

OAT Optometry Admission Test

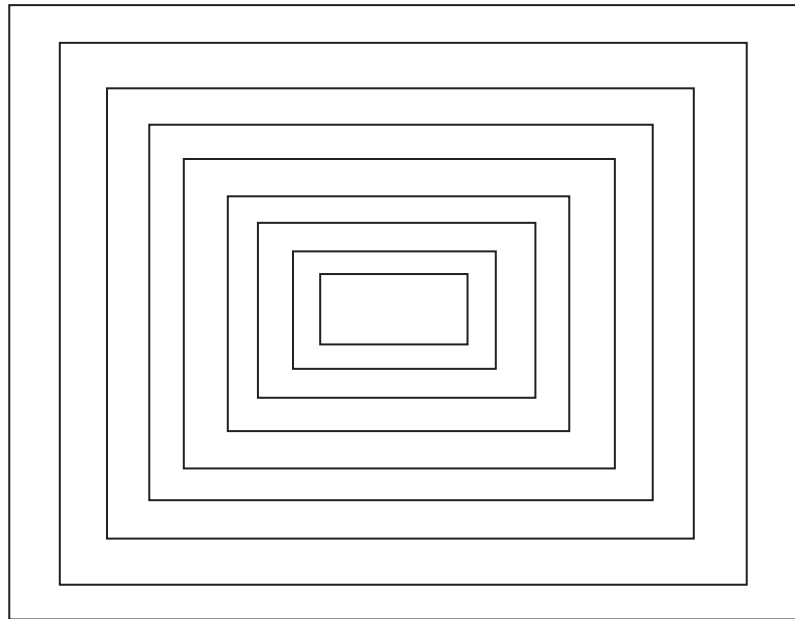


Optometry Admissions Test (OAT) 2022 User's Manual



**Optometry
Admission
Testing
Program**

**Optometry Admission Test (OAT™)
User Guide
2022 Data**



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Part One: Introduction and Background

History of the Optometry Admission Test Program

In 1987, the format of the Optometry College Admission Test (OCAT) was changed to include four tests: the Survey of the Natural Sciences (biology, general chemistry, and organic chemistry); Reading Comprehension; Physics; and Quantitative Reasoning. At that time the name of the test was changed to the Optometry Admission Test (OAT™).

The Optometry Admission Test (OAT) is administered under the auspices of the Association of Schools and Colleges of Optometry (ASCO) for applicants seeking admission to schools and colleges of optometry. This testing program is designed to measure general academic ability and comprehension of scientific information. While the majority of optometry schools in the United States and Canada require applicants to participate in the OAT Program, test results are only one factor considered in evaluating an applicant's potential.

Validity studies conducted by the testing program have shown that test scores in conjunction with collegiate records are useful in predicting optometry school performance. The relative importance of these predictors in the admission process is determined by each optometry school.

Content of the Optometry Admission Test

The OAT is a battery consisting of four individual tests: the Survey of the Natural Sciences, Reading Comprehension Test, Physics Test, and Quantitative Reasoning Test.

The Survey of the Natural Sciences is an achievement test covering content from first-year courses in Biology, General Chemistry, and Organic Chemistry. The 90-minute test contains a total of 100 items, including 40 Biology items, 30 General Chemistry items, and 30 Organic Chemistry items. The three subtests are subdivided into several topic areas.

The Reading Comprehension Test consists of three reading passages varying in length from 900 to 1,600 words. Each passage is accompanied by 12 to 20 items which relate to the concepts and ideas developed in the corresponding passage. There are a total of 50 items divided among the three passages. The subject matter of these passages is drawn from aspects of the basic sciences. The time limit for the test is 60 minutes.

The Physics Test is an achievement test covering content from a two-semester physics course. It is a 50-minute test containing 40 items.

The Quantitative Reasoning Test measures an examinee's ability to reason with numbers and work intelligently with quantitative materials. This 45-minute test contains 40 items.

Additional content specifications for these four tests are presented in Part Three of this *User Guide*. Practice test material can be found at <https://oat.ada.org/>.

Test Construction

Test construction for the OAT is a complex, multi-step process. Undergraduate faculty specializing in each of these disciplines develop new items for the Survey of the Natural Sciences, Physics, and Quantitative Reasoning Tests. Test Construction Teams (TCTs) specific to each discipline review new items for accuracy and relevance. Items that pass this initial review process are then pre-tested. After pretesting, the appropriate TCT may review item content and performance, and, if necessary, revise the content to meet psychometric standards established for the test. Subject matter experts with backgrounds in science and English language arts develop the topics for new Reading Comprehension Test passages and work to develop the passages and accompanying items. New reading passages undergo the same review and pretesting process as other test items.

TCTs and trained psychometricians select the items to be included on each edition of the test, based on content specifications and various standards of item quality. Item quality is determined by an item's performance when administered to examinees. Two statistics in particular are of chief interest: the difficulty of the item and its discrimination index.

Item difficulty is measured by the percent of individuals who answered the item correctly. The difficulty level of the item is thus inversely related to the percentage of examinees who answer the item correctly. As the percentage of examinees who answer the item correctly increases, the difficulty of the item decreases. The recommended item-difficulty level for OAT items ranges from 40 percent to 89 percent.

The discrimination index is a point-biserial correlation coefficient, where the coefficient associated with an item represents the correlation between scores on that item and the total score on that particular test. A low correlation coefficient, such as 0.01, would indicate the average test score of individuals who answered the item correctly was roughly the same as the average score of individuals who answered the item incorrectly. In this case, item performance would be unrelated to overall test performance, thus indicating that the item does not discriminate and should therefore be discarded. A higher correlation coefficient, such as .45, would indicate the item is effective at discriminating between high scoring and low scoring examinees. Items with higher discrimination index values are more useful in determining a rank order of examinees according to the ability being measured. OAT items with insufficient discrimination indices are either revised or discarded.

Interpreting OAT Scores

Each test in the OAT battery yields a raw score, which is the sum of an examinee's correct answers. The raw score is converted to a scale score which can range from 200 to 400. Using scale scores it is possible to compare the performance of examinees who attempted different editions of the examination.

In addition to the scale scores provided for each test, scale scores are also reported to represent overall performance across the science tests, and overall performance in academic areas appearing on the OAT. The total science score is based on the raw scores for the 100 items from the Survey of the Natural Sciences — including Biology, General Chemistry, and Organic Chemistry — and the 40 Physics items. The academic average is a composite score computed from the mean of the Quantitative Reasoning, Reading Comprehension, Biology, General Chemistry, Organic Chemistry, and Physics standard scores. If an examinee does not

take a section of the test, they would receive a raw score of zero and a standard score of 200 on that section.

Ideally, the mean score for each test on the OAT would always be exactly 300, assuming a comparably skilled set of examinees is completing the test. However, in any testing program, some variation in scores is inevitable; therefore the amount of drift from the ideal mean of 300 is constantly monitored. The OAT Program provides frequency tables for each OAT subtest regularly. This information provides guidance in interpreting the scores and insight into any drift from the expected mean score of 300. For example, in the frequency tables for 2022, the mean scores were 302 for Biology, 302 for General Chemistry, 295 for Organic Chemistry, 327 for Reading Comprehension, 318 for Quantitative Reasoning, and 282 for Physics.

As part of the ongoing validation process for the OAT, ASCO requested the OAT scale be recalibrated so the mean scale score would return to 300 with a standard deviation of 40. The data for this recalibration study was based on a “reference group” of examinees taking the OAT for the first time in 2008. The rescaling for each subtest on the OAT was accomplished through the use of the Rasch model, which takes both examinee ability and item difficulty into account. The score scales for all OAT subtests were recalibrated and the new scale score of 300 took effect May 1, 2009.

The new scale had the following major implications for OAT scores:

- Scores obtained under the new and old scales were not directly comparable. A score of 300 on the old scale, for example, does not have the same conceptual meaning as a score of 300 on the new scale.
- When reviewing examinees’ scores, the date the test was taken and differences in the scale should be considered.
- The recalibration did not change the OAT’s difficulty. Scores achieved after May 1, 2009 might be somewhat lower than those achieved prior to the recalibration date because the mean score was set back to be as close as possible to 300. This does not indicate a change in test takers’ skill levels.
- Scores achieved prior to May 2009 can be compared with other scores from within that time period, and scores achieved after May 2009 are comparable with other scores from the same period. However, scores from different time periods (e.g., scores from May 2008 vs. scores from May 2010) are not considered directly comparable.
 - For example, an examinee who tests in May 2009 and December 2009 will be scored on the same score scale, and the two sets of scores can be directly compared.
 - The scores of an examinee who tested in January 2009 and retested in July 2009 should not be directly compared, because the test’s scale scores were different in the two time periods.
 - When comparing scores involving two or more examinees, take care to determine whether the scores are from a comparable period.

Information on the details of this change was distributed to all optometry schools, pre-health education advisors, and potential examinees in March of 2009. Frequency distributions, or

percentile equivalents of scale scores, for the new OAT subtest scales were generated, and the means and standard deviations for the scale scores were computed.

Evaluation of the Optometry Admission Test Program

When considering an examination's effectiveness, two basic psychometric aspects of tests—reliability and validity must be considered.

Reliability is the precision or consistency of the assessment. For the OAT Program, a measure of internal consistency reliability, KR-20, is calculated for each scale (with the exception of the Academic Average for which a composite reliability estimate is determined). Table 1 lists reliability estimates based on administrations of the OAT occurring in 2022.

To ensure the OAT is capable of fulfilling its purpose, it is essential to understand the content and predictive validity evidence available for each section of the test. For the OAT, Test Construction Team members provide support for content validity. These individuals are experts in the subject areas corresponding to their team. For the Reading Comprehension Test, published writers typically possessing a minimum of a master's degree in English language arts or the sciences and educational writing experience produce the passages.

Predictive validity is assessed by examining correlations among OAT scores and students' grades in their first and second years of optometry school. The predictive power of the OAT varies from school to school and from one OAT section to another. The *OAT Validity Study* report provides detailed information on this topic, and is available at [ADA.org/OAT](https://ada.org/OAT). Validity is also addressed in the article, *Validity of the Optometry Admission Test in Predicting Performance in Schools and Colleges of Optometry* (Kramer & Johnston, 1997).

Introduction to the Tables

The tables in this report describe performance on the OAT by gender (Tables 2-9), ethnic identification (Tables 10-17), and Hispanic origin (Table 18).

The data in the tables is based on examinees who answered the questions on gender and ethnic identification. Not all examinees chose to answer these demographic questions. The total count for each table varies because some examinees chose not to answer the questions, but the percentages will add up to 100% because the data is based solely on respondents. The columns for gender, ethnicity, Hispanic origin, total percentage, and total count can be added vertically. The statistics in the tables in this User Guide were based on all participating examinees.

The OAT Program publishes an *OAT Candidate Guide* each year with information about the testing policies, procedures, and eligibility requirements for the calendar year. For additional information concerning the requirements that were applicable to the tested group, please consult the *OAT Candidate Guide* which is available at [ADA.org/OAT](https://ada.org/OAT).

References

Kramer, G.A. & Johnston, J. (1997). Validity of the Optometry Admission Test in predicting performance in schools and colleges of optometry. *Optometric Education*, 22(2), 53-59.

Part Two: 2022 Data Tables

Table 1
Overall Descriptive Statistics
2022

N = 3,068	Number of Items	Mean	S.D.	Reliability
Quantitative Reasoning	40	318.2	48.11	0.87
Reading Comprehension	50	326.6	43.39	0.81
Biology	40	302.2	53.00	0.86
General Chemistry	30	302.0	50.02	0.83
Organic Chemistry	30	294.5	48.79	0.85
Physics	40	282.3	47.60	0.89
Total Science	140	293.4	51.10	0.95
Academic Average	230	304.6	40.43	0.96

N = Number of administrations.
S.D. = Standard deviation.

Table 2
Optometry Admission Test
2022
Biology Score by Gender

Score	Females	Males	Total	Count
200	3.0%	2.5%	2.9%	87
210	2.0%	1.6%	1.9%	57
220	2.8%	2.4%	2.7%	83
230	4.1%	3.5%	3.9%	119
240	4.3%	2.3%	3.8%	115
250	6.1%	4.6%	5.7%	172
260	5.7%	4.0%	5.2%	159
270	6.9%	4.7%	6.3%	192
280	7.1%	7.7%	7.3%	222
290	7.1%	8.0%	7.3%	223
300	5.9%	7.4%	6.3%	192
310	7.1%	7.7%	7.3%	221
320	5.6%	5.4%	5.6%	169
330	5.9%	6.6%	6.1%	185
340	4.7%	5.2%	4.8%	146
350	3.6%	4.6%	3.9%	118
360	4.7%	6.2%	5.1%	155
370	3.2%	3.6%	3.3%	101
380	2.2%	2.7%	2.3%	71
390	1.9%	1.2%	1.7%	51
400	6.1%	8.1%	6.7%	203
Percentage	72.77%	27.23%	100.00%	3041
Mean	299.90	308.41	302.21	
SD	53.09	52.40	53.03	
Count	2213	828	3041	

Table 3
Optometry Admission Test
2022
General Chemistry Score by Gender

Score	Females	Males	Total	Count
200	2.6%	1.7%	2.3%	71
210	1.1%	0.5%	1.0%	29
220	2.4%	1.6%	2.2%	66
230	3.4%	3.0%	3.3%	100
240	4.7%	3.5%	4.3%	132
250	5.9%	3.4%	5.2%	159
260	6.4%	5.4%	6.1%	187
270	6.7%	6.0%	6.5%	199
280	8.1%	7.1%	7.8%	238
290	8.8%	8.0%	8.5%	260
300	7.1%	6.5%	7.0%	212
310	7.5%	7.5%	7.5%	229
320	6.9%	5.2%	6.4%	196
330	6.1%	9.2%	6.9%	210
340	4.3%	5.6%	4.6%	141
350	4.3%	4.3%	4.3%	132
360	3.3%	4.7%	3.7%	112
370	1.3%	1.2%	1.3%	39
380	2.8%	4.6%	3.3%	99
390	1.6%	2.1%	1.7%	53
400	4.7%	8.9%	5.8%	177
Percentage	72.77%	27.23%	100.00%	3041
Mean	298.35	311.51	301.95	
SD	49.09	51.04	49.97	
Count	2213	828	3041	

Table 4
Optometry Admission Test
2022
Organic Chemistry Score by Gender

Score	Females	Males	Total	Count
200	1.5%	1.6%	1.5%	47
210	1.9%	1.0%	1.6%	50
220	2.8%	2.4%	2.7%	83
230	5.2%	2.1%	4.3%	132
240	6.3%	4.2%	5.7%	174
250	5.8%	6.4%	6.0%	182
260	9.7%	8.7%	9.4%	287
270	6.8%	7.5%	7.0%	213
280	7.7%	7.1%	7.6%	230
290	9.9%	10.1%	10.0%	304
300	5.1%	5.4%	5.2%	157
310	7.1%	7.0%	7.1%	215
320	5.5%	5.3%	5.4%	165
330	4.7%	5.3%	4.9%	149
340	4.2%	5.9%	4.7%	142
350	3.4%	3.7%	3.5%	106
360	3.3%	4.3%	3.6%	110
370	2.3%	3.4%	2.6%	80
380	1.5%	1.2%	1.4%	43
390	1.6%	1.9%	1.7%	51
400	3.5%	5.3%	4.0%	121
Percentage	72.77%	27.23%	100.00%	3041
Mean	292.03	300.88	294.44	
SD	48.39	49.01	48.71	
Count	2213	828	3041	

Table 5
Optometry Admission Test
2022
Reading Comprehension Score by Gender

Score	Females	Males	Total	Count
200	0.3%	0.4%	0.3%	10
210	0.0%	0.0%	0.0%	1
220	0.5%	0.4%	0.5%	14
230	0.9%	0.5%	0.8%	25
240	0.9%	0.8%	0.9%	26
250	2.7%	1.0%	2.2%	68
260	3.5%	2.2%	3.1%	95
270	4.9%	4.6%	4.8%	147
280	4.7%	4.6%	4.7%	143
290	7.2%	6.4%	7.0%	213
300	8.4%	7.0%	8.0%	244
310	7.5%	8.5%	7.8%	237
320	8.1%	8.5%	8.2%	249
330	8.5%	10.5%	9.1%	276
340	7.6%	9.7%	8.2%	249
350	8.7%	8.2%	8.5%	260
360	4.8%	4.0%	4.6%	140
370	3.8%	6.0%	4.4%	135
380	5.1%	5.3%	5.1%	156
390	3.4%	3.4%	3.4%	104
400	8.2%	8.2%	8.2%	249
Percentage	72.77%	27.23%	100.00%	3041
Mean	325.40	330.00	326.66	
SD	43.96	41.38	43.31	
Count	2213	828	3041	

Table 6
Optometry Admission Test
2022
Physics Score by Gender

Score	Females	Males	Total	Count
200	3.0%	1.9%	2.7%	83
210	2.9%	2.2%	2.7%	82
220	5.2%	1.6%	4.2%	128
230	7.9%	5.1%	7.1%	216
240	7.5%	5.2%	6.8%	208
250	10.3%	8.1%	9.7%	295
260	7.2%	5.2%	6.7%	203
270	8.6%	7.9%	8.4%	256
280	8.8%	8.0%	8.5%	260
290	7.7%	8.1%	7.8%	238
300	4.1%	5.6%	4.5%	136
310	6.6%	9.3%	7.3%	223
320	4.4%	6.9%	5.1%	154
330	3.3%	5.0%	3.7%	114
340	3.9%	5.1%	4.2%	129
350	1.4%	2.5%	1.7%	53
360	1.6%	2.4%	1.8%	55
370	1.4%	1.8%	1.5%	47
380	1.5%	4.5%	2.3%	71
390	0.6%	0.8%	0.7%	20
400	2.0%	3.0%	2.3%	70
Percentage	72.77%	27.23%	100.00%	3041
Mean	277.65	294.47	282.23	
SD	46.35	48.29	47.47	
Count	2213	828	3041	

Table 7
Optometry Admission Test
2022
Quantitative Reasoning Score by Gender

Score	Females	Males	Total	Count
200	0.6%	0.4%	0.6%	17
210	0.7%	0.0%	0.5%	16
220	1.4%	0.2%	1.1%	34
230	1.1%	1.1%	1.1%	33
240	3.2%	2.3%	2.9%	89
250	3.3%	1.9%	3.0%	90
260	5.2%	3.5%	4.7%	143
270	6.2%	3.9%	5.6%	169
280	8.5%	5.1%	7.5%	229
290	7.7%	5.1%	7.0%	212
300	8.7%	6.9%	8.2%	249
310	6.7%	6.6%	6.7%	203
320	7.8%	6.5%	7.4%	226
330	6.9%	8.2%	7.2%	220
340	5.9%	6.6%	6.1%	185
350	6.1%	7.7%	6.5%	199
360	4.6%	7.7%	5.5%	166
370	3.1%	4.7%	3.5%	107
380	1.9%	3.5%	2.4%	72
390	3.0%	4.1%	3.3%	101
400	7.5%	13.9%	9.2%	281
Percentage	72.77%	27.23%	100.00%	3041
Mean	313.24	331.53	318.22	
SD	47.46	47.13	48.06	
Count	2213	828	3041	

Table 8
Optometry Admission Test
2022
Total Science Score by Gender

Score	Females	Males	Total	Count
200	1.9%	1.7%	1.8%	56
210	2.3%	1.3%	2.1%	63
220	4.3%	2.2%	3.7%	114
230	6.8%	4.3%	6.1%	187
240	5.6%	4.3%	5.3%	160
250	8.5%	6.2%	7.8%	238
260	7.3%	6.4%	7.1%	215
270	7.8%	7.1%	7.6%	231
280	7.7%	6.3%	7.3%	222
290	5.8%	5.9%	5.9%	178
300	7.2%	8.5%	7.5%	229
310	5.1%	6.3%	5.4%	164
320	5.1%	5.6%	5.2%	159
330	4.2%	5.4%	4.6%	139
340	4.2%	5.6%	4.6%	139
350	3.6%	4.6%	3.9%	118
360	3.3%	5.4%	3.9%	118
370	2.9%	2.2%	2.7%	82
380	1.8%	2.3%	1.9%	58
390	1.4%	2.5%	1.7%	53
400	3.1%	5.9%	3.9%	118
Percentage	72.77%	27.23%	100.00%	3041
Mean	288.90	302.80	292.68	
SD	50.30	51.57	51.02	
Count	2213	828	3041	

Table 9
Optometry Admission Test
2022
Academic Average Score by Gender

Score	Females	Males	Total	Count
200	0.0%	0.0%	0.0%	0
210	0.3%	0.0%	0.2%	6
220	0.5%	0.4%	0.5%	15
230	1.8%	0.6%	1.5%	45
240	4.0%	2.7%	3.6%	110
250	5.4%	3.1%	4.8%	146
260	7.1%	4.7%	6.4%	196
270	9.6%	6.6%	8.8%	267
280	8.8%	8.3%	8.7%	264
290	9.1%	7.6%	8.7%	265
300	9.5%	9.1%	9.4%	286
310	8.2%	8.3%	8.2%	250
320	6.9%	10.1%	7.8%	236
330	6.4%	7.4%	6.7%	203
340	6.1%	6.4%	6.1%	187
350	4.2%	7.6%	5.2%	157
360	4.2%	5.9%	4.7%	143
370	3.6%	4.0%	3.7%	112
380	2.0%	3.9%	2.5%	77
390	1.4%	2.1%	1.5%	47
400	0.9%	1.2%	1.0%	29
Percentage	72.77%	27.23%	100.00%	3041
Mean	301.99	313.74	305.19	
SD	40.19	39.58	40.36	
Count	2213	828	3041	

Table 10
Optometry Admission Test
2022
Biology Score by Ethnic Identification

Score	Native American	Asian	Black	Pacific Islander	White	Multi	Total	Count
200	13.3%	2.6%	4.4%	0.0%	2.6%	3.4%	2.8%	83
210	0.0%	1.4%	2.2%	0.0%	1.8%	3.6%	1.9%	56
220	6.7%	2.5%	1.5%	15.4%	2.5%	3.6%	2.7%	79
230	0.0%	3.7%	4.4%	0.0%	4.1%	4.2%	4.0%	116
240	6.7%	3.4%	8.1%	7.7%	3.2%	5.0%	3.8%	110
250	6.7%	4.5%	8.1%	15.4%	6.0%	7.3%	5.8%	169
260	13.3%	3.5%	8.1%	7.7%	5.5%	7.8%	5.3%	154
270	6.7%	4.9%	7.4%	0.0%	6.8%	7.6%	6.2%	182
280	6.7%	5.9%	8.9%	0.0%	7.5%	10.1%	7.3%	213
290	6.7%	6.5%	8.1%	7.7%	7.7%	6.7%	7.2%	210
300	0.0%	5.2%	8.1%	7.7%	7.0%	7.0%	6.4%	188
310	6.7%	6.9%	7.4%	7.7%	8.0%	5.0%	7.2%	211
320	0.0%	6.2%	2.2%	0.0%	5.6%	4.8%	5.5%	161
330	0.0%	6.9%	5.9%	7.7%	5.8%	6.2%	6.2%	183
340	13.3%	5.4%	2.2%	7.7%	5.0%	3.4%	4.9%	143
350	0.0%	5.0%	0.7%	0.0%	3.6%	3.1%	3.9%	113
360	6.7%	6.4%	3.7%	15.4%	4.9%	2.8%	5.2%	151
370	6.7%	3.7%	3.7%	0.0%	3.1%	2.8%	3.3%	96
380	0.0%	3.1%	0.7%	0.0%	2.2%	0.6%	2.2%	65
390	0.0%	2.1%	0.7%	0.0%	1.9%	0.8%	1.8%	52
400	0.0%	10.2%	3.0%	0.0%	5.2%	4.2%	6.7%	197
Percentage	0.51%	35.33%	4.60%	0.44%	46.93%	12.18%	100.00%	2932
Mean	279.33	312.21	285.48	286.92	300.60	287.98	302.30	
SD	55.09	55.18	48.2	50.56	51.18	50.09	53.09	
Count	15	1036	135	13	1376	357	2932	

Table 11
Optometry Admission Test
2022
General Chemistry Score by Ethnic Identification

Score	Native American	Asian	Black	Pacific Islander	White	Multi	Total	Count
200	6.7%	1.7%	3.0%	0.0%	2.0%	5.3%	2.4%	69
210	0.0%	0.7%	2.2%	0.0%	0.9%	0.8%	0.9%	26
220	6.7%	1.8%	4.4%	0.0%	1.8%	3.6%	2.2%	64
230	13.3%	2.4%	4.4%	0.0%	3.3%	5.6%	3.4%	99
240	13.3%	3.2%	8.1%	0.0%	4.1%	7.6%	4.4%	130
250	0.0%	4.0%	7.4%	15.4%	5.5%	7.8%	5.4%	157
260	20.0%	4.9%	12.6%	15.4%	6.0%	5.6%	6.0%	176
270	0.0%	5.1%	9.6%	0.0%	7.2%	7.6%	6.5%	192
280	0.0%	6.9%	8.9%	23.1%	7.6%	10.4%	7.7%	227
290	6.7%	7.0%	10.4%	15.4%	9.4%	8.7%	8.6%	251
300	0.0%	6.8%	5.9%	7.7%	7.7%	5.0%	6.9%	203
310	6.7%	7.3%	2.2%	15.4%	8.1%	6.2%	7.3%	215
320	0.0%	6.7%	5.2%	0.0%	6.9%	5.3%	6.5%	190
330	13.3%	7.4%	3.7%	0.0%	7.3%	4.8%	6.9%	201
340	0.0%	5.8%	1.5%	7.7%	4.0%	4.8%	4.6%	135
350	0.0%	6.1%	2.2%	0.0%	4.0%	3.1%	4.5%	132
360	6.7%	5.0%	1.5%	0.0%	3.1%	3.4%	3.8%	110
370	0.0%	1.4%	0.0%	0.0%	1.5%	0.8%	1.3%	37
380	0.0%	4.4%	2.2%	0.0%	3.0%	0.8%	3.2%	93
390	0.0%	2.8%	1.5%	0.0%	1.5%	0.0%	1.8%	52
400	6.7%	8.6%	3.0%	0.0%	5.0%	2.8%	5.9%	173
Percentage	0.51%	35.33%	4.60%	0.44%	46.93%	12.18%	100.00%	2932
Mean	277.33	313.30	280.07	284.62	300.75	283.81	301.98	
SD	57.38	51.24	46.45	26.34	48.03	47.41	50.12	
Count	15	1036	135	13	1376	357	2932	

Table 12
Optometry Admission Test
2022
Organic Chemistry Score by Ethnic Identification

Score	Native American	Asian	Black	Pacific Islander	White	Multi	Total	Count
200	13.3%	1.7%	3.0%	0.0%	0.9%	2.5%	1.6%	46
210	6.7%	1.3%	5.2%	7.7%	1.4%	2.2%	1.7%	49
220	0.0%	2.4%	3.7%	7.7%	2.5%	3.1%	2.6%	77
230	6.7%	4.0%	7.4%	7.7%	4.1%	5.3%	4.4%	128
240	20.0%	4.3%	5.9%	0.0%	5.4%	10.6%	5.7%	168
250	0.0%	5.3%	5.9%	7.7%	6.0%	8.7%	6.1%	178
260	6.7%	7.2%	11.9%	23.1%	10.0%	12.0%	9.4%	276
270	0.0%	6.1%	13.3%	0.0%	7.1%	7.8%	7.1%	207
280	13.3%	6.2%	9.6%	7.7%	8.5%	8.1%	7.7%	226
290	13.3%	10.1%	6.7%	0.0%	10.2%	9.5%	9.9%	290
300	0.0%	3.9%	5.9%	7.7%	6.3%	3.9%	5.1%	149
310	6.7%	7.1%	4.4%	7.7%	7.7%	5.0%	7.0%	206
320	0.0%	6.7%	1.5%	7.7%	4.9%	4.5%	5.3%	156
330	0.0%	5.1%	3.0%	7.7%	5.5%	2.8%	4.9%	144
340	0.0%	5.2%	3.0%	0.0%	4.9%	2.2%	4.6%	134
350	6.7%	4.1%	4.4%	7.7%	3.3%	3.1%	3.6%	106
360	0.0%	5.2%	0.7%	0.0%	2.8%	2.5%	3.5%	103
370	6.7%	3.8%	1.5%	0.0%	2.2%	1.4%	2.6%	77
380	0.0%	1.8%	0.7%	0.0%	1.5%	0.8%	1.5%	43
390	0.0%	2.6%	0.7%	0.0%	1.2%	1.7%	1.7%	51
400	0.0%	5.9%	1.5%	0.0%	3.5%	2.0%	4.0%	118
Percentage	0.51%	35.33%	4.60%	0.44%	46.93%	12.18%	100.00%	2932
Mean	266.00	303.36	275.63	275.38	293.84	280.11	294.47	
SD	51.10	51.61	44.76	43.90	46.20	45.98	48.84	
Count	15	1036	135	13	1376	357	2932	

Table 13
Optometry Admission Test
2022
Reading Comprehension Score by Ethnic Identification

Score	Native American	Asian	Black	Pacific Islander	White	Multi	Total	Count
200	0.0%	0.2%	0.0%	0.0%	0.3%	1.1%	0.3%	10
210	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%	2
220	0.0%	0.2%	2.2%	0.0%	0.2%	1.4%	0.4%	13
230	0.0%	0.9%	2.2%	0.0%	0.5%	0.8%	0.8%	22
240	0.0%	1.0%	3.0%	0.0%	0.6%	1.1%	0.9%	26
250	0.0%	2.2%	5.9%	0.0%	1.3%	3.6%	2.1%	62
260	0.0%	3.6%	3.7%	15.4%	2.4%	3.4%	3.0%	89
270	13.3%	4.4%	9.6%	7.7%	3.9%	7.8%	4.9%	143
280	6.7%	4.7%	6.7%	7.7%	3.9%	5.9%	4.6%	135
290	6.7%	7.7%	11.1%	7.7%	5.9%	6.7%	6.9%	202
300	6.7%	7.1%	14.1%	7.7%	7.4%	10.1%	7.9%	233
310	0.0%	7.9%	3.7%	7.7%	8.6%	7.0%	7.9%	232
320	20.0%	6.9%	8.1%	15.4%	8.2%	10.6%	8.2%	239
330	13.3%	8.1%	8.1%	7.7%	10.1%	8.1%	9.1%	266
340	6.7%	8.0%	6.7%	0.0%	8.6%	8.4%	8.2%	241
350	6.7%	8.7%	3.7%	15.4%	9.0%	7.0%	8.4%	247
360	6.7%	5.0%	0.7%	0.0%	4.7%	3.6%	4.5%	132
370	0.0%	4.8%	2.2%	0.0%	4.7%	4.2%	4.5%	132
380	0.0%	5.3%	3.0%	0.0%	6.5%	2.0%	5.3%	156
390	0.0%	3.8%	3.0%	0.0%	3.9%	2.0%	3.5%	104
400	13.3%	9.2%	2.2%	7.7%	9.2%	5.0%	8.4%	246
Percentage	0.51%	35.33%	4.60%	0.44%	46.93%	12.18%	100.00%	2932
Mean	325.33	328.06	303.33	310.77	332.25	314.76	327.18	
SD	40.86	44.17	42.29	40.71	41.59	43.29	43.40	
Count	15	1036	135	13	1376	357	2932	

Table 14
Optometry Admission Test
2022
Physics Score by Ethnic Identification

Score	Native American	Asian	Black	Pacific Islander	White	Multi	Total	Count
200	0.0%	1.7%	5.2%	0.0%	2.8%	4.5%	2.7%	79
210	0.0%	2.1%	5.9%	0.0%	2.4%	4.8%	2.7%	80
220	0.0%	3.7%	8.1%	0.0%	3.1%	8.4%	4.2%	122
230	13.3%	5.4%	11.9%	7.7%	6.6%	11.8%	7.1%	208
240	13.3%	6.0%	14.1%	23.1%	6.2%	7.3%	6.7%	197
250	6.7%	7.7%	8.1%	7.7%	10.2%	13.7%	9.7%	283
260	6.7%	5.3%	10.4%	0.0%	7.1%	8.4%	6.8%	198
270	20.0%	9.6%	7.4%	7.7%	7.4%	7.8%	8.3%	243
280	6.7%	7.9%	4.4%	15.4%	10.3%	5.3%	8.6%	252
290	13.3%	7.7%	7.4%	7.7%	8.4%	5.6%	7.8%	229
300	0.0%	4.2%	3.0%	15.4%	4.9%	3.1%	4.4%	128
310	0.0%	7.8%	4.4%	7.7%	7.6%	7.3%	7.4%	218
320	0.0%	6.1%	3.7%	0.0%	5.0%	2.8%	5.0%	147
330	6.7%	4.7%	0.7%	0.0%	3.6%	3.6%	3.9%	113
340	0.0%	5.0%	3.7%	0.0%	4.7%	2.2%	4.4%	129
350	0.0%	1.7%	0.0%	0.0%	2.2%	0.8%	1.7%	51
360	6.7%	2.4%	0.0%	0.0%	1.7%	0.8%	1.8%	53
370	6.7%	2.0%	0.7%	7.7%	1.3%	0.8%	1.5%	45
380	0.0%	3.3%	0.0%	0.0%	2.3%	0.8%	2.3%	68
390	0.0%	1.1%	0.7%	0.0%	0.5%	0.0%	0.6%	19
400	0.0%	4.5%	0.0%	0.0%	1.7%	0.0%	2.4%	70
	0.51%	35.33%	4.60%	0.44%	46.93%	12.18%	100.00%	2932
Percentage								
Mean	278.67	292.11	258.22	276.92	282.81	263.17	282.53	
SD	43.89	50.39	38.94	38.81	45.58	40.82	47.58	
Count	15	1036	135	13	1376	357	2932	

Table 15
Optometry Admission Test
2022
Quantitative Reasoning Score by Ethnic Identification

Score	Native American	Asian	Black	Pacific Islander	White	Multi	Total	Count
200	0.0%	0.2%	0.7%	0.0%	0.4%	2.0%	0.5%	16
210	0.0%	0.4%	0.7%	0.0%	0.4%	1.7%	0.5%	16
220	0.0%	1.4%	3.7%	0.0%	0.5%	2.0%	1.1%	33
230	0.0%	0.8%	5.9%	0.0%	0.7%	2.2%	1.1%	33
240	6.7%	2.4%	11.9%	0.0%	2.0%	4.2%	2.9%	84
250	0.0%	2.3%	6.7%	0.0%	2.0%	6.4%	2.9%	84
260	20.0%	4.3%	8.1%	23.1%	3.2%	8.1%	4.6%	135
270	6.7%	4.6%	8.9%	7.7%	5.1%	7.8%	5.5%	160
280	6.7%	6.7%	10.4%	30.8%	6.8%	10.1%	7.4%	218
290	0.0%	5.7%	10.4%	0.0%	7.2%	9.0%	7.0%	204
300	6.7%	7.5%	10.4%	7.7%	8.6%	9.0%	8.3%	244
310	26.7%	6.3%	4.4%	0.0%	6.8%	5.9%	6.4%	189
320	6.7%	9.4%	3.7%	0.0%	6.9%	6.7%	7.6%	222
330	0.0%	6.8%	6.7%	7.7%	8.8%	4.5%	7.4%	217
340	0.0%	5.4%	0.0%	7.7%	7.4%	3.9%	5.9%	173
350	13.3%	6.9%	1.5%	7.7%	7.3%	4.8%	6.6%	193
360	0.0%	5.3%	1.5%	0.0%	7.0%	2.0%	5.5%	160
370	0.0%	4.2%	2.2%	0.0%	3.1%	3.9%	3.5%	103
380	0.0%	3.5%	0.0%	7.7%	2.2%	1.1%	2.4%	71
390	0.0%	3.7%	0.7%	0.0%	3.8%	1.7%	3.3%	97
400	6.7%	12.5%	1.5%	0.0%	10.0%	3.1%	9.5%	280
Percentage	0.51%	35.33%	4.60%	0.44%	46.93%	12.18%	100.00%	2932
Mean	302.00	324.94	280.52	297.69	324.06	295.77	318.69	
SD	42.63	48.63	40.45	39.40	45.53	46.38	48.17	
Count	15	1036	135	13	1376	357	2932	

Table 16
Optometry Admission Test
2022
Total Science Score by Ethnic Identification

Score	Native American	Asian	Black	Pacific Islander	White	Multi	Total	Count
200	6.7%	1.5%	4.4%	0.0%	1.4%	3.1%	1.8%	53
210	0.0%	2.2%	3.0%	0.0%	1.6%	3.1%	2.0%	60
220	6.7%	3.2%	5.2%	0.0%	3.3%	7.3%	3.8%	112
230	20.0%	4.5%	12.6%	15.4%	6.0%	8.4%	6.2%	181
240	6.7%	3.9%	5.9%	15.4%	5.3%	8.4%	5.3%	154
250	6.7%	5.6%	12.6%	7.7%	8.0%	12.0%	7.8%	230
260	13.3%	5.5%	9.6%	15.4%	7.6%	8.1%	7.1%	208
270	0.0%	6.9%	8.9%	0.0%	8.3%	7.6%	7.7%	225
280	0.0%	6.6%	8.1%	7.7%	7.3%	9.0%	7.2%	212
290	13.3%	5.1%	7.4%	0.0%	6.6%	3.1%	5.7%	167
300	6.7%	7.1%	3.7%	7.7%	8.1%	7.0%	7.4%	218
310	0.0%	6.1%	3.0%	7.7%	5.5%	3.6%	5.4%	157
320	6.7%	6.0%	3.0%	15.4%	5.4%	2.8%	5.2%	153
330	0.0%	4.9%	0.7%	0.0%	5.0%	3.6%	4.6%	134
340	0.0%	5.3%	3.0%	0.0%	4.8%	3.1%	4.6%	136
350	0.0%	5.1%	2.2%	0.0%	3.8%	2.2%	4.0%	116
360	6.7%	4.4%	4.4%	7.7%	3.1%	3.9%	3.8%	111
370	0.0%	4.0%	0.0%	0.0%	2.5%	1.1%	2.7%	80
380	0.0%	2.3%	1.5%	0.0%	2.2%	0.8%	2.0%	59
390	6.7%	2.4%	0.0%	0.0%	1.5%	0.6%	1.7%	49
400	0.0%	7.2%	0.7%	0.0%	2.7%	1.1%	4.0%	117
Percentage	0.51%	35.33%	4.60%	0.44%	46.93%	12.18%	100.00%	2932
Mean	271.33	304.17	269.19	276.92	291.96	273.56	292.81	
SD	53.70	53.99	44.20	41.51	48.39	46.29	51.17	
Count	15	1036	135	13	1376	357	2932	

Table 17
Optometry Admission Test
2022
Academic Average Score by Ethnic Identification

Score	Native American	Asian	Black	Pacific Islander	White	Multi	Total	Count
200	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0
210	0.0%	0.1%	0.0%	0.0%	0.1%	0.8%	0.2%	6
220	0.0%	0.2%	2.2%	0.0%	0.4%	1.4%	0.5%	15
230	0.0%	1.9%	2.2%	0.0%	1.0%	1.1%	1.4%	41
240	20.0%	2.7%	9.6%	0.0%	2.4%	8.4%	3.6%	107
250	0.0%	4.2%	9.6%	7.7%	4.1%	8.1%	4.9%	143
260	13.3%	4.7%	13.3%	23.1%	5.4%	10.6%	6.3%	184
270	20.0%	6.6%	14.1%	23.1%	8.8%	12.3%	8.8%	258
280	6.7%	7.8%	8.1%	0.0%	9.7%	7.3%	8.6%	253
290	0.0%	7.7%	11.9%	7.7%	8.6%	10.6%	8.7%	254
300	0.0%	7.7%	5.9%	0.0%	11.1%	9.2%	9.3%	274
310	13.3%	8.8%	7.4%	7.7%	8.6%	5.6%	8.3%	242
320	13.3%	8.2%	3.7%	7.7%	8.3%	5.9%	7.8%	228
330	0.0%	7.4%	1.5%	15.4%	7.0%	5.6%	6.7%	197
340	0.0%	6.5%	4.4%	7.7%	6.6%	3.1%	6.0%	176
350	6.7%	5.9%	2.2%	0.0%	5.5%	3.6%	5.3%	154
360	0.0%	6.2%	2.2%	0.0%	4.5%	2.8%	4.7%	139
370	0.0%	5.5%	1.5%	0.0%	3.1%	2.2%	3.7%	109
380	6.7%	3.6%	0.0%	0.0%	2.8%	0.3%	2.6%	77
390	0.0%	2.8%	0.0%	0.0%	1.2%	0.3%	1.6%	46
400	0.0%	1.5%	0.0%	0.0%	0.8%	0.6%	1.0%	29
Percentage	0.51%	35.33%	4.60%	0.44%	46.93%	12.18%	100.00%	2932
Mean	288.00	313.27	280.89	289.23	306.66	288.52	305.43	
SD	42.12	42.14	34.37	32.26	38.15	37.93	40.49	
Count	15	1036	135	13	1376	357	2932	

Table 18
Optometry Admission Test
2022
OAT Scores by Examinees of Hispanic Origin

Score	BIO	GCH	OCH	RCT	PHY	QRT	SCI	AA
200	3.3%	4.9%	1.6%	0.0%	8.2%	1.6%	3.3%	0.0%
210	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
220	1.6%	4.9%	1.6%	0.0%	1.6%	0.0%	6.6%	0.0%
230	6.6%	0.0%	8.2%	0.0%	9.8%	0.0%	3.3%	0.0%
240	4.9%	1.6%	6.6%	4.9%	11.5%	0.0%	9.8%	6.6%
250	4.9%	3.3%	9.8%	1.6%	18.0%	8.2%	8.2%	4.9%
260	6.6%	8.2%	6.6%	8.2%	13.1%	8.2%	11.5%	8.2%
270	8.2%	11.5%	9.8%	8.2%	4.9%	13.1%	4.9%	13.1%
280	9.8%	9.8%	4.9%	4.9%	6.6%	13.1%	11.5%	13.1%
290	8.2%	13.1%	6.6%	8.2%	3.3%	11.5%	11.5%	14.8%
300	18.0%	11.5%	8.2%	9.8%	11.5%	9.8%	6.6%	14.8%
310	6.6%	3.3%	3.3%	14.8%	3.3%	6.6%	8.2%	6.6%
320	6.6%	13.1%	9.8%	3.3%	3.3%	11.5%	4.9%	4.9%
330	3.3%	4.9%	8.2%	9.8%	3.3%	1.6%	3.3%	4.9%
340	4.9%	3.3%	4.9%	8.2%	0.0%	1.6%	1.6%	1.6%
350	0.0%	4.9%	3.3%	4.9%	0.0%	6.6%	1.6%	3.3%
360	1.6%	0.0%	0.0%	9.8%	0.0%	3.3%	0.0%	3.3%
370	1.6%	0.0%	1.6%	1.6%	0.0%	1.6%	1.6%	0.0%
380	1.6%	0.0%	3.3%	1.6%	1.6%	0.0%	1.6%	0.0%
390	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
400	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%
Mean	278.03	278.69	279.34	253.44	285.57	297.87	266.72	279.67
SD	41.06	38.01	45.01	35.11	35.66	36.34	38.50	29.66
Count	61	61	61	61	61	61	61	61

BIO=Biology, GCH=General Chemistry, OCH=Organic Chemistry, RCT=Reading Comprehension Test, PHY=Physics, QRT=Quantitative Reasoning Test, SCI=Total Science and AA=Academic Average.

Part Three: Content Specifications

Survey of Natural Sciences: Biology (January 1 – April 14, 2022)

40 items

1.1 Cell and Molecular Biology

- 1.1.1 Origin of Life
- 1.1.2 Cell metabolism (including photosynthesis / enzymology)
- 1.1.3 Cellular processes
- 1.1.4 Thermodynamics
- 1.1.5 Organelle structure and function
- 1.1.6 Mitosis/ Meiosis
- 1.1.7 Cell structure and function
- 1.1.8 Experimental cell biology
- 1.1.9 Biomolecules

1.2 Diversity of Life: Biological Organization and Relationship of Major Taxa (Six-Kingdom, Three-Domain System)

- 1.2.1 Plantae
- 1.2.2 Animalia
- 1.2.3 Protista
- 1.2.4 Fungi
- 1.2.5 Eubacteria (Bacteria)
- 1.2.6 Archae
- 1.2.7 Relationships

1.3 Structure and Function of Systems

- 1.3.1 Integumentary
- 1.3.2 Skeletal
- 1.3.3 Muscular
- 1.3.4 Circulatory
- 1.3.5 Immunological
- 1.3.6 Digestive
- 1.3.7 Respiratory
- 1.3.8 Urinary
- 1.3.9 Nervous/senses
- 1.3.10 Endocrine
- 1.3.11 Reproductive
- 1.3.12 Relationships

1.4 Developmental Biology

- 1.4.1 Fertilization
- 1.4.2 Descriptive embryology
- 1.4.3 Developmental mechanisms

1.5 Genetics

- 1.5.1 Molecular genetics
- 1.5.2 Human genetics
- 1.5.3 Classical genetics
- 1.5.4 Chromosomal genetics
- 1.5.5 Genetic technology

1.6 Evolution, Ecology, and Behavior

- 1.6.1 Natural selection
- 1.6.2 Population genetics/Speciation
- 1.6.3 Population and community ecology
- 1.6.4 Ecosystems
- 1.6.5 Animal behavior (including social)

Survey of Natural Sciences: Biology
(April 15 – December 31, 2022)

40 items

1.1 Cell and Molecular Biology

- 1.1.1 Cell metabolism
- 1.1.2 Cellular processes
- 1.1.3 Thermodynamics
- 1.1.4 Mitosis/meiosis
- 1.1.5 Cell and organelle structure and function
- 1.1.6 Experimental cell biology
- 1.1.7 Biomolecules
- 1.1.8 Integrated relationships

1.2 Diversity of Life

- 1.2.1 Viruses
- 1.2.2 Archaeobacteria
- 1.2.3 Eubacteria
- 1.2.4 Fungi
- 1.2.5 Protista
- 1.2.6 Plantae
- 1.2.7 Animalia
- 1.2.8 Integrated relationships

1.3 Structure and Function of Systems

- 1.3.1 Integumentary
- 1.3.2 Skeletal
- 1.3.3 Muscular
- 1.3.4 Circulatory
- 1.3.5 Lymphatic/immune
- 1.3.6 Digestive
- 1.3.7 Respiratory
- 1.3.8 Urinary
- 1.3.9 Nervous/sensory
- 1.3.10 Endocrine
- 1.3.11 Reproductive
- 1.3.12 Integrated relationships

1.4 Genetics

- 1.4.1 Molecular genetics
- 1.4.2 Human genetics
- 1.4.3 Classical genetics
- 1.4.4 Chromosomal genetics
- 1.4.5 Genetic technology
- 1.4.6 Developmental mechanisms
- 1.4.7 Genomics
- 1.4.8 Gene expression
- 1.4.9 Epigenetics
- 1.4.10 Integrated relationships

1.5 Evolution and Ecology

- 1.5.1 Natural selection
- 1.5.2 Population genetics/speciation
- 1.5.3 Animal behavior
- 1.5.4 Ecology
- 1.5.5 Integrated relationships

Survey of Natural Sciences: General Chemistry

30 items

1. Stoichiometry and General Concepts

- A. Percent composition
- B. Empirical formulae
- C. Balancing equations
- D. Moles and molecular formulas
- E. Molar mass
- F. Density
- G. Calculations from balanced equations

2. Gases

- A. Kinetic molecular theory of gases
- B. Dalton's gas law
- C. Boyle's gas law
- D. Charles's gas law
- E. Ideal gas law

3. Liquids and Solids

- A. Intermolecular forces
- B. Phase changes
- C. Vapor pressure
- D. Structures
- E. Polarity
- F. Properties

4. Solutions

- A. Polarity
- B. Properties
 - 1. Colligative
 - 2. Non-colligative
- C. Forces
- D. Concentration calculations

5. Acids and Bases

- A. pH
- B. Strength
- C. Brønsted-Lowry reactions
- D. Calculations

6. Chemical Equilibria

- A. Molecular
- B. Acid/base
- C. Precipitation
- D. Calculations
- E. Le Chatelier's principle

7. Thermodynamics and Thermochemistry

- A. Laws of thermodynamics
- B. Hess's law
- C. Spontaneity
- D. Enthalpies and entropies
- E. Heat transfer

8. Chemical Kinetics

- A. Rate laws
- B. Activation energy
- C. Half-life

9. Oxidation-Reduction Reactions

- A. Balancing equations
- B. Determination of oxidation numbers
- C. Electrochemical calculations
- D. Electrochemical concepts and terminology

10. Atomic and Molecular Structure

- A. Electron configuration
- B. Orbital types
- C. Lewis-Dot diagrams
- D. Atomic theory
- E. Quantum theory
- F. Molecular geometry
- G. Bond types
- H. Sub-atomic particles

11. Periodic Properties

- A. Representative elements
- B. Transition elements
- C. Periodic trends
- D. Descriptive chemistry

12. Nuclear Reactions

- A. Balancing equations
- B. Binding energy
- C. Decay processes
- D. Particles
- E. Terminology

13. Laboratory

- A. Basic techniques
- B. Equipment
- C. Error analysis
- D. Safety
- E. Data analysis

Survey of Natural Sciences: Organic Chemistry

30 items

1. Mechanisms: Energetics and Structure

- A. Elimination
- B. Addition
- C. Free radical
- D. Substitution mechanisms
- E. Other

2. Chemical and Physical Properties of Molecules

- A. Spectroscopy
 - 1. ^1H NMR
 - 2. ^{13}C NMR
 - 3. Infrared
 - 4. Multi-spectra
- B. Structure
 - 1. Polarity
 - 2. Intermolecular forces (solubility, melting/boiling point, etc.)
- C. Laboratory Theory and Techniques (i.e. TLC, separations, etc.)

3. Stereochemistry (Structure Evaluation)

- A. Chirality
- B. Isomer relationships
- C. Conformations

4. Nomenclature

- A. IUPAC rules
- B. Functional groups in molecules

5. Individual Reactions of the Major Functional Groups and Combinations of Reactions to Synthesize Compounds

- A. Alkene/Alkyne
 - 1. General
 - 2. One-step
 - 3. Multi-step

- A. B. Aromatic
 - 1. General
 - 2. One-step
 - 3. Multi-step
- B. C. Substitution/Elimination
 - 1. General
 - 2. One-step
 - 3. Multi-step
- C. D. Aldehyde/Ketone
 - 1. General
 - 2. One-step
 - 3. Multi-step
- D. E. Carboxylic acids and derivatives
 - 1. General
 - 2. One-step
 - 3. Multi-step
- E. F. Other
 - 1. General
 - 2. One-step
 - 3. Multi-step

6. Acid-Base Chemistry

- A. A. Ranking Acidity/Basicity
 - 1. Structure Analysis
 - 2. pH/pKa data analysis
- C. B. Prediction of products and equilibria

7. Aromatics and Bonding

- A. Concept of aromaticity
- B. Resonance
- C. Atomic/molecular orbitals
- D. Hybridization
- E. Bond angles/lengths

Reading Comprehension

The Reading Comprehension Test contains three science-based reading passages and requires no prior knowledge of the topics covered other than basic undergraduate preparation in science. The test measures the ability to comprehend, organize, analyze, and remember the information presented.

Each reading passage is 900 -1,600 words in length and is followed by 12-20 items, which can be answered from a reading of the passage. The total number of items for all three passages is 50.

Physics

40 items

- | | |
|---------------------------|---------------------------------------|
| 1. Units and Vectors | 9. Fluid Statics |
| 2. Linear Kinematics | 10. Thermodynamics and Thermal Energy |
| 3. Statics | 11. Electrostatics |
| 4. Dynamics | 12. D.C. Circuits |
| 5. Rotational Motion | 13. Optics |
| 6. Energy and Momentum | |
| 7. Simple Harmonic Motion | |
| 8. Waves | |

Quantitative Reasoning

40 Items

1. Mathematical Problems

- 1.1 Algebra
 - 1.1.1 Equations and expressions
 - 1.1.2 Inequalities
 - 1.1.3 Exponential notation
 - 1.1.4 Absolute value
 - 1.1.5 Ratios and proportions
 - 1.1.6 Graphical analysis

1.2 Data Analysis

1.3 Interpretation and Sufficiency

1.4 Quantitative Comparison

1.5 Probability and Statistics

2. Applied Mathematics (Word) Problems

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