

## K.CC: COUNTING & CARDINALITY

**Cluster Statement:** B: Count to tell the number of objects.

**Major Cluster** (Students should spend the large majority of their time (65-85%) on the major work of the grade/course. Supporting work and, where appropriate, additional work should be connected to and engage students in the major work of the grade.)

<p><b>Standard Text</b></p> <p><b>K.CC.B.4: Understand the relationship between numbers and quantities; connect counting to cardinality.</b></p> <ul style="list-style-type: none"> <li>• <b>K.CC.B.4.A: 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.</b></li> <li>• <b>K.CC.B.4.B: 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.</b></li> <li>• <b>K.CC.B.4.C: Understand that each successive number name refers to a quantity that is one larger.</b></li> </ul>	<p><b>Standard for Mathematical Practices</b></p> <p>SMP 2: Students can reason abstractly and quantitatively by representing sets of objects with the number of counts.</p> <p>SMP 6: Students can attend to precision by developing the idea of one-to-one correspondence and realizing that one number name goes with each item when counting objects.</p>	<p><b>Students who demonstrate understanding can:</b></p> <ul style="list-style-type: none"> <li>• Count objects in a group (each object is counted only once) regardless of arrangement and order.</li> <li>• Determine "how many" are in a group after counting all the objects.</li> <li>• Indicate by counting that the last item said tells the number of objects.</li> <li>• Count on from a known number (without recounting the whole group) when one more object is added to the group.</li> </ul>
		<p><b>Depth of Knowledge:</b> 2</p>
		<p><b>Bloom's Taxonomy:</b> Apply and Analyze</p>

<p><b>Standard Text</b></p> <p><b>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.</b></p>	<p><b>Standard for Mathematical Practices</b></p> <p>SMP 7: Students can look for and make use of structure by rearranging scattered items and placing them into circles, a straight line or groups of two to help them count.</p> <p>SMP 8: Students look for and express regularity in repeated reasoning by recognizing that the total number of objects does not change regardless of the way the items/objects are arranged.</p>	<p><b>Students who demonstrate understanding can:</b></p> <ul style="list-style-type: none"> <li>Count objects up to 20 in a variety of arrangements (transition to dot cards, ten frames, dominos, and other representations)</li> <li>Tell "how many" objects are in a group in a variety of arrangements.</li> <li>Show the correct number of objects when I am told a number up to 20.</li> <li>Show the correct number of objects, when told a number, in different arrangements.</li> </ul> <p><b>Depth of Knowledge: 2</b></p> <p><b>Bloom's Taxonomy:</b> Apply</p>
<p><b>Previous Learning Connections</b></p> <ul style="list-style-type: none"> <li>Connect to counting the number of items in a group of up to 10 objects and knowing that the last number tells how many</li> <li>Connect to giving up to 5 items when requested</li> </ul>	<p><b>Current Learning Connections</b></p> <ul style="list-style-type: none"> <li>Connect to continuing to work with concepts of number meaning in the domains of <b>Order and Algebraic Thinking</b>, as well as <b>Number and Operations in Base Ten</b>.</li> <li>Connect to comparing the size of sets to tell greater than, less than, or the same, including written numerals. <b>(K.CC.6, 7)</b></li> </ul>	<p><b>Future Learning Connections</b></p> <ul style="list-style-type: none"> <li>Connect to extending the counting sequence, number recognition and writing to 120. <b>(1.NBT.1)</b></li> <li>Connect to counting strategies to add and subtract within 20. <b>(1.OA.1)</b></li> </ul>
<p><b>Clarification Statement:</b></p> <p>K.CC.B.4: Experience with <b>counting</b> allows students to discuss and come to understand the second part of K.CC.4b—that the <b>number</b> of objects is the <b>same</b> regardless of their <b>arrangement</b> or the <b>order</b> in which they were counted.</p> <p>K.CC.B.5: Counting objects arranged in a <b>line</b> is easiest; with more practice, students learn to count objects in more difficult arrangements, such as <b>rectangular arrays</b> (they need to ensure they reach every <b>row</b> or <b>column</b> and do not repeat rows or columns); <b>circles</b> (they need to stop just before the object they started with); and <b>scattered</b> configurations (they need to make a single path through all of the objects).</p>		
<p><b>Common Misconceptions</b></p> <ul style="list-style-type: none"> <li>Not yet understanding one-to-one correspondence</li> <li>Believing that the arrangement of a set of objects affects the total count</li> <li>Believing that the tagged count is related to the object rather than its position (e.g., the triangle is always 4 even when it is first in a line)</li> </ul>		

## Multi-Layered System of Supports (MLSS)/Suggested Instructional Strategies

### Pre-Teach

#### **Pre-teach (targeted)**

What pre-teaching will prepare students to productively struggle with the mathematics for this cluster within your HQIM?

For example, some learners may benefit from targeted pre-teaching that rehearses new mathematical language when studying counting objects because not all students will make the connection between rote counting, numbers, and quantity/one-to-one correspondence.

#### **Pre-teach (intensive)**

What critical understandings will prepare students to access the mathematics for this cluster?

New Mexico Early Learning Guidelines, Essential Indicator 9.1, 9.3 a-b, and 12.1 and K.CC.A.12: These standards provide a foundation for work with counting objects because students need a foundational understanding of numbers and counting/labeling quantities prior to counting objects at higher quantities. If students have unfinished learning within this standard, based on assessment data, consider ways to provide intensive pre-teaching support prior to the start of the unit to ensure students are ready to access grade level instruction and assignments.

### Core Instruction

#### **Access:**

How will the learning for students provide multiple options for recruiting student interest?

For example, learners engaging with materials of interest to them benefit when learning experiences include ways to recruit interest such as creating accepting and supportive classroom climate because students value respectful support of their interest for learning, such as allowing them to demonstrate skills learned with materials that are relevant to them culturally or personally. Bugs, beads, gems, and dinosaurs are much more interesting than primary colored circle counters.

#### **Build:**

**Effort and Persistence:** How will the learning for students provide options for sustaining effort and persistence?

For example, learners engaging with counting objects benefit when learning experiences attend to students attention and affect to support sustained effort and concentration such as using prompts or scaffolds for visualizing desired outcomes because students at this level have varying experiences and background knowledge, or needs support with academic language to understand the expectations and learn the skill. Modeling counting objects for students can support their understanding of the prompts and can be used in scaffolding students to perform counting objects in increasing quantities.

**Language and Symbols:** How will the learning for students provide alternative representations to ensure accessibility, clarity and comprehensibility for all learners? (e.g., a graph illustrating the relationship between two variables may be informative to one learner and inaccessible or puzzling to another; picture or image may carry very different meanings for learners from differing cultural or familial backgrounds)

For example, learners engaging with counting objects benefit when learning experiences attend to the linguistic and nonlinguistic representations of mathematics to ensure clarity can comprehensibility for all learners such as making connections to previously learned structures because connecting previous learning supports student to understand expectations and generalize skills and begin to understand application of the skill of counting in various activities or with various objects.

**Expression and Communication:** How will the learning provide multiple modalities for students to easily express knowledge, ideas, and concepts in the learning environment?

For example, learners engaging with counting objects benefit when learning experiences attend to the multiple ways students can express knowledge, ideas, and concepts such as providing differentiated

feedback (e.g., feedback that is accessible because it can be customized to individual learners) because students respond to different types of feedback in different ways. A student may find great success or great frustration using computer-aided instruction to get feedback on correct/ incorrect responses and may respond differently to a teacher's verbal response to their counting.

**Internalize:** How will the learning for students support transforming accessible information into usable knowledge, knowledge that is accessible for future learning and decision-making?

For example, learners engaging with counting objects benefit when learning experiences attend to students by intentionally building connections to prior understandings and experiences; relating important information to the learning goals; providing a process for meaning making of new learning; and, applying learning to new contexts such as using cues and prompts to draw attention to critical features because supporting students to use the skill of counting in a functional and meaningful way will support them in their math learning and establishing an interest in learning long term. Supporting students to group larger quantities and count with one-to-one correspondence allows students to increase the quantity of items counted and may lead students to use their counting skills in novel situations, rather than in teacher directed or classroom learning.

### **Re-teach**

#### **Re-teach (targeted)**

What formative assessment data (e.g., tasks, exit tickets, observations) will help identify content needing to be revisiting during a unit?

Examine assessments for evidence of lingering misconceptions (see common misconceptions). If students exhibit one more of these misconceptions, consider addressing the misconception. For example, students may benefit from re-engaging with content during a unit on counting objects by critiquing student approaches/solutions to make connection through a short mini-lesson because not all students have the functional ability and experience to develop a strategy or the perseverance to try until they develop a strategy that will encourage their success in the long term (e.g., counting 2 items is not likely to need more than one-to-one-correspondence, however, 20 items may require grouping, moving, recall and memory to sustain the task to completion and success).

#### **Re-teach (intensive)**

What assessment data will help identify content needing to be revisited for intensive interventions? Some students may benefit from intensive extra time during and after a unit counting objects by offering opportunities to understand and explore different strategies because not all students have the functional ability and experience to develop a strategy or the perseverance to try until they develop a strategy that will encourage their success in the long term (e.g., counting 2 items is not likely to need more than one-to-one-correspondence, however, 20 items may require grouping, moving, recall and memory to sustain the task to completion and success). ...

### **Extension**

What type of extension will offer additional challenges to 'broaden' your student's knowledge of the mathematics developed within your HQIM?

To extend students learning about counting objects, some learners may benefit from an extension such as the opportunity to explore links between various topics when studying counting objects because standard K.C.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 is taught in tandem and allows for the natural extension and linking of concepts around grouping and sorting objects.

**Culturally and Linguistically Responsive Instruction:**

**Validate/Affirm:** How can you design your mathematics classroom to intentionally and purposefully legitimize the home culture and languages of students and reverse the negative stereotypes regarding the mathematical abilities of students of marginalized cultures and languages?

**Build/Bridge:** How can you create connections between the cultural and linguistic behaviors of your students' home culture and language the culture and language of school mathematics to support students in creating mathematical identities as capable mathematicians that can use mathematics within school and society?

Goal Setting: Setting challenging but attainable goals with students can communicate the belief and expectation that all students can engage with interesting and rigorous mathematical content and achieve in mathematics. Unfortunately, the reverse is also true, when students encounter low expectations through their interactions with adults and the media, they may see little reason to persist in mathematics, which can create a vicious cycle of low expectations and low achievement. For example, when studying counting objects goal setting is critical because students come to Kindergarten with a variety of early experiences and different developmental levels and rate of learning differs depending on the needs of individual students. When students know the expectations and can establish goals as targets there is a development of intrinsic motivation that encourages student progress in the development of the skill.

**Standards Aligned Instructionally Embedded Formative Assessment Resources:**

Source: <http://tasks.illustrativemathematics.org/content-standards/K/CC/B/5/tasks/1420>

The purpose of this task is for students to build fluency in counting. Fluency is about being able to quickly and efficiently use the knowledge that is stored in one's brain. The timer is used so that students will use their most efficient counting strategies.

**Relevance to families and communities:**

During a unit focused on counting objects, consider options for learning from your families and communities the cultural and linguistic ways this mathematics exists outside of school to create stronger home to school connections for students, families may find value in teaching students about counting activities in their everyday activities and filming them to share with the class. Students and families can share the names for numbers in their heritage language and active connection to the learning in the classroom and learning in their culture.

**Cross-Curricular Connections:**

Science: In Kindergarten, the NGSS states students should "use and share observations of local weather conditions to describe patterns over time. Consider providing opportunities for students to track on a calendar and then count the number of cloudy, sunny or rainy days.

Language Arts: Literature can offer connections about measurement such as: *Ten Black Dots* by Donald Crews and *The Very Hungry Caterpillar* by Eric Carle.