



**Pennsylvania
Department of Education**

**Findings and Recommendations
Pursuant to Act 1 of 2016**

**A Report Submitted to the General Assembly of Pennsylvania
by the Pennsylvania Department of Education**



Commonwealth of Pennsylvania
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Department of Education
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Executive Summary

Findings

1. Under current regulations, Pennsylvania high school students will be required to meet state graduation requirements via demonstrations of proficiency in Algebra I, Biology and Literature on Keystone exams. Among high school graduates in 2015, barely half scored proficient on all three Keystone exams.
2. According to research and the experience of other states, passing high school exit exams is not the sole valid measure of mastery of standards-based core subject matter, nor is it the sole reliable indicator of readiness for postsecondary success.
3. Postsecondary success looks different for different students. Several measures of readiness for postsecondary success are valid and appropriate as state level graduation requirements.
4. For students who do not score proficient or above on one or more Keystone exam, Project Based Assessments (PBA) have proved to be an ineffective and inefficient strategy to demonstrate mastery of the required content.

Recommendations

1. Adopt and implement four options for students to demonstrate postsecondary readiness as follows:
 - a. Option 1: Achieve an identified composite score, based on performance across all three Keystone exams (Algebra I, Biology and Literature);
 - b. Option 2: Achieve equivalent score(s) in standards-based subject matter content area(s) on one of the alternate assessments approved by PDE;
 - c. Option 3: Demonstrate competency in standards-based subject matter content through course grades or assessments plus, for students who are identified as Career and Technical Education (CTE) Concentrators, demonstrate evidence of readiness for postsecondary success through National Occupancy Competency Testing Institute (NOCTI)/National Institute for Metalworking Skills (NIMS) Skills assessments or Competency Certificates; and
 - d. Option 4: Demonstrate competency in standards-based subject matter content through course grades or assessments plus evidence related to postsecondary plans that demonstrate readiness to meaningfully engage in those plans.
2. Discontinue the use of Project Based Assessments as an option for meeting state graduation requirements.
3. Allow local education agencies (LEA) to determine whether or not to include Keystone exam scores on student transcripts.

Introduction

The state level graduation requirements currently set forth in Chapter 4 of the Pennsylvania Code, fail to provide Pennsylvania students with a sufficient number of measures to demonstrate mastery of standards-based subject matter content and readiness for postsecondary success. This conclusion is based on review of relevant research, the practices of other states and review of graduation requirements with a broad cross section of education stakeholders in Pennsylvania.

There are multiple valid measures for students to demonstrate the knowledge and skills necessary to be college and career ready. As postsecondary success looks different for different students, several measures of readiness for postsecondary success are valid and appropriate as state level graduation requirements.

The regulations providing for Keystone exams in Algebra I, Biology and Literature, as a statewide graduation requirement, and related PBAs, were adopted in 2014 by the Pennsylvania State Board of Education. Under the current regulations, beginning with the graduating class of 2017, high school students would have to pass state-developed end-of-course assessments in Algebra I, Biology and Literature in order to receive a diploma. The regulation also allowed students to meet the state graduation requirement by passing an Advanced Placement (AP) Exam; an International Baccalaureate (IB) Exam; or a locally selected, independently validated exam for each standards-based content area.

This strategy was implemented at least partly in response to the 2006 Report of the Governor’s Commission on College and Career Success (Commission Report)¹ which concluded that, in order to meet the realities of the 21st century global economy, “the commonwealth must prepare all students to go to college, whether they choose to attend or not, as they will need ‘college level’ skills and knowledge no matter what their choice.”²

The imperative for meaningful postsecondary experiences is only growing stronger. A 2013 report by The Georgetown Center on Education and the Workforce finds that by 2020, 65 percent of all jobs will require postsecondary education and training.³ Analysis of the future job market focuses on a serious “middle skills gap,” which refers to looming skills shortages in jobs that “require more education and training than a high school diploma but less than a four-year college degree” – such as machinists, registered nurses, technical salespeople and computer technicians.⁴

When Governor Tom Wolf took office in 2015, his administration immediately began to look at the need to consider additional state level options for students to demonstrate readiness for postsecondary success. Governor Wolf and Secretary of Education Pedro Rivera believe strongly that, as postsecondary success looks different for different students, different measures of readiness for postsecondary success are valid and appropriate as state level graduation requirements.

The standard to evaluate the validity of a given option to measure readiness for postsecondary success should be whether that measure is related to postsecondary programs or jobs. Students who want to pursue a four-year college education should have an option to demonstrate readiness for college; students who want to enter an apprenticeship program in the skilled trades should have an option to demonstrate readiness for that skill. It is valid and appropriate for these different pathways to use different measures to demonstrate readiness for postsecondary success. Conversely, a single graduation requirement of scoring proficient on Keystone exams in each of three areas falls short of that standard.

In fact, the State Board’s 2014 Chapter 4 regulations *did* provide an alternate option for students who fail to demonstrate proficiency on Keystone exams. The regulations call for LEAs⁵ to provide “supplemental instruction” to students who fail to achieve proficiency on one or more Keystone exam and then provide for students to take a PBA to be graded by a statewide review panel.⁶

¹ <http://www.stateboard.education.pa.gov/Documents/Research%20Reports%20and%20Studies/GovComm.pdf>

² Commission Report, p. 5.

³ Carnevale, Smith and Strohl, [Recovery: Job Growth and Education Requirements Through 2020](#), p. 2.

⁴ [Bridge the Gap: Rebuilding America’s Middle Skills](#), <http://www.hbs.edu/competitiveness/Documents/bridge-the-gap.pdf>

⁵ LEAs are local education agencies and include school districts, intermediate units, career and technical centers, charter schools and cyber charter schools.

⁶ Students must fail to pass a Keystone exam twice in order to be eligible for a PBA; 12th grade students are eligible after failing the first time. <http://www.pacode.com/secure/data/022/chapter4/s4.51c.html>

In practice, however, the considerable number of students who became eligible for PBAs signaled a larger core instructional challenge. As this alternative to the Keystone exams emerged as a main route for satisfying state graduation requirements that was significantly time and labor intensive, state policymakers recognized the need to examine whether the regulation was working as intended; whether the state had provided sufficient supports to help students reach new and more ambitious academic targets; and whether graduation requirements were too narrowly construed.

Act 1 of 2016 (Act 1), enacted in February 2016, paused the Keystone exam/PBA graduation requirement⁷ for a period of two years and provided policymakers with an opportunity to thoughtfully consider options for students to demonstrate readiness for postsecondary success in addition to Keystone exams. Specifically, Act 1 requires the Pennsylvania Department of Education (PDE or Department) to investigate alternative options for a state level graduation requirement and to provide recommendations to the General Assembly.

This report fulfills the reporting requirement outlined in Act 1 and also provides the following information and recommendations:

- Describes guiding principles identified by PDE to develop different options for state level graduation requirements to supplement Keystone exams;
- Details the process and materials used to inform these options, and to elicit feedback from stakeholders across the state;
- Lists PDE's recommendations for the design and implementation of new state level requirements for graduation;
- Describes each of the proposed options for state level requirements for graduation, its rationale and proposed design; and
- Outlines required next steps and the activities/resources necessary to support these next steps.
- Includes an appendix summarizing key research considered in the development of the graduation options as well as draft legislation.

Background

In December 2006, the Governor's Commission on College and Career Success issued a report detailing 12 policy recommendations designed to "move Pennsylvania towards increasing the educational achievement of all of its students to meet the challenges of the 21st century economy."

The commission took note of the significant increases in education and skills forecasted for the jobs expected to be available in coming years: ". . . by 2010, two-thirds of all new jobs created will require at least some postsecondary education. For those entering the job force directly from high school, stronger math, reading and technical skills will be needed to succeed."

The commission also took note of the disconnect between students leaving Pennsylvania high schools and their readiness for postsecondary success:

- 2004 graduation rate of approximately 77 percent (Commission Report, p. 7);
- Business dissatisfaction with quality of Pennsylvania high school graduates (Commission Report, p.5);⁸ and
- National remediation rates of 30 percent for high school graduates. (Commission Report p. 5).

⁷ It is important to note that students must continue to take Keystone exams even during this pause as the Keystone exams are the statewide assessment for federal accountability.

⁸ "Employers tell us they are being forced to lower their standards just to fill their empty positions. In fact, 82 percent of the businesses surveyed by the *Business Calling Program* since 2003 say they are having difficulty recruiting the skilled workforce they need. These results mirror those found in national surveys as well." Commission Report, p. 5

The commission asserted that, ‘in short, Pennsylvania’s educational pipeline [to postsecondary success] is leaking with no low skill jobs paying reasonable wages to catch those students who do not make it through.’”

First among the commission’s 12 recommendations was that all students be required to demonstrate proficiency in Pennsylvania’s academic standards. At the time, all students were required to take the 11th grade Pennsylvania System of School Assessment (PSSA), but the scores were used to evaluate schools pursuant to the requirements of ESEA/No Child Left Behind, not to evaluate individual students for purposes of graduation. In most cases, an individual student’s readiness for graduation was based on local standards consisting mostly of completion of courses and grades. The commission proposed that all students be required to demonstrate proficiency in state standards via 10 state-level, end of course tests. The commission noted that end of course exams are closer in time to the teaching of specific course content, allowing for more in-depth assessment and timely information that could inform instructional decisions.⁹

Implementation of Keystones

Implementation of Keystone exams and the associated PBAs has not been without challenges. Annual pass rates are below 60 percent across all three Keystone exams for more than half of all districts and charters statewide, with lower pass rates on average for students of color and economically disadvantaged students. Students who twice fail to achieve a score of proficient on a Keystone exam¹⁰ become eligible for a PBA. LEAs are required to provide “supplemental instruction” in order for students to be eligible for PBAs.

By 2015, the time, resources and energy required for implementation of supplemental instruction and the administering and scoring of PBAs proved to be a substantial and growing burden on students, schools and educators. During spring and summer 2015 and winter 2015-16, there were approximately 740,000 Keystone exam modules requiring supplemental instruction and supervised PBA activities across all three subjects. PBA activities have resulted in significant constraints on opportunities for students to engage in other coursework, including career and technical education (CTE) and extracurricular activities.

These low pass rates for all three Keystone exams are not necessarily a valid indicator that the students who fail to pass all three Keystone exams are not ready for postsecondary success. PDE believes that many of these students would be able to demonstrate readiness if a broader menu of options for illustrating readiness was available. Such a menu is not a watering down of the graduation requirement that all students need to master standards-based subject matter content in order to receive a diploma. Rather, it is recognition that, as postsecondary success looks different for different students, options for demonstrating readiness should look different, too.

⁹ “The Commission recommends that the state require all students to take a progressive series of Graduation Competency Assessments (GCAs) within each of four major content areas: math (including but not limited to content traditionally instructed through Algebra II); English/Language Arts (demonstrating reading comprehension and written communication skills); laboratory science; and American History, Economics and Government.” Commission Report, p. 9.

¹⁰ Students who are in 12th grade need only to fail one time to be eligible for PBA.

Also, importantly, the high stakes associated with the Keystone exams make it essential that PDE acknowledge the measurement error inherent in scoring assessments. Measurement error refers to the difference between a measured value of quantity and its true value, such as a poll in a political campaign that comes with a caveat that the results could fall within a few percentage points in either direction of the reported figures. For example, with regard to a proficiency score of 1500 on a Keystone Algebra I exam, measurement error means that a score of 1486 could also represent proficiency for a given student on a given day. PDE believes it is necessary and appropriate to have a strategy to account for measurement error, and we now have multiple years of assessment data to ensure an informed decision.

Further, the experiences of other states tell us that proficient scores on alternative standardized tests may also serve as reliable indicators of readiness for postsecondary success; such assessments include:

- The SAT and ACT;
- Passing scores on AP and IB assessments in content areas comparable to Algebra I, Biology or Literature; and
- Passing scores on AP or IB assessments in other science content areas including Physics, Chemistry, Environmental Science, Computer Science or Statistics.

In addition, stakeholders who routinely make judgments about postsecondary readiness—including representatives from the admissions and placement offices at institutions of higher education, workforce investment boards, and local chambers of commerce—report that proficiency on Keystone exams in Algebra I, Biology and Literature is not necessarily the evidence given the greatest weight in their analysis of student readiness for postsecondary success.

A key factor behind the passage of Act 1 was the concern that the current law does not provide students with an adequate array of options to demonstrate readiness for graduation and postsecondary success; the urgency was generated by the high number of students defaulting to the time consuming and resource intensive PBAs. School administrators, parents, community members and legislators reported that large numbers of students were being diverted from participation in CTE programs and coursework. A system of testing that poses a barrier to CTE opportunities is particularly problematic as the Department recognizes that CTE is a significant component of successful preparation for postsecondary career readiness. Similarly, a testing system should not divert students from participation in electives and extracurricular activities which provide richness, context and depth to the educational experience of students. Act 1 offers an opportunity for Pennsylvania policymakers to more broadly conceptualize what a profile of readiness could look like for different students with different strengths, interests and postsecondary goals.

Guiding Principles

To ensure that the options developed for state level graduation requirements would be consistent with the goals, values and priorities of PDE and the administration, the Department outlined a set of guiding principles to inform and direct its work. These principles, listed in Table 1, provide a common foundation for evaluating and refining the range of options proposed for this process and was strongly validated by stakeholders.

Table 1. Guiding Principles for Identifying Alternate Options for Demonstrating Student Readiness for Postsecondary Success

PDE believes:

1. Standardized assessments are not the exclusive measure of college and/or career readiness.
2. There should be multiple options to demonstrate college and/or career readiness.
3. Some indicators of college and/or career readiness should be measured at the local (LEA) level.
4. Students need not be equally strong in all academic areas to demonstrate college and/or career readiness.
5. Graduation requirements should incentivize holistic instructional opportunities and should not result in a narrowing of the curriculum.

There should be only one diploma offered to any student who satisfies one (or more) of the options for graduation.

While these guiding principles themselves require little elaboration, several underlying values deserve highlighting, specifically: local control, flexibility and equity.

Pennsylvania is a local control state and PDE's guiding principles recognize that local communities in the commonwealth feel strongly about their local graduation requirements. The importance of locally selected indicators is reiterated throughout this report both in the recommended options for graduation requirements and how they are proposed to be defined and operationalized. Local control as embodied in local curricula and local graduation requirements are not a blank slate as Chapter 4 regulations still require students to demonstrate proficiency in Pennsylvania standards. In particular, it is and will remain important that local curricula are well aligned to Pennsylvania Core and Academic Standards.

Defining Readiness for Graduation

PDE's guiding principles are necessary, but not sufficient, to inform the development of options for state level graduation requirements. Also required is a clear definition of what *readiness* looks like. Based upon the guiding principles and feedback from diverse stakeholders across the commonwealth, PDE generated the following goal for postsecondary readiness to be attained and demonstrated through evidence in order for a student to meet the state level requirement for graduation and receive a diploma.

“A student has demonstrated a profile of performance, activities and behaviors in high school that reflects his/her postsecondary goals and exhibits a level of competency necessary to meaningfully engage in postsecondary education (i.e., college), workforce training and/or an entry level position in a chosen career pathway.”

Beyond state graduation requirements, additional evidence at the local level will be necessary for school districts to make their own overall determinations as to whether a student is ready to graduate. The role of LEAs in identifying and establishing appropriate and rigorous local graduation requirements is established in regulation; therefore it is important to note that *the graduation requirements presented in this report are to be considered a floor, rather than a ceiling*. LEAs continue to have their existing autonomy, through the decisions of their boards of school directors, to extend or expand upon these requirements as they see appropriate.

Research Supporting Initial Recommendations

To support its identification and prioritization of different options for graduation, PDE asked the Center for Assessment to review and summarize key research on state policies related to high school graduation, including the use of end-of-course assessments for graduation, and the relationship between student grade point averages and postsecondary outcomes.

State Policies Related to High School Graduation

To identify promising practices, trends and key areas of variability across states, a broad survey of current state level graduation requirements was conducted. Some of the specific questions addressed during this review included:

- What are the components or elements underlying most state graduation requirements?
- Which components or requirements tend to be state-defined versus locally defined?
- What are the different measures and sources of information that states consider appropriate evidence of readiness for graduation?
- For those states having end-of-course graduation requirements, what alternative pathways are provided to students who do not meet the test-based standard?

This policy scan revealed that, for most states, the components associated with graduation requirements include three factors:

1. A state's definition of readiness for postsecondary education, training or work;¹¹
2. Academic expectations—the courses, credits and other experiences a student is expected to have taken to be ready for graduation; and
3. Performance expectations as reflected by assessment results, grades and/or the attainment of credentials or certificates.

States vary with regard to whether it is the state, district or school which dictates these requirements; in most cases, the total number of credits required for graduation is state-defined. In states that require students to pass an exit exam for graduation, alternative options for meeting the standard include consideration of:

- Performance on state-selected alternative assessments (alone or in combination with other measures);
- Performance on the exit exam in conjunction with local performance measures (e.g., portfolios, performance tasks); and
- Performance on a locally developed assessment approved by the state.

¹¹ For example, states that define college readiness differently from career readiness may have different course and credit requirements for graduation for traditional students versus students completing a CTE program of study and/or working toward an industry credential.

Most states also had procedures in place for appealing a failure to achieve a state graduation requirement or for a waiver for a certain number or percentage of students. In some states, different options result in different types of diplomas or, in some cases, a competency designation in lieu of a diploma.

Student Grades

In light of research touting the value of high school grades in evaluating the likelihood of success in college, PDE was interested in exploring grade-based options for demonstrating readiness for postsecondary success. PDE reviewed research highlighting the relevance, utility and predictive validity of student grades as an indicator of postsecondary readiness, some of which is summarized in Appendix C. Many of these studies suggest that high school grade point average and/or course grades are stronger predictors of college outcomes than other traditional measures, including large-scale standardized assessment results. In addition, college admissions offices tend to prioritize course grades, specifically for college prep courses, over other forms of evidence when making decisions about college admissions and placement.

Summary of Stakeholder Feedback Sessions

In order for a Pennsylvania high school diploma to be considered a useful and meaningful credential, those who prepare and approve students for graduation as well as those who rely on the diploma as certification of student competency must have confidence that the graduation options afforded to students are fair, viable and rigorous. To this end, throughout spring 2016, PDE met with approximately 650 stakeholders in 19 stakeholder feedback sessions including: parents, district level administrators, principals, teachers, school counselors, curriculum specialists, school board members, intermediate unit staff, local legislators, representatives from community colleges, four-year colleges and other providers of postsecondary training and representatives from local workforce development boards and chambers of commerce.

The goal of these sessions was to allow secondary and postsecondary stakeholders with different perspectives and priorities to comment on PDE's guiding principles, PBAs and to explore alternative options for meeting the commonwealth graduation requirements. These sessions also afforded stakeholders the opportunity to propose additional designs, measures and indicators for PDE's consideration.

Overarching Recommendations

Based on feedback established through the stakeholder sessions and additional evidence compiled in response to Act 1, PDE proposes three broad recommendations related to Chapter 4 requirements for graduation.

1. Recognizing that postsecondary success looks different for different students, adopt and implement four options for students to demonstrate readiness.
2. Discontinue the use of PBAs as an option for meeting the graduation requirement in lieu of performance on Keystone exams.
3. Allow LEAs to determine whether or not to include Keystone exam scores on student transcripts.

Each of these recommendations is discussed in detail in the sections that follow, and reiterated in the graduation options presented for consideration in the final section of this report.

Recommendation 1: Recognizing that postsecondary success looks different for different students, adopt and implement four options for students to demonstrate readiness.

PDE recommends that Pennsylvania adopt additional options for a state level requirement that students demonstrate readiness for postsecondary success as follows:

- a. Option 1: Achieve an identified composite score, based on performance across all three Keystone exams (Algebra I, Biology and Literature);
- b. Option 2: Achieve equivalent score(s) in standards based subject matter content area(s) on one of the alternate assessments approved by PDE (can be combined with scores on Keystone exams);
- c. Option 3: Demonstrate competency in standards-based subject matter content through course grades or assessments and, for students who are identified as CTE Concentrators, demonstrate evidence of readiness for postsecondary success through NOCTI/NIMS skills assessments or Competency Certificates; and
- d. Option 4: Demonstrate competency in standards-based subject matter content through course grades or assessments and provide evidence related to postsecondary plans that demonstrates readiness to meaningfully engage in those plans.

Each of these options is fully explained in the [PDE Recommendations for State Level Graduation Requirements](#) section.

Recommendation 2: Discontinue the use of Project Based Assessments as an option for meeting the graduation requirement in lieu of performance on Keystone exams.

The factors underlying PDE's recommendation to discontinue PBAs include the following:

- Feedback from stakeholders questioning the validity of a PBA as a proxy for a comprehensive end of course exam to measure a student's mastery of overall course content;
- The time required of students associated with supplemental instruction. The secure testing environment required for PBA tasks which often time prohibits students from participating in other instructional or extracurricular activities including career and technical education coursework;
- The time and resources required from teachers and LEAs associated with implementation of PBAs, as estimated by using information provided by schools/districts; and
- The resources required of PDE to implement the final state level review and scoring of individual PBAs.

PBAs were developed to provide students with a project based alternative to scoring proficient on all three Keystone exams. At the time, it was anticipated that most students would be able to score proficient on Keystone exams and that PBAs would apply to a relatively small percentage of students. PBAs were intended to measure the mastery of content described within the Keystone Performance Level Descriptors and Eligible Content¹² and allow students to work independently to demonstrate their proficiency in a given content area.

Current regulations provide that students who have twice failed to achieve proficiency on a Keystone exam become eligible to participate in the PBA only after they have “participated in a satisfactory manner in supplemental instructional services consistent with the student’s educational program.” Students in 12th grade may meet this requirement after one unsuccessful Keystone exam attempt.

The unexpectedly large number of students not scoring proficient on Keystone exams resulted in a significant number of students needing to participate in PBAs. Student participation in a PBA requires a significant commitment on the part of the student, as well as on the school and its staff. Once eligible for a PBA, a student is assigned a trained PBA tutor who is responsible for evaluating the quality of the student’s work and providing feedback and remediation at designated checkpoints until that student’s PBA is complete. In addition, test administrators are necessary to monitor students as they work on PBA tasks, which must occur in a secure testing environment during school hours. Finally, school and LEA assessment coordinators must verify that implementation of the PBA is occurring as intended and available to all students who are eligible for participation.

In addition to the work required of students, teachers and schools, statewide review panels consisting of trained evaluators assembled by PDE are necessary to evaluate each project submitted, award a satisfactory or unsatisfactory designation and when necessary, provide comments for improvement.

Over the past year, approximately 6,700 students participated in approximately 15,700 PBA projects.

In order to inform recommendations related to PBAs, PDE asked approximately 650 stakeholders to comment on their experience with PBAs and their beliefs and concerns about the reasonableness of the PBA strategy. Across the commonwealth, stakeholders consistently voiced serious concerns about the feasibility, fairness and cost in time and resources of PBAs for both students and schools. Although stakeholders liked the idea of having students complete a project to demonstrate proficiency in lieu of passing a test, educators were concerned that PBAs were not projects as typically conceptualized, and the tasks generally undertaken in the PBA were not sufficiently demonstrative of the full range of the skills and content of the relevant standards-based subject matter coursework.

Many educators with experience in administration of PBAs were concerned that the time and effort required for a student to complete a PBA crowded out other coursework and activities that were better aligned to their goals and interests, including career and technical education. This was especially the case for students with disabilities, some of whom took 30 or more hours to complete just one PBA task.

In addition, stakeholders reported that most schools struggled to find adequate resources to provide PBAs to all students who were eligible. The large majority of stakeholders indicated that the time and staff necessary to support implementation of PBAs were simply not available. In fact, most educators indicated that their schools did not even attempt to provide PBAs in 2015-2016 because of a lack of available resources.

¹² See, e.g., English Literature, http://static.pdesas.org/content/documents/keystone_literature_pld_021113.pdf. See also Algebra I and Biology.

LEA costs reported for PBA implementation that did occur varied according to the number of students requiring “supplemental instruction” and administration of PBAs. A suburban LEA in southeastern Pennsylvania reported hiring nine specialists to support students at a cost of \$900,000. A large urban district estimated that a minimum of \$4.1 million would be needed to staff remedial classes had the district begun to provide PBAs. Estimates of costs to the Department are more than \$7 million associated with state level scoring¹³ of PBAs now in the queue.¹⁴

For these reasons, PDE recommends that PBAs should be eliminated as an option for students who fail to achieve proficiency on one or more Keystone exams.

Recommendation 3: Allow local education agencies to determine whether or not to include Keystone exam scores on student transcripts.

Current regulation states that the information presented on a student’s transcript must include the highest performance level demonstrated by a student on each Keystone exam, validated local assessment or Project-Based Assessment at the time the transcript is produced. The original intent behind this requirement, as defined in the Governor’s Commission Report, was to provide postsecondary institutions and employers with information that could be used to support decision-making regarding a student’s postsecondary activities and incentivize students to perform their best on assessments the scores of which had not previously been applied to individual students nor included on their transcripts.¹⁵ While this remains a laudable goal, for a variety of reasons PDE believes the inclusion of a Keystone exam score on student transcripts should be a local decision.

Education stakeholders had mixed opinions about this subject. Most educator stakeholders were clear that Keystone exam results are *not generally* used to make important decisions about postsecondary opportunities for students (e.g., college admission, need for postsecondary remedial coursework or acceptance into a technical program or hiring). Therefore, including Keystone exam scores serves little function on a transcript. However, several educators noted that the practice often motivates students (typically high performing) to do their best. Since aggregate Keystone exam results are reported for federal accountability, the increased motivation for high ability students was viewed as useful to the most accurate measure of *school* performance.

Educators also commented on a second issue pertaining to high performing students. Under current regulations, students are not able to retest on a given Keystone exam or module if they have already scored proficient. High performing students sometimes expressed frustration when denied an opportunity to obtain an Advanced designation on their transcript. Students argued that since the Keystone exam scores are on a student’s permanent record, they should be allowed to re-test, if desired, even after proficiency was attained.

¹³ PDE initially planned to staff state level scoring of PBAs with volunteer statewide evaluation panels. However, a combination of a higher number than expected of PBAs and lower than expected number of volunteer evaluators made this plan unfeasible.

¹⁴ During the period spring 2015, summer 2015, and winter 2015-16 there were approximately 740,000 modules requiring PBAs across all three Keystone subjects. Assuming that it takes one hour to score two modules, the cost estimate at the rate of \$20 per hour is approximately \$7.4 million.

¹⁵ Anecdotal evidence suggests that some students did not put forth their best efforts on standardized tests when they knew the test scores were not relevant to their personal standing.

On the other hand, stakeholders associated with districts or schools having high proportions of historically disadvantaged students indicated that the practice of placing Keystone exam scores on the transcript was unfair and, essentially, the same as a differentiated diploma. They argued that options for graduation should be defined in such a way that the attainment of a diploma, on its own, provided for adequate evidence that a student had demonstrated readiness for postsecondary success.

Since school entities have different beliefs regarding the utility of including Keystone results on student transcripts, and there is no reliable evidence on the use of Keystone exam results for college admissions or course placement, PDE recommends that the decision to include these results on student transcripts, or the results/evidence associated with the other graduation options outlined in this report, be a local decision.

PDE Recommendations for State Level Graduation Requirements

Prior to the discussion of the different options recommended by PDE for students to meet a state level graduation requirement, it is important to first reiterate the requirements that apply to all students in order to receive a high school diploma in Pennsylvania. First, all students must meet the local graduation requirements of their LEA. These include such things as the number of courses or credits a student needs to be considered eligible for graduation, decisions related to minimum attendance and GPA and any activities, demonstrations or projects identified by the LEA as required for graduation. Second, all students must demonstrate mastery of PA Core and Academic Standards in all content areas for which such standards are defined. The demonstration may be based on state-developed assessments (if available) or local assessments and evaluation practices that provide valid and reliable information regarding student competency.

While local graduation requirements apply to all students, it is important to note that how local requirements are defined and evaluated may differ significantly depending on the LEA in which a student is enrolled. Similarly, while current regulations require all students to show competency in PA Core and Academic standards, how that competency is demonstrated and what is considered sufficient is a local decision. Local assessment of competency in academic standards was one of the key factors underlying the call for statewide competency assessments in the Governor's Commission Report and subsequent development of the Keystone exams. The intent of statewide assessment of standards-based subject matter content was, in large part, to ensure that all students in the commonwealth were held to and evaluated against the same rigorous performance standards in those content areas believed to be necessary for future success.

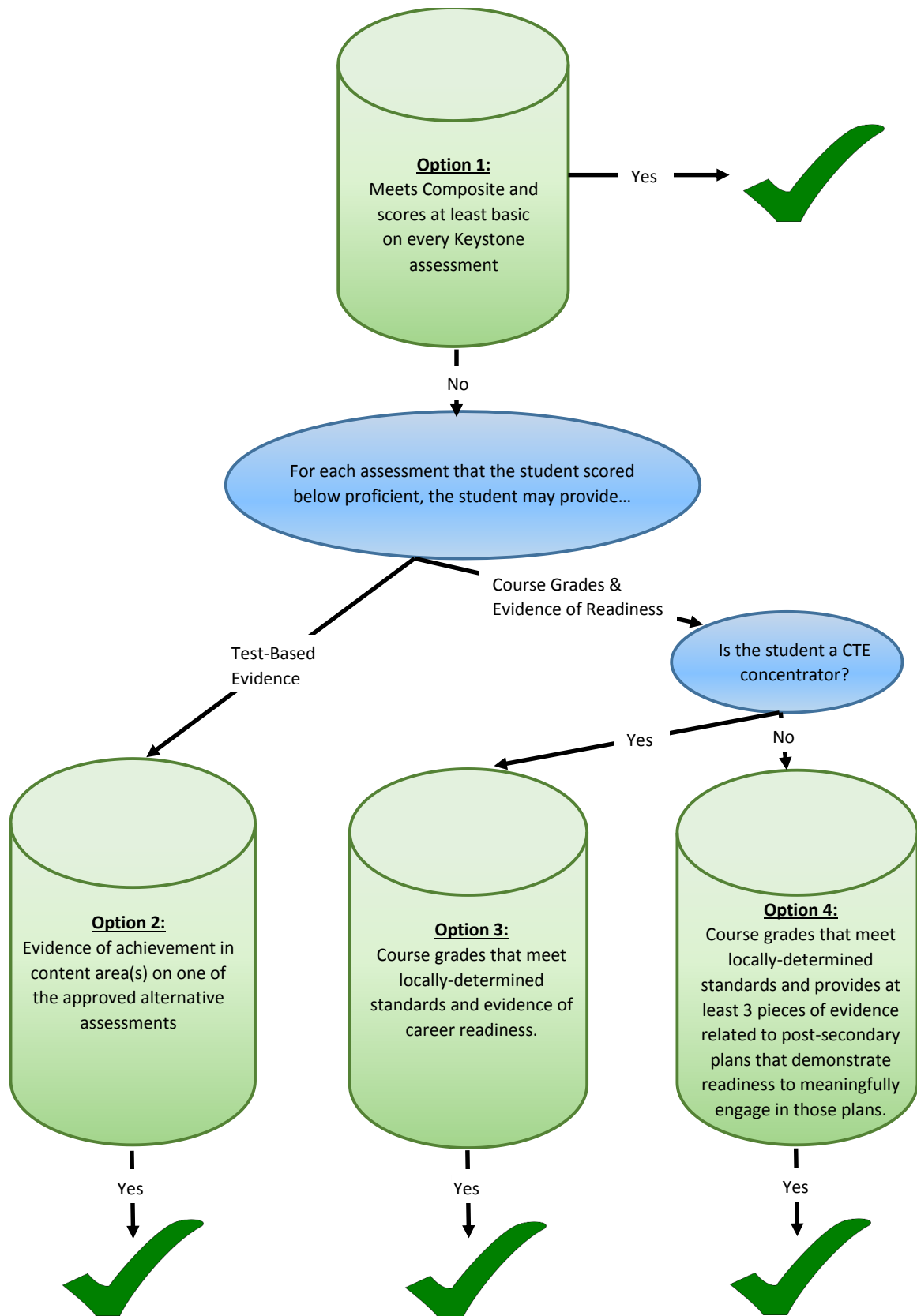
PDE believes that achieving proficiency in standards-based subject matter content should continue to be the target for students upon entry into a standards-based subject matter course. However, data shows that many students who are currently able to demonstrate readiness for postsecondary success by other reliable and valid measures will not be able to score proficient on one or more Keystone exam, even after spending significant time engaged in supplemental instruction and retesting.

Options 1 through 4 proposed by PDE and described in this section are intended to ensure that all students are challenged to meet rigorous requirements for graduation, but at the same time enabled to focus on those courses, activities and interactions that will best equip them with the skills they need to be successful after graduation. In addition, these proposals are intended to provide incentives for LEAs to improve effective implementation of Pennsylvania's Career Education and Work Standards which will help students begin to understand their occupational options and develop their career portfolios as early as middle school.

Table 2 provides a summary of PDE’s recommended options for graduation. It is followed by a flow chart illustrating the relationship among the options and how a student might move between them. A description of each option, its rationale and the next steps necessary to support its implementation are provided in the sections that follow.

Table 2. Summary of Recommended Options for Graduation

Option 1: Keystone Assessments	Option 2: Alternative Assessments	Option 3: CTE Concentrators Competency in PA Standards + Additional Evidence of Readiness	Option 4: Competency in PA Standards + Additional Evidence of Readiness
<p>A student meets or exceeds a state-specified composite score across the three Keystone exams and performance in all three content areas is at least Basic.</p>	<p>A student meets or exceeds a state-defined Keystone equivalent cut score on one or more approved alternative assessments (e.g., SAT, PSAT, ACT, AP and IB), in those content areas in which a Keystone Proficient cut score was not obtained.</p>	<p>A student meets or exceeds a locally-established minimum grade in any Keystone-designated course for which Proficiency on the Keystone exam was not obtained. (Note: a science course other than Biology may fulfill the requirement under this option.)</p> <p style="text-align: center;">AND</p> <p>Attains an Industry -Based Competency Certificate (e.g., NOCTI/NIMS) in a student’s program of study</p> <p style="text-align: center;">OR</p> <p>Provides evidence demonstrating a high likelihood of success on these assessments and/or readiness for continued meaningful engagement in the Program of Study (POS) area as represented by performance on benchmark assessments, course grades, and other artifacts consistent with a student’s goals and career plan as represented in the student’s Career Portfolio.</p>	<p>A student meets or exceeds a locally-established minimum grade in any Keystone-designated course for which Proficiency on the Keystone exam was not obtained. (Note: a science course other than Biology may fulfill the requirement under this option.)</p> <p style="text-align: center;">AND</p> <p>Provides at least 3 pieces of evidence that reflect readiness for meaningful postsecondary engagement consistent with a student’s goals and career plan as represented in the student’s Career Portfolio.</p>



Option 1: Composite Score Model for Keystone Exams

As currently written, Chapter 4 requires that students demonstrate proficiency on *each* of the Keystone exams in order to meet the state level graduation requirement. This means scoring a scaled score of 1500 or greater on each of the three subject matter exams or demonstrating proficiency on each Keystone module. The current model is considered *conjunctive* because a specified standard must be met on each of the three Keystone exams in order for the Keystone graduation requirement to be fulfilled.

Option 1 proposes to shift from a conjunctive model to a *compensatory* model, in which high performance in one content area is allowed to compensate for lower performance in another content area. A compensatory model would specify a performance standard for combined performance across all three exams.

Rationale

The recommendation to move from a conjunctive model to a compensatory composite model is consistent with PDE's guiding principle 4, that students need not be equally strong in all content areas. The compensatory composite model is also strongly supported by stakeholders. Approximately 60 percent of stakeholders agreed that it is reasonable to consider the use of a rigorous combined score across all three exams to determine whether a student meets the Keystone exam graduation requirement. Stakeholders stated that they liked the flexibility provided by the composite score option and that it makes sense for high performance in one area to offset slightly lower performance in another.

The compensatory model also helps to accommodate the issue of measurement error. Measurement error is a reality of standardized testing and high-stakes cut scores. It refers to a quantitative representation of the consistency of an obtained test result. In other words, measurement error refers to the extent to which an obtained test score would be expected to vary if the same test were administered to the same student on multiple occasions and under identical conditions. For criterion-referenced tests like the Keystone exam, measurement error is controlled through sound test development, administration and scoring practices; however, even under the best test conditions, all test scores are affected by some amount of error. This means there will always be some number of false positive and false negative results.

While the goal is to limit the incidence of any type of error, PDE believes that failing to designate a student as meeting the Keystone exam graduation requirement who really is prepared could result in significant negative consequences. That is, students should be given the benefit of the doubt regarding the risk of measurement error so that they do not get frustrated, question their ability to participate in college preparatory or other rigorous courses or spend time participating in remedial activities that may not be a beneficial use of their time.

For each Keystone exam, the Proficient cut score is 1500. While this suggests a composite cut score of 4500 for all three exams, to account for measurement error, PDE proposes to establish the Keystone composite cut score one standard error of measurement below this value. Accounting for one standard error of measurement is common practice, especially when establishing cut scores that inform high stakes decisions. A composite cut score at one standard error below 4500, essentially indicates that a student who is truly above the 4500 cut score, but has an observed score below that value, will be correctly classified as meeting the standard two-thirds of the time. To inform this report, an exemplar composite cut score of 4476 was calculated at the Graduation Summit discussed below, using standard errors from the 2014-2015 administrations.

Proposed Design

On July 19 and 20, a panel of 27 educators convened in Harrisburg to collaborate with PDE in developing the parameters for the graduation options recommended by PDE in this report (the Evaluation Summit). The panel included teachers, principals, district superintendents, school counselors and representatives from higher education and CTE. The specific goals of the meeting were as follows:

- To specify the business rules underlying the amount of compensation allowed across the three tests to define the composite standard. ;
- To identify profiles of Keystone performance that would not be considered reasonable for meeting the graduation requirement under Options 3 and 4, even in combination with additional evidence aligned to a student's career path and goals; and
- To discuss the different types of evidence that would/would not be considered reasonable to demonstrate that a student is ready for graduation.

Following a presentation of PDE's guiding principles and discussion of the different options under consideration, participants in the Evaluation Summit discussed the minimum score that a student should have to attain within any one content area in order to meet the composite standard. Panelists ultimately concluded that a student must demonstrate at least Basic performance in each content area *in addition to meeting the composite cut score* in order to meet the graduation requirement under Option 1.¹⁶

In order to evaluate its potential impact, Option 1 was applied to the 2014-2015 graduation file for students who graduated by virtue of meeting local graduation requirements; proficiency on Keystone exams were not yet required for the class of 2015. Approximately 72 percent, or over 82,000 of the 114,392 students who graduated in 2015, would have met the Keystone graduation requirement using Option 1, the composite score approach.¹⁷ This is compared to only 51 percent, or over 58,000 of the students who scored proficient on *each* exam. This represents an increase of approximately 21 percentage points representing 22,368 students.

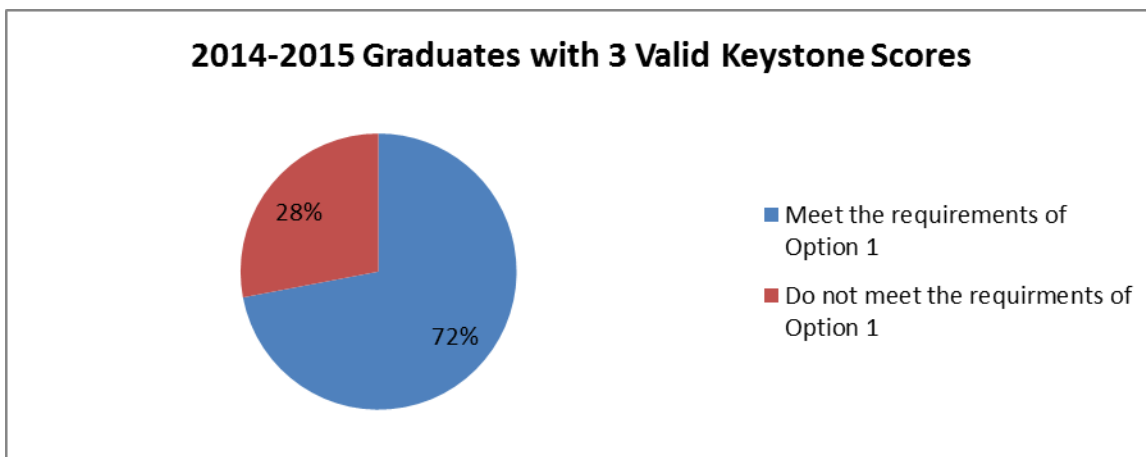


Figure 1

¹⁶ It is important to note that the likelihood of meeting the composite cut score and having a Below Basic designation on one of the Keystone tests is extremely small. Of the 114,392 students who graduated in 2014-2015 and had three valid Keystone scores, only 1,072 students had a Below Basic score in one content area.

¹⁷ Using error estimates from 2014-2015, the estimated composite cut score was 4476.

Next Steps

The composite standard error takes into account the error associated with the Proficient cut score for each exam that contributes to a student's composite score. Because this value varies slightly across administrations, in theory the cut score could differ across a student population depending on the specific set of Keystone administrations contributing to a student's composite score. PDE believes that through additional analyses and consultation with their Technical Advisory Committee, a common composite cut score can be identified.

Option 2: Alternative Assessment Options

A student who does not meet the composite cut score defined for Option 1 can satisfy the Keystone graduation requirement using one of several state selected alternative assessments. Specifically, if a student scores below proficient on a Keystone exam, his/her performance on an SAT, PSAT, ACT, AP and/or IB exam may serve as a proxy if a state-defined cut score is met. For example, a student who does not meet the composite cut score defined for Option 1 and scores in the Basic range on the Algebra I Keystone could meet the graduation requirement for this content area by meeting a defined cut score on the SAT Math test. Current regulation already allows for student performance on AP and IB exams to meet the graduation standard in this manner, so Option 2 simply expands upon this menu of assessment options.

Rationale

Many states with test-based, end-of-course requirements for graduation allow student results from alternative assessments to meet their standard. What tends to differ is the extent to which these assessments (1) must align to the state's academic standards and/or (2) provide for similar claims about student proficiency or readiness. The Keystone exams were specifically developed to measure Pennsylvania's Assessment Anchors and Eligible Content in three specific subject matter areas of Algebra I, Biology and Literature; these indicate those parts of the Keystone Course Standards (Instructional Standards) to be assessed on the Keystone exams and the specific knowledge and skills from which the tests are designed. Although the proposed alternative assessments described above were not developed to measure the PA Core Standards for Algebra I and Literature or Academic Standards for Biology, as the keystones were, each of the identified alternative assessments measures knowledge and skills deemed necessary for success after high school and was developed to support claims regarding a student's readiness for postsecondary education. In addition, these assessments are nationally recognized and supported by research and evidence demonstrating their technical quality.

Some stakeholders proposed Armed Services Vocational Aptitude Battery (ASVAB) and NOCTI assessments for inclusion under Option 2 as well; however, PDE determined that these tests were developed to support different goals than the assessments previously discussed. For example, the ASVAB assesses general aptitude and informs decisions about whether an examinee possesses the skills necessary to fill a particular role or position in the military. While students are assessed in Science and Math and Language Arts, the depth and breadth of skills tested would not support claims of postsecondary readiness consistent with those offered by the other exams. Similarly, NOCTI exams assess an examinee's readiness for continuation or participation in a given career or program of study. While these assessments require some level of reading, mathematics and science competency¹⁸ to attain a PA Competency or Skills certificate, they were not developed to support general claims regarding postsecondary readiness. For these reasons, PDE determined not to recommend a student's performance on a NOCTI or ASVAB test *alone* as a valid demonstration of

¹⁸ The specific skills addressed within each content area will vary depending on the specific NOCTI exam taken.

readiness for graduation, even if statistically equivalent cuts could be established. Instead, performance on these assessments is recommended to be included within the menu of additional evidence proposed in Options 3 and 4.

Stakeholders overwhelmingly agreed that student performance on alternative nationally recognized exams such as ACT, SAT, AP and IB exams could serve to meet the requirements for demonstrating proficiency in standards-based subject matter content if *appropriate standards for performance were established*. For example, stakeholders stated that students should not be held to a higher standard than would typically be expected on the ACT or SAT (e.g., college-readiness standards/benchmarks) in order to meet the state level graduation requirements.

Next Steps

To fully define Option 2, the specific *alternative exams* must be identified as aligned to specific subject matter content areas and the Keystone exam equivalent cut-scores need to be determined. For example, the ACT has tests in English, Writing and Reading, which are reported separately, but also averaged to provide an overall English Language Arts score. A decision will need to be made as to whether a student's score on one of these tests or the only the ACT composite will be used to determine whether the graduation requirement in the content area of Literature has been met.

PDE recommends using a concordance table to identify Keystone exam-equivalent standards for alternative assessments. A concordance table uses a sample of students who have taken both tests (i.e., the Keystone and the select alternative assessment) which allows location of the score on the alternative assessment that represents an equivalent level of performance on the Keystone exam. For example, a simple equipercentile procedure could be used to identify the score on the alternative assessment (e.g., SAT Math test) that results in the same percentage of students being deemed "not proficient" as is observed on the Keystone exam (e.g., Algebra I). This is a relatively straightforward process, and requires a sample of students taking both tests that is moderately large and representative of the total test taking population.

It is important to note that while providing additional assessment options was viewed as a positive, many stakeholders expressed concerns related to: equity of access (especially to AP/IB courses and exams), funding of the different assessment options if made available as alternatives to Keystone exams; and the availability of results for making graduation decisions (e.g., if the tests are not administered until 12th grade). In addition, many stakeholders noted that, as a practical matter, students who achieve the requisite scores on AP/IB tests or SATs to meet state graduation requirements were also likely to pass Keystone exams. Therefore, as a practical matter, PDE recognizes that Option 2 does little to support those students at the greatest risk of not being able to demonstrate proficiency in standards-based subject matter content and most in need of a rigorous, yet feasible option for meeting the state graduation requirement.

Options 3 and 4: Competency in Core Standards + Additional Evidence of Readiness

Options 1 and 2, respectively, represent a modification and an extension of the current Keystone graduation requirements. Specifically, they provide a test-based option for demonstrating competency at a level endorsed by PDE as indicative of readiness for meaningful postsecondary engagement. While these options are consistent with PDE's guiding principles, there remains a large percentage of students for whom these options will not be viable. Some of these students are truly not prepared and therefore should not graduate. Many others will be ready for postsecondary success but, for a variety of reasons, are unable to demonstrate this through test scores alone. As shown on Figure 1, 28 percent of the students who graduated in 2014-2015 would still have required an alternative way to demonstrate competency in the Keystone subject matter content areas and readiness for graduation even if the composite score of Option 1 had been available.

Rationale

The PA Standards reflect the knowledge and skills educators, employers and society expect of high school graduates and what is required to engage in college and careers. However, as postsecondary success looks different for different students, different measures of readiness for postsecondary success are valid and appropriate as state level graduation requirements.

PDE's guiding principles provide in part:

1. Standardized assessments are not the exclusive measure of college and/or career readiness.
2. There should be multiple options to demonstrate college and/or career readiness.
3. Some indicators of college and/or career readiness should be measured at the local (LEA) level.
4. Students need not be equally strong in all academic areas to demonstrate college and/or career readiness.

Option 3 is specific to students who are Career and Technical Education (CTE) secondary concentrators.¹⁹ These are students who by the end of a school year, have successfully completed at least 50 percent of the minimum technical instructional hours required for PDE approval of the CTE program.

Option 4 is open to all students.

Proposed Design

To meet the graduation requirements under Options 3 and 4 students must demonstrate a level of competency with the PA Standards that, in combination with additional evidence, represents a profile of performance appropriate for graduation.

As displayed in Table 2, both Options 3 and 4 require students to provide two types of evidence. The first type of evidence, depicted in red, reflects student competency in the Keystone content areas as demonstrated by a proficient score on the Keystone assessment or the grades earned in a Keystone-related course. The second type of evidence, depicted in blue, includes performance artifacts (e.g., grades, courses, test scores, certifications, credentials, letters of recommendation) demonstrating readiness for meaningful postsecondary engagement consistent with a student's career plan or portfolio. Both types of evidence are necessary in order for a student to meet the graduation requirement.

¹⁹ A secondary concentrator is a student who, by the end of the reporting (current) school year, will be reported as successfully completing (receiving a passing grade) at least 50 percent of the minimum technical instructional hours required for PDE program approval.

For both options, competency in Algebra I, Biology and Literature standards must be displayed through either performance on the Keystone assessments or grades earned in Keystone courses. Under all circumstances, to be eligible for this option, a student must take the Keystone-related course designated by the district and participate in each of the Keystone assessments.

Student grades provide a holistic determination of competency based on a variety of measures (e.g., formal and informal assessments, homework, performance demonstrations) providing a different lens by which to evaluate a student's understanding and application of the standards. In addition, as discussed earlier in this report and in Appendix C, there is a positive relationship between high school grade point average and indicators of future success including freshman and four-year college outcomes. If a student does not meet the Proficient cut score on a given Keystone assessment, he or she can satisfy the competency requirements in that content area by meeting a locally-specified minimum grade in the Keystone-related course.

Stakeholders applauded the idea of using student grades in Keystone courses as a means of meeting the graduation requirement, stating that the option highlights the perspective of educators in making decisions regarding a student's readiness for graduation. Stakeholders noted, however, that biology skills are not equally important for all students and therefore, grades in other appropriately-leveled science courses should be allowed to substitute for Biology under this option. For this reason, while all students are still required to take the Keystone-designated Biology course and participate in the Keystone exam (for school accountability purposes under federal law), a different science course may be used to determine whether a student met the graduation requirement if that course is identified by the district as appropriately rigorous for this purpose.²⁰

Options 3 and 4 require students to provide evidence of readiness in addition to competency in the Keystone content areas in order to meet the graduation requirement. Furthermore, this evidence must be aligned to the skills necessary for a student to engage in activities, education and training consistent with his/her career plan and goal.

Career Plan and Career Portfolio

Pennsylvania's Standards for Career Education and Work²¹ require that all students develop and maintain a personal career plan and portfolio. Pursuant to these standards, a student's career plan should "identify a series of educational studies and experiences that will prepare them for postsecondary education, work, or both, in a selected career." By 11th grade, a student's career plan and portfolio should include details and artifacts that clearly reflect a student's postsecondary goals and the coursework, activities and experiences that have been taken to ensure they are realized.

In making a determination regarding a student's readiness for graduation one must account for the unique path that student has taken to achieve specified goals and evaluate the body of evidence provided accordingly. A student who is planning to go to a four-year college to study Accounting, for example, will likely have engaged in different activities and courses than a student who is planning to pursue training as an electrician. While both students require competency in the areas of English Language Arts, Mathematics and Science, the additional evidence necessary to support claims that a student is ready for graduation will differ in light of the goals, courses and activities identified in a student's Career Plan and Portfolio.

²⁰ Regardless of student level graduation options, all students must participate in Keystone exams since these exams are currently the designated statewide assessment for federal accountability under Pennsylvania's No Child Left Behind (NCLB) waiver.

²¹ <http://www.pacareerstandards.com/documents/career-education-and-work-standards.pdf>

Option 3: Focus on CTE Concentrators

As outlined in Table 2, a CTE Concentrator who demonstrates competency through Keystone performance or grades in Keystone subject matter courses, can meet the additional evidence requirements under Option 3 by:

- Meeting the NOCTI/NIMS Skills or Competency Certificate (if possible), attaining a high value industry credential OR providing evidence reflecting proficiency on required benchmark assessments within their CTE program of study (POS); or
- Providing at least three pieces of evidence that reflect readiness for meaningful postsecondary engagement consistent with a student's goals and career plan as represented in the student's Career Plan and Portfolio.

A student who earns a high value industry credential is ready to meaningfully engage in a career aligned with his or her identified program of study. Therefore, earning a credential in addition to demonstrating competency on the PA standards is sufficient to meet the graduation requirement under Option 3. If an industry credential has not yet been obtained, students will be required to provide at least three pieces of evidence specifically aligned to their career plan or goal.

Option 4: Additional Evidence for All Students

To meet the graduation requirements under Option 4, students must provide three *rigorous* and *compelling* pieces of evidence that reflect readiness for meaningful postsecondary engagement consistent with a student's goals and career plan as represented in the student's Career Plan and Portfolio. Examples of evidence that demonstrate the required rigor could include:

- Earning a passing grade in a dual enrollment course;
- Performance on the ASVAB adequate for enlistment;
- Guaranteed full-time employment letter;
- Attainment of a high value industry credential;
- Attainment of workforce readiness certificate;
- Certificate of successful completion of an internship program related to career goals;
- Performance on PA Career Academic Work Standards assessment; or
- Performance on an SAT or ACT subject specific test.

This represents only an illustrative list; appropriate and reasonable evidence for a given student will vary depending on the specific goals, activities and courses delineated in a student's career plan and portfolio.

Next Steps

PDE believes that one explanation for the high number of students failing to pass Keystone exams is that curricula and core classroom instructional practices in some LEAs are not fully aligned with the Pennsylvania Core and Academic Standards. Implementation of Options 3 and 4 would, therefore, require PDE to develop and provide supports and resources to LEAs on a voluntary basis. PDE would develop model curricula for standards-based subject matter courses in Algebra I, Biology and Literature. PDE would also develop voluntary common interim/formative assessments to be used in conjunction with model curricula comparable to Classroom Diagnostic Tools. While both the curricula and the interim assessments would be voluntary on the part of LEAs, many superintendents have requested this type of resource.

For LEAs utilizing locally-developed curriculum, it is proposed that PDE have the authority to develop a curriculum review process to ensure alignment to Pennsylvania Core and Academic Standards. If PDE finds that the curricula of any LEA is not adequately aligned to Pennsylvania Core and Academic Standards, then PDE may require the LEA to revise or replace its curricula to bring it into alignment with standards. PDE estimates the cost of such a review process to be approximately \$1.8 million.

It is also recommended that PDE craft specific guidance to operationalize the requirement for additional evidence as described in Options 3 and 4. This guidance should reflect evidence related to CTE programs of study, the requirements of Pennsylvania's Career and Education Work Standards and Chapter 339 guidance plans²² related to K-12 guidance services such as:

- Assistance to students in selecting vocational curricula that meet their needs and address their interests;
- Assistance to vocational students in making educational career plans;
- Occupational and educational information for career planning;
- Placement services from school to work;
- Consultation with teachers, administrators and school staff;
- A system of parental involvement in occupational and career exploration and planning;
- Liaison with community agencies; and
- Follow-up studies to determine the effectiveness of the curriculum.

Conclusion

The Pennsylvania Department of Education is grateful for the opportunity provided by Act 1 to review the current state graduation requirements and consider how research and experience should inform consideration of the best strategies for Pennsylvania's students. PDE has concluded that the current graduation requirements too narrowly define postsecondary readiness. In order to more accurately recognize the varied pathways to postsecondary success, PDE recommends that a statewide graduation requirement reflect those pathways by offering options for students to demonstrate readiness. The Department of Education looks forward to working with the General Assembly to implement changes that will benefit the students and communities of the commonwealth.

²² PDE is aware that fewer than half of LEAs across the commonwealth have currently developed and implemented robust Chapter 339 plans. The guidance and associated technical support provided should serve to greatly increase fidelity of implementation in this critically important area for students.

Appendix A:

Summary of State High School Graduation Requirements

The purpose of this document is to provide an overview of the components underlying high school graduation and summarize key policies influencing how graduation requirements are defined and represented in different states across the nation.

The components associated with high school graduation represent three major areas:

1. Definition of readiness for postsecondary experiences
2. Academic experiences in high school
3. Performance in high school

These three components are seen in state policies established by states in the US. A differentiating factor underlying these policies, however, is the degree of local control explicitly indicated or implied based on state charter. A brief overview of these components is provided below. More detailed description is provided in the PowerPoint presentation, *Framework for High School Graduation Requirements*, Patelis (2016a).

Definition of Readiness

A state's definition of readiness, when provided, may apply to "college and career" readiness unitarily or, in some cases, separate definitions of college and career readiness may be supplied.

Academic Experiences in High School

This represents the courses and other experiences that students should have as part of their graduation. Usually, these involve varying types and number of courses. Increasingly, college or career-related courses are included. In some cases, the high school academic requirements are being articulated with college/university minimal entrance requirements.

Performance in High school

Indicators of performance in high school are typically reflected by assessment results; however, performance in certain academic courses has also been seen. In some cases, achieving certain credentials is also used as an indicator. There are some states that have specified interventions based on student performance.

If one of the goals of a K-12 educational system is ensuring college and career readiness, a framework for introducing reform efforts in state policymaking has been provided by the Education Commission of the States (Glancy, et al., 2014). The recommendations suggested in this framework encompass three areas of high school policies, higher education policies and bridge policies. The specific policy approaches for each of these areas represent the following:

High School Policies

College and career readiness standards – states should adopt college and career readiness standards ensuring all students achieve readiness before high school graduation and improving student performance.

College and career readiness assessments – identify benchmarks that will trigger targeted, appropriate interventions, identify students likely to succeed in advanced opportunities (e.g., AP, IB, dual enrollment), provide options and provide clear information of assessment results.

High school graduation requirements - align high school graduation requirements with statewide minimum higher education admission standards, create transparency between high school and higher education institutions, increase number of high school graduates entering postsecondary institutions, provide multiple options for meeting minimum course requirements and provide multiple options for determining a student's level of college readiness beyond course requirements (e.g., GPA or class rank).

Accountability – increase transparency, balance fairness for all schools and rigor for all students while increasing community expectations and increasing educator accountability, create improvement goals and align accountability measures with state education goals.

Higher Education Policies

Statewide admission standards – increase the number of high school graduates entering postsecondary institutions, create transparency between high schools and higher education institutions, increase access to higher education for underrepresented populations and use multiple measures to determine college readiness for admission and placement decisions.

Statewide remedial and placement policies – clearly communicate college readiness standards, encourage high school student to improve academic preparation before college, provide common and consistent expectations for college readiness, clarify the role of various institutions to provide remedial courses and services and ensure students with academic deficits receive remediation.

Transfer and articulation – ensure students do not have to repeat courses, ease transition, increase transparency, offer multiple options for course completion and achieve statewide higher education credential attainment goals.

Accountability – increase number of adults in the state who have a postsecondary credential to support workforce needs, hold institutions accountable for successful outcomes, provide multiple measures for institutions to demonstrate student success and set specific attainment or completion number or rate to provide clear and measurable goals.

Statewide college and career readiness definition – increase collaboration between K-12 and higher education, address remedial needs observed by both higher education and employers and provide benchmarks to help teachers understand the knowledge and skills of students who will need to demonstrate college and career readiness by high school graduation.

Data pipeline and reporting – improve pathways and preparedness for high school and adult students, provide meaningful data to help transition policies, provide training and communication with students, parents, K-12 teachers and other stakeholders to improve data literacy, improve quality and breadth of the data in the workforce data systems and ensure security and privacy for student-related information.

With respect to high school graduation requirements, proposed policies encompass multiple goals, including:

- Aligning statewide minimum high school graduation requirements with statewide minimum higher education admission standards.
- Creating transparency between high schools and higher education institutions about college readiness standards.
- Increasing the number of high school graduates entering postsecondary institutions.
- Providing multiple options for meeting the minimum course requirements in both high school and higher education. Examples include the use of competency-based assessment results and the scores on Advanced Placement exams.
- Providing multiple options for determining a student's level of college readiness in areas other than course requirements, such as GPA or class rank.

High school graduation policies have important consequences for students. The use of a broader range of measures to award a high school diploma (along with other reforms to strengthen teaching) is not only supported by professional guidelines and standards, but also seems to have positive impacts on teaching and learning (Darling-Hammond, Rustique-Forrester, Pecheone, 2005).

The elements typically represented in state high school graduation requirements, which often reflect a multiple measures approach, include:

1. Course requirements, which in most cases local education agencies can be augmented by LEAs.
2. Assessments – in high school, multiple assessments are indicated in many states including use of college entrance examinations
3. Career courses and credentials
4. Appeals process and use of alternative measures (e.g., learning portfolio)

Several state-specific examples are provided in the PowerPoint presentation, *State Graduation Requirements* (Patelis, 2016b). The states represented in the examples are California, Colorado, Mississippi, New Jersey, New York, Ohio, and Texas. All offer local additions to add/enhance state specifications.

References:

Darling-Hammond, L., Rustique-Forrester, E., & Pecheone, R. L. (2005). *Multiple measures approaches to high school graduation*. Stanford, CA: School Redesign Network, Stanford University.

Glancy, E. Fulton, M., Anderson, L., Zinth, J. D., Millard, M., & Delander, B. (October, 2014). *Blueprint for College Readiness*. Denver, CO: Education Commission of the States. Retrieved from <http://www.ecs.org/docs/BlueprintforCollegeReadiness.pdf>.

Patelis, T. (2016a). *Framework for high school graduation requirements*. Dover, NH: NCIEA.

Patelis, T. (2016b). *State graduation requirements*. Dover, NH: NCIEA.

Appendix B:

Summary of the Literature on the Effects of High School Exit Exams

Much of the research examining the relationship of high school exit exams on various student outcomes has shown negative effects on student outcomes.

A meta-analysis on the effects of high school exit exams, including minimum competency versions and newer, more rigorous tests, found that, in general, the exit exams did not produce the expected benefits (Holme, Richards, Jimerson, & Cohen, 2010). Across 46 studies, the authors examined student outcomes related to exit exam policies and high school achievement, high school graduation, postsecondary education and workforce participation, as well as the effects of failing an exit exam on students in terms of achievement, dropout and postsecondary outcomes. Across all outcomes studied, exit exam policies often resulted in mixed or inconclusive findings, and were rarely associated with positive outcomes for students. Some general findings:

- Students barely missing the passing score on the high school exit exam on the first try see no effects on their subsequent achievement.
- Students who score below the passing score on the high school exit exams representing their last chance have an increased probability of dropping out of high school with the likelihood being higher for low-income, minority and low-achieving students.
- Students who fall just below the cut score on the high school exit exam are less likely to attend college, and for those that do, earn fewer credits compared to students who were just above the cut score.
- Student who perform below the cut score on high school exit exams representing their last chance are associated with less earnings just after high school than students who just barely passed the last chance exam. Disparities, however, decreased over time.

The outcomes that have been used in research studies with varying degrees of rigor involve student achievement based on test scores, graduation rates, dropout rates, course taking, incarceration, postsecondary outcomes in the form of performance in college and wages earned.

- Student outcomes in terms of achievement have mostly not increased with the use of high school exit exams (Holme, Richards, Jimerson, & Cohen, 2010; Reardon, Atteberry, & Kurlaender, 2009; Baker & Long, 2013).
 - There was no difference in National Assessment of Educational Programs (NAEP) mathematics and reading scores between states that had a high school exit exam versus those that did not overall and at different performance ranges (Grodsky, Warren & Kalogrides, 2009).
- State exit exams reduce high school graduation rates (Warren, Jenkins, & Kulick, 2006). In states with exams that assess mastery of material that students should learn before 9th grade, graduation rates declined by about one percentage point. In states with exit exams with more challenging content, graduation rates declined by about two percentage points.
 - Even when controlling for substantial demographic variables related to the outcomes, high school graduation examinations contributed to decreased graduations rates and lower SAT scores (Marchant & Paulson, 2005).
- Using district-by-grade-level data from the Common Core data, Hemelt & Macotte (2013) found dropout rates for students in 12th grade were increased by the introduction of high school exit exams with large

effects for black and Hispanic students. However, the dropout rates were smaller in states that offered alternative pathways to receiving a diploma or substitute credential for students that could not pass the exit exams. They did not limit the amount of time students spend in school, however.

- Ou (2010) and Papay, Murnane, and Willett (2010) found that failing exit exams in New Jersey and Massachusetts (respectively) reduced the likelihood of graduating for low-income and minority students.
- Reardon et al. (2010) used data from four large districts in California and found no effects on dropout.
- Martorell (2005) used data from Texas and found no overall effect of HSEEs on dropout.
 - Martorell did, however, distinguish between students taking the HSEE in Texas during their senior year, compared to those in their initial attempts. Like all states, students in Texas take the HSEE early in high school, and then re-take only if they fail. Martorell identified 12th grade students who had not yet passed the HSEE as "last chance" exit exam takers, since there would be no option for them to re-take before the end of high school if they failed. For this group, he found a significant increase in the likelihood of not graduating, and of receiving a GED.
- Dee and Jacob (2006) found that dropout rate in urban and high poverty school districts as well as in relatively large concentration of minority students in Minnesota increased among 12th grade students. However, low poverty and suburban districts saw a decrease in dropout rates.
- In Florida, more rigorous graduation requirements did not change high school dropout rates, but led to small reductions in high school graduation rates (Clark & See, 2011).
- Students who performed slightly below the cut-off on an Algebra I exit exam in ninth grade in North Carolina were five percentage points less likely to take a more rigorous, college preparatory math sequence than students who just passed the exam (Ahn, 2014).
- Young high school graduates who obtained their diplomas in exit exam states fared no better in the labor market than their peers who obtained their diplomas in other states (Warren, Grodsky, & Lee, 2008).
 - No difference was found between the earnings of students who just pass and just fail the last administration of a high school exit exam (Martorell & Clark, 2010).
 - There is no evidence of an effect of high school exit exams on non-employment or the distribution of wages (Baker & Lang, 2013).
- Effects of high school exit exams were found on incarceration rates (Baker & Lang, 2013).

Conclusions

Concluding statements provided by Holme, Richards, Jimerson, & Cohen (2010) apply here:

- Schools have engaged in significant reform efforts in response to exit tests. However, many schools have turned to remediation programs as their major response strategy.
- Exit tests have yielded few benefits, in light of the costs of these policies to students. Proponents might argue that these tests prevented the graduation of students who had not mastered the requisite skills and that these rates of diploma denial are acceptable costs of this policy. However, ways to ameliorate some of the negative effects associated with the high-stakes nature of the exams should be considered.
- Alternative measures or means for students to demonstrate content mastery may moderate some of the negative impact. But they are not enough.

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Appendix C:

Summary of the Literature on the Relationship between High School Grade Point Average and Postsecondary Outcomes

There has been a variety of research that highlights the relative importance of high school GPA and course grades in predicting a student's readiness for college or career, as well as future indicators of success. Many of these studies suggest that a student's readiness is often better predicted by their performance in high school, as reflected by grades and other measures of performance, than standardized test scores. An overview of some of the most compelling research is provided below. Additional resources are included in the reference list that follows.

- Colleges and universities have different policies related to the need for students to submit standardized assessment results with their application for college. For some schools, college admissions test scores are required and for others they are optional. Hiss & Franks (2014) evaluated college outcomes for students who did/did not submit standardized test scores (e.g., ACT or SAT) to inform college admissions decisions. They found that students accepted in light of high school GPA or rank tended to have similar graduation rates and cumulative GPAs as students who were accepted into college in consideration of standardized test results. Non-submitters' cumulative GPAs were only 0.05 less than submitters (2.83 vs. 2.88, respectively) and the difference in graduation rates was only .6 percent. This was true despite the fact that non-submitters often had much lower SAT/ACT scores than their submitting counterparts. This study also showed that students having strong high school GPAs tended to perform well in college despite modest or low scores on standardized assessments, but the opposite did not hold true (i.e., students who performed well on college admissions tests but had a low high school GPA were not typically successful).
- Research conducted by French, et. al. (2015) revealed that high school GPA is a positive and statistically significant predictor of educational attainment and earnings in adulthood. Specifically, researchers found that a one-point increase in high school GPA raises annual earnings in adulthood by around 12 percent for men and 14 percent for women; and that a one-point increase in GPA doubles the probability of completing college (21 percent to 42 percent) for both gender groups. Furthermore, the relationship between high school GPA and overall educational attainment was highest for minority groups. African American and Hispanic men were more likely to go to college and graduate than white male peers with similar high school GPAs.

- A study by Homer and Studley (2003) found high school grade point average in college-preparatory courses to be the best predictor of freshman grade point average for students admitted to the University of California when compared to SAT I verbal and math scores, and SAT II Writing, Mathematics and Third Test scores. In 2007, Homer and Santelices (2007) expanded upon this research (using the same sample of students) by looking at the predictive power of high school grade point average and standardized test results in predicting freshman grades *and* four-year college outcomes (i.e., cumulative college grades and graduation rate). Analyses confirmed and expanded upon the previously established findings, specifically:
 - When compared to standardized test results, unweighted high school grade point average was consistently the strongest predictor of four-year college outcomes for all academic disciplines followed by SAT II Writing.
 - The predictive power of increased after freshman year, accounting for a larger proportion of the variance observed in four-year student outcomes; and
 - Scores on standardized tests tend to be more strongly related to student socio-economic factors than high school GPA; suggesting that high school grade point average has less adverse impact on disadvantaged and underrepresented minority students when used to inform admissions decisions.
- Jakobson and Mocker (2009) found significant differences in college attendance among Florida high school students having different GPAs. Students with A-level GPAs were:
 - Twice as likely to attend college as C or below students (79 percent versus 39 percent); and
 - Significantly more likely than students with C or below GPAs to attend a four-year college directly (45 percent versus 5 percent) or transfer from a two-year to four-year college (28 percent versus 7 percent).
- Research touting the utility of grades in predicting or making inferences about the likelihood of future success also focuses on the fact that grades represent more than the mastery of content within a given content area, and incorporate “qualities of motivation and perseverance— as well as the presence of good study habits and time management skills” (Tough, 2009), which are often considered as important to success in college and careers as academic proficiency.

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Appendix D

Proposed Legislation

The Pennsylvania Department of Education provides the following as proposed legislation to replace current high school graduation requirements as set forth in 22 Pa. Code § 4.24.

Amend the Pennsylvania Public School Code by adding section 1613.1 (relating to high school graduation requirements)

- (a) High school graduation requirements and revisions to them shall be approved by a school entity's governing board by [DATE], and a copy of the requirements shall be published and distributed to students, parents and guardians. Copies of the requirements also shall be available in each school building or on each school entity's publicly accessible web site. Changes to high school graduation requirements shall be published and distributed to students, parents and guardians and made available in each school building or on each school entity's publicly accessible web site immediately following approval by the governing board.
- (b) Notwithstanding any other provision of law to the contrary, beginning in the 2018-2019 school year, each school entity, if applicable, shall adopt and implement requirements for high school graduation that, at minimum, include:
- (1) Course completion and grades; and
 - (2) Demonstration of proficiency as determined by the school entity, if applicable, in each of the State academic standards not assessed by a State assessment; and
 - (3) Successful completion of each of the following State academic standards: Mathematics, specifically Algebra I; English Language Arts, specifically Literature; and Science and Technology and Environment and Ecology, as determined through any one of the following:
 - (i) Attainment of an established composite score on the Algebra I, Biology and Literature Keystone Exams, provided that each student who satisfies the requirements of this section in this manner must achieve Basic or above on each of the three Keystone Exams. The Secretary shall establish and identify the satisfactory composite score a student must achieve in order to meet the requirements of this section, provided that the composite score and any changes thereto must be approved by the State Board; or
 - (ii) For each Keystone Exam on which a student did not achieve proficiency, completion and attainment of an established score on an approved alternative assessment that includes academic content aligned to the following State academic standards: Mathematics, specifically Algebra I; English Language Arts, specifically Literature; and Science and Technology and Environment and Ecology, specifically Biology. The Secretary will identify approved alternative assessments for each content area of Algebra I, Biology, and Literature, if applicable, and will establish the score a

student must attain on each approved alternative assessment in order to meet the requirements of this section, provided that the State Board must approve the score a student must attain on each approved alternative assessment, the list of approved alternative assessments, and any changes thereto; or

- (iii) For each Keystone Exam on which a CTE Concentrator did not achieve proficiency:
 - (A) Completion of locally established grade-based requirements for the associated academic content area; and
 - (B) Attainment of an industry based competency certification related to a student's program of study; or
 - (C) Demonstration of a high likelihood of success on an industry based competency assessment or readiness for continued meaningful engagement in the program of study as represented by performance on benchmark assessments, course grades, and other artifacts consistent with a student's goals and career plan as represented in the student's Career Portfolio.
 - (D) For purposes of this subsection, completion of grade-based requirements in any Science and Technology and Environment and Ecology course will satisfy the requirements of this section.
 - (E) The Secretary will identify approved industry based competency assessments, provided that the State Board must approve the list of industry based competency assessments and any changes thereto.
 - (F) The Department shall provide guidance to school entities related to the content of a Career Portfolio.
 - (iv) For each Keystone Exam on which any student did not achieve proficiency, completion of locally established grade-based requirements for the associated academic content area and demonstration of three pieces of evidence that reflect readiness for meaningful postsecondary engagement consistent with a student's goals and career plan as represented in the student's Career Portfolio. The Department shall provide guidance as to what may be considered as evidence of readiness for meaningful postsecondary engagement.
- (c) Children with disabilities who satisfactorily complete a special education program developed by an Individualized Education Program team under the Individuals with Disabilities Education Act and 22 Pa. Code Chapter 14 shall be granted and issued a regular high school diploma by the school entity, if applicable. This subsection applies if the special education program of a child with a disability does not otherwise meet the requirements of this section.
- (d) For purposes of this section, a student shall be deemed proficient in the State academic standards whenever the student satisfies the requirements of subsection (b), regardless of the student's grade level or age.
- (e) A student who has achieved a score of proficient or advanced on a Keystone Exam is not permitted to retake the exam.

- (f) The performance level demonstrated in each of the State academic standards in subsection (b), including the highest performance level demonstrated by a student on the associated Keystone Exam may be included on student transcripts.
- (g) This section does not allow for the release of individual student PSSA or Keystone Exam scores to the Department or other commonwealth entities in accordance with 22 Pa. Code § 4.51(f) and
- (h) Beginning in the 2016-17 school year, a school entity is not required to provide and a student is not required to complete supplemental instruction as required by 22 Pa. Code §§ 4.24(k), 4.51(b), or any other provision of law.
- (i) A student shall not be required to participate in a project-based assessment pursuant to 22 Pa. Code §§ 4.24, 4.51c, or any other provision of law,
- (j) A school entity shall determine whether a student who transfers from an out-of-State school having demonstrated proficiency in coursework and assessments aligned with the State academic standards assessed by each Keystone Exam may satisfy the requirements of subsection (b) subject to guidance developed by the Secretary.
- (k) The following words and terms, when used in this section, have the following meanings, unless the context clearly indicates otherwise:

Career Portfolio—A future education and career plan required under the PA Career Education and Work Standards.

CTE Concentrator—A student who, by the end of a reporting year, will be reported as successfully completing at least 50% of the minimum technical instructional hours required under 22 Pa. Code Chapter 339.

Department—The Department of Education of the Commonwealth

Keystone Exams—State-developed end-of-course exams. Designated exams will be used to determine, in part, a student's eligibility for high school graduation.

Program of Study—Instructional programs developed by the Department's Bureau of Career and Technical Education that include content aligned with academic standards and relevant career and technical content in a progression of courses that align secondary education with postsecondary education to adequately prepare students to succeed in postsecondary education.

School entity—A school district, charter school, cyber charter school, AVTS or intermediate unit.

Secretary – The Secretary of Education of the Commonwealth of Pennsylvania.

State assessment—A valid and reliable measurement of student performance on a set of academic standards as measured by the Pennsylvania System of School Assessment or the Keystone Exams.

State Board —The State Board of Education established under sections 2601-B—2606-B of the School Code.