



### WHAT IS IT?

Counting means telling how many things are in a group. This may seem simple, but it is actually fairly complex. Counting involves a variety of skills and concepts.



Cardinality is the idea that the final number of the sequence represents the amount of objects that were counted. The last number named when all objects in a set have been counted is the number that tells how many.

Key skills and concepts	Definitions
Providing the sequence of counting words in order	Saying numbers in order. For example, “one, two, three, four, five.”
One-to-one correspondence	The understanding that one number word represents one object that is being counted.
Conservation of number	Recognizing that the number of objects stays the same regardless of how the objects are arranged.



### WHY IS IT IMPORTANT?

Counting and cardinality is an essential skill, and we use it daily. Studies suggest that students’ early counting skills are a really important predictor of later abilities. Students who can recite and count to 20 in preschool have the highest math skills in first grade. Counting and cardinality is related to many other important skills, like understanding order and sequence, and problem solving using a step-by-step procedure.



### HOW DOES IT DEVELOP?

At this age	Children can typically:
4	<ul style="list-style-type: none"> <li>• Accurately count up to 5 objects in a line.</li> <li>• Provide the last number counted to answer the question of “how many?”</li> <li>• Produce a group of objects of a certain quantity. (If you provide a student with a pile of blocks and ask him to give you 4, he can successfully give you 4 blocks.)</li> </ul>
5	<ul style="list-style-type: none"> <li>• Count and produce up to 10 objects accurately, and then beyond to 30.</li> <li>• Understand that numbers tell how many.</li> <li>• Keep track of objects that have and have not been counted, even if those objects are in various arrangements.</li> <li>• Begin to recognize errors in others’ counting and eliminate most errors in their own counting.</li> <li>• Count backwards from 10 to 1.</li> </ul>
6	<ul style="list-style-type: none"> <li>• Begin to “count on.” (This means they don’t have to start at 1 when they count. They can start with another number such as, “7, 8, 9, 10.”)</li> <li>• Tell you the number immediately before or after another number without starting at 1.</li> <li>• Start “skip counting.” (counting by 2s, 5s, and 10s)</li> </ul>

## SKILL: COUNTING AND CARDINALITY

## STRATEGIES TO SUPPORT DEVELOPMENT OF COUNTING AND CARDINALITY

## Say number words in correspondence with objects.



This helps students to develop one-to-one correspondence, or the idea that each item in a set must have a unique count word. Encourage students to count slowly and carefully, and count each object only once.

## THE NEXT STEP

A student is ready to count to larger numbers when he/she can accurately count and assign one number to a group of small objects. For example, point to and assign one number to each car in a group of 5 cars.

## Teach “keeping track” strategies.



For example, let students see you physically move objects as you count out loud, and then ask them to do the same.

## Discuss how the last number said is how many objects there are altogether.



Knowing that the last number counted gives the total number of objects in the group is called cardinality. For example, count students as they stand in line, then gesture to the line saying, “Ten students in all.”

## THE NEXT STEP

A child is ready to count to larger numbers when he/she can accurately count and tell you “how many” (the total number) in a group of up to 5 objects.

## Provide opportunities for children to produce sets of a given size.



Take advantage of opportunities throughout the day to ask children to produce a “goal” number of objects. For example, ask a child to count out a group of 5 forks for the children sitting at her table. If the child produces the wrong number, remind her of the goal number and ask him to re-count.

## THE NEXT STEP

If the child consistently produces the correct number of objects with smaller groups, start asking the child to produce up to 10 objects.

## THE LINGO

**Cardinality** – The idea that the final number of the sequence represents the amount of objects that were counted

**Conservation of number** – Recognizing that the number of objects stays the same regardless of how the objects are arranged

**Counting** – Telling how many things are in a group

**One-to-one correspondence** – Understanding that one number word represents one object that is being counted

## SKILL: COUNTING AND CARDINALITY

## INTEGRATING COUNTING AND CARDINALITY THROUGHOUT THE DAY

## ROUTINES



Take attendance. Count to determine the number of students present in one or more of the following ways:

- Teacher counts the number of students present
- Students count around the circle to determine the number of students present
  - Consider stopping students while they are counting around the circle to ask how many students have counted so far. This helps develop an understanding of cardinality.
  - Consider asking students to predict what they think would happen if they count around the circle again but start with a different student. Have students count around the circle again and discuss if their predictions were correct and why. This helps develop an understanding of conservation of number.
- One student counts the number of children present

## TRANSITION



As students transition from one activity to another, count the number of steps from one place in the room to another.

## MEALS



Pass out 5-frames or 10-frames for students to count out how many snacks (like fruit snacks or raisins) students have.

## OUTDOOR TIME



Have one student count to determine how many seconds it takes another student to run a given distance (like from you, to the slide, and back).


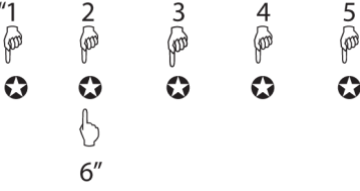

## CENTERS



In the dramatic play area, encourage students to play store by counting out the number of pennies that particular items cost. (Items should be labeled with prices.) One student can make the purchase, and another student can be the cashier and check the amount.

**SKILL: COUNTING AND CARDINALITY**

**COMMON COUNTING ERRORS**

Type of Counting Error	Examples	Remedy
<b>SEQUENCE ERROR</b>		
<p>Saying the number sequence out of order, skipping numbers, or using the same number more than once.</p>		<p>Practice reciting (or singing) the single-digit sequence, first focusing on one to ten, then later moving on to numbers greater than ten.</p>
<p>Struggling with the count sequence past twelve</p>	<p>Skips 15: "1...13, 14, 16, 17, 18."</p>	<p>Highlight and practice exceptions, such as <i>fif + teen</i>. Fifteen and thirteen are commonly skipped because they are irregular.</p>
	<p>Uses incorrect words: "1...13, 14, fiveteen" "1...18, 19, 10-teen" or "1...29, 20-ten, 20-eleven"</p>	<p>Recognize that a nine signals the end of a series and that a new one needs to begin (e.g., nineteen marks the end of the teens.)</p> <p>Recognize that each new series (decade) involves combining a decade and the single-digit sequence, such as twenty, twenty plus one, twenty plus two, etc.</p>
	<p>Stops at a certain number: "1...20" (stops) "1...20" (starts from 1 again)</p>	<p>Recognize the decade term that begins each new series (e.g., twenty follows nineteen, thirty follows twenty-nine, and so forth). This involves both memorizing terms such as ten, twenty, and thirty by rote and recognizing a pattern: "add -ty to the the single-digit sequence" (e.g., <i>six + ty</i>, <i>seven + ty</i>, <i>eight + ty</i>, <i>nine + ty</i>).</p>
<b>COORDINATION ERROR</b>		
<p>Labeling an object with more than one number word.</p>		<p>Encourage the child to slow down and count carefully. Underscore that each item needs to be tagged only once with each number word.</p>
		<p>Same as above.</p>

**SKILL: COUNTING AND CARDINALITY**

Type of Counting Error	Examples	Remedy
<b>KEEPING TRACK ERROR</b>		
Recounting an item counted earlier		Help the child devise strategies for sorting counted items from uncounted items. For movable objects, for instance, have the child place counted items aside in a pile clearly separated from uncounted items. For pictured objects, have him or her cross off items as counted.
<b>SKIM</b>		
No effort at one-to-one counting or keeping track.	Waves fingers over the collection like a wand (or jabs randomly at the collection) while citing the counting sequence (e.g., “1, 2, 3...9, 10”).	Underscore that each item needs to be tagged with one and only one number word and help the child to learn processes for keeping track. Model the counting.
<b>NO CARDINALITY RULE</b>		
Not recognizing that the last number word used in the counting process indicates the total.	Asked how many, the child tries to re-count the collection or simply guesses.	Play <i>Hidden Stars</i> with small collections of one to three items first and then somewhat larger collections of items.

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**SAMPLE ACTIVITIES THAT SUPPORT COUNTING AND CARDINALITY**

**Counting with Gold Bars**

[Available as PDF](#)

MTP/MS©

**The Animal Spots Game**

[Available as PDF](#)

WWC Report

**Counting with Gummy Bears**

[Available as PDF](#)

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**Movement Counts**

<https://earlymath.erikson.edu/movement-counts/>

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**Introduction to the 5-frame**

[Available as PDF](#)

MTP/MS©

**The Hidden Stars Game**

[Available as PDF](#)

WWC Report

**SKILL: COUNTING AND CARDINALITY****REFERENCES**

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