



WASHINGTON

Sciences & Life Sciences Achievement

STUDENT ACHIEVEMENT

NAEP Grade 8	WA	U.S. Avg.	State Rank
Science Average, 2005	154.2	147.1	16
Science, 2005 (% at or above "proficient")	32.8%	27.3%	18
Life Sciences Average, 2005	154.6	148.2	18

ACT	WA	U.S. Avg.	State Rank
Science Average, 2008	22.4	20.8	4
Biology, 2008 (% of students ready for college level)	40%	28%	2

AP	WA	U.S. Avg.	State Rank
Science Scores, 2008 (% with a score of 3 or higher)	54.1%	55.4%	30
Science Exams, 2008 (Exams as % of all H.S. grads)	9.5%	10.5%	24
Biology Scores, 2008 (% with a score of 3 or higher)	45.6%	49.8%	33
Biology Exams, 2008 (Exams as % of all H.S. grads)	4.0%	4.6%	24

SCIENCE TEACHER QUALITY and PROFESSIONAL DEVELOPMENT	WA	U.S. Avg.	State Rank
Science Teachers with Major in Assigned Field, 2003–04 (% , Grades 7–12)	77%	77%	21
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.

Key Organization(s) Promoting Bioscience Education

The **Northwest Association for Biomedical Research (NWABR)** is a regional nonprofit established to promote public understanding of biomedical research. NWABR both sponsors and tracks extensive K-12 science educational programming.

The **Puget Sound Center for Teaching, Learning and Technology** is a private nonprofit

WA STATE SCIENCE STANDARDS & REQUIREMENTS

STANDARDS PROFILE

- Most recent update of K-12 Science Standards: **2008**
- Next scheduled update: Currently in draft status for public review
- Research scientists provided input in development of standards
- Science standards specifically mention applied laboratory or other tools for biotechnology or biosciences. The standards reference genetic engineering as an element of the “domains of science” Essential Academic Learning Requirement.

BIOSCIENCE-RELATED GRADUATION REQUIREMENTS:

Biology is not specifically included in the science requirement



that partners with the NWABR and the Workforce Development Council of Seattle-King County on an extensive database of life sciences educational and outreach programming.

Examples of Bioscience Education Activities

Teacher Preparation and Professional Development

The Office of the Superintendent of Public Instruction through the **Washington Mathematics and Science Partnerships** distributes \$2.2 million in federal funding per year to create enhanced professional learning and/or to operate intensive summer institutes.

The University of Washington offers both teacher professional development and experiential learning activities through a broad range of programs, including the **Biology Programs for Teachers, Summer Institute in Life Science for Teachers, Science Education Partnership, Department of Genome Sciences, Genetics Education Partnership Project, High School Human Genome Program**, National Science Foundation (NSF) -funded **Materials Research Science and Engineering Center (MRSEC) in Genetically Engineered Materials**, and NSF-sponsored **Engineering Research Center in Engineered Biomaterials**.

The Seattle Biomedical Research Institute offers both teacher professional development and student experiential learning through its **BioQuest science education program**.

The Fred Hutchinson Cancer Research Center offers the 10-week **CURE (Continuing Umbrella of Research Experiences) High School Summer Internship Program**, a paid and mentored internship for rising juniors and seniors nominated by high schools in King County (one nominee each).

Washington State University's Equipment Loan Program provides sophisticated scientific equipment and supplies for hands-on curricula aligned with the state science standards. To date, teachers from more than 250 schools have borrowed equipment at no cost.

The Institute for Systems Biology sponsors a **Center for Inquiry Science** whose mission is to enable schools and districts to have the capacity to produce scientifically literate students through inquiry-based learning.

Pacific Northwest National Laboratory offers training appointments for science teachers and operates an equipment loan and gift program.

Companies reported by the Washington Biotechnology and Biomedical Association to be directly involved in teacher development include Amgen, ZymoGenetics, and Geospiza.

Seattle Public Schools maintains a **Science Materials Center**, which provides kits and modules to PK-12 inquiry-based science programs. Participation requires teacher training.

The NWABR received a \$1.3 million grant from the NSF to operate a bioinformatics-oriented **Innovative Technology Experiences for Students and Teachers (Bio-ITEST) program**. Collaborators include Geospiza; Puget Sound Center for Teaching, Learning, and Technology; and Bellevue Community College. NWABR also provides a range of other professional development.



Experiential Learning and Outreach

The NWABR supports 10 high school students in a 2-week paid summer research fellowship involving visits to a range of research institutions in the Seattle area. NWABR also sponsors an annual **Student Biotech Expo**, supported in part by the Amgen Foundation.

The **K-12 Institute for Science and Mathematics Education at University of Washington** arranges or coordinates a wide range of experiential learning programs. Among UW outreach efforts are the **High School Human Genome Program**, the 5-day Bioengineering Summer Camp for rising 9th and 10th graders.

The Seattle chapter of the Association for Women in Science sponsors **GEMS (Girls in Engineering, Math and Science)**, a program of hands-on activities and field trips for middle school girls.

The Fred Hutchison Cancer Research Center sponsors **Hutch High**, a half-day science symposium for 250 students from 25 high schools statewide, and also a **Minority Scientist Recruitment and Retention Coalition** with K-12 activities.

TINCAN, a nonprofit focused on information technology in the Inland Northwest region, sponsors **Women in Biotechnology and Information Technology**, an after-school program for middle school girls operating in two schools, with 15 students per grade in each school.

Pacific Northwest National Laboratory offers research internships and apprenticeships for high school students and graduating seniors, and a **Young Women in Science Program**.

Washington State University offers **Cougar Quest**, a science summer camp for grades 7 through 12, and **Spokane CityLab**, which provides science, technology, engineering, and mathematics (STEM) enrichment opportunities to K-12 students and teachers.

Eastern Washington University sponsors an annual **Science Olympiad**.

Bioscience-focused Schools and Programs

With partnership from Pacific Northwest National Laboratory, a new STEM school named **Delta High** will open in the Kennewick/Pasco/Richland district.





Basic Skills Achievement and Other Summary Metrics

STUDENT ACHIEVEMENT

NAEP Grade 8	WA	U.S. Avg.	State Rank
Math Average, 2007	284.9	280.2	20
Math, 2007 (% at or above "proficient")	35.9%	31.0%	16
Reading Average, 2007	264.9	261.0	21
Reading, 2007 (% at or above "proficient")	34.1%	29.2%	16
Writing Average, 2007	157.7	154.3	13
Writing, 2007 (% at or above "proficient")	35.3%	30.6%	12

ACT	WA	U.S. Avg.	State Rank
Percentage of Graduates Tested	17%	43%	40
Math Average, 2008	23.2	21.0	4
Reading Average, 2008	23.7	21.4	2
English Average, 2008	22.7	20.6	4

SAT	WA	U.S. Avg.	State Rank
Percentage of Graduates Tested	53%	48%	21
Math Average, 2008	533	515	25
Critical Reading Average, 2008	526	502	25
Writing Average, 2008	509	494	28

AP	WA	U.S. Avg.	State Rank
Math Scores, 2008 (% with a score of 3 or higher)	64.4%	65.2%	28
Math Exams, 2008 (Exams as % of all H.S. grads)	9.4%	8.7%	14
English Scores, 2008 (% with a score of 3 or higher)	61.1%	59.2%	29
English Exams, 2008 (Exams as % of all H.S. grads)	20.1%	18.9%	14

SUMMARY STATE EDUCATION METRICS

Selected Indicators	WA	U.S. Avg.	State Rank
High School Graduation Rate, 2005–06	72.9%	73.4%	34
Student/Teacher Ratio, 2006–07	19.1	15.5	47*
Low-income Students, 2006–07 (% of all students)	36.7%	41.6%	–
Expenditure per Student (\$), 2005–06	\$7,984	\$9,154	38

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).