5A Physical Science Assessment Report

Dashboard link:
[B1](#)
Student Survey [link](#)
[https://analytics.csueastbay.edu/t/Public/views/GEB1and2Fall23/Overview?%3Aembed=y&%3Aiid=1&%3AisGuestRedirectFromVizportal=y](#)

PURPOSE AND BACKGROUND

The overarching purpose of assessment in General Education (GE) is to enhance and improve undergraduate student learning experiences afforded by the GE program at Cal State East Bay. Looking beyond the CSU Chancellor's Office and WASC accreditation requirements which necessitate GE assessment ([EO 1100](#), Section 6.2.5), the true value of GE assessment extends from how we collaboratively make meaning of assessment results to inform improvements in GE.

GE learning outcomes are aligned to the [Institutional Learning Outcomes (ILOs)](#), [WASC Core Competencies](#), and [AAC&U's LEAP Essential Learning Outcomes](#), all of which express the knowledge, skills, and values CSUEB graduates are expected to attain. Collectively, CSUEB's GE learning outcomes and ILOs distinguish who we are, what we value, and how we expect students to demonstrate their learning. Thus, the assessment of GE outcomes enables our campus community to gauge how effective we are in helping our students attain these outcomes.

The General Education Long-term Assessment Plan for 2022-2027 [22-23 CAPR 39](#) (which supercedes [18-19 CAPR 2](#)) details a consistent, rigorous assessment process.

THE PROCESS

To date, General Education Area B1 (5A) Physical Sciences has never been assessed at East Bay. In Spring 2023, the Office of General Education asked faculty who were teaching our Physical Sciences to revise the learning outcomes for these areas to better align with our teaching practices. The faculty then created the first rubric (see Appendix below for learning outcomes and rubric).

In Fall 2023 GE collected assignments from 5A courses. We collected assignments from 3 courses from Chemistry (one course) and Physics (two courses, three

sections), with a total of four sections. GE had issues with finding more courses from 5B for assessment so the assessment itself was delayed by an academic year.   Five unfunded assessors who taught B1 or B2 were chosen through CAPR's GE Assessment subcommittee and assessment took place in Spring 2025. Ten assignments were randomly selected from each section and each assignment was assessed by two trained assessors. Results were sent to Institutional Effectiveness and Research, who pulled student demographic data and then created the dashboard with our results.

ASSESSMENT RESULTS (H1)

B1(5A) Physical Science

Interrater Reliability

Before looking at the results, it should be noted that the assessment team had very good interrater reliability scores. The interrater reliability shows that the five assessors gave student assignments the same scores or a difference of 1 (i.e., one assessor gave an assignment a score of 3 in one category with the second assessor gave the same assignment, in the same category, a 4) between 91% and 92%.

92% 0 or 1 for Application
91% 0 or 1 for Concepts
92% 0 or 1 for Evaluation

The rubric for B1 (5A) has three criteria: Application ("Articulate knowledge of scientific concepts"), Concepts ("Evaluation of scientific theories, concepts, and/or interpretation of data," and Evaluation ("Use scientific practices, methods, arguments and/or describe accepted standards/ethics associated with scientific inquiry").

The overall assessment results show that our students are proficient (a 3 or 4 in a 1-4 scale) in Application (79.5%) and almost proficient in Evaluation (74.4% of students received a 3 or 4). 72% of the students received a 3 or a 4 for Concepts. These show that most of our students who took these B1/5A courses were at proficiency or very close for our learning outcomes while 17% of the students received a 2 (some gaps) and 4% received a score of 1 (major gaps) for Application, while 24% received a score of 2 and 4% received a 1 for Concepts. 21% of students received a score of 2 and 5% a score of 1 for Evaluation. See Figure 1 below.

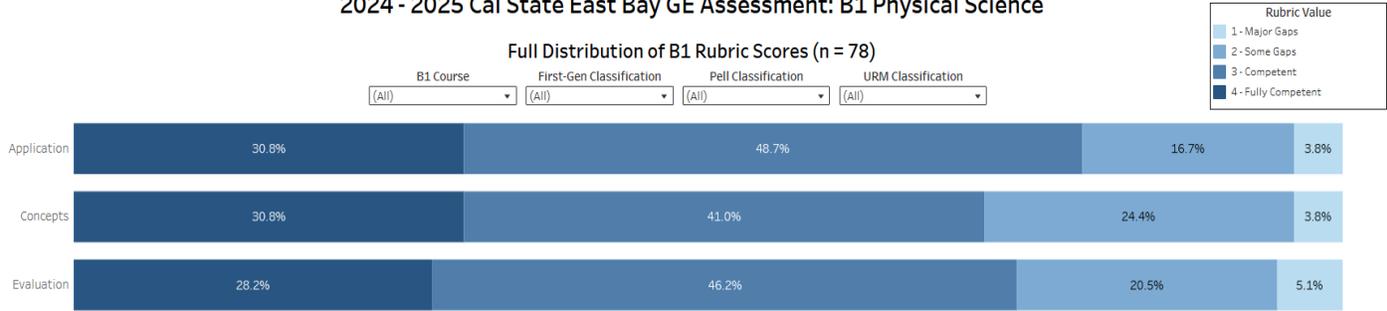2024 - 2025 Cal State East Bay GE Assessment: B1 Physical Science

Full Distribution of B1 Rubric Scores (n = 78)

| B1 Course | First-Gen Classification | Pell Classification | URM Classification |
| (All) ▼ | (All) ▼ | (All) ▼ | (All) ▼ |

Rubric Value
- 1 - Major Gaps
- 2 - Some Gaps
- 3 - Competent
- 4 - Fully Competent

Application	30.8%	48.7%	16.7%	3.8%
Concepts	30.8%	41.0%	24.4%	3.8%
Evaluation	28.2%	46.2%	20.5%	5.1%

Fig 1 showing full distribution of scores for all assessed courses/sections.

The set of data below shows the percentage of scores (4,3,2,1) for each of the three areas (Application, Concepts, and Evaluation), broken down by First Gen vs Non First Gen, Pell vs Non Pell, and URM vs Non URM.
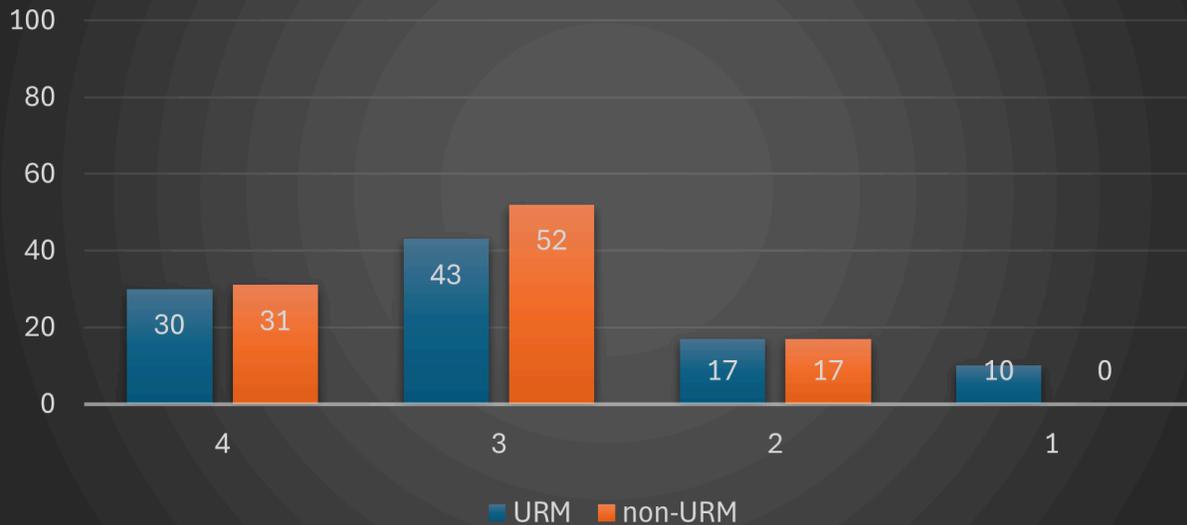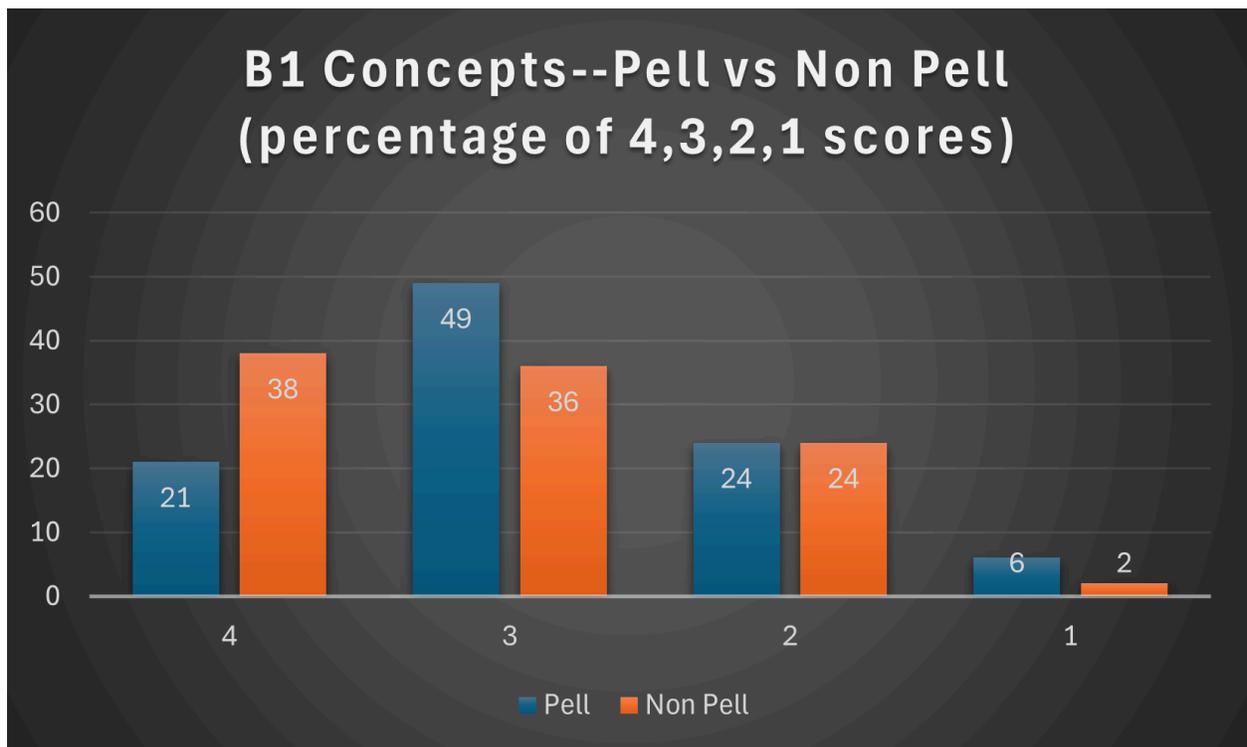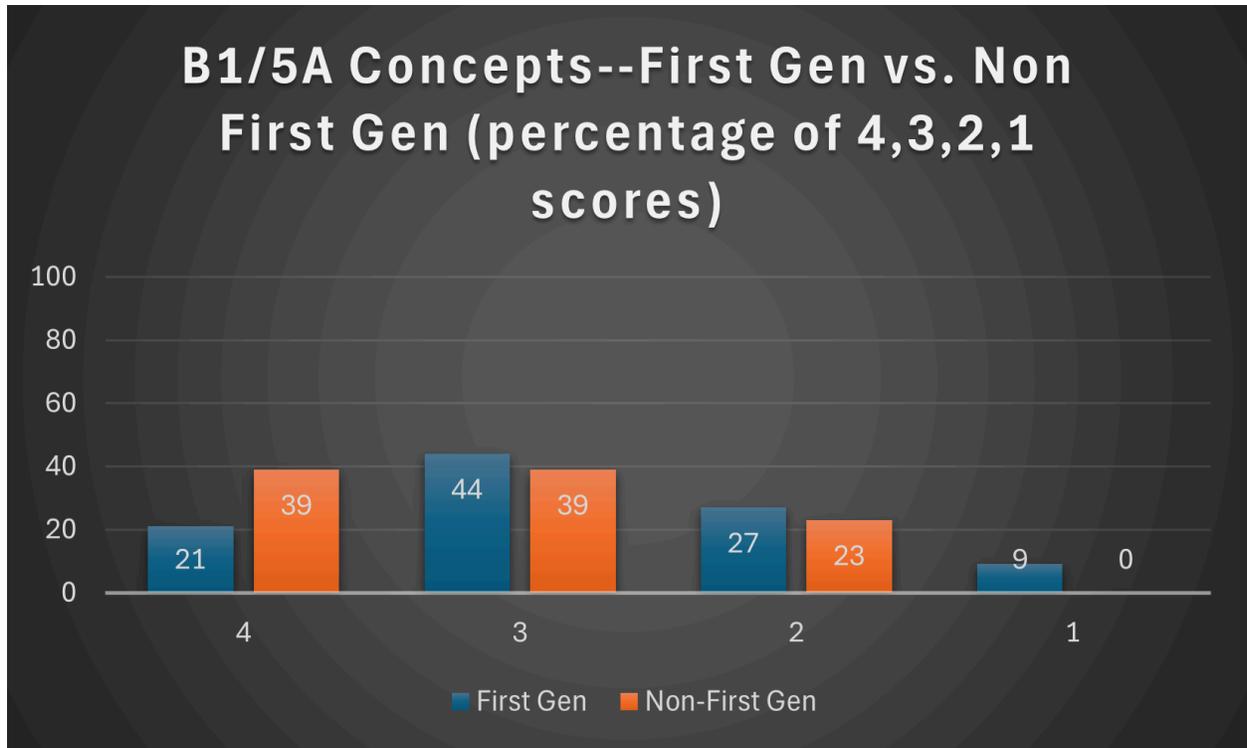
Application Criterion

B1/5A Application--First Gen vs Non First Gen (percentage of 4,3,2,1 scores)

Score	First Gen	Non-First Gen
4	24	36
3	47	50
2	24	11
1	6	2
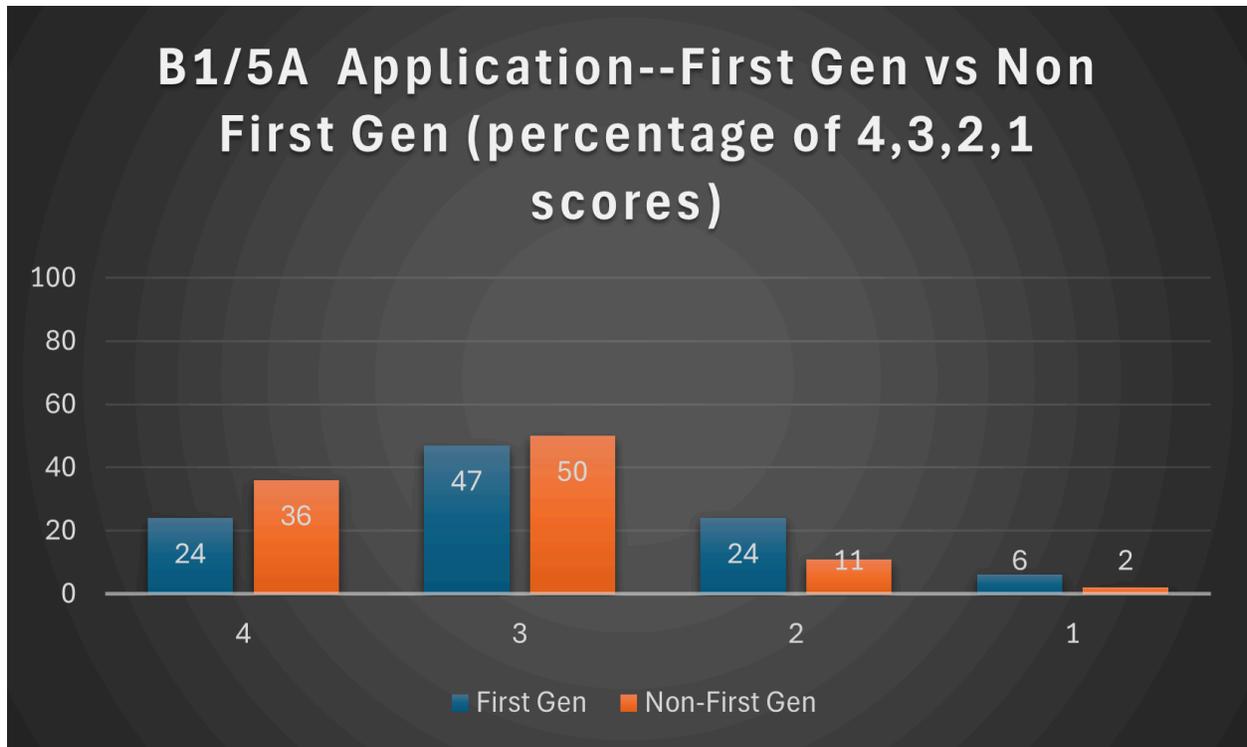
B1 Application--Pell vs Non Pell (percentage of 4,3,2,1 scores)

Score	Pell	Non Pell
4	24	36
3	42	53
2	24	11
1	9	0

B1 Application--URM vs Non URM (percentage of 4,3,2,1 scores)

Score	URM	non-URM
4	30	31
3	43	52
2	17	17
1	10	0

Concepts Criterion

B1/5A Concepts--First Gen vs. Non First Gen (percentage of 4,3,2,1 scores)

B1 Concepts--Pell vs Non Pell (percentage of 4,3,2,1 scores)

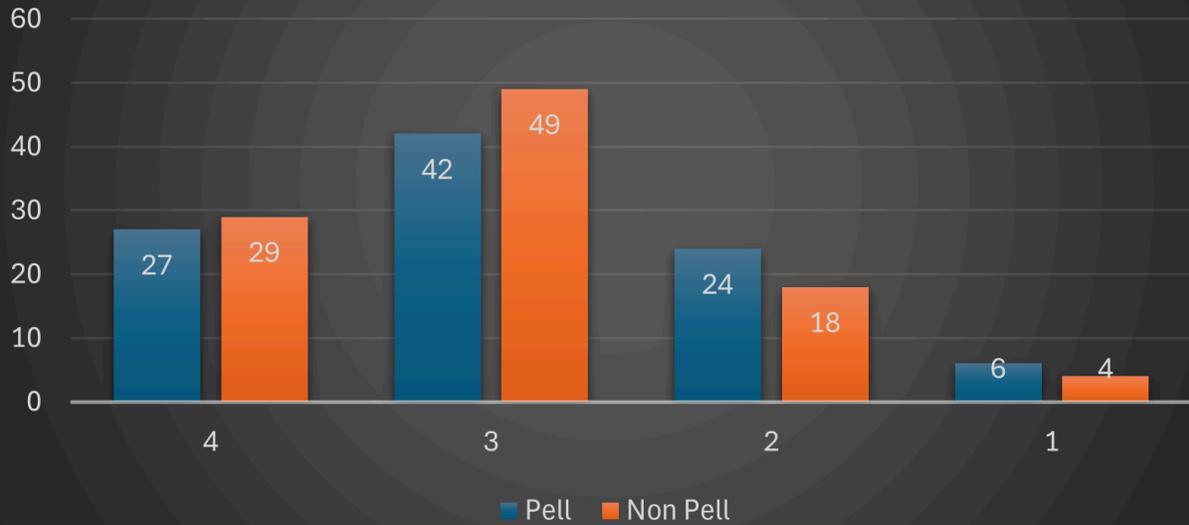B1 Concepts--URM vs Non URM (percentage of 4,3,2,1 scores)
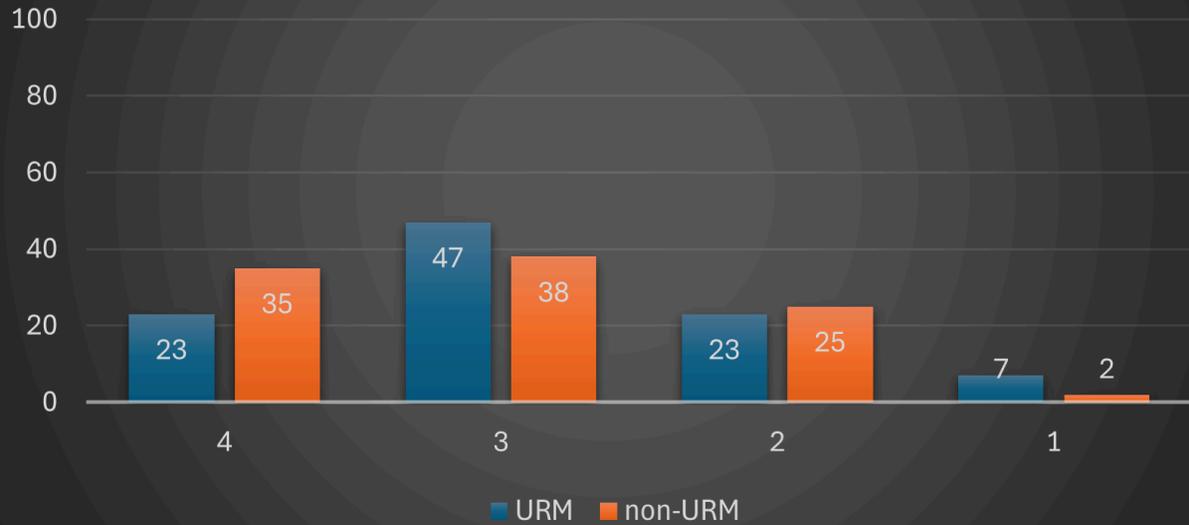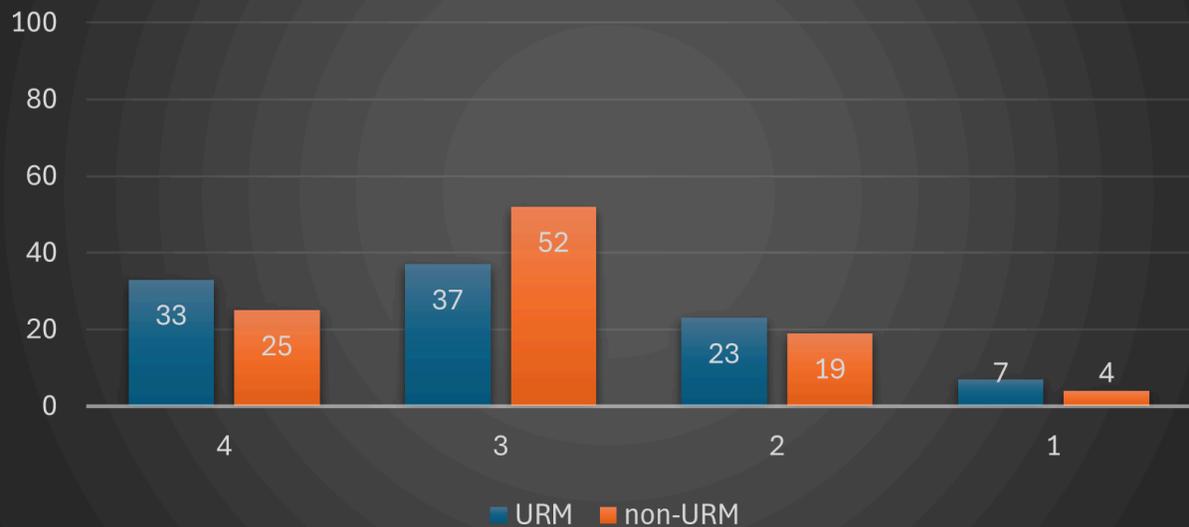
Evaluation Criterion

B1/5A Evaluation--First Gen vs. Non First Gen (percentage of 4,3,2,1 scores)
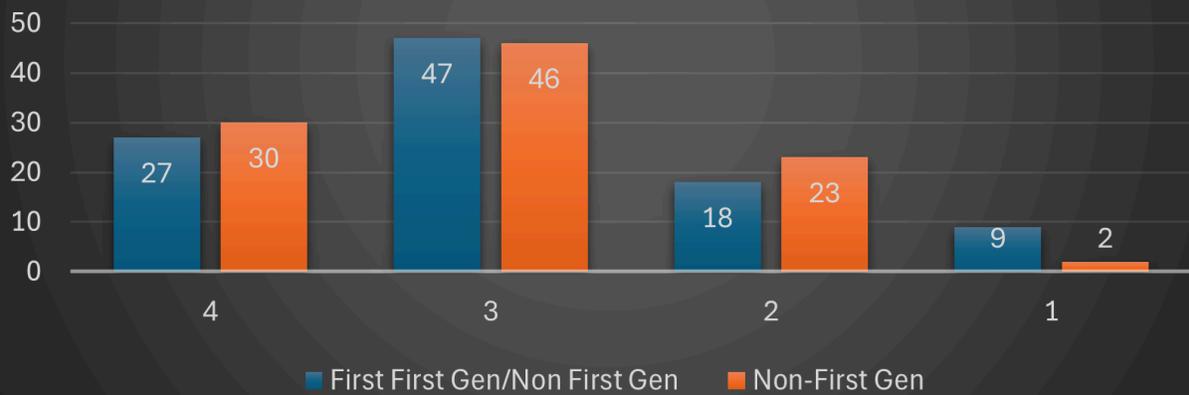
B1 Evaluation--Pell vs. Non Pell
(percentage of 4,3,2,1 scores)

B1 Evaluation--URM vs Non URM
(percentage of 4,3,2,1 scores)

Average Score

If we look at the average rubric score for B1 (combining 4, 3, 2, and 1), we see that all of our students are at proficiency. Below is a breakdown of the data of our non-Pell, non-URM, and non-First Gen students average scores and it shows that our Pell, URM, and First Gen students are all receiving scores that are less than our non-Pell, non-URM, and non-First Gen students except in Evaluation where our URM and non-URM received the same average score.
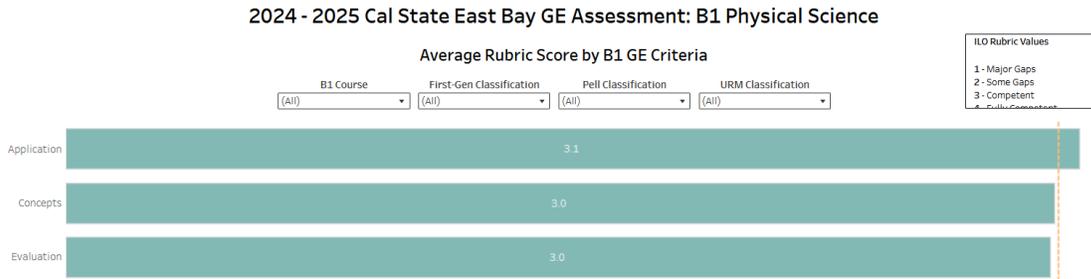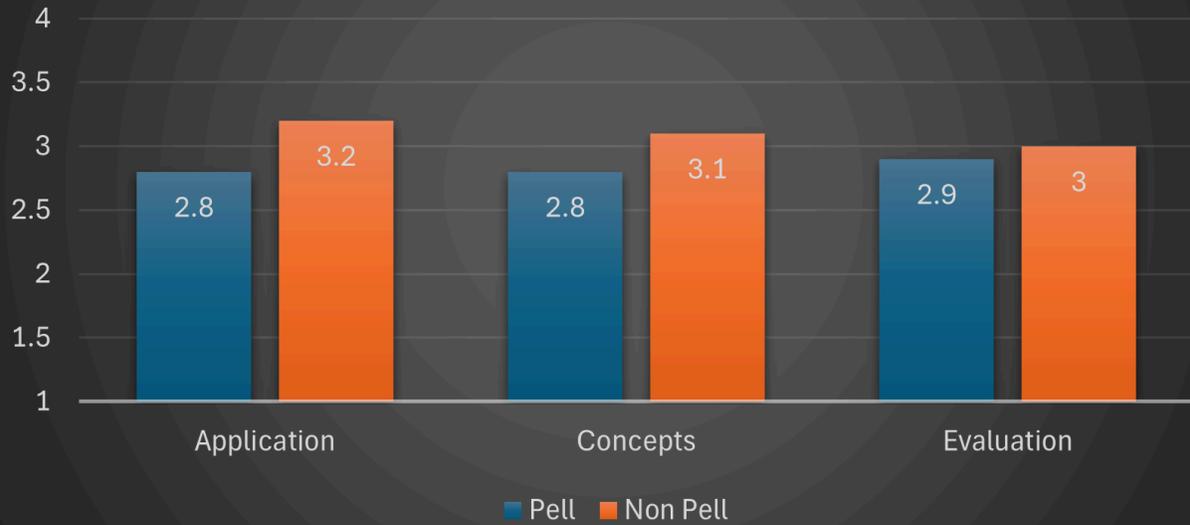

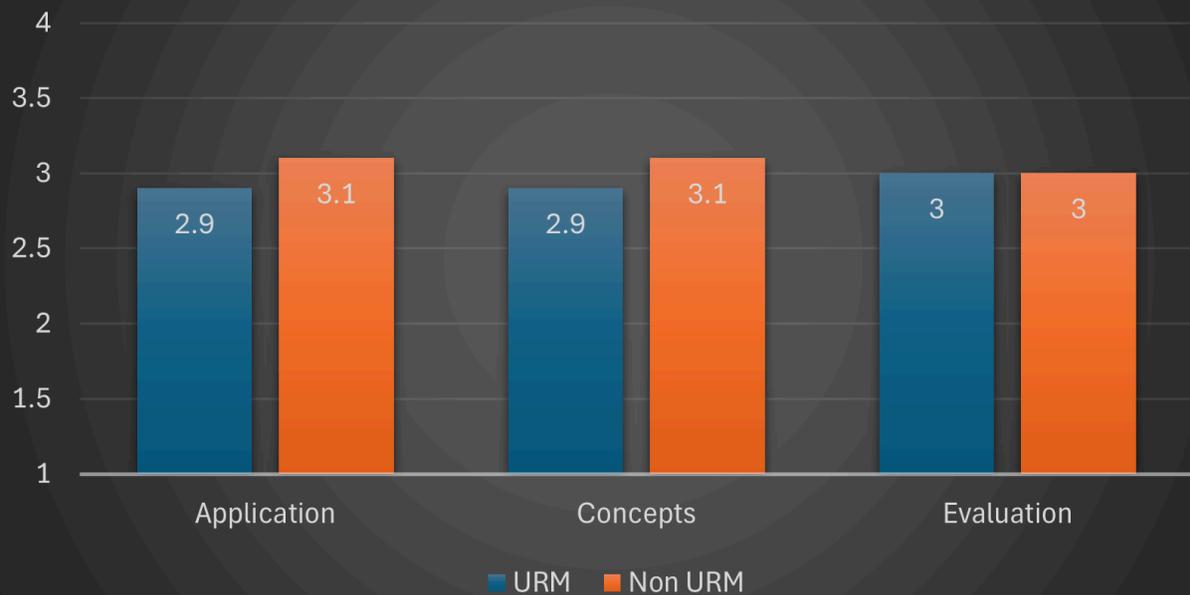**Average Score First Gen vs Non First Gen**
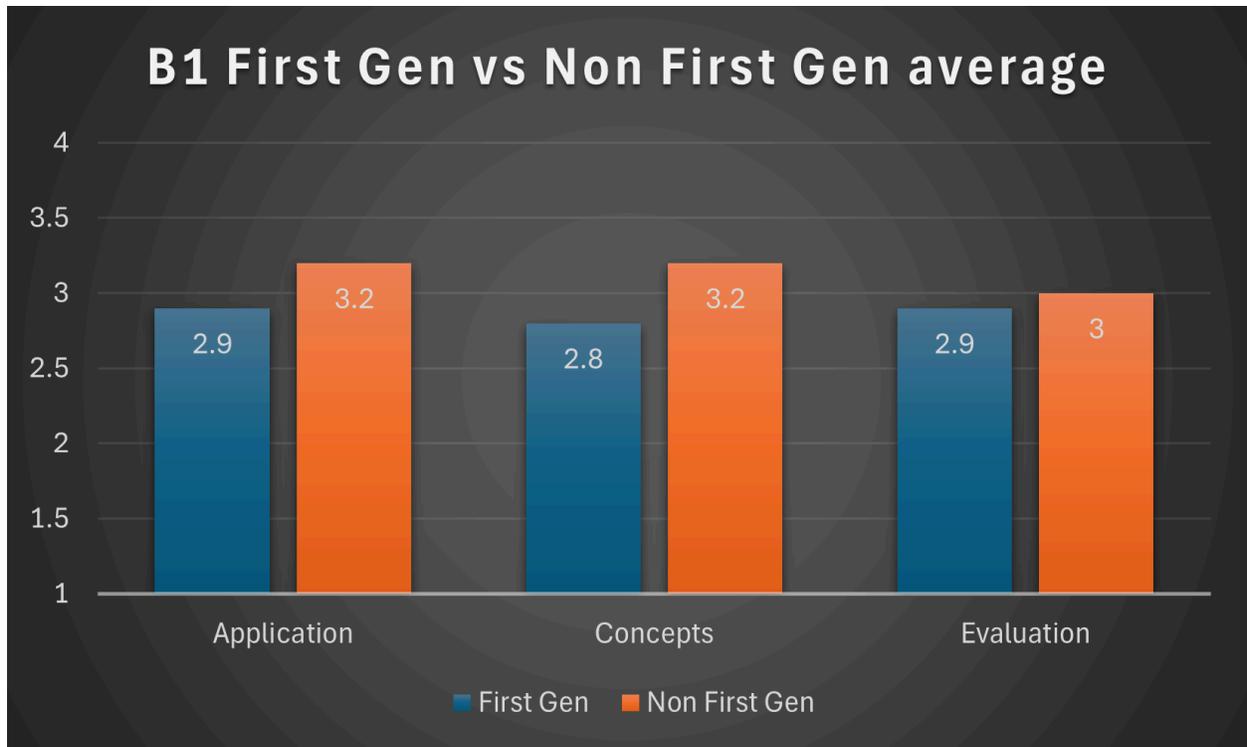
Average Score Pell vs. Non Pell

B1 Pell vs Non Pell average score

Average Score URM vs Non URM

B1 URM vs non URM average score

Student Survey Results for B1

Students in the assessed sections were sent a survey asking them to comment on their perceived success (in terms of the learning outcomes) in the course. Here is the [link to the dashboard](#) with the results. Please click through the results as well as the second tab that reports results about specific questions.

Selected Assessment Comment from faculty assessors

"It would be helpful if the instructors could provide an assignment-specific rubric that conforms with the main rubric. As a non-specialist, I don't know all the elements of every assignment. The different assessors may be picking at different elements and I don't know what is more important or less important."

CONTINUAL IMPROVEMENT/CLOSING THE LOOP and NEXT ACTION STEPS

The results from this GE B1/3 (5A/5C) assessment are intended to promote discussion across the campus community about how we support our students in attaining the physical science outcomes, and ultimately, to inform improvements in the learning experiences in GE 5A/C courses and beyond.

The following questions are part of the continuous improvement/closing the loop activity for departments to fill out and return to the Office of General Education (kevin.kaatz@csueastbay.edu and nancy.white@csueastbay.edu) by end of Spring, 2026. The questions will help guide a specific action plan to improve student success for our 5A courses.
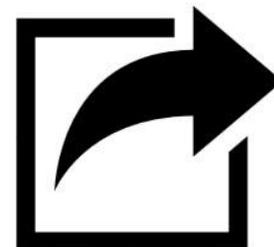
- How are these data consistent with your experience as a department/instructor?
- How can your department improve the student success of our First Generation, Pell, and URM students who are taking these courses?
- As you look through the Student Survey results, what trends do you see and how can student learning be improved, based on these specific results? (The 5A and 5B results are mixed together)
- Overall, what steps do you think could be taken to improve student success in general?
- Do you have any advice on updating the learning outcomes and/or rubric for future assessment projects?

Appendix Rubric and B1/2 Learning Outcomes

Upon completion of the GE Area 5A requirement, students will be able to:
1. Demonstrate knowledge of scientific theories, concepts, and data about the physical sciences;
2. Demonstrate an understanding of scientific practices, including the scientific method; and
3. Describe the potential limits of scientific endeavors, including the accepted standards and ethics associated with scientific inquiry.

DIMENSION	PERFORMANCE DESCRIPTORS BY LEVEL			
	4 Exceeds Expectations	3 Meets Expectations	2 Needs Improvement	1 Does not meet expectations
Concepts Articulate knowledge of scientific concepts.	Comprehensive articulation; thoroughly captured the main idea(s).	Adequate articulation; captured main idea(s) at a basic level.	Limited articulation; some misunderstanding of the main idea(s).	Little to no articulation of the main idea(s).
Evaluation Evaluation of scientific theories, concepts, and/or interpretation of data.	Evaluation or interpretation is thorough, correct, and clearly presented.	Evaluation or interpretation is mostly correct.	Evaluation or interpretation has multiple errors.	Evaluation or interpretation is incorrect.
Application Use scientific practices, methods, arguments and/or describe accepted standards/ethics associated with scientific inquiry.	Application thoroughly demonstrates comprehension.	Application adequately demonstrates comprehension; missing no more than one element.	Application demonstrates limited comprehension; missing multiple elements.	Application demonstrates little to no comprehension.