

**UNIVERSITY OF VIRGINIA
COLLEGE OF ARTS AND SCIENCES AND
SCHOOLS OF ARCHITECTURE, COMMERCE, AND EDUCATION**

Definition of Scientific Reasoning Competency:

The University of Virginia expects graduates of its College of Arts and Sciences, School of Architecture, School of Commerce, and School of Education to have and to understand basic knowledge and skills about scientific reasoning in order to use it effectively and productively for their own purposes. Specifically, the University expects these graduates to be able to use scientific reasoning to denote consistent, logical thought patterns which are employed during the process of scientific inquiry that enable individuals to propose relationships between observed phenomena in order to accomplish the following:

1. Design experiments which test hypotheses concerning the proposed relationships.
2. Determine possible alternatives and outcomes.
3. Consider probabilities of occurrences.
4. Predict logical consequences.
5. Weight evidence, or proof.
6. Use a number of instances to justify a particular conclusion.¹

Description of Methodology Used to Gather Evidence of Scientific Reasoning Competency

In spring 2004, the University administered the “Collegiate Assessment of Academic Proficiency” (CAAP) test in scientific reasoning to a random sample of not less than 5 percent of fourth-year undergraduates enrolled in the Schools listed above to determine the extent to which students have mastered the competencies described. We believe the American College Testing Service’s (ACT) CAAP test for scientific reasoning measures the elements in the definition of scientific reasoning given above, and that, therefore, the CAAP test provides a good reading on the extent to which UVa undergraduates are achieving the goals listed. Moreover, results of this test provide information on the competency levels of UVa students in comparison with students at other institutions using the same test.

The results below show the mean test score as well as the percentile ranking of UVa students compared to all other students in the United States who took the same test. The test is scored on a scale of 40 to 80.

Results for spring 2004 assessment of Scientific Reasoning Competency	College of Arts and Sciences Science Majors Only	College of Arts & Sciences All students except Science Majors	School of Architecture All Undergraduate Majors	School of Commerce All Undergraduate Concentrations	School of Education All Undergraduate majors
Mean Test Score	68	65	64	66	63
Percentile Ranking	94	82	76	87	71

Summary:

Science majors did very well on the test, scoring in the 94th percentile. The rest of the College of Arts and Sciences scored in the 82nd percentile. The School of Commerce scored in the 87th percentile. The Schools of Architecture and Education scored a bit lower, in the 76th and 71st percentile respectively.

¹ This definition of scientific reasoning has been adapted from, C. Stuessy, “Path Analysis: A Model for the Development of Scientific Reasoning in Adolescents,” Journal of Research in Science Teaching, 1984.