Mathematics

Assessment Anchors and Eligible Content
Aligned to the Pennsylvania Core Standards

Grade 7

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 Reporting Category, 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 PSSA.

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

Reporting Category

The Assessment Anchors are organized into four classifications, as listed below.

- o A = Numbers and Operations
- o B = Algebraic Concepts
- o C = Geometry
- o D = Data Analysis and Probability

These four classifications are used throughout the grade levels. In addition to these classifications, there are five Reporting Categories for each grade level. The first letter of each Reporting Category represents the classification; the second letter represents the Domain as stated in the Pennsylvania Core Standards for Mathematics. Listed below are the Reporting Categories for Grade 7.

- o A-N = The Number System
- o A-R = Ratios and Proportional Relationships
- o B-E = Expressions and Equations
- o C-G = Geometry
- o D-S = Statistics and Probability

The title of each Reporting Category is consistent with the title of the corresponding Domain in the Pennsylvania Core Standards for Mathematics. The Reporting Category title appears at the top of each page.

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 (skills and concepts) that anchor the content of the PSSA. Each Assessment Anchor is part of a Reporting Category and has one or more Anchor Descriptors unified under and aligned to it.

Anchor Descriptor

Below each Assessment Anchor is one or more specific Anchor Descriptors. The Anchor Descriptor adds a level of specificity to the content covered by the Assessment Anchor. Each Anchor Descriptor is part of an Assessment Anchor and has one or more Eligible Content statements unified under and aligned to 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 skills and concepts assessed on the PSSA. This level is considered the assessment limit and helps educators identify the range of the content covered on the PSSA.

Reference

In the space below each Assessment Anchor table is a code representing one or more Pennsylvania Core Standards for Mathematics that correlate to the Eligible Content statements.

M07.A-N The Number System

ASSESSMENT ANCHOR	
M07.A-N.1	**Apply and extend previous understandings of operations to add, subtract, multiply, and divide rational numbers.**

DESCRIPTOR		ELIGIBLE CONTENT	
M07.A-N.1.1	Solve real-world and mathematical problems involving the four operations with rational numbers.	**M07.A-N.1.1.1**	Apply properties of operations to add and subtract rational numbers, including real-world contexts.
		M07.A-N.1.1.2	Represent addition and subtraction on a horizontal or vertical number line.
		M07.A-N.1.1.3	Apply properties of operations to multiply and divide rational numbers, including real-world contexts; demonstrate that the decimal form of a rational number terminates or eventually repeats.

Reference:

CC.2.1.7.E.1

Apply and extend previous understandings of operations with fractions to operations with rational numbers.

M07.A-R Ratios and Proportional Relationships   **Reporting Category**

ASSESSMENT ANCHOR	
M07.A-R.1	**Demonstrate an understanding of proportional relationships.**

DESCRIPTOR		ELIGIBLE CONTENT	
M07.A-R.1.1	Analyze, recognize, and represent proportional relationships and use them to solve real-world and mathematical problems.	**M07.A-R.1.1.1**	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. *Example: If a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2 / 1/4 miles per hour, equivalently 2 miles per hour.*
		M07.A-R.1.1.2	Determine whether two quantities are proportionally related (e.g., by testing for equivalent ratios in a table, graphing on a coordinate plane and observing whether the graph is a straight line through the origin).
		M07.A-R.1.1.3	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
		M07.A-R.1.1.4	Represent proportional relationships by equations. *Example: If total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.*
		M07.A-R.1.1.5	Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r), where r is the unit rate.
		M07.A-R.1.1.6	Use proportional relationships to solve multi-step ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease.*

Reference:

CC.2.1.7.D.1

Analyze proportional relationships and use them to model and solve real-world and mathematical problems.

M07.B-E Expressions and Equations

ASSESSMENT ANCHOR	
M07.B-E.1	**Represent expressions in equivalent forms.**

DESCRIPTOR		ELIGIBLE CONTENT	
M07.B-E.1.1	Use properties of operations to generate equivalent expressions.	**M07.B-E.1.1.1**	Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients.
			Example 1: The expression $1/2 \cdot (x + 6)$ is equivalent to $1/2 \cdot x + 3$.
			Example 2: The expression $5.3 - y + 4.2$ is equivalent to $9.5 - y$ (or $^-y + 9.5$).
			Example 3: The expression $4w - 10$ is equivalent to $2(2w - 5)$.

Reference:

CC.2.2.7.B.1

Apply properties of operations to generate equivalent expressions.

M07.B-E Expressions and Equations

ASSESSMENT ANCHOR	
M07.B-E.2	**Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities.**

DESCRIPTOR		ELIGIBLE CONTENT	
M07.B-E.2.1	Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers.	**M07.B-E.2.1.1**	Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate.
			Example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50 an hour (or 1.1 × $25 = $27.50).

Reference:

CC.2.2.7.B.3

Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

M07.B-E Expressions and Equations

ASSESSMENT ANCHOR	
M07.B-E.2	**Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities.**

DESCRIPTOR		ELIGIBLE CONTENT	
M07.B-E.2.2	Use variables to represent quantities in a real-world or mathematical problem and construct simple equations and inequalities to solve problems.	**M07.B-E.2.2.1**	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers.
			Example: The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
		M07.B-E.2.2.2	Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers, and graph the solution set of the inequality.
			Example: A salesperson is paid $50 per week plus $3 per sale. This week she wants her pay to be at least $100. Write an inequality for the number of sales the salesperson needs to make and describe the solutions.

Reference:

CC.2.2.7.B.3

Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

M07.B-E Expressions and Equations
<div align="right">Reporting Category</div>

ASSESSMENT ANCHOR	
M07.B-E.2	**Solve real-world and mathematical problems using numerical and algebraic expressions, equations, and inequalities.**

DESCRIPTOR		ELIGIBLE CONTENT	
M07.B-E.2.3	Determine the reasonableness of the answer(s) in problem-solving situations.	**M07.B-E.2.3.1**	Determine the reasonableness of answer(s) or interpret the solution(s) in the context of the problem.
			Example: _If you want to place a towel bar that is 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation._

Reference:

CC.2.2.7.B.3

Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

M07.C-G Geometry Reporting Category

ASSESSMENT ANCHOR	
M07.C-G.1	**Demonstrate an understanding of geometric figures and their properties.**

DESCRIPTOR	ELIGIBLE CONTENT
M07.C-G.1.1 Describe and apply properties of geometric figures.	**M07.C-G.1.1.1** Solve problems involving scale drawings of geometric figures, including finding length and area.
	M07.C-G.1.1.2 Identify or describe the properties of all types of triangles based on angle and side measures.
	M07.C-G.1.1.3 Use and apply the triangle inequality theorem.
	M07.C-G.1.1.4 Describe the two-dimensional figures that result from slicing three-dimensional figures.
	Example: Describe plane sections of right rectangular prisms and right rectangular pyramids.

Reference:

CC.2.3.7.A.2

Visualize and represent geometric figures and describe the relationships between them.

M07.C-G Geometry　　　　　　　　　　　　　　　　　　**Reporting Category**

ASSESSMENT ANCHOR	
M07.C-G.2	**Solve real-world and mathematical problems involving angle measure, circumference, area, surface area, and volume.**

DESCRIPTOR		ELIGIBLE CONTENT	
M07.C-G.2.1	Identify, use, and describe properties of angles and their measures.	**M07.C-G.2.1.1**	Identify and use properties of supplementary, complementary, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
		M07.C-G.2.1.2	Identify and use properties of angles formed when two parallel lines are cut by a transversal (e.g., angles may include alternate interior, alternate exterior, vertical, corresponding).

Reference:

CC.2.3.7.A.1

Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

M07.C-G Geometry | **Reporting Category**

ASSESSMENT ANCHOR	
M07.C-G.2	**Solve real-world and mathematical problems involving angle measure, circumference, area, surface area, and volume.**

DESCRIPTOR		ELIGIBLE CONTENT	
M07.C-G.2.2	Determine circumference, area, surface area, and volume.	**M07.C-G.2.2.1**	Find the area and circumference of a circle. Solve problems involving area and circumference of a circle(s). **Formulas will be provided.**
		M07.C-G.2.2.2	Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. **Formulas will be provided.**

Reference:

CC.2.3.7.A.1

Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

M07.D-S Statistics and Probability   **Reporting Category**

ASSESSMENT ANCHOR	
M07.D-S.1	**Use random sampling to draw inferences about a population.**

DESCRIPTOR		ELIGIBLE CONTENT	
M07.D-S.1.1	Use random samples.	**M07.D-S.1.1.1**	Determine whether a sample is a random sample given a real-world situation.
		M07.D-S.1.1.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest.
			Example 1: Estimate the mean word length in a book by randomly sampling words from the book.
			Example 2: Predict the winner of a school election based on randomly sampled survey data.

Reference:

CC.2.4.7.B.1

Draw inferences about populations based on random sampling concepts.

M07.D-S Statistics and Probability

ASSESSMENT ANCHOR	
M07.D-S.2	**Draw comparative inferences about populations.**

DESCRIPTOR	ELIGIBLE CONTENT
M07.D-S.2.1 Use statistical measures to compare two numerical data distributions.	**M07.D-S.2.1.1** Compare two numerical data distributions using measures of center and variability. *Example 1: The mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team. This difference is equal to approximately twice the variability (mean absolute deviation) on either team. On a line plot, note the difference between the two distributions of heights.* *Example 2: Decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*

Reference:

CC.2.4.7.B.2

Draw informal comparative inferences about two populations.

M07.D-S Statistics and Probability | **Reporting Category**

ASSESSMENT ANCHOR	
M07.D-S.3	**Investigate chance processes and develop, use, and evaluate probability models.**

DESCRIPTOR	ELIGIBLE CONTENT
M07.D-S.3.1 Predict or determine the likelihood of outcomes.	**M07.D-S.3.1.1** Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible (i.e., a probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event).

Reference:

CC.2.4.7.B.3

Investigate chance processes and develop, use, and evaluate probability models.

M07.D-S Statistics and Probability

ASSESSMENT ANCHOR	
M07.D-S.3	**Investigate chance processes and develop, use, and evaluate probability models.**

DESCRIPTOR		ELIGIBLE CONTENT	
M07.D-S.3.2	Use probability to predict outcomes.	**M07.D-S.3.2.1**	Determine the probability of a chance event given relative frequency. Predict the approximate relative frequency given the probability.
			Example: When rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times but probably not exactly 200 times.
		M07.D-S.3.2.2	Find the probability of a simple event, including the probability of a simple event **not** occurring.
			Example: What is the probability of **not** rolling a 1 on a number cube?
		M07.D-S.3.2.3	Find probabilities of independent compound events using organized lists, tables, tree diagrams, and simulation.

Reference:

CC.2.4.7.B.3

Investigate chance processes and develop, use, and evaluate probability models.