PSSA

Pennsylvania System of School Assessment

Math

Grade 3

Item Sampler Scoring Guide

2025–2026

Pennsylvania
Department of Education

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INFORMATION ABOUT MATHEMATICS

Introduction

General Introduction

The Pennsylvania Department of Education (PDE) provides districts and schools with tools to assist in delivering focused instructional programs aligned with the Pennsylvania Core Standards (PCS). These tools include Academic Standards, Assessment Anchors and Eligible Content (AAEC) documents, assessment handbooks, content-based online Item Samplers, and Sampler Guides. The online Item Sampler provides examples of actual PSSA questions. The Sampler Guide provides examples of scored student responses. Pennsylvania educators can use the online Item Samplers in conjunction with the Sampler Guides as a tool in preparing local instruction. Questions from the Item Samplers are not designed to serve as a pretest or benchmark assessment.

The online Item Samplers are available in Braille format. For more information regarding a Braille version, call (717) 901-2238.

Pennsylvania Core Standards (PCS)

The online Item Sampler and this Sampler Guide contain examples of test questions designed to assess the Pennsylvania Assessment Anchors and Eligible Content aligned to the PCS.

What Is Included

The online Item Samplers contain test questions aligned to the Assessment Anchors and Eligible Content of the PCS. Teams of Pennsylvania educators thoroughly reviewed each question for alignment to the Assessment Anchors, context, word selection, and difficulty level prior to field testing and operational use on the PSSA. Answer choices and distractor rationales are included for multiple-choice questions. The Sampler Guides contain Scoring Guidelines for open-ended questions, Formula Sheets, and summary data, as well as the Mathematics Test Directions for online assessments. Actual responses for each point value (4, 3, 2, 1, and 0) are provided as well. To access the Online Item Sampler, go to https://portal.te.drcedirect.com/PA. Select Item Samplers. Then, select the subject and grade levels as needed.

Purpose and Uses

Pennsylvania educators may use[1] the questions within the Item Samplers as examples when creating classroom-level assessments. Students can answer the multiple-choice and open-ended questions in the testing platform. Classroom teachers can use the Scoring Guidelines as well as sample student responses to the open-ended questions as a guide if they wish to score students' work, either independently or alongside school or district colleagues. Students have access to the *General Description of Scoring Guidelines for Mathematics Open-Ended Questions* during the PSSA. Educators may distribute copies to students for use during classroom assessments.

Item Format and Scoring Guidelines

The multiple-choice (MC) items have four answer choices. Each correct response to an MC item is worth one point.

Each OE question in mathematics is scored using a question-specific rubric based upon a 0–4-point scale. The Sampler Guides include the rubric and examples of students' responses for each score point.

Item Alignment

All PSSA items are aligned to statements and specifications included in the *Assessment Anchors and Eligible Content Aligned to the Pennsylvania Core Standards*. The mathematics content, process skills, directives, and action statements included in the PSSA mathematics questions align with the Assessment Anchor Content Standards. The eligible content statements reflect the content limits of mathematics questions.

Testing Time and Mode of Test Delivery for the PSSA

The PSSA is delivered in an online format. The estimated response time for each item type is listed below.

- **Multiple-Choice:** 2 minutes
- **Open-Ended:** 10 to 15 minutes

During an official test administration, students are given as much additional time as is necessary to complete the test questions.

[1] The permission to copy and/or use these materials does not extend to commercial purposes.

Mathematics Reporting Categories

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 Common Core State Standards for Mathematics. Listed below are the Reporting Categories for Grade 3.

- A-T = Numbers and Operations in Base Ten
- A-F = Numbers and Operations—Fractions
- B-O = Operations and Algebraic Thinking
- C-G = Geometry
- D-M = Measurement and Data

Examples of MC and OE items assessing these categories are included in the online Item Samplers and the Sampler Guides.

Item and Scoring Sampler Format

The online Item Samplers and the Sampler Guides include the test directions and scoring guidelines that appear in the PSSA Mathematics assessments. Each MC item contains a table that includes the item alignment, the answer key, the depth of knowledge (DOK) level, points possible, the percentage[2] of students who chose each answer option, and a brief answer-option analysis or rationale. The OE item contains a table that includes the item alignment, the DOK level, points possible, and the mean student score. Additionally, every item-specific scoring guideline included in this Sampler Guide is combined with sample student responses representing each score point to form a practical item-specific scoring guide. The *General Description of Scoring Guidelines for Mathematics Open-Ended Questions* used to develop the item-specific scoring guidelines should be used if any additional item-specific scoring guidelines are created for use within local instructional programs. The student responses in this Sampler Guide are actual student responses.

Example Multiple-Choice Item Information Table

Item-Specific Information	Item Statistics
Alignment:	*p*-value A:
Answer Key:	*p*-value B:
Depth of Knowledge:	*p*-value C:
Points Possible:	*p*-value D:

Option Annotations
Brief answer-option analysis or rationale.

Example Open-Ended Item Information Table

Category	Item-Specific Information
Alignment	Assigned AAEC
Depth of Knowledge	Assigned DOK
Points Possible	Number of Points
Mean Score	Average Score

[2] All *p*-value percentages listed in the item information tables have been rounded.

General Description of Scoring Guidelines for Mathematics Open-Ended Questions

4 –The response demonstrates a *thorough* understanding of the mathematical concepts and procedures required by the task.

The response provides correct answer(s) with clear and complete mathematical procedures shown and a correct explanation, as required by the task. The response may contain a minor "blemish" or omission in work or explanation that does not detract from demonstrating a *thorough* understanding.

3 –The response demonstrates a *general* understanding of the mathematical concepts and procedures required by the task.

The response and explanation (as required by the task) are mostly complete and correct. The response may have minor errors or omissions that do not detract from demonstrating a *general* understanding.

2 –The response demonstrates a *partial* understanding of the mathematical concepts and procedures required by the task.

The response is somewhat correct with a *partial* understanding of the required mathematical concepts and/or procedures demonstrated and/or explained. The response may contain some work that is incomplete or unclear.

1 –The response demonstrates a *minimal* understanding of the mathematical concepts and procedures required by the task.

The response is marginally correct with a *minimal* understanding of the required mathematical concepts and/or procedures demonstrated and/or explained. The response may contain work that is undeveloped and rudimentary in nature.

0 –The response has no correct answer and *insufficient* evidence to demonstrate any understanding of the mathematical concepts and procedures required by the task for that grade level.

The response may show only information copied from the question.

Special Categories within zero reported separately:

BLK (blank)	Blank, entirely erased, or written refusal to respond
OT	Off task
LOE	Response in a language other than English
IL	Illegible

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PSSA MATHEMATICS GRADE 3

Mathematics—Summary Data

Multiple-Choice

An asterisk (*) indicates the key.

Sample Number	Alignment	Answer Key	Depth of Knowledge	Points	*p*-value A	*p*-value B	*p*-value C	*p*-value D
1	A-T.1.1	B	2	1	21%	44%*	12%	22%
2	A-T.1.1.1	D	1	1	7%	7%	15%	70%*
3	A-T.1.1.3	C	1	1	10%	21%	64%*	4%
4	A-F.1.1	B	2	1	34%	48%*	9%	7%
5	A-F.1.1.2	A	1	1	64%*	18%	8%	9%
6	A-F.1.1.5	D	1	1	14%	17%	25%	43%*
7	B-O.1.2.1	C	2	1	4%	17%	73%*	5%
8	B-O.2.1.1	A	1	1	69%*	11%	9%	10%
9	B-O.2.2.1	B	1	1	10%	63%*	17%	9%
10	B-O.3.1.1	A	2	1	59%*	15%	10%	15%
11	B-O.3.1.7	D	1	1	8%	14%	19%	57%*
12	D-M.1.1.1	D	2	1	11%	28%	14%	45%*
13	D-M.1.2.3	B	1	1	10%	53%*	22%	14%
14	D-M.1.3.2	B	1	1	25%	37%*	14%	22%
15	D-M.2.1.2	C	1	1	12%	10%	63%*	14%
16	D-M.4.1.1	D	2	1	8%	24%	24%	42%*

Open-Ended

Sample Number	Alignment	Points	Depth of Knowledge	Mean Score
17	C-G.1	4	3	2.07

Mathematics Test Directions

Read these directions carefully before beginning the assessment. To look at these directions again, select the **? [Help]** button and choose the **Test Directions** tab.

You may not use a calculator on this test. This section of the test has multiple-choice questions and open-ended questions. Each multiple-choice question has four answer choices. The open-ended question has one or more areas in which to enter your response(s). The open-ended question, which is question number 17, may have multiple pages. These page numbers will be shown below the question number, for example, “Page 1 of 3.”

Answering Questions

Read each question carefully and choose your answer or enter your response.

1. For the multiple-choice questions, numbers 1–16, first, solve the problem on scratch paper. Then, find the answer to the question and select the correct answer using the **Pointer** tool.
    - Only one of the answer choices provided is correct. If none of the choices matches your answer, go back and check your work for possible errors.
    - To change an answer, use the **Pointer** tool to choose a different answer.
    - Select the **Flag** button if you are not sure of the answer to a question. It will mark the question so you know to go back and answer the question later.
2. For the open-ended question, number 17, use the keyboard, the equation builder, and other online tools to enter your response in the areas provided.
    - These questions have more than one part. Be sure to read the directions carefully.
    - You cannot receive the highest score for an open-ended question without completing all tasks in the question. For example,
        - if the question asks you to show your work or explain your reasoning, be sure to show your work or explain your reasoning in the space provided.
        - if the question asks you to explain, be sure to use words to explain your reasoning in the space provided.
    - If the question does not ask you to show your work or explain your reasoning, you may use the space provided, but only those parts of your response that the question specifically asks for will be scored.
    - For questions that require using the equation builder, select the question mark button **[?]** in the upper-right corner of that feature. This will open **Help**, which offers descriptions about how to use that feature.
    - An example of the scoring guidelines that professional scorers will use to evaluate your responses to open-ended questions can be found by selecting the **? [Help]** button and choosing the **Scoring Guidelines** tab. You may refer to the **Scoring Guidelines** at any time while responding to open-ended questions.
3. Use tools such as the **Cross-Off**, **Highlighter**, **Notepad**, **Magnifier**, **Line Guide**, and **Ruler** to assist you during the test.

Navigation

1. Only one question at a time will appear on the screen. Use the **Next** and **Back** buttons to move from question to question or page to page.
2. When you have answered all the questions, select the **Review/End Test** button at the top-right of the screen.
    - Select questions from the list that appears on the screen to check your work.
    - When you have finished and have checked your answers, follow the directions on the screen to exit.

Helpful Hints

- There is no time limit to finish the test.
- If you need to take a break from the assessment, select the **Pause Test** button. Select the **Resume** button to continue. If you are away from the assessment for more than 20 minutes, you will need to log back in.
- To see your progress on the test, select the **Review/End Test** button. You may go to any question by selecting it from the list that appears on the screen.
- Select the **? [Help]** button to find more information.

Open-Ended Item-Specific Scoring Guideline

#17 Item Information

Category	Item-Specific Information
Alignment	C-G.1
Depth of Knowledge	3
Points Possible	4
Mean Score	2.07

Assessment Anchor this item will be reported under:

M03.C-G.1 Reason with shapes and their attributes.

Specific Anchor Descriptor addressed by this item:

M03.C-G.1.1 Analyze characteristics of polygons.

Item-Specific Scoring Guideline

Score	In this item, the student . . .
4	Demonstrates a thorough understanding of how to reason with shapes and their attributes by correctly solving problems and clearly explaining procedures.
3	Demonstrates a general understanding of how to reason with shapes and their attributes by correctly solving problems and clearly explaining procedures with only minor errors or omissions.
2	Demonstrates a partial understanding of how to reason with shapes and their attributes by correctly performing a significant portion of the required task.
1	Demonstrates minimal understanding of how to reason with shapes and their attributes.
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.

Top-Scoring Student Response and Training Notes

Score	Description
4	Student earns 4 points.
3	Student earns 3.0–3.5 points.
2	Student earns 2.0–2.5 points.
1	Student earns 0.5–1.5 points. OR Student demonstrates minimal understanding of how to reason with shapes and their attributes.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

Top-Scoring Response

Part A (1 point):

1 point for correct answer

What?

$\frac{2}{6}$

OR

One over three

OR equivalent

[Note: Students may write their answers in numerical or word form.]

Part B (1 point):

1 point for correct and complete explanation

OR 1/2 point for incomplete explanation (must be at least partially correct)

Why?

Sample Explanation:

Dividing the same area into more pieces means there will be less area for each piece.

OR equivalent

Part C (1 point):

1 point for correct and complete explanation

OR 1/2 point for incomplete explanation (must be at least partially correct)

Why?

Sample Explanation:

One thing circles and triangles have in common is that they are both closed shapes [or, are both 2-dimensional shapes; or, are both shapes; or, both have area].

OR equivalent

Part D (1 point):

1 point for correct and complete explanation

OR 1/2 point for incomplete explanation (must be at least partially correct)

Why?

Sample Explanation:

One thing that is different between circles and triangles is that triangles are polygons and circles are not. [or, triangles have (straight) sides, triangles have angles, etc., and a circle does not].

OR equivalent

Sample Student Responses

Item 17 – 4 points

Part A – Student Response	Part A – Annotations
$\frac{2}{6}$	The student provided the correct answer expressed as a fraction $\left(\frac{2}{6}\right)$. While support is not required for Part A, the student likely used the selected number of pieces (2) as the numerator and the total number of pieces as the denominator. [1 point]

Part B – Student Response	Part B – Annotations
Because if you cut more pieces the smaller the pece.	The student provided a correct and complete explanation of why the size of one piece of Leon's pizza is smaller than one piece of Finn's pizza (*if you cut more pieces the smaller the pece* [piece]). [1 point]

Part C – Student Response	Part C – Annotations
Circles and triangles are both closed.	The student provided a correct and complete explanation of one thing circles and triangles have in common (*Circles and triangles are both closed*). [1 point]

Part D – Student Response	Part D – Annotations
Triangles hav 3 angles. Circles have no angles.	The student provided a correct and complete explanation of one thing that is different between circles and triangles (*Triangles hav 3 angles. Circles have no angles*). [1 point]

Item 17 – 3 points

Part A – Student Response	Part A – Annotations
$\frac{2}{6}$	The student provided the correct answer expressed as a fraction $\left(\frac{2}{6}\right)$. While support is not required for Part A, the student likely used the selected number of pieces (2) as the numerator and the total number of pieces as the denominator. [1 point]

Part B – Student Response	Part B – Annotations
Example: $\frac{1}{5} > \frac{1}{10}$ The bigger the bottom number the smaller the piece / fraction.	The student provided a correct and complete explanation of why the size of one piece of Leon's pizza is smaller than one piece of Finn's pizza $\left(\frac{1}{5} > \frac{1}{10}$, *The bigger the bottom number the smaller the piece / fraction* $\right)$. [1 point]

Part C – Student Response	Part C – Annotations
triangles can be squares > similar circles can be squares	The student provided an incorrect explanation of one thing circles and triangles have in common (*triangles can be squares, circles can be squares, similar*). [0 points]

Part D – Student Response	Part D – Annotations
Triangles have sides △ > different Circles don't have sides °	The student has provided a correct and complete explanation of one thing that is different between circles and triangles (*Triangles have sides △, Circles don't have sides °, different*). [1 point]

Item 17 – 2 points

Part A – Student Response	Part A – Annotations
$\frac{2}{4}$	The student provided an incorrect answer $\left(\frac{2}{4}\right)$. While the numerator (*2*) is correct, no support (work or explanation) is required, so it is unclear where an error was made for the denominator. The student may have used the number of non-selected pieces (6 − 2 = 4) for the denominator rather than the total number of pieces (6). [0 points]

Part B – Student Response	Part B – Annotations
Because it is not equal.	The student provided an incorrect explanation of why the size of one piece of Leon's pizza is smaller than one piece of Finn's pizza (*Because it is not equal*). [0 points]

Part C – Student Response	Part C – Annotations
They both are closed	The student provided a correct and complete explanation of one thing circles and triangles have in common (*They both are closed*). [1 point]

Part D – Student Response	Part D – Annotations
A triangle has strate and circles do not.	The student provided a correct and complete explanation of one thing that is different between circles and triangles in terms of their sides (*A triangle has strate* [straight] *and circles do not*). [1 point]

Item 17 – 1 point

Part A – Student Response	Part A – Annotations
6\2	The student provided an incorrect answer (*6\2*). No support (work or explanation) is required, so it is unclear where an error was made. The student may have switched the values in the fraction, using the total number of pieces as the numerator and the selected number of pieces (2) as the denominator. [0 points]

Part B – Student Response	Part B – Annotations
i know this because finn's pizza is bigger	The student provided an incorrect explanation of why the size of one piece of Leon's pizza is smaller than one piece of Finn's pizza (*because finn's pizza is bigger*). The explanation provided claims that Finn's pizza is bigger; however, the two pizzas are the same size. [0 points]

Part C – Student Response	Part C – Annotations
i know this because they are both quadralattiralls	The student provided an incorrect explanation of one thing circles and triangles have in common (*because they are both quadralattiralls* [quadrilaterals]). Quadrilaterals have 4 sides and 4 vertices; triangles have 3 sides and 3 vertices, and circles have no sides and no vertices. [0 points]

Part D – Student Response	Part D – Annotations
i know this because triangles have three sides and circles have zero	The student provided a correct and complete explanation of one thing that is different between circles and triangles (*triangles have three sides and circles have zero*). [1 point]

Item 17 – 0 points

Part A – Student Response	Part A – Annotations
8 pizza	The student provided an incorrect answer (*8 pizza*). No support (work or explanation) is required, so it is unclear where an error was made. The student may have added the two numbers from the prompt together (6 + 2 = 8). [0 points]

Part B – Student Response	Part B – Annotations
Finn's pizza is 6 equal sized and hes 4 equal awa form 5	The student provided an incorrect and unclear explanation of why the size of one piece of Leon's pizza is smaller than one piece of Finn's pizza (*Finn's pizza is 6 equal sized and hes 4 equal awa form 5*). [0 points]

Part C – Student Response	Part C – Annotations
Pizza hes 3 sids and napkns have 4 side so if the pizz was a sqre it will be the same	The student provided an incorrect explanation that does not compare triangles and circles (*Pizza hes* [has] *3 sids* [sides] *and napkns have 4 side so if the pizz was a sqre* [square] *it will be the same*). [0 points]

Part D – Student Response	Part D – Annotations
it has 3 and triagles has 4	The student provided an incorrect explanation of one thing that is different between circles and triangles (*it has 3 and triagles has 4*). [0 points]

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