

## Using the Chemistry Placement Exam to Improve Student Success in Biology 40A

### History

- Prior to the Winter of 2003, Biology 40A instructors were typically spending two weeks of an eleven week session reviewing information related to Chemistry basics that was needed for a more advanced discussion of Human Anatomy and Physiology. Course success rates tended to be in the 70% range.
- In an effort to improve an understanding of the biology skills needed for health care professionals, instructors began to limit the discussion of basic chemistry concepts in Biology 40A (beginning in Winter 2003).
- Beginning in Winter of 2003, the placement test for Chemistry was given to students seeking admission to Biology 40A. Since the students were told that the score did not matter and would not be used, the Division suspected that the testing results might be bias and not truly reflective of student knowledge.
- Beginning in Fall 2003, the Chemistry assessment was used as a basis for entry into Biology 40A with a score of 13 or higher (or equivalent coursework) required for registration. The cut off score used for entry into Chemistry 1A is 22.

### Observations on the Data

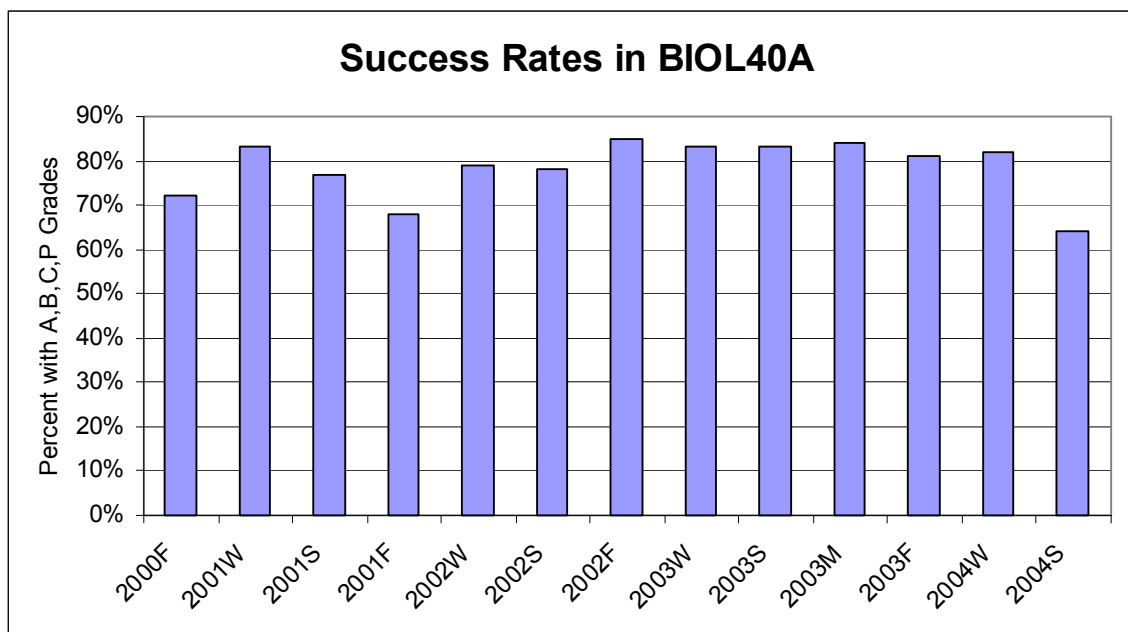
- According to the California Community College Research and Planning Group the best way to assess the validity of an instrument used for placement is to give the exam without restricting access to the course and then correlate the placement scores with course success.
  - Since a cut off score was imposed in 2003-04, the value of a comparison of course success and placement scores is limited.

To properly validate the assessment instrument, it is necessary to do one of the following which have been ranked in order of desirability:

1. Evaluate an assessment instrument which is not presently being used for placement but is being considered by the college. Even more critical, the course should have no restrictions on enrollment. One cannot expect much of a relationship between scores that fall within a narrow range and course performance.
2. If the assessment instrument is already being used to place students, temporarily suspend the reporting of the assessment scores on an experimental basis. Continue to administer the assessment test, but do not provide the assessment results to counselors or students.
3. Lower the current cut scores by a few points. This approach will provide some information about the course performance for students scoring below the existing cut scores.

Source: Matriculation Local Research Options Assessment Validation Project, RP Group, 1991.

- With the limitation in mind, the data for 2002-03 does appear to suggest that a higher placement score will result in a higher likelihood of passing the course, however:
  - A high percentage of students with scores between 13 and 21 were successful.
  - Students at all score groups were successful (students with a score below 13 were allowed to take the class if they had a previous attempt).
- This analysis does not account for other factors that may be better predictors of success in Biology 40A.



### BIOL40A Success Trends by Term

Term	Success		NonSuccess		W		Total	
	# of Grades	% of this Term	# of Grades	% of this Term	# of Grades	% of this Term	# of Grades	% of this Term
Fall 2000	94	72%	16	12%	21	16%	131	100%
Winter 2001	87	83%	9	9%	9	9%	105	100%
Spring 2001	51	77%	5	8%	10	15%	66	100%
Fall 2001	111	68%	28	17%	24	15%	163	100%
Winter 2002	117	79%	19	13%	13	9%	149	100%
Spring 2002	59	78%	8	11%	9	12%	76	100%
Fall 2002	120	85%	10	7%	11	8%	141	100%
Winter 2003	129	83%	12	8%	14	9%	155	100%
Spring 2003	86	83%	8	8%	9	9%	103	100%
Fall 2003	159	81%	13	7%	24	12%	196	100%
Winter 2004	131	82%	13	8%	15	9%	159	100%
Spring 2004	84	64%	24	19%	18	17%	126	100%

### Fall 2003 BIOL40A Grades by CHEM1A Placement Score

Grade Group	0-12		13-21		22 and above		Exempt		Total	
	# of Grades	% with this Score	# of Grades	% with this Score	# of Grades	% with this Score	# of Grades	% with this Score	# of Grades	% with this Score
Success:A-B-C-P	21	64%	41	85%	50	83%	47	85%	159	81%
NonSuccess:D-F-NP	6	18%	2	4%	1	2%	4	7%	13	7%
NonSuccess:W	6	18%	5	10%	9	15%	4	7%	24	12%
Total	33	100%	48	100%	60	100%	55	100%	196	100%

### Winter 2004 BIOL40A Grades by CHEM1A Placement Score

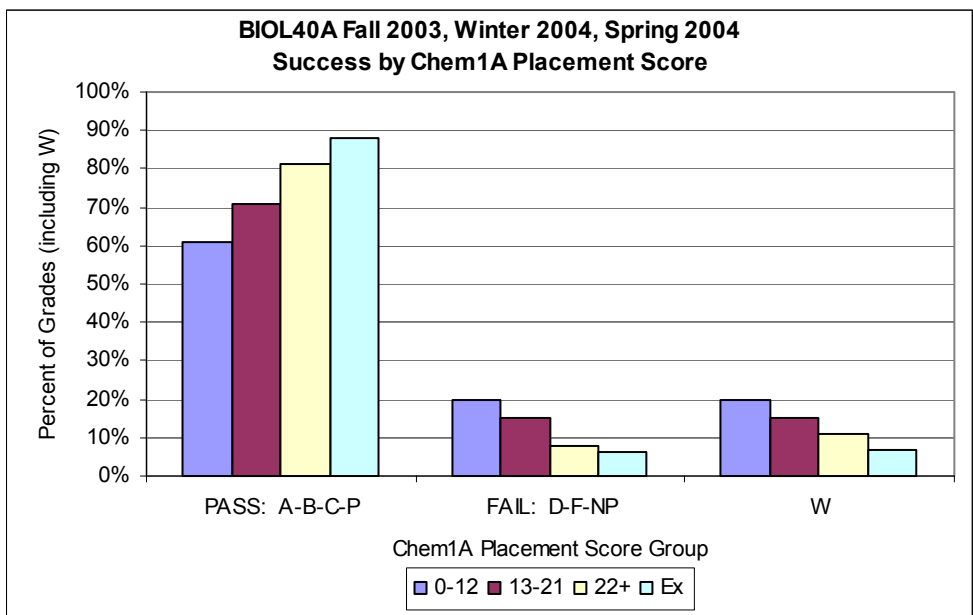
Grade Group	0-12		13-21		22 and above		Exempt		Total	
	# of Grades	% with this Score	# of Grades	% with this Score	# of Grades	% with this Score	# of Grades	% with this Score	# of Grades	% with this Score
Success:A-B-C-P	1	50%	34	69%	55	85%	41	95%	131	64%
NonSuccess:D-F-NP	1	50%	7	14%	5	8%	0	0%	13	19%
NonSuccess:W	0	0%	8	16%	5	8%	2	5%	15	17%
Total	2	100%	49	100%	65	100%	43	100%	159	100%

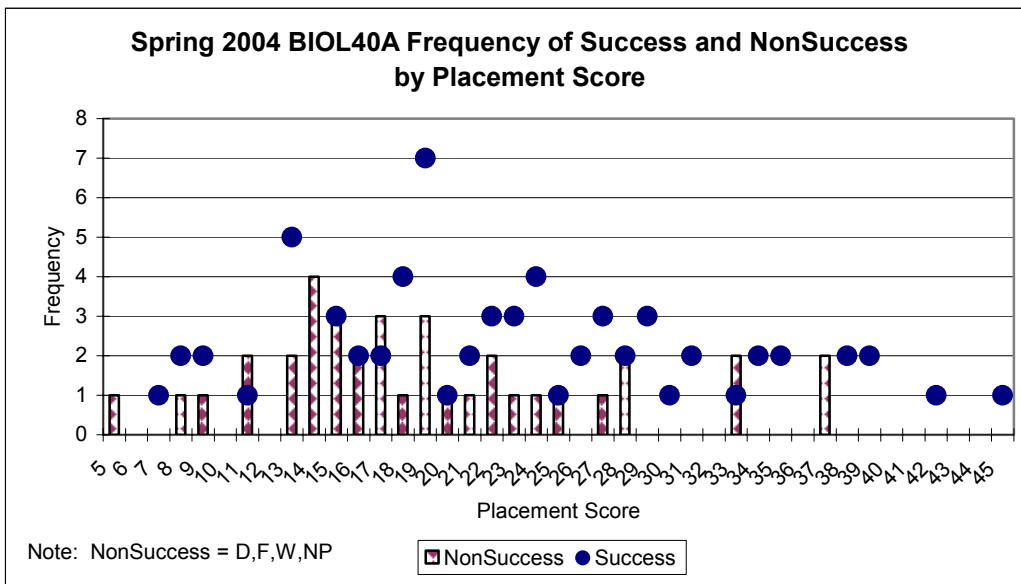
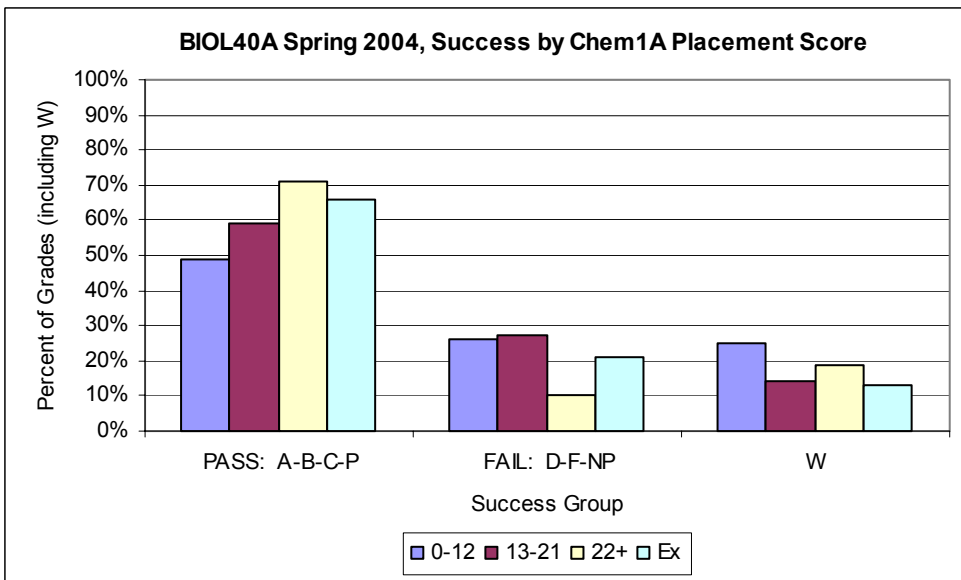
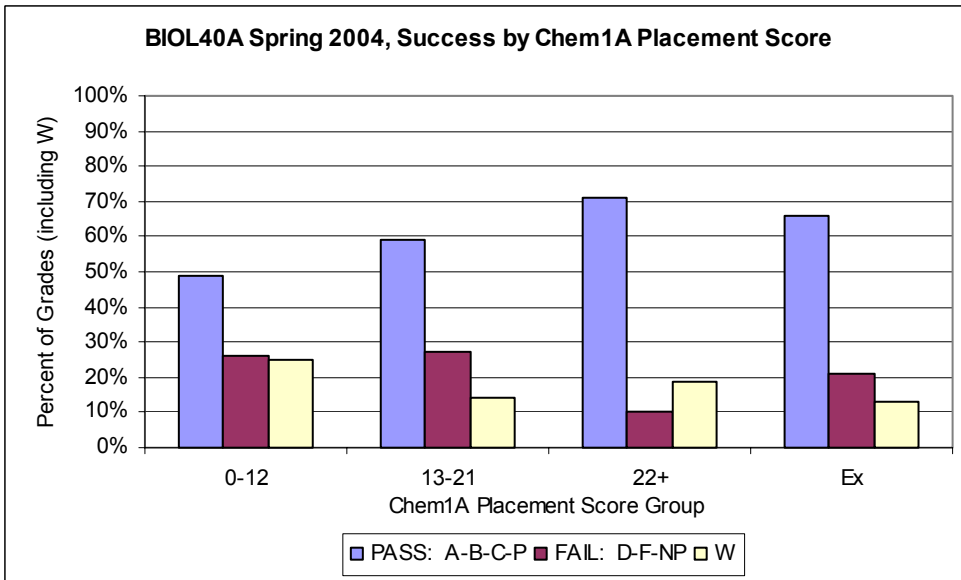
### Spring 2004 BIOL40A Grades by CHEM1A Placement Score

Grade Group	0-12		13-21		22 and above		Exempt		Total	
	# of Grades	% with this Score	# of Grades	% with this Score	# of Grades	% with this Score	# of Grades	% with this Score	# of Grades	% with this Score
Success:A-B-C-P	6	49%	26	59%	35	71%	17	66%	84	64%
NonSuccess:D-F-NP	2	26%	12	27%	7	10%	3	21%	24	19%
NonSuccess:W	3	25%	8	14%	5	19%	2	13%	18	17%
Total	11	100%	46	100%	47	100%	22	100%	126	100%

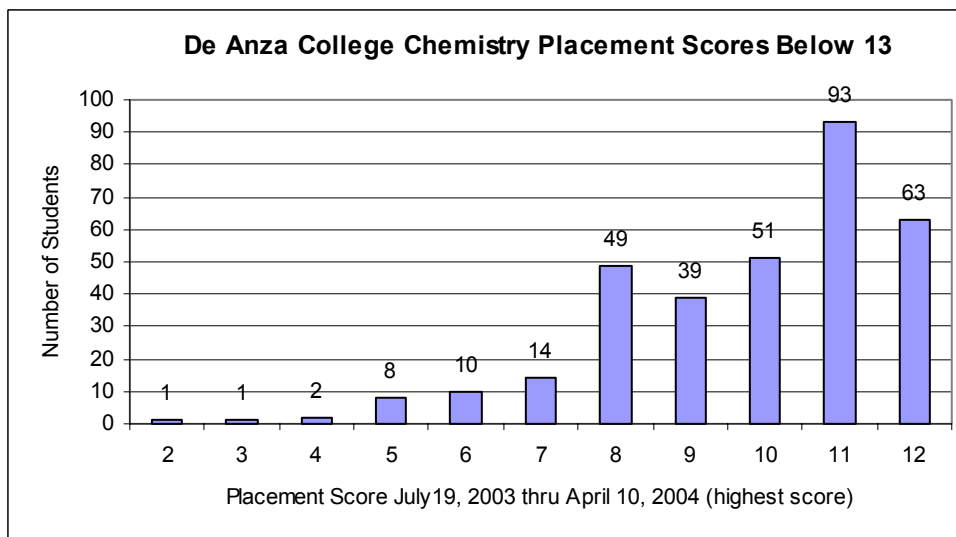
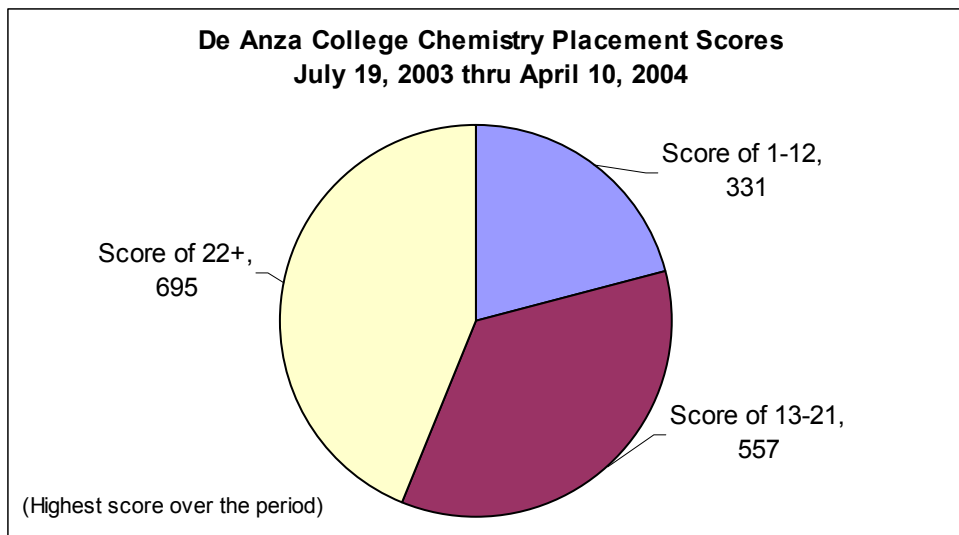
**Fall 2003, Winter 2004, Spring 2004 BIOL40A Grades by CHEM1A Placement Score**

Grade Group	0-12		13-21		22 and above		Exempt		Total	
	# of Grades	% with this Score	# of Grades	% with this Score	# of Grades	% with this Score	# of Grades	% with this Score	# of Grades	% with this Score
Success:A-B-C-P	28	61%	101	71%	140	81%	105	88%	374	78%
NonSuccess:D-F-NP	9	20%	21	15%	13	8%	7	6%	50	10%
NonSuccess:W	9	20%	21	15%	19	11%	8	7%	57	12%
Total	46	100%	143	100%	172	100%	120	100%	481	100%





## Chemistry Placement Test Used for Chemistry 1A / Biology 6A, 40A



## **Placement Test: Chemistry 1A / Biology 6A, 40A Summer, Fall 2004**

**The Chemistry/Biology test is a single test. This test asks only chemistry questions and is the prerequisite for Chem 1A, Biol 6A, 40A.** Download [sample test questions \(PDF\)](#).

### **To be eligible for Chemistry 1A, a student must:**

1. Obtain a satisfactory score (22 of 44) on the Chemistry/Biology Readiness Test.
2. A student must also have completed the equivalent of high school chemistry ( or Chemistry 50 at De Anza) and intermediate algebra with a grade of "C" or better. Students must provide transcript proof to Assessment Center to verify completion of prerequisites prior to enrolling.

**Exception:** Students completing Chemistry 50 at De Anza or Chem 25 at Foothill with a "C" or better are eligible for Chemistry 1A. They do not need to take the placement test or verify prerequisites.

### **To be eligible for Biology 6A, 40A, a student must:**

1. Obtain a satisfactory score on the Chemistry/Biology Readiness Test, **OR**
2. Complete De Anza's Chemistry 50, or Foothill's Chem 25 or Chemistry 1A with a grade of "C" or better.

The **Chemistry /Biology Readiness Test is 45 minutes** and may be taken once per quarter (90-day minimum between tests). The results for Chemistry 1A are valid for 12 months from the test date. There is no expiration of results for Biology 6A, 40A. **Calculators are allowed.**

