Keystone Exams: Algebra I
Assessment Anchors and Eligible Content

Pennsylvania Department of Education

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PENNSYLVANIA DEPARTMENT OF EDUCATION

General Introduction to the Keystone Exam Assessment Anchors

Introduction

Since the introduction of the Keystone Exams, the Pennsylvania Department of Education (PDE) has been working to create a set of tools designed to help educators improve instructional practices and better understand the Keystone Exams. The Assessment Anchors, as defined by the Eligible Content, are one of the many tools the Department believes will better align curriculum, instruction, and assessment practices throughout the commonwealth. Without this alignment, it will not be possible to significantly improve student achievement across the Commonwealth.

How were Keystone Exam Assessment Anchors developed?

Prior to the development of the Assessment Anchors, multiple groups of PA educators convened to create a set of standards for each of the Keystone Exams. Enhanced standards, derived from a review of existing standards, focused on what students need to know and be able to do in order to be college and career ready.

Additionally, the Assessment Anchors and Eligible Content statements were created by other groups of educators charged with the task of clarifying the standards assessed on the Keystone Exams. The Assessment Anchors, as defined by the Eligible Content, have been designed to hold together or *anchor* the state assessment system and curriculum/instructional practices in schools.

Assessment Anchors, as defined by the Eligible Content, were created with the following design parameters:

- **Clear:** The Assessment Anchors are easy to read and are user friendly; they clearly detail which standards are assessed on the Keystone Exams.
- **Focused:** The Assessment Anchors identify a core set of standards that could be reasonably assessed on a large-scale assessment, which will keep educators from having to guess which standards are critical.
- **Rigorous:** The Assessment Anchors support the rigor of the state standards by assessing higher-order and reasoning skills.
- **Manageable:** The Assessment Anchors define the standards in a way that can be easily incorporated into a course to prepare students for success.

How can teachers, administrators, schools, and districts use these Assessment Anchors?

The Assessment Anchors, as defined by the Eligible Content, can help focus teaching and learning because they are clear, manageable, and closely aligned with the Keystone Exams. Teachers and administrators will be better informed about which standards will be assessed. The Assessment Anchors and Eligible Content should be used along with the Standards and the Curriculum Framework of the Standards Aligned System (SAS) to build curriculum, design lessons, and support student achievement.

The Assessment Anchors and Eligible Content are designed to enable educators to determine when they feel students are prepared to be successful in the Keystone Exams. An evaluation of current course offerings, through the lens of what is assessed on those particular Keystone Exams may provide an opportunity for an alignment to ensure student preparedness.

How are the Assessment Anchors organized?

The Assessment Anchors, as defined by the Eligible Content, are organized into cohesive blueprints, each structured with a common labeling system that can be read like an outline. This framework is organized first by module, then by Assessment Anchor, followed by Anchor Descriptor, and then finally, at the greatest level of detail, by an Eligible Content statement. The common format of this outline is followed across the Keystone Exams.

Here is a description of each level in the labeling system for the Keystone Exams:

Module: The Assessment Anchors are organized into two thematic modules for each of the Keystone Exams. The module title appears at the top of each page. The module level is important because the Keystone Exams are built using a module format, with each of the Keystone Exams divided into two equally-sized test modules. Each module is made up of two or more Assessment Anchors.

Assessment Anchor: The Assessment Anchor appears in the shaded bar across the top of each Assessment Anchor table. The Assessment Anchors represent categories of subject matter that anchor the content of the Keystone Exams. Each Assessment Anchor is part of a module and has one or more Anchor Descriptors unified under it.

Anchor Descriptor: Below each Assessment Anchor is a specific Anchor Descriptor. The Anchor Descriptor level provides further details that delineate the scope of content covered by the Assessment Anchor. Each Anchor Descriptor is part of an Assessment Anchor and has one or more Eligible Content unified under it.

Eligible Content: The column to the right of the Anchor Descriptor contains the Eligible Content statements. The Eligible Content is the most specific description of the content that is assessed on the Keystone Exams. This level is considered the assessment limit and helps educators identify the range of the content covered on the Keystone Exams.

Enhanced Standard: In the column to the right of each Eligible Content statement is a code representing one or more Enhanced Standards that correlate to the Eligible Content statement.

What impact will the implementation of the K–12 Common Core Standards have on the content of this document?

It is anticipated that there will be significant alignment between PA's Academic Standards and the Common Core. Every effort will be made to ensure that the alignment of the standards to the Assessment Anchors and Eligible Content is maintained. As more information becomes available, PDE will inform state educators.

Standards Aligned System — http://www.pdesas.org/

Pennsylvania Department of Education — www.education.state.pa.us

ASSESSMENT ANCHOR
A1.1.1 Operations with Real Numbers and Expressions

Anchor Descriptor		Eligible Content		Enhanced Standard
A1.1.1.1	Represent and/or use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, square roots, and exponents).	**A1.1.1.1.1**	Compare and/or order any real numbers. Note: Rational and irrational may be mixed.	2.1.A1.A
		A1.1.1.1.2	Simplify square roots (e.g., $\sqrt{24} = 2\sqrt{6}$).	2.1.A1.A

Anchor Descriptor		Eligible Content		Enhanced Standard
A1.1.1.2	Apply number theory concepts to show relationships between real numbers in problem-solving settings.	**A1.1.1.2.1**	Find the Greatest Common Factor (GCF) and/or the Least Common Multiple (LCM) for sets of monomials.	2.1.A1.E

Anchor Descriptor		Eligible Content		Enhanced Standard
A1.1.1.3	Use exponents, roots, and/or absolute values to solve problems.	**A1.1.1.3.1**	Simplify/evaluate expressions involving properties/laws of exponents, roots, and/or absolute values to solve problems. Note: Exponents should be integers from -10 to 10.	2.2.A1.C

Eligible Content may be assessed using problem-solving situations.

Anchor Descriptor		Eligible Content		Enhanced Standard
A1.1.1.4	Use estimation strategies in problem-solving situations.	**A1.1.1.4.1**	Use estimation to solve problems.	2.2.A1.C

Anchor Descriptor		Eligible Content		Enhanced Standard
A1.1.1.5	Simplify expressions involving polynomials.	**A1.1.1.5.1**	Add, subtract, and/or multiply polynomial expressions (express answers in simplest form). Note: Nothing larger than a binomial multiplied by a trinomial.	2.8.A1.B
		A1.1.1.5.2	Factor algebraic expressions, including difference of squares and trinomials. Note: Trinomials are limited to the form ax^2+bx+c where a is equal to 1 after factoring out all monomial factors.	2.1.A1.B
		A1.1.1.5.3	Simplify/reduce a rational algebraic expression.	2.8.A1.B

Eligible Content may be assessed using problem-solving situations.

ASSESSMENT ANCHOR
A1.1.2 Linear Equations

Anchor Descriptor	Eligible Content	Enhanced Standard
A1.1.2.1 Write, solve, and/or graph linear equations using various methods.	**A1.1.2.1.1** Write, solve, and/or apply a linear equation (including problem situations).	2.1.A1.F 2.8.A1.E 2.8.A1.F
	A1.1.2.1.2 Use and/or identify an algebraic property to justify any step in an equation-solving process. Note: Linear equations only.	2.1.A1.F
	A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation. Note: Linear equations only.	2.8.A1.F

Anchor Descriptor	Eligible Content	Enhanced Standard
A1.1.2.2 Write, solve, and/or graph systems of linear equations using various methods.	**A1.1.2.2.1** Write and/or solve a system of linear equations (including problem situations) using graphing, substitution, and/or elimination. Note: Limit systems to two linear equations.	2.8.A1.E 2.8.A1.F
	A1.1.2.2.2 Interpret solutions to problems in the context of the problem situation. Note: Limit systems to two linear equations.	2.8.A1.F

Eligible Content may be assessed using problem-solving situations.

ASSESSMENT ANCHOR
A1.1.3 Linear Inequalities

Anchor Descriptor	Eligible Content	Enhanced Standard
A1.1.3.1 Write, solve, and/or graph linear inequalities using various methods.	**A1.1.3.1.1** Write or solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities).	2.1.A1.F 2.8.A1.E 2.8.A1.F
	A1.1.3.1.2 Identify or graph the solution set to a linear inequality on a number line.	2.8.A1.B
	A1.1.3.1.3 Interpret solutions to problems in the context of the problem situation. Note: Limit to linear inequalities.	2.8.A1.F

Anchor Descriptor	Eligible Content	Enhanced Standard
A1.1.3.2 Write, solve, and/or graph systems of linear inequalities using various methods.	**A1.1.3.2.1** Write and/or solve a system of linear inequalities using graphing. Note: Limit systems to two linear inequalities.	2.8.A1.E 2.8.A1.F
	A1.1.3.2.2 Interpret solutions to problems in the context of the problem situation. Note: Limit systems to two linear inequalities.	2.8.A1.F

Eligible Content may be assessed using problem-solving situations.

ASSESSMENT ANCHOR A1.2.1 Functions			
Anchor Descriptor	**Eligible Content**		**Enhanced Standard**
A1.2.1.1 Analyze and/or use patterns or relations.	**A1.2.1.1.1**	Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.	2.8.A1.C
	A1.2.1.1.2	Determine whether a relation is a function, given a set of points or a graph.	2.8.A1.D
	A1.2.1.1.3	Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table).	2.8.A1.D
Anchor Descriptor	**Eligible Content**		**Enhanced Standard**
A1.2.1.2 Interpret and/or use linear functions and their equations, graphs, or tables.	**A1.2.1.2.1**	Create, interpret, and/or use the equation, graph, or table of a linear function.	2.8.A1.D
	A1.2.1.2.2	Translate from one representation of a linear function to another (i.e., graph, table, and equation).	2.8.A1.D

Eligible Content may be assessed using problem-solving situations.

ASSESSMENT ANCHOR A1.2.2 Coordinate Geometry			
Anchor Descriptor		**Eligible Content**	**Enhanced Standard**
A1.2.2.1 Describe, compute, and/or use the rate of change (slope) of a line.	**A1.2.2.1.1**	Identify, describe, and/or use constant rates of change.	2.11.A1.B
	A1.2.2.1.2	Apply the concept of linear rate of change (slope) to solve problems.	2.9.A1.C
	A1.2.2.1.3	Write or identify a linear equation when given • the graph of the line, • two points on the line, or • the slope and a point on the line. Note: Linear equation may be in point-slope, standard, and/or slope-intercept form.	2.9.A1.C
	A1.2.2.1.4	Determine the slope and/or *y*-intercept represented by a linear equation or graph.	2.8.A1.D
Anchor Descriptor		**Eligible Content**	**Enhanced Standard**
A1.2.2.2 Analyze and/or interpret data on a scatter plot.	**A1.2.2.2.1**	Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.	2.6.A1.C

Eligible Content may be assessed using problem-solving situations.

ASSESSMENT ANCHOR
A1.2.3 Data Analysis

Anchor Descriptor		Eligible Content		Enhanced Standard
A1.2.3.1	Use measures of dispersion to describe a set of data.	**A1.2.3.1.1**	Calculate and/or interpret the range, quartiles, and interquartile range of data.	2.6.A1.C
Anchor Descriptor		**Eligible Content**		**Enhanced Standard**
A1.2.3.2	Use data displays in problem-solving settings and/or to make predictions.	**A1.2.3.2.1**	Estimate or calculate to make predictions based on a circle, line, bar graph, measures of central tendency, or other representations.	2.6.A1.E
		A1.2.3.2.2	Analyze data, make predictions, and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots, scatter plots, measures of central tendency, or other representations).	2.6.A1.E
		A1.2.3.2.3	Make predictions using the equations or graphs of best-fit lines of scatter plots.	2.6.A1.E
Anchor Descriptor		**Eligible Content**		**Enhanced Standard**
A1.2.3.3	Apply probability to practical situations.	**A1.2.3.3.1**	Find probabilities for compound events (e.g., find probability of red and blue, find probability of red or blue) and represent as a fraction, decimal, or percent.	2.7.A1.A

Eligible Content may be assessed using problem-solving situations.