



VIRGINIA

Sciences & Life Sciences Achievement

STUDENT ACHIEVEMENT

NAEP Grade 8	VA	U.S. Avg.	State Rank
Science Average, 2005	155.4	147.1	12
Science, 2005 (% at or above "proficient")	34.5%	27.3%	14
Life Sciences Average, 2005	157.9	148.2	12

ACT	VA	U.S. Avg.	State Rank
Science Average, 2008	21.3	20.8	24
Biology, 2008 (% of students ready for college level)	32%	28%	20

AP	VA	U.S. Avg.	State Rank
Science Scores, 2008 (% with a score of 3 or higher)	53.1%	55.4%	31
Science Exams, 2008 (Exams as % of all H.S. grads)	12.3%	10.5%	11
Biology Scores, 2008 (% with a score of 3 or higher)	48.1%	49.8%	29
Biology Exams, 2008 (Exams as % of all H.S. grads)	5.6%	4.6%	11

SCIENCE TEACHER QUALITY and PROFESSIONAL DEVELOPMENT

	VA	U.S. Avg.	State Rank
Science Teachers with Major in Assigned Field, 2003–04 (% , Grades 7–12)	74%	77%	28
Science Teachers Certified, 2006 (% , Grades 7–8)	99%	N/A%	5
Biology Teachers Certified, 2006 (% , Grades 9–12)	99%	88%	6

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

Key Organization(s) Promoting Bioscience Education

Chesapeake Bioscience Education Foundation

(C-BEF) operates as a clearinghouse for bioscience workforce development statewide.

C-BEF is sponsored by the Virginia Biotechnology Association, WilmerHale, and Merck.

VA STATE SCIENCE STANDARDS & REQUIREMENTS

STANDARDS PROFILE

- Most recent update of K-12 Science Standards: **Prior to 2005**
- Next scheduled update: **2009**
- Research scientists are providing input in development of standards
- Science standards specifically reference "genetic engineering and its applications"

Virginia Department of Education, Standards of Learning, Science Standards

BIOSCIENCE-RELATED GRADUATION REQUIREMENTS:

Biology is not specifically required in laboratory science requirement

90% of 6th–8th graders and 88% of biology students in 10th–12th grade met "proficient" level under No Child Left Behind Adequate Yearly Progress test



Examples of Bioscience Education Activities

Teacher Preparation and Professional Development

C-BEF sponsors **summer professional-development programs** for middle and high school teachers and has a \$40,000 annual grant program to help bioscience teachers purchase laboratory or related supplies. Two grants are made annually.

Experiential Learning and Outreach

Virginia Tech operates the **VT-STEM (Science, Technology, Engineering, and Mathematics) K-12 Outreach Initiative**, which coordinates outreach efforts university-wide, including programming for middle school students, a Virginia Bioinformatics Institute for high school students, and “bridge” programs for entering students.

The **VT-STEM Initiative Science Outreach Program (SOuP)** provides resource kits aligned with science standards.

Virginia Tech also offers a “**Biotech-in-a-Box**” **program** that loans out 30 biotech education kits to schools statewide. C-BEF is funding an expansion of the program.

Bioscience-focused Schools and Programs

Prince William County has a **Biotechnology Center** located at Osbourn Park High School including an enriched curriculum and an independent research credit offered senior year.

Businesses in Fairfax County are partnering with the public school system on the **Thomas Jefferson High School for Science and Technology**.

Among the seven Governor’s Career and Technical Academies established to date is a **general STEM academy in Russell County** offering dual enrollment at the University of Virginia’s College at Wise.



Basic Skills Achievement and Other Summary Metrics

STUDENT ACHIEVEMENT

NAEP Grade 8	VA	U.S. Avg.	State Rank
Math Average, 2007	287.6	280.2	8
Math, 2007 (% at or above "proficient")	37.5%	31.0%	11
Reading Average, 2007	266.9	261.0	16
Reading, 2007 (% at or above "proficient")	33.7%	29.2%	18
Writing Average, 2007	156.9	154.3	15
Writing, 2007 (% at or above "proficient")	31.4%	30.6%	21

ACT	VA	U.S. Avg.	State Rank
Percentage of Graduates Tested	19%	43%	38
Math Average, 2008	21.8	21.0	21
Reading Average, 2008	22.2	21.4	24
English Average, 2008	21.5	20.6	18

SAT	VA	U.S. Avg.	State Rank
Percentage of Graduates Tested	73%	48%	9
Math Average, 2008	512	515	35
Critical Reading Average, 2008	511	502	33
Writing Average, 2008	499	494	32

AP	VA	U.S. Avg.	State Rank
Math Scores, 2008 (% with a score of 3 or higher)	66.0%	65.2%	22
Math Exams, 2008 (Exams as % of all H.S. grads)	11.4%	8.7%	5
English Scores, 2008 (% with a score of 3 or higher)	64.5%	59.2%	20
English Exams, 2008 (Exams as % of all H.S. grads)	24.9%	18.9%	6

SUMMARY STATE EDUCATION METRICS

Selected Indicators	VA	U.S. Avg.	State Rank
High School Graduation Rate, 2005–06	74.5%	73.4%	31
Student/Teacher Ratio, 2006–07	11.6	15.5	3*
Low-income Students, 2006–07 (% of all students)	32.7%	41.6%	–
Expenditure per Student (\$), 2005–06	\$9,452	\$9,154	19

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).

