State Rank
Percentage of Graduates Tested	9%	43%	51
Math Average, 2008	22.5	21.0	9
Reading Average, 2008	23.2	21.4	7
English Average, 2008	22.7	20.6	4

SAT	ME	U.S. Avg.	State Rank
Percentage of Graduates Tested	100%	48%	1
Math Average, 2008	466	515	50
Critical Reading Average, 2008	469	502	51
Writing Average, 2008	461	494	51

AP	ME	U.S. Avg.	State Rank
Math Scores, 2008 (% with a score of 3 or higher)	64.5%	65.2%	27
Math Exams, 2008 (Exams as % of all H.S. grads)	8.6%	8.7%	21
English Scores, 2008 (% with a score of 3 or higher)	63.3%	59.2%	25
English Exams, 2008 (Exams as % of all H.S. grads)	21.3%	18.9%	12

SUMMARY STATE EDUCATION METRICS

Selected Indicators	ME	U.S. Avg.	State Rank
High School Graduation Rate, 2005–06	76.3%	73.4%	26
Student/Teacher Ratio, 2006–07	11.5	15.5	2*
Low-income Students, 2006–07 (% of all students)	35.0%	41.6%	–
Expenditure per Student (\$), 2005–06	\$10,841	\$9,154	12

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).