

AP Biology 2013 Scores: A Summary

From the College Board:

2013 AP Biology Exam Results

The AP Biology course and exam were redesigned to provide a learning experience that improves readiness for college placement and credit, focused on both the content and the skills (quantitative, laboratory, etc.) most higher education institutions are expecting students to know and be able to do to merit exemption from the introductory college biology course.

In the past, the AP Biology course lacked specificity about the exact tasks students would be required to perform with their biological content knowledge. Accordingly, teachers felt tremendous pressure to cover all possible topics within a college-level biology textbook, and many felt they had to sacrifice in-depth study of key concepts and the development of students' ability to perform the mathematics, experimental design, and analysis skills essential to science majors and careers. In fact, across all AP subjects, AP Biology teachers reported the lowest levels of satisfaction with the breadth/depth balance of their course.

On June 18–19, college professors and AP teachers from a range of institutions convened to review each of the redesigned AP Biology Exam questions, and 1,182 college students' performance on such questions. The college students' responses to the AP exam questions were scored alongside AP students' exams at this year's AP Biology Reading. Using an established standard-setting methodology (known as modified Angoff), and basing their judgments on achievement level descriptions grounded in the redesigned AP Biology program's required content and skills, the panelists reached consensus on the number of points needed for each AP score of 1, 2, 3, 4, and 5.

Multiple-Choice Results

Educators and students had reported perceptions that the multiple-choice section was easy, that it did not require content knowledge, or that it was a test of reading comprehension. None of these perceptions proved accurate. The panelists who took the exam themselves felt that the questions effectively balanced required content knowledge with fundamental quantitative, analysis, experimental design, and data interpretation skills. Student performance does not indicate that the section was easy. In fact, the results show that AP Biology students on average are not yet performing as well as college students on such tasks.

On the multiple-choice and grid-in questions, AP Biology students scored, on average, 61% correct.

By way of comparison, the mean score on the "old" AP Biology Exam (2012) multiple-choice section was 63% correct.

Other details on this year's multiple-choice section:

123 students (out of 189,982) answered all multiple-choice questions, including the grid-ins, correctly.

Eleven questions focused on content from Big Idea 1. The average score on these questions was 64% correct.

Twenty-one questions focused on content from Big Idea 2. The average score on these questions was 60% correct.

Fourteen questions focused on content from Big Idea 3. The average score on these questions was 55% correct.

Thirteen questions focused on content from Big Idea 4. The average score on these questions was 65% correct.

Eighteen questions required application of Science Practice 1. The average score on these questions was 61% correct.

Four questions required application of Science Practice 2. The average score on these questions was 48% correct.

Four questions required application of Science Practice 3. The average score on these questions was 61% correct.

Five questions required application of Science Practice 4. The average score on these questions was 62% correct.

Eight questions required application of Science Practice 5. The average score on these questions was 63% correct.

Eighteen questions required application of Science Practice 6. The average score on these questions was 63% correct.

Ten questions required application of Science Practice 7. The average score on these questions was 56% correct.

Twenty-one questions were lab sets. The average score on these questions was 63% correct.

Grid-In Questions

Five questions in a new grid-in question type required students to meet college biology's standards for use of mathematics to solve biological problems and understand biological concepts.

The performance of AP Biology students on these questions was very low, with an average correct score of just 36%.

Some have asked whether the length of the exam or uncertainty about whether to proceed to these questions impacted these results. We examined these possibilities closely and found no evidence of any impacts. AP Biology students completed the exam at rates consistent with prior years. A persistent misunderstanding has been that the exam contained a stop sign at the bottom of the page prior to the grid-in questions. That is not the case. There was no stop sign on the page. The exact directions were: "End of Part A. Do not stop. Go on to Part B." Moreover, we found that students completed the 5 grid-in questions at the same rate as a control group of students who piloted the exam and were given the signal of an arrow at the bottom of the page. To reduce any risk of student confusion, we will stress the need to turn the page in future exams, but the evidence shows that there was no negative effect on student completion rates for these questions this year.

Specific details about student performance on the grid-ins:

7.5% of students answered all 5 grid-ins correctly

11.7% of students answered 4 grid-ins correctly

14.3% of students answered 3 grid-ins correctly

16.1% of students answered 2 grid-ins correctly

18.7% of students answered 1 grid-in correctly

31.7% of students answered 0 grid-ins correctly

Free-Response Questions

Each free-response question was aligned to multiple learning objectives. These multiple alignments provided students with an expanded opportunity to demonstrate knowledge and application of the science practices within the free-response section of the exam.

Question 1: Fruit fly behavior

Out of 10 points possible, the average was low: 3.6. Only 2.5% of all AP Biology students earned more than 7 points on this question. This question measured Learning Objectives 2.21, 2.23, 2.24, 2.38, 3.40, 3.41, 3.44, 3.45, 3.46, 4.14, and 4.16.

Question 2: Photosynthetic pigments

Out of 10 points possible, the average was low: 3.7. While 17.9% of AP Biology students earned more than 7 points on this question, 21% were unable even to earn a single point on it. This question measured Learning Objectives 1.2, 1.12, 1.13, 1.25, 2.24, 2.5, 4.4, 4.5, and 4.6.

Question 3: Transitional species

Out of 4 points possible, the average was 2.55 (63% of points possible for this question). Many students did well on this question: 13% earned all 4 points, and 43.3% earned 3 points. 8% earned 0 points. This question measured Learning Objectives 1.9, 1.10, 1.11, and 1.12.

Question 4: Carbon cycle

Out of 4 points possible, the average was 1.64 (41% of the points possible for this question). 28.9% of AP students earned 0 points. 13.4% of AP students earned all 4 points. This question measured Learning Objectives 1.15, 2.5, 2.9, 4.6, and 4.15.

Question 5: Polypeptide comparisons

Out of 4 points possible, the average was just 1.18 (30% of the points possible for this question). 44.9% of AP students earned 0 points. 8.2% of AP students earned all 4 points. This question measured Learning Objectives 3.26, 4.1, and 4.3.

Question 6: Organelles in different cell types

This question, highly regarded by colleges as a measure of Learning Objectives 2.5 and 4.6, had the lowest performance of any of the free-response questions. The average was 0.69 on the 3-point rubric (23% of the points possible for this question). 49.4% of students earned 0 of the 3 points possible, and just 2.1% of AP students earned all 3 points.

Question 7: Effect of alcohol on urine production

This question had the highest performance of any of the free-response questions. Out of 3 points possible, the average was 2.19 (73% of the points possible for this question). 58.6% of students earned all 3 points possible, and 13.5% earned 0 points. This question measured Learning Objectives 2.10, 2.22, 2.23, 2.24, 2.25, 4.8, and 4.14.

Question 8: Hormone-signaling pathway

Out of 3 points possible, the average was 0.9 (30% of the points possible for this question). 53.5% of students earned 0 points on this question. 13.8% of students earned all 3 points possible. This question measured Learning Objectives 3.22 and 3.23.

The low student performance, in general, on most of the free-response questions had a significant impact on this year's AP scores.

AP Biology Score Distribution:

The standard setting panel, comprised of 10 college professors and 6 AP Biology teachers, reviewed each multiple-choice, grid-in, and free-response question on the exam to determine what level of student performance on each question is required for AP scores of 2, 3, 4, and 5.

To receive an AP score of 5, the panelists found that students should earn a minimum of 78 total raw score points across the multiple-choice, grid-in, and free-response questions.

So to earn an AP score of 5, a student would, for example, need to answer 47 out of 58 multiple-choice and grid-in questions correctly and 31 points across the 8 free-response questions. (To earn 31 points on the free-response section, one possible combination is: 8/10, 8/10, 3/4, 3/4, 3/4, 2/3, 2/3, and 2/3.)

Given the critical knowledge and skills measured on each of the free-response sections, and their tight alignment to the AP Biology Learning Objectives, we are confident educators will agree with the panelists' (both college professors' and AP teachers') insistence that a minimum of 78 points should be required for AP students to receive a score of 5.

To receive an AP score of 4, the panelists found that students should earn a minimum of 64 total raw score points across the multiple-choice, grid-in, and free-response questions.

To receive an AP score of 3, the panelists found that students should earn a minimum of 45 total raw score points across the multiple-choice, grid-in, and free-response questions.

To receive an AP score of 2, the panelists found that students should earn a minimum of 26 total raw score points across the multiple-choice, grid-in, and free-response questions.

The resulting AP Biology score distribution for 2013 is:

AP Score	Raw Points Required (out of 99)	Percentage of AP Bio Students in 2013
5	78	5.4
4	64	21.4
3	45	36.3
2	26	29.5
1		7.4