Grade 2 Mathematics – Evidence Statements

Overview of the Maryland Comprehensive Assessment Program (MCAP)

The Maryland Comprehensive Assessment Program (MCAP) includes a coherent set of mathematics assessments aligned to the Maryland College and Career Ready Standards for Mathematics.

The MCAP Mathematics assessment development process is based on Evidence -Centered Design (ECD). The Evidence-Centered Design process begins by establishing the answer to "What skills and understandings should be assessed?" The Maryland College and Career Ready Standards (MCCRS) describe the skills and understandings that the MCAP Mathematics assessments assess. Assessments are then designed to gather evidence that allows inferences to be made. Assessments can be designed to allow inferences of various grain sizes. The MCAP Mathematics assessments are designed to provide evidence that allows only general inferences about a student's mathematical skills and understandings to be made.

Overview of the MCAP Mathematics Evidence Statements

MCAP Mathematics Evidence Statements help teachers, curriculum developers, and administrators understand how the MCCRSM will be assessed. Assessment items are designed to elicit the evidence described in the Evidence Statements.

The MCAP Mathematics Evidence Statements are organized using the same structure as the MCCRSM. The Domains, Clusters, and then Standards organize the Grade 2 Evidence Statements.

ORGANIZATION OF EVIDENCE STATEMENTS

The MCAP Mathematics Evidence Statements are organized using the same structure and wording as the MCCRSM. Each grade is organized by the mathematical domains for the grade followed by the cluster headings. The standards for each domain are listed under the appropriate cluster heading with an explanation explaining how evidence is being gathered for that standard (i.e., how the standard is being assessed.) When applicable, the bolded portion of the standard address the focus of the evidence statement.

CODING OF CONTENT EVIDENCE STATEMENTS

Explanation of Coding	Example of the Evidence Statement
Assessing the Entire Standard • The evidence statement code is the same as the MCCRSM. • The exact language and intent of the entire standard is assessed, which includes examples and "e.g." parts of the standard.	• 2.NBT.A.1 Count within 1000; skip-count by 5s, 10s, and 100s.
Assessing Portions of a Standard with Multiple Operations • The evidence statement code is the same as the MCCRSM with an addition of a dash and a sequential number, e.g. -1, -2, -3, … • The portion of the standard that is assessed will appear in bold font.	• 2.OA.C.3 **Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s;** write an equation to express an even number as a sum of two equal addends.
Assessing Portions of a Standard with Multiple Operations • The evidence statement code is the same as the MCCRSM with an addition of a dash and a sequential number, e.g. -1, -2, -3, … • The portion of the standard that is being assessed will appear in bold font.	• 2.OA.A.1-1 **Use addition** and subtraction **within 100 to solve one- and two-step word problems involving situations of adding to**, taking from, putting together, taking apart, and comparing, **with unknowns in all positions, e.g., by using drawings, and equations with a symbol for the unknown number to represent the problem.** • 2.OA.A.1-2 **Use** addition and **subtraction within 100 to solve one- and two-step word problems involving situations of** adding to, **taking from**, putting together, taking apart, and comparing, **with unknowns in all positions, e.g., by using drawings, and equations with a symbol for the unknown number to represent the problem.**

Standards for Mathematical Practice

The Standards for Mathematical Practice describe the varieties of expertise that mathematics educators at all levels should seek to develop in their students.

These practice rest on important “processes and proficiencies” with longstanding importance in mathematics education.

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Definitions

Defined below are some common terms used in the Evidence Statements.

- **Context:** The situation or setting for a word problem. The situations influence the solution path.
- **Thin Context:** A sentence or phrase that provides meaning for the quantity/quantities in a problem. For example, “The fractions represent lengths of a string.”
- **No context:** The item has no situation or setting. There are only numbers, symbols, and/or visual models in the item.
- **Visual models:** Drawn or pictorial examples that are representations of the mathematics.

Content Subclaim

2.OA Operations and Algebraic Thinking

2.OA.A Represent and solve problems involving addition and subtraction.

2.OA.A.1-1 **Use addition** and subtraction **within 100 to solve one- and two-step word problems involving situations of adding to**, taking from, putting together, taking apart, and comparing, **with unknowns in all positions, e.g., by using drawings, and equations with a symbol for the unknown number to represent the problem.**

Evidence Statement:

- Use addition to solve **adding to** problems with either result unknown, change unknown, or start unknown.

Clarifications:

- The sum in addition problems must be beyond 20 but within 100.
- Items must be in context.
- One- or two-step word problems are allowed.
- Items may use drawings and/or equations with a symbol for the unknown number to represent a problem.
- Allowed symbols for the unknown include a question mark, an empty box, or a blank space.
- Allowable problem types are result unknown, change unknown, and start unknown. For more information about problem types, refer to Table 1, found in the back of this document.
    - **Result unknown:** Two birds sat on a ledge. Three more birds flew to the ledge. How many birds are now on the ledge?

      2 + 3 = ?
    - **Change unknown:** Two birds sat on a ledge. Some more birds flew to the ledge. Then there were five birds on the ledge. How many birds flew over to the first two?

      2 + ? = 5

      Start Unknown: Some birds sat on a ledge. Three more birds flew to the ledge. Then there were five birds on the ledge. How many birds were on the ledge before?

      ? + 3 = 5

2.OA.A.1-2 **Use** addition and **subtraction within 100 to solve one- and two-step word problems involving situations of** adding to, **taking from**, putting together, taking apart, and comparing, **with unknowns in all positions, e.g., by using drawings, and equations with a symbol for the unknown number to represent the problem.**

Evidence Statement:

- Use subtraction to solve **taking from** problems with either result unknown, change unknown, or start unknown.

Clarifications:

- The minuend, subtrahend, and difference in subtraction problems must be beyond 20 but within 100.
- Items must be in context.
- One- or two-step word problems are allowed.
- Items may use drawings and/or equations with a symbol for the unknown number to represent a problem.
- Allowed symbols for the unknown include a question mark, an empty box, or a blank space.
- Allowable problem types are **result unknown, change unknown,** and **start unknown.** For information about problem types, refer to Table 1, found in the back of this document.
    - **Result Unknown:** Three oranges were on the table. I ate one orange. How many oranges are on the table now?

      3 -1 = ?
    - **Change Unknown:** Three oranges were on the table. I ate some oranges. Then there were two oranges. How many oranges did I eat?

      3 - ? = 2
    - **Start Unknown:** Some oranges were on the table. I ate one orange. Then there were two oranges. How many oranges were on the table before?

      ? – 3 = 2

2.OA.A.1-3 **Use addition** and subtraction **within 100 to solve one- and two-step word problems involving situations of** adding to, taking from, **putting together,** taking apart, and comparing, **with unknowns in all positions, e.g., by using drawings, and equations with a symbol for the unknown number to represent the problem.**

Evidence Statement:

- Use addition to solve **putting together** problems with either addend unknown.

Clarifications:

- The sum in addition problems must be beyond 20 but within 100.
- Items must be in context.
- One- or two-step word problems are allowed.
- Addend unknown situations occur when the total is known and either addend may be unknown.
- Items may use drawings and/or equations with a symbol for the unknown number to represent a problem.
- Allowed symbols for the unknown include a question mark, an empty box, or a blank space.
- Allowable problem type is **addend unknown**. For more information about problem types, refer to Table 1, found in the back of this document.
    - **Addend Unknown:** Ten marbles are on the table. Five are red and the rest are green. How many marbles are green?
      5 + ? = 10 or
      ? + 5 = 10

2.OA.A.1-4 **Use** addition and **subtraction within 100 to solve one- and two-step word problems involving situations of** adding to, taking from, putting together, **taking apart,** and comparing**, with unknowns in all positions, e.g., by using drawings, and equations with a symbol for the unknown number to represent the problem.**

Evidence Statement:

- Use subtraction to solve **taking apart** problems with both addends unknown.

Clarifications:

- The total must be beyond 20 but within 100.
- Items must be in context.
- Use both addend unknown situations to show decompositions of a given number with the total to the left of the equal sign (**Total = addend + addend**).
- Items may ask for more than one decomposition.
- One- or two-step word problems are allowed.

- Items will not include incorrect equations.
- Allowed symbols for the unknown include a question mark, an empty box, or a blank space.
    - Allowable problem type is **both addends unknown.** For more information about problem types, refer to Table 1, found in the back of this document.
    - **Both Addends Unknown:** Max has five marbles. How many can she put in her left hand and how many in her right hand?

      5 = 0 + 5

      5 = 5 + 0

      5 = 1 + 4

      5 = 4 + 1

      5 = 2 + 3

      5 = 3 + 2

2.OA.A.1-5 **Use addition** and subtraction **within 100 to solve one- and two-step word problems involving situations of** adding to, taking from, putting together, taking apart, and **comparing, with unknowns in all positions, e.g., by using drawings, and equations with a symbol for the unknown number to represent the problem.**

Evidence Statement:

- Use addition to solve **comparing** problems with either difference unknown or bigger unknown.

Clarifications:

- Sums in addition problems must be beyond 20 but within 100.
- Items must be in context.
- For the bigger unknown or smaller unknown situations, one version directs the correct operation using “more” for bigger unknown and “less” for smaller unknown.
- One- or two-step word problems are allowed.
- Allowed symbols for the unknown include a question mark, an empty box, or a blank space.
- Allowable problem types are **difference unknown** or **bigger unknown.** For more information about problem types, refer to Table 1, found in the back of this document.

- **Difference Unknown:** "How many more?" version: A teacher has two cats. A principal has five cats. How many more cats does the principal have than the teacher?

  2 + ? = 5

- **Bigger Unknown:** Version with "more": A teacher has two cats. A principal has three more cats than the teacher. How many cats does the principal have?

  2 + 3 = ?

2.OA.A.1-6 **Use** addition and **subtraction within 100 to solve one- and two-step word problems involving situations of** adding to, taking from, putting together, taking apart, and **comparing, with unknowns in all positions, e.g., by using drawings, and equations with a symbol for the unknown number to represent the problem.**

Evidence Statement:

- Use subtraction to solve **comparing** problems with either difference unknown or smaller unknown.

Clarifications:

- Subtrahends, minuends, and differences in subtraction problems must be beyond 20 but within 100.
- Items must be in context.
- For the bigger unknown or smaller unknown situations, one version directs the correct operation using "more" for bigger unknown and "less" for smaller unknown. "Fewer" may also be used.
- One- or two-step word problems are allowed.
- Allowed symbols for the unknown include a question mark, an empty box, or a blank space.
- Allowable problem types are **difference unknown** or **smaller unknown.** For more information about problem types, refer to Table 1, found in the back of this document.
  - **Difference Unknown:** "How many fewer?" version: A teacher has two cats. A principal has five cats. How many fewer cats does the teacher have than the principal?

    5 – 2 = ?

  - **Smaller Unknown:** Version with "more": A principal has five cats. The principal has three more cats than a teacher. How many cats does the teacher have?

    5 – 3 = ?

2.OA.B Add and subtract within 20.

2.OA.B.2 Fluently add and subtract within 20 using mental strategies. By end of grade 2, know from memory all sums of two one-digit numbers.

This is an instructional standard. This standard is not directly assessed.

2.OA.C Work with equal groups of objects to gain foundations for multiplication.

2.OA.C.3 **Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s;** write an equation to express an even number as a sum of two equal addends.

Evidence Statement:

- Determine whether a set of objects has an odd or even number of members.

Clarifications:

- Items must include an image or graphic when determining whether a group of objects has an odd or even number of members (e.g., cookies on a baking sheet, ladybugs on a leaf, toys in a basket).

2.OA.C.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Evidence Statement:

- The language of the standard guides the creation of assessment items.

Clarifications:

- Items assessing this standard give the number of rows and columns and focus on the creation or identification of repeated addition equations.
- Items may have thin or no context.
- A visual of an array must be given.
- Arrays may not exceed 5 rows by 5 columns with a total of 25.
- Items will not include incorrect equations.

2.NBT Number and Operations in Base Ten

2.NBT.A Understand place value.

2.NBT.A.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.

1a. Understand the following as a special case: 100 can be thought of as a bundle of ten tens -- called a "hundred."

1b. Understand the following as a special case: The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

Evidence Statement:

- The language of the standard guides the creation of assessment items.

Clarifications:

- Items do not have context.
- The placement of the numbers of hundreds, tens, and ones can be arranged in any order.
- Items ask students to flexibly name a number using hundreds, tens, and ones.
- Special cases (1a & 1b) can be assessed within items.

2.NBT.A.2 Count within 1000; skip-count by 5s, 10s, and 100s.

Evidence Statement:

- The language of the standard guides the creation of assessment items.

Clarifications:

- Items do not have context.
- Skip-counting may start at any multiple of 5, 10, or 100 within 1000.
- Items may ask students to complete a pattern or select the correct pattern based on the rule.

2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

Evidence Statement:

- The language of the standard guides the creation of assessment items.

Clarifications:

- Items must include three-digit numbers.
- Items must include expanded form.
- Items will not use incorrect equations.
- For consistency in items, do not use the word "and" when writing numbers in word form, e.g., 205 will be written as "two hundred five" and 146 will be written as “one hundred forty-six.”

2.NBT.A.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.

Evidence Statement:

- The language of the standard guides the creation of assessment items.

Clarifications:

- Items do not have context.

2.NBT.B Use place value understanding and properties of operations to add and subtract.

2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

5-1. Fluently add and subtract **within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.**

Evidence Statement:

- Fluently add within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

Clarifications:

- Items do not have context.

- Sums must be beyond 20 but within 100.

5-2. Fluently add and **subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.**

Evidence Statement:

- Fluently subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

Clarifications:

- Items do not have context.
- Differences must be beyond 20 but within 100.

2.NBT.B.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.

Evidence Statement:

- The language of the standard guides the creation of assessment items.

Clarifications:

- Items may have very thin or no context.
- Items must have three or four addends.

2.NBT.B.7-1 **Add** and subtract **within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding** or subtracting **three-digit numbers, one adds** or subtracts **hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.**

Evidence Statement:

- Add three-digit numbers within 1000.

Clarifications:

- Items do not have context.
- Items may include a visual representation of place value models including bundles of sticks or rods, flats, or units to associate a written equation with the visual models.

- Items may require students to understand composition or decomposition of tens or hundreds by place value.

2.NBT.B.7-2 Add and **subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in** adding or **subtracting three-digit numbers, one** adds or **subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.**

Evidence Statement:

- Subtract three-digit numbers within 1000.

Clarifications:

- Items do not have context.
- Items may include a visual representation of place value models including bundles of sticks or rods, flats, or units to associate a written equation with the visual models.
- Items may require students to understand composition or decomposition of tens or hundreds by place value.

2.NBT.B.8 Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.

This is an instructional standard. This standard is not directly assessed.

2.NBT.B.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.

This is an instructional standard. This standard is not directly assessed.

2.MD Measurement and Data

2.MD.A Measure and estimate length in standard units.

2.MD.A.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

This is an instructional standard. This standard is not directly assessed.

2.MD.A.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.

This is an instructional standard. This standard is not directly assessed.

2.MD.A.3 Estimate lengths using units of inches, feet, centimeters, and meters.

This is an instructional standard. This standard is not directly assessed.

2.MD.A.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

This is an instructional standard. This standard is not directly assessed.

2.MD.B Relate addition and subtraction to length.

2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.

Evidence Statement:

- The language of the standard guides the creation of assessment items.

Clarifications:

- Items must have a context, involving lengths, for adding and subtracting within 100.
- Lengths are limited to inches, centimeters, feet, or meters.
- Items are limited to one-step problems.

2.MD.B.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, … and **represent whole-number sums and differences within 100 on a number line diagram.**

Evidence Statement:

- Represent whole-number sums and differences within 100 on a number line diagram.

Clarifications:

- Items may or may not have a context.

2.MD.C Work with time and money.

2.MD.C.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

This is an instructional standard. This standard is not directly assessed.

2.MD.C.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*

This is an instructional standard. This standard is not directly assessed.

2.MD.D Represent and interpret data.

2.MD.D.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

This is an instructional standard. This standard is not directly assessed.

2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

Evidence Statement:

- The language of the standard guides the creation of assessment items.

Clarifications:

- The “draw” portion of this standard is not assessed.

- Instead of drawing a picture graph or bar graph, items could involve completing a graph OR solving a simple put-together, take-apart, or compare problem based on the data in the graph.
- Refer to 2.OA.A.1 for clarifications when solving a simple put-together, take-apart, or compare problem based on the data in the graph.

2.G Geometry

2.G.A Reason with shapes and their attributes.

2.G.A.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

This is an instructional standard. This standard is not directly assessed.

2.G.A.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

Evidence Statement:

- The language of the standard guides the creation of assessment items.

Clarifications:

- Representations of partitioned rectangles will not exceed five rows by five columns.
- Items may ask for the selection of correctly partitioned rectangles from given information or for the creation of a partitioned rectangle.

2.G.A.3 **Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words *halves, thirds, half of, a third of, etc.*, and describe the whole as two halves, three thirds, four fourths.** Recognize that equal shapes of identical wholes need not have the same shape.

Evidence Statement:

- Partition circles and rectangles into two, three, or four equal shares and describe the whole as two halves, three thirds, four fourths, or four quarters.

Clarifications:

- Items will not focus on physically partitioning circles and rectangles.

This standard is foundational work for fractions in grade 3.

Table 1: Common addition and subtraction situations (adapted from the Common Core State Standards Initiative)

	Results Unknown	Change Unkown	Start Unknown
Add to	Two birds sat on a ledge. Three more birds flew to the ledge. How many birds are now on the ledge? 2 + 3 = ?	Two birds sat on a ledge. Some more birds flew to the ledge. Then there were five birds on the ledge. How many birds flew over to the first two? 2 + ? = 5	Some birds sat on a ledge. Three more birds flew to the ledge. Then there were five birds on the ledge. How many birds were on the ledge before? ? + 3 = 5
Take from	Three oranges were on the table. I ate one orange. How many oranges are on the table now? 3 – 1 = ?	Three oranges were on the table. I ate some oranges. Then there were two oranges. How many oranges did I eat? 3 – ? = 2	Some oranges were on the table. I ate one orange. Then there were two oranges. How many oranges were on the table before? ? – 3 = 2
	Total Unknown	Addend Unknown	Both Addends Unknown
Put Together/ Take Apart	Five red marbles and two green marbles are on the table. How many marbles are on the table? 5 + 2 = ?	Ten marbles are on the table. Five are red and the rest are green. How many marbles are green? 5 + ? = 10 or ? + 5 = 10	Max has five marbles. How many can she put in her left hand and how many in her right hand? 5 = 0 + 5 5 = 5 + 0 5 = 1 + 4 5 = 4 + 1 5 = 2 + 3 5 = 3 + 2

	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare "more"	**"How many more?" version:** Macy has two cats. Marcus has five cats. How many more cats does Marcus have than Macy? 2 + ? = 5	**Version with "more":** Marcus has three more cats than Macy. Macy has two cats. How many cats does Marcus have? 2 + 3 = ?	Version with "more": Marcus has three more cats than Macy. Marcus has five cats. How many cats does Macy have? 5 – 3 = ?
Compare "fewer"	**"How many fewer?" version:** Macy has two cats. Marcus has five cats. How many fewer cats does Macy have than Marcus? 5 – 2 = ?	**Version with "fewer":** Macy has three fewer cats than Marcus. Macy has two cats. How many cats does Marcus have? 3 + 2 = ?	**Version with "fewer":** Macy has three fewer cats than Marcus. Marcus has five cats. How many cats does Macy have? ? + 3 = 5

Darker shading indicates the four Kindergarten problem subtypes. Grade 1 and 2 students work with all subtypes and variants. Unshaded (white) problems are the four difficult subtypes that students should work on in grade 1 but need not master until grade 2. *Adapted from CCSS, p.88, which is based on Mathematics Learning in Early Childhood: Paths Towards Excellence and Equity, National Research Council, 2009, pp. 32-22 and the CCSS Progression document pp. 9.*