Pittsburgh Public Schools Goal Monitoring Report: Keystone Biology, First-Time Test Takers

Introduction and Goal

This report presents the Pittsburgh Public Schools' (PPS) progress towards improving biology proficiency among first-time Keystone Exam test takers. It is important to focus on students taking the Keystone Biology exam for the first time because it's one of three Keystone exams needed to meet graduation requirements. Students can take the exam more than once if they do not pass the first time. However, our science classes after biology (chemistry, and physics) do not provide enough support to help students who need to take the biology exam a second or third time. The goal for the 2024-2025 school year is to achieve a 35.7% proficiency rate among first-time biology test takers. This represents a steady increase from the 24.0% baseline set in the 2020-2021 school year, ultimately contributing to the district's broader five-year goal of achieving a 41.5% proficiency rate by 2027. Improving first-time biology proficiency rates is essential in reducing the need for remediation and retakes based on the previously mentioned course continuum, ensuring students are on track to meet graduation requirements without additional obstacles.

Why Focus on Biology Keystone First-Time Test Takers?

Unlike the PSSA exams (administered one time at various times during grades 3-8), which assess student learning by grade level, the Keystone Biology Exam is administered upon the completion of the biology course, typically in 9th grade and in one of our schools, 10th grade. Students who do not achieve proficiency the first time have multiple opportunities until the end of 11th grade to achieve proficiency. The Keystone Biology Exam consists of questions grouped into two modules: Module 1-Cells and Cell Processes and Module 2-Continuity and Unity of Life. To reach proficiency, students need an average score of 1500 from both modules of the Keystone exam. Each time students take the Keystone exam; their scores are saved. The highest score from each module is always used to help reach the 1500 average, which means they can improve their proficiency score over time. The focus on first-time test takers is important because, as students move on to chemistry and physics, there is no guarantee students will receive continued biology support. This is because chemistry and physics teachers hold certifications specific to their subjects, which do not include biology, limiting the availability of assistance for students who need to retake the exam.

Biology Curriculum and Instructional Approach

To support stronger outcomes on the Biology Keystone Exam, PPS purchased new instructional materials aligned with the Next Generation Science Standards (NGSS) as well as the new and upcoming Pennsylvania Science, Technology, Engineering, Environmental Literacy, and Sustainability (STEELS) Standards. The National Geographic: Biology (Cengage, 2023) instructional materials were selected following a rigorous review process involving teachers and parents, ensuring alignment with NGSS and STEELS standards while incorporating the latest advancements in science education. "National Geographic: Biology is the first high school biology program created with National Geographic images, photography, and explorers, a diverse group of scientists and engineers hand-picked by National Geographic for their innovation and storytelling. Students will build their fundamental biology knowledge with 3-dimensional, phenomena-based lessons that include engaging text, visuals, hands-on labs and investigations, and a powerful digital platform called MindTap. MindTap includes an interactive eBook with embedded videos featuring National Geographic Explorers, interactive simulations, and Virtual Labs that transport students alongside Explorers to different sites for virtual adventures and biology research."

Implementation Challenges and Supports

The transition to the new National Geographic*:* Biology instructional materials represents a significant step forward for Pittsburgh Public Schools (PPS) in aligning science instruction with NGSS and STEELS standards. The alignment of phenomena-driven, inquiry-based materials provides students with a more engaging and rigorous science learning experience, equipping them with the critical thinking and analytical skills necessary for success on the Keystone Biology Exam.

As with any large-scale adoption of new materials, ensuring seamless implementation across all schools requires a multi-faceted approach that includes comprehensive professional development, timely access to instructional materials, curriculum creation to accompany instructional materials, and ongoing support to reinforce best practices. While PPS has made substantial progress in distributing the new instructional materials, we recognize that adjustments in professional learning and curriculum pacing are necessary to maximize the impact of these resources.

One area of focus moving forward is enhancing professional learning participation and engagement. While all nineteen (19) Biology teachers had access to training on the new instructional materials, participation rates varied throughout the year. Early engagement was strong, with teachers demonstrating enthusiasm for the phenomena-based instructional approach, but participation in later sessions declined. As we continue supporting this transition, our goal is to increase attendance and accessibility to professional learning opportunities, ensuring that all educators feel confident in implementing the curriculum effectively.

Additionally, the delivery of hands-on laboratory materials and classroom resources occurred at different times throughout the year, which required some schools to adjust their instructional approaches while awaiting supplies. Despite these logistical challenges, PPS remains committed to ensuring that all teachers and students have the resources they need to engage in meaningful, inquiry-based learning experiences using the newly adopted instructional materials. Moving forward, we will strengthen coordination and communication to streamline material distribution so that every school receives the tools they need at the start of each academic term.

In addition to the instructional materials, PPS is working on developing additional instructional supports that align with Keystone-tested eligible content, ensuring that students are prepared not only for state assessments but also for deeper, long-term mastery of biological concepts. Looking ahead, PPS is committed to refining our implementation strategies, strengthening teacher support, and optimizing the use of curriculum resources to provide all students with a high-quality, engaging, and standards-aligned Biology education.

Keystone Accountability and Post-Pandemic Impact
In 2023, we achieved a significant milestone by meeting our Keystone Accountability goal (different than first time test takers) for the first time, with 34.5% accountability. This achievement marks an important step in our recovery from the disruptions caused by the pandemic.

The COVID-19 pandemic waiver granted by the U.S. Department of Education in 2019-2020 allowed students who passed their biology course that year to be granted automatic proficiency, meaning they were excluded from state accountability calculations. As a result, the number of students included in Keystone accountability fluctuated significantly, with 294 students counted in 2022, 1,137 in 2023, and 1,190 in 2024. The waiver created a disruption in proficiency tracking, making it difficult to assess long-term performance trends. In 2020, because of COVID-19, students were not required to take the Keystone Biology Exam. If they passed their biology class, they were automatically marked as proficient, but their scores were not recorded in the official school accountability report. This led to a significant drop in the number of students whose scores were counted in Keystone performance data, as seen in attachment A. SEE ATTACHMENT A

By 2022, the students who had skipped the exam in 2020 were now in 11th grade, the year when their scores would have normally factored into accountability measures. However, because many of them had been waived from testing, the official number of students counted in the report was significantly lower than in previous years. This explains why only 294 students were included in the 2022 accountability results, a sharp contrast to pre-pandemic years. As students began taking the exam again in 2023 and 2024, the reported numbers created growth towards pre-pandemic levels.

The Data
While Keystone Accountability measures the percentage of students meeting proficiency requirements based on their highest Keystone Exam scores, Keystone First Time Test Takers, results reflect the initial performance of students on the exams. While we successfully met the Keystone Accountability goal last year with a 34.5% accountability rate, we did not meet the Keystone Biology First Time Test Takers goal. The most recent Biology Keystone Exam results indicate that overall proficiency among first-time test takers (31.2% proficiency) remains below our desired goal (32.8% proficiency). The district-wide proficiency rate for first-time test takers is 31.2% (2024), reflecting a 4% increase from the previous year (2023). SEE ATTACHMENT B

Disaggregated data reveal significant performance gaps among student subgroups. The proficiency rate for white students is 57.3%, whereas African American students demonstrate a proficiency rate of 12.6%, resulting in a 44.7% gap. English Language Learners (ELL) have a proficiency rate of 32.9%, which is 1.7% higher than the district average. Students with Individualized Education Plans (IEPs) scored at 6% proficiency, marking a 25.2% gap compared to the district. Economically disadvantaged students achieved 19.2% proficiency, showing a 12% difference when compared to the district average and a 38.1% difference when compared to the leading subgroup, white students. SEE ATTACHMENT C

CDT Data - Administration 1&2 of 3

The Classroom Diagnostic Tool (CDT) has been administered twice this school year for Biology students in Pittsburgh Public Schools, first in the fall and most recently in the winter. The CDT Assessment completion rates for all subgroups, with the exception of white students were concerning, completion rates were in the 70-79% range for both the fall and winter administration for African American students, students with IEPs and Economically disadvantaged students. However, for those who did complete the assessment, the results from the second administration highlight an encouraging trend of improved performance across all subgroups. Between the fall and winter administrations, African American students saw a 5.6% increase in the percentage of students likely performing at or above grade level. White students demonstrated a more significant increase of 13.4%. Students with Individualized Education Plans (IEPs) improved by 5.4%, while English Language Learners (ELL) saw a 7.1% increase. Economically disadvantaged students experienced a 5.8% increase. On average, first-time test takers in Biology across the district improved by 8%, reflecting an upward trajectory in performance. SEE ATTACHMENT D

The total number of students included in Keystone accountability calculations has increased from 294 in 2022 to 1190 in 2024. The data continue to show disparities in proficiency rates across all measured subgroups. SEE ATTACHMENT A

The Interpretation

The data reflects both progress and ongoing challenges in achieving biology proficiency among first-time Keystone Exam test takers in Pittsburgh Public Schools. The district-wide increase in proficiency suggests an upward trend in student performance; however, significant gaps persist across student subgroups.

CDT results from the first and second administrations provide additional insight into student progress throughout the year. The observed increase in students performing at or above grade level indicates that instructional efforts are yielding some improvements across all student populations. However, the varying rates of improvement among subgroups highlight differences in the effectiveness of instructional approaches, resource access, and student preparedness. While overall proficiency rates have improved, the performance gap between white students and African American students remains substantial. Similarly, students with IEPs continue to score significantly below their peers, and economically disadvantaged students demonstrate lower proficiency rates when compared to the district average. These disparities indicate variations in student readiness, access to academic support, and alignment between classroom instruction and assessment expectations.

As the district continues to implement curriculum changes and strengthen instructional practices, the CDT data will serve as a valuable tool for identifying trends and guiding targeted interventions. The focus remains on ensuring that all students—regardless of background—receive the support needed to improve their understanding of biology and perform successfully on the Keystone Exam.

The Evidence and Plan

To address the proficiency gaps and improve outcomes for first-time test takers on the Biology Keystone Exam, Pittsburgh Public Schools (PPS) is implementing three strategic responses: Curriculum-Based Professional Learning, Access to Standards-Aligned Resources, and Data-Driven Instruction. These strategies are designed to ensure that teachers are equipped with the tools and knowledge necessary to provide high-quality biology instruction while also supporting students with targeted interventions that align with Keystone Exam expectations.

Strategy #1: Curriculum-Based Professional Learning

PPS is committed to ensuring that all Biology teachers and school leaders have a deep understanding of standards-aligned instruction to improve student engagement and comprehension. The professional learning approach will focus on phenomena-driven instruction, which allows students to connect biological concepts to real-world applications. This strategy will also emphasize inquiry-based learning, where students develop critical thinking skills through hands-on experimentation and analysis.

Key Components of This Strategy:

- **Virtual Professional Learning Series:** PPS will implement a structured series of virtual professional learning sessions to deepen teacher understanding of anchoring phenomena and instructional pedagogy. These sessions will focus on connecting science content to students' lived experiences, which is particularly important for historically underserved students.
- **March 7, 2025, Professional Learning Half-Day:** A dedicated half-day session will be used to prepare all Biology teachers for upcoming lab instruction, ensuring that teachers are confident in implementing hands-on learning experiences.
- **School Leadership Support:** Principals will receive ongoing professional learning through monthly Leadership Learning Institute (LLI) meetings, Network Meetings, and individualized support, ensuring that instructional best practices are reinforced at the building level.
- **Classroom Walkthroughs & Implementation Monitoring:** The Science Supervisor will conduct weekly classroom walkthroughs to track how well teachers are integrating anchoring phenomena and laboratory experiences into instruction. Data from these walkthroughs will be shared with principals and Assistant Superintendents to monitor progress and inform ongoing support.

This strategy ensures that both teachers and school leaders have the capacity to deliver rigorous, inquiry-based Biology instruction that supports student success on the Keystone Exam while fostering a deeper understanding of scientific concepts.

Strategy #2: Access to Standards-Aligned Resources

To enhance student preparedness for the Keystone Exam, PPS is aligning curriculum resources with tested content and providing teachers with structured supports to integrate Keystone-style practice into daily instruction. This approach ensures that students receive consistent exposure to high-leverage concepts and become familiar with test formats to reduce assessment-related anxiety.

Key Components of This Strategy:

- **Curriculum Mapping:** PPS will provide a clear instructional roadmap that aligns Biology coursework with Keystone Exam eligible content. This resource will help teachers intentionally connect classroom instruction to assessed concepts, ensuring students receive targeted instruction on key topics.
- **Released Keystone Items & Practice Integration:** A comprehensive resource bank of Keystone Biology Exam released multiple-choice and constructed-response questions, scoring rubrics, and sample answers will be provided to teachers. Professional learning sessions will focus on how to:
    - **Analyze question structures** and identify common student misconceptions.
    - **Use Keystone-style questions** in warm-ups, exit tickets, and formative assessments.
    - **Incorporate constructed-response prompts** into daily instruction to build reasoning and writing skills.
    - **Use peer and small-group tutoring strategies** to break down complex questions.
    - **Scaffold academic language** to improve student understanding of scientific terminology.

By equipping teachers and students with consistent exposure to Keystone exam formats, PPS aims to improve student confidence and performance, particularly among students who have historically been underserved in standardized assessments.

Strategy #3: Data-Driven Instruction

PPS is strengthening data-informed instructional decision-making to accelerate student growth and close achievement gaps. By leveraging multiple sources of student performance data—including Classroom Diagnostic Tool (CDT) results, Keystone practice assessments, and classroom-level formative assessments—teachers and school leaders will be able to provide targeted interventions based on real-time student needs.

Key Components of This Strategy:

- **Data Literacy Training:** PPS will provide ongoing training for teachers and school leaders on how to analyze multiple data sources to identify learning gaps, trends, and strengths in student performance.
- **Comprehensive Data Analysis Protocols:** A structured data analysis framework will be used to evaluate CDT results and other assessments, helping teachers make informed decisions about instructional modifications.
- **Differentiated Support for Students:** Schools will use CDT data to inform targeted small-group instruction, intervention blocks, and individualized support for students performing below proficiency.
- **Instructional Resources Aligned to Data:** PPS will develop targeted intervention guides and sample assessments that align with student data trends, ensuring that remediation efforts are precise, intentional, and based on identified learning gaps.

This approach ensures that instruction is responsive to student needs and that PPS can intervene early to provide students with the support necessary to improve their Keystone Exam performance.

Conclusion

Pittsburgh Public Schools is making progress toward improving Biology proficiency among first-time Keystone Exam test takers, but achievement gaps persist, particularly among African-American students, Students with IEPs, and Economically Disadvantaged students. To reach the district's long-term proficiency goals, PPS is implementing a comprehensive strategy focused on curriculum-based professional learning, access to high-quality instructional materials, and data-driven interventions. Strengthening teacher training, improving resource distribution, and refining assessment strategies will be key to ensuring all students are prepared for success. Moving forward, PPS will continue monitoring progress and refining instructional approaches to close achievement gaps and support student achievement in Biology and beyond.