Mathematics

Assessment Anchors and Eligible Content

Aligned to the Pennsylvania Core Standards

Grade 6

Pennsylvania Department of Education

www.pdesas.org www.education.state.pa.us

April 2014

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.

- A = Numbers and Operations
- B = Algebraic Concepts
- C = Geometry
- 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 6.

- A-N = The Number System
- A-R = Ratios and Proportional Relationships
- B-E = Expressions and Equations
- C-G = Geometry
- 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.

M06.A-N The Number System

Reporting Category

ASSESSMENT ANCHOR			
M06.A-N.1	**Apply and extend previous understandings of multiplication and division to divide fractions by fractions.**		
	DESCRIPTOR		**ELIGIBLE CONTENT**
M06.A-N.1.1	Solve real-world and mathematical problems involving division of fractions.	**M06.A-N.1.1.1**	Interpret and compute quotients of fractions (including mixed numbers), and solve word problems involving division of fractions by fractions. *Example 1: Given a story context for (2/3) ÷ (3/4), explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = (a/b) × (d/c) = ad/bc.)* *Example 2: How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?* *Example 3: How many 2 1/4-foot pieces can be cut from a 15 1/2-foot board?*

Reference:

CC.2.1.6.E.1

Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

M06.A-N The Number System

Reporting Category

ASSESSMENT ANCHOR			
M06.A-N.2	**Compute with multi-digit numbers and find common factors and multiples.**		
	DESCRIPTOR		**ELIGIBLE CONTENT**
M06.A-N.2.1	Compute with multi-digit numbers using the four arithmetic operations with or without a calculator.	**M06.A-N.2.1.1**	Solve problems involving operations (+, –, ×, and ÷) with whole numbers, decimals (through thousandths), straight computation, or word problems.

Reference:

CC.2.1.6.E.2

Identify and choose appropriate processes to compute fluently with multi-digit numbers.

M06.A-N The Number System

Reporting Category

ASSESSMENT ANCHOR

M06.A-N.2 **Compute with multi-digit numbers and find common factors and multiples.**

DESCRIPTOR		ELIGIBLE CONTENT	
M06.A-N.2.2	Apply number theory concepts (specifically, factors and multiples).	**M06.A-N.2.2.1**	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12.
		M06.A-N.2.2.2	Apply the distributive property to express a sum of two whole numbers, 1 through 100, with a common factor as a multiple of a sum of two whole numbers with no common factor. *Example: Express 36 + 8 as 4(9 + 2).*

Reference:

CC.2.1.6.E.3

Develop and/or apply number theory concepts to find common factors and multiples.

M06.A-N The Number System

Reporting Category

ASSESSMENT ANCHOR			
M06.A-N.3	**Apply and extend previous understandings of numbers to the system of rational numbers.**		
	DESCRIPTOR		**ELIGIBLE CONTENT**
M06.A-N.3.1	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values and locations on the number line and coordinate plane.	**M06.A-N.3.1.1**	Represent quantities in real-world contexts using positive and negative numbers, explaining the meaning of 0 in each situation (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge).
		M06.A-N.3.1.2	Determine the opposite of a number and recognize that the opposite of the opposite of a number is the number itself (e.g., $-(-3) = 3$; 0 is its own opposite).
		M06.A-N.3.1.3	Locate and plot integers and other rational numbers on a horizontal or vertical number line; locate and plot pairs of integers and other rational numbers on a coordinate plane.

Reference:

CC.2.1.6.E.4

Apply and extend previous understandings of numbers to the system of rational numbers.

M06.A-N The Number System

Reporting Category

ASSESSMENT ANCHOR

M06.A-N.3 Apply and extend previous understandings of numbers to the system of rational numbers.

DESCRIPTOR		ELIGIBLE CONTENT	
M06.A-N.3.2	Understand ordering and absolute value of rational numbers.	**M06.A-N.3.2.1**	Write, interpret, and explain statements of order for rational numbers in real-world contexts. *Example: Write ⁻3°C > ⁻7°C to express the fact that ⁻3°C is warmer than ⁻7°C.*
		M06.A-N.3.2.2	Interpret the absolute value of a rational number as its distance from 0 on the number line and as a magnitude for a positive or negative quantity in a real-world situation. *Example: For an account balance of ⁻30 dollars, write |⁻30| = 30 to describe the size of the debt in dollars, and recognize that an account balance less than ⁻30 dollars represents a debt greater than 30 dollars.*
		M06.A-N.3.2.3	Solve real-world and mathematical problems by plotting points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Reference:

CC.2.1.6.E.4

Apply and extend previous understandings of numbers to the system of rational numbers.

M06.A-R Ratios and Proportional Relationships — Reporting Category

ASSESSMENT ANCHOR

M06.A-R.1 Understand ratio concepts and use ratio reasoning to solve problems.

DESCRIPTOR		ELIGIBLE CONTENT	
M06.A-R.1.1	Represent and/or solve real-world and mathematical problems using rates, ratios, and/or percents.	**M06.A-R.1.1.1**	Use ratio language and notation (such as 3 to 4, 3:4, 3/4) to describe a ratio relationship between two quantities. *Example 1: "The ratio of girls to boys in a math class is 2:3 because for every 2 girls there are 3 boys."* *Example 2: "For every five votes candidate A received, candidate B received four votes."*
		M06.A-R.1.1.2	Find the unit rate a/b associated with a ratio $a:b$ (with $b \neq 0$) and use rate language in the context of a ratio relationship. *Example 1: "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar."* *Example 2: "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*
		M06.A-R.1.1.3	Construct tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and/or plot the pairs of values on the coordinate plane. Use tables to compare ratios.
		M06.A-R.1.1.4	Solve unit rate problems including those involving unit pricing and constant speed. *Example: If it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*
		M06.A-R.1.1.5	Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percentage.

Reference:

CC.2.1.6.D.1
Understand ratio concepts and use ratio reasoning to solve problems.

M06.B-E Expressions and Equations — Reporting Category

ASSESSMENT ANCHOR			
M06.B-E.1	**Apply and extend previous understandings of arithmetic to numerical and algebraic expressions.**		
	DESCRIPTOR		**ELIGIBLE CONTENT**
M06.B-E.1.1	Identify, write, and evaluate numerical and algebraic expressions.	**M06.B-E.1.1.1**	Write and evaluate numerical expressions involving whole-number exponents.
		M06.B-E.1.1.2	Write algebraic expressions from verbal descriptions. *Example: Express the description "five less than twice a number" as 2y – 5.*
		M06.B-E.1.1.3	Identify parts of an expression using mathematical terms (e.g., sum, term, product, factor, quotient, coefficient, quantity). *Example: Describe the expression 2(8 + 7) as a product of two factors.*
		M06.B-E.1.1.4	Evaluate expressions at specific values of their variables, including expressions that arise from formulas used in real-world problems. *Example: Evaluate the expression $b^2 – 5$ when $b = 4$.*
		M06.B-E.1.1.5	Apply the properties of operations to generate equivalent expressions. *Example 1: Apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x.* *Example 2: Apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6(4x + 3y).* *Example 3: Apply properties of operations to y + y + y to produce the equivalent expression 3y.*

Reference:

CC.2.2.6.B.1

Apply and extend previous understandings of arithmetic to algebraic expressions.

M06.B-E Expressions and Equations — Reporting Category

ASSESSMENT ANCHOR			
M06.B-E.2	**Interpret and solve one-variable equations and inequalities.**		
	DESCRIPTOR		**ELIGIBLE CONTENT**
M06.B-E.2.1	Create, solve, and interpret one-variable equations or inequalities in real-world and mathematical problems.	**M06.B-E.2.1.1**	Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
		M06.B-E.2.1.2	Write algebraic expressions to represent real-world or mathematical problems.
		M06.B-E.2.1.3	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q, and x are all non-negative rational numbers.
		M06.B-E.2.1.4	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem and/or represent solutions of such inequalities on number lines.

Reference:

CC.2.2.6.B.2

Understand the process of solving a one-variable equation or inequality and apply to real-world and mathematical problems.

M06.B-E Expressions and Equations — Reporting Category

ASSESSMENT ANCHOR			
M06.B-E.3	**Represent and analyze quantitative relationships between dependent and independent variables.**		
	DESCRIPTOR		**ELIGIBLE CONTENT**
M06.B-E.3.1	Use variables to represent two quantities in a real-world problem that change in relationship to one another.	**M06.B-E.3.1.1**	Write an equation to express the relationship between the dependent and independent variables. *Example: In a problem involving motion at a constant speed of 65 units, write the equation d = 65t to represent the relationship between distance and time.*
		M06.B-E.3.1.2	Analyze the relationship between the dependent and independent variables using graphs and tables and/or relate these to an equation.

Reference:

CC.2.2.6.B.3
Represent and analyze quantitative relationships between dependent and independent variables.

ASSESSMENT ANCHOR			
M06.C-G.1	**Solve real-world and mathematical problems involving area, surface area, and volume.**		
	DESCRIPTOR		**ELIGIBLE CONTENT**
M06.C-G.1.1	Find area, surface area, and volume by applying formulas and using various strategies.	**M06.C-G.1.1.1**	Determine the area of triangles and special quadrilaterals (i.e., square, rectangle, parallelogram, rhombus, and trapezoid). **Formulas will be provided.**
		M06.C-G.1.1.2	Determine the area of irregular or compound polygons. *Example: Find the area of a room in the shape of an irregular polygon by composing and/or decomposing.*
		M06.C-G.1.1.3	Determine the volume of right rectangular prisms with fractional edge lengths. **Formulas will be provided.**
		M06.C-G.1.1.4	Given coordinates for the vertices of a polygon in the plane, use the coordinates to find side lengths and area of the polygon (limited to triangles and special quadrilaterals). **Formulas will be provided.**
		M06.C-G.1.1.5	Represent three-dimensional figures using nets made of rectangles and triangles.
		M06.C-G.1.1.6	Determine the surface area of triangular and rectangular prisms (including cubes). **Formulas will be provided.**

Reference:

CC.2.3.6.A.1
Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.

M06.D-S Statistics and Probability — Reporting Category

ASSESSMENT ANCHOR			
M06.D-S.1	**Demonstrate understanding of statistical variability by summarizing and describing distributions.**		
	DESCRIPTOR		**ELIGIBLE CONTENT**
M06.D-S.1.1	Display, analyze, and summarize numerical data sets in relation to their context.	**M06.D-S.1.1.1**	Display numerical data in plots on a number line, including line plots, histograms, and box-and-whisker plots.
		M06.D-S.1.1.2	Determine quantitative measures of center (e.g., median, mean, mode) and variability (e.g., range, interquartile range, mean absolute deviation).
		M06.D-S.1.1.3	Describe any overall pattern and any deviations from the overall pattern with reference to the context in which the data were gathered.
		M06.D-S.1.1.4	Relate the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

Reference:

CC.2.4.6.B.1
Demonstrate an understanding of statistical variability by displaying, analyzing, and summarizing distributions.