Kindergarten 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.	• K.NBT.A.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.
Assessing Portions of a Standard with Two or More Concepts • The evidence statement code is the same as the MCCRSM • The portion of the standard that is assessed will appear in bold font.	• K.OA.A.3 **Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings,** and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).
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.	• K.OA.A.2-1 **Solve addition** and subtraction **word problems, and add** and subtract **within 10, e.g., by using objects or drawings to represent the problem.** • K.OA.A.2-2 **Solve** addition and **subtraction word problems**, and add **and subtract within 10, e.g., by using objects or drawings 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

K.CC Counting and Cardinality

K.CC.A Know number names and the count sequence.

K.CC.A.1 Count to 100 by ones and by tens.

Evidence Statement:

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

Clarifications:

- The given count sequence will start at 0.
- Students are not asked to count objects.

K.CC.A.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).

Evidence Statement:

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

Clarifications:

- The given count sequence will not start at 0 or 1.
- Students do not count beyond 100.
- Students are not asked to count objects.

K.CC.A.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0–20 (with 0 representing a count of no objects).

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

K.CC.B Count to tell the number of objects.

K.CC.B.4 Understand the relationship between numbers and quantities; connect counting to cardinality.

4a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

4b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.

4c. Understand that each successive number name refers to a quantity that is one larger.

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

K.CC.B.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.

Evidence Statement:

- Count a set of objects in a picture to answer the question "how many?" or, given a number from 1–20, count out that many objects.

Clarifications:

- Items ask students to:
  - Count a set of objects up to 20 in an arranged pattern in a picture, or
  - Count a set of objects up to 10 in a scattered pattern in a picture.
- Items may ask students to represent a given number.
- Items may ask students to identify the correct numeral to represent a given quantity.

K.CC.C Compare numbers.

K.CC.C.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies (Include groups with up to ten objects).

Evidence Statement:

- Identify if a group is greater than, less than, or equal to another group of up to ten objects.

Clarifications:

- Sets may be up to 10 objects pictured.
- Use of symbols will not be assessed.
- Items will ask students to identify a set that is greater than, less than, or equal to another set.

K.CC.C.7 Compare two numbers between 1 and 10 presented as written numerals.

Evidence Statement:

- Compare two numbers that are between 1 and 10.

Clarifications:

- Items use oral language to compare two values (greater than, less than, equal to).
- Use of symbols will not be assessed.

K.OA Operations and Algebraic Thinking

K.OA.A Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

K.OA.A.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, or verbal explanations, expressions, or equations.

Evidence Statement:

- This standard is assessed within items aligned to K.OA.A.2.

Clarifications:

- See K.OA.A.2.

K.OA.A.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

2-1. Solve addition and subtraction **word problems, and add** and subtract **within 10, e.g., by using objects or drawings to represent the problem.**

Evidence Statement:

- Solve addition word problems using drawings or equations. Understand addition as **putting together** and **adding to**.

Clarifications:

- Items must have a context.
- Items include sums up to 10.
- The unknown value refers to either the result unknown, the total unknown, or the addend unknown.
- Items may ask students to identify a correct drawing or equation to model the word problem.
- K.OA.A.1 can be assessed with items aligned to this standard.
- Allowable problem types are **result unknown**, **total unknown or addend 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 = ?

- **Total Unknown:**
  - Five red marbles and two green marbles are on the table. How many marbles are on the table? 5 + 2 = ?
- **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.-2. Solve addition and **subtraction word problems,** and add **and subtract within 10, e.g., by using objects or drawings to represent the problem.**

Evidence Statement:

- Solve subtraction word problems using drawings or equations. Understand subtraction as **taking from**.

Clarifications:

- Items must have a context.
- Items include subtraction within 10.
- The unknown value refers to either the result unknown or the addend unknown.
- Items may ask students to identify a correct drawing or equation to model the word problem.
- K.OA.A.1 can be assessed with items aligned to this standard.
- Allowable problem type is **result unknown**. For more 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 = ?

K.OA.A.3 **Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings**, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

Evidence Statement:

- Decompose a given quantity in more than one way using drawings or equations.

Clarifications:

- Items may have a thin context.
- Sums are less than or equal to ten.

K.OA.A.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

Evidence Statement:

- Find combinations of 10 using drawings, expressions, or equations.

Clarifications:

- Items do not have context.
- Items may include representations in pictures or models such as ten frames.
- Items may ask students to identify what number can be added to another number to make ten.

K.OA.A.5 Fluently add and subtract within 5

5-1. Fluently add and subtract **within 5.**

Evidence Statement:

- Add within 5.

Clarifications:

- Items do not have context.
- Items will ask students to solve basic addition within 5 by selecting an answer or entering an answer.
- For assessment purposes, fluency will be defined as accuracy.

5-2. Fluently add and **subtract within 5.**

Evidence Statement:

- Subtract within 5.

Clarifications:

- Items do not have context.
- Items will ask students to solve basic subtraction within 5 by selecting an answer or entering an answer.
- For assessment purposes, fluency will be defined as accuracy.

K.NBT Number and Operations in Base Ten

K.NBT.A Work with numbers 11-19 to gain foundations for place value.

K.NBT.A.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Evidence Statement:

- Model that numbers between 11 and 19 can be thought of as ten ones and some more ones by composing and decomposing a given number.

Clarifications:

- Items may ask students to use ten frames to show how to decompose a “teen” number.

K.MD Measurement and Data

K.MD.A Describe and compare measurable attributes.

K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

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

K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. *For example, directly compare the heights of two children and describe one child as taller/shorter.*

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

K.MD.B Classify objects and count the number of objects in each category.

K.MD.B.3 Classify objects into given categories; count the number of objects in each category and sort the categories by count (Limit category counts to be less than or equal to 10).

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

K.G Geometry

K.G.A Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).

K.G.A.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.

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

K.G.A.2 Correctly name shapes regardless of their orientations or overall size.

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

K.G.A.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").

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

K.G.B Analyze, compare, create, and compose shapes.

K.G.B.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).

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

K.G.B.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

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

K.G.B.6 Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?"*

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

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.*