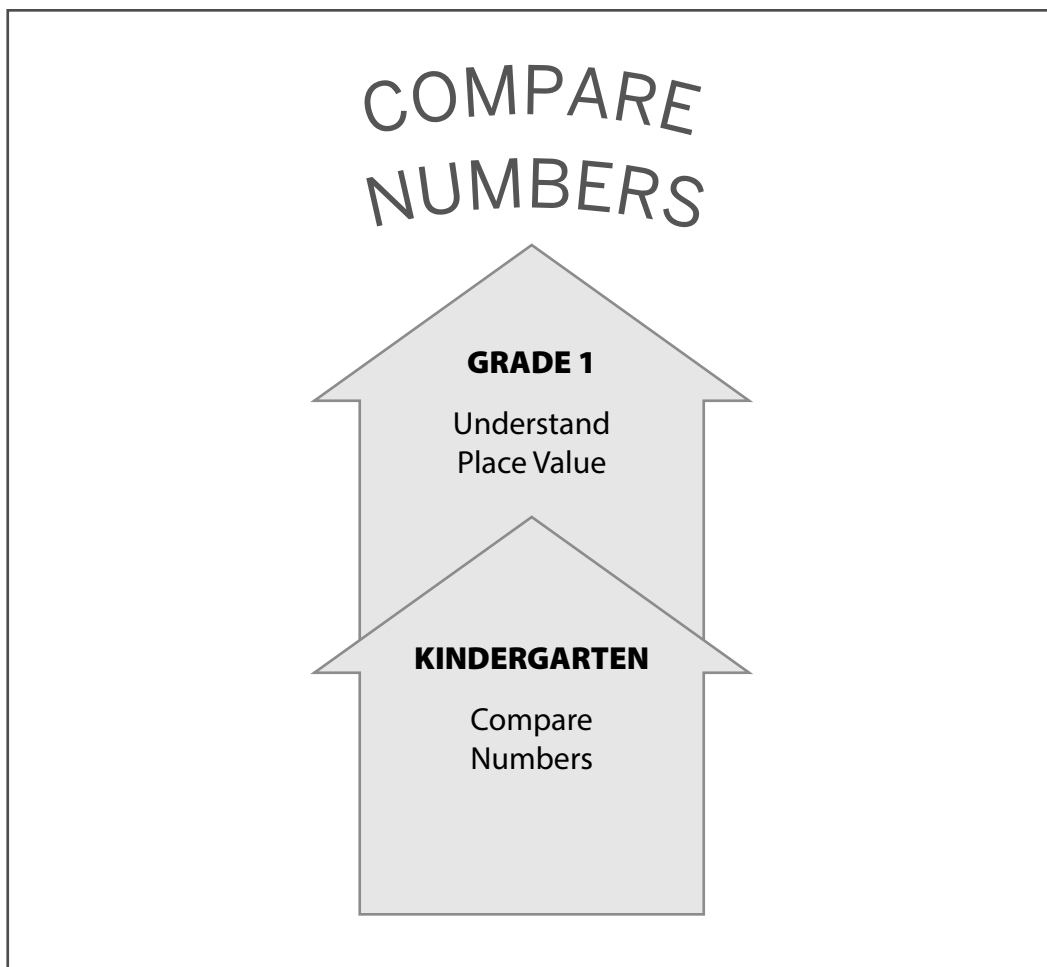


# MATH K-1 Common Core Assessments

## Kindergarten/Grade 1

### INTRODUCTION



## Introduction to Compare Numbers

The assessments associated with the compare numbers progression are designed to help you assess student understanding of how to compare numbers. Comparing numbers connects to other topics in early mathematics, especially counting, addition, subtraction, and understanding place value. Through kindergarten and grade one, students use increasingly complex techniques to compare numbers and groups of objects.

The main comparison strategies students use are:

- The counting sequence: Numbers that come later in the counting sequence are greater numbers.
- Matching: When comparing two groups of objects, make pairs of one object from each group. The group with leftover objects has more.
- A mental number line: Numbers that occur farther to the right on the number line are greater numbers.
- Place value: Compare numbers based on how many tens and ones they have and then extend to comparing 100s, 1000s, and so on.

When developing a mental number line, students tend to overestimate the distance between small numbers and underestimate the distance between larger numbers. This results in number lines that look like the following (Clement and Sarama).



It is helpful to work with students to create accurate number lines. It helps students construct mental images of benchmark numbers like 5, 10, and 100. It also supports future work with fractions and measurement.

Comparing numbers presents an excellent opportunity to discuss important vocabulary like more, less, fewer, greater, and change. Familiarity with these terms support understanding of addition and subtraction situations.

Note that matching strategies are effective for comparing groups of objects with up to 20 objects. Beyond 20, the counting sequence and place value become the most efficient comparison strategies.

All of the tasks in the compare number progression are tied to the learning progression below.

The assessments include:

## K-1 MATH - Introduction to Compare Numbers

---

- a blueprint (showing the specific common core standards targeted);
- directions for administration;
- a scoring sheet/interpretation guide;
- a copy of the learning progression;
- a guide to creating instructional groups.

The scoring sheet/interpretation guide makes it easy to record student responses and interpret students' approximate developmental levels with respect to the learning progression. You can use the instructional grouping guide to create groups of students at approximately the same level who need experience working on the same or similar activities.

## Learning Progression: Compare Numbers

Developmental Level	Description
Compares groups of up to 5 different items by matching	Shows that small collections (up to 5) of different items have the same number by matching (e.g., there is one cookie for each student so there are the same number of cookies as students).
Compares groups of up to 5 by counting	Determines which group has more objects by counting each group and comparing the results. May be less accurate when groups have 6 or more objects, when the objects in one group are smaller than the objects in the other (may count to same number but then say the group of larger objects has more), or when the group of larger objects has a smaller number of items.
Compares using the count sequence to 10	Compares two numbers and tells which is greater by telling which comes later in the count sequence (K.CC.7).
Creates mental number line to 5	Place numbers on a number line given only 0 and 5 as starting and end points. Places the numbers approximately equal distances apart.
Compares by matching or counting up to 10	Determines which group has more by counting. Works with groups up to 10 and is no longer thrown off by the size of the objects in the group (K.CC.6).
Creates mental number line to 10	Accurately places numbers on a number line based on knowledge of relative magnitudes and counting sequence up to 10 (e.g., which number is closer to 7: 4 or 9?).
Orders objects based on numerical order up to 10	Given cards or dominoes or other objects with dots representing a quantity, places the objects in order from the least number of dots to the greatest number of dots.
Compares numbers using place value to 20	Knows the numbers 11 to 19 are composed of one ten and some number of ones. Distinguishes between similar words (e.g., “fourteen” and “forty”) (1.NBT.2).
Uses tens units	Thinks of a ten as a bundle of ten ones. Understands decade numbers (e.g., 10, 20, and 30) as some number of tens units (1.NBT.2).
Compares numbers using place value	Uses place value to compare numbers up to 100 (e.g., 72 is more than 65 because 7 tens is more than 6 tens) (1.NBT.3).
Creates mental number line to 100	Accurately places numbers on a number line based on the knowledge of relative magnitudes and counting sequence up to 100.

## References

Clement, Doug and Julie Sarama. *Learning and Teaching Early Math; The Learning Trajectories Approach*. New York: Routledge, 2009.

Confrey, Jere. Turn On CC Math. Web. 20 June 2012. <turnonccmath.com>.

McCallum, Bill and The Common Core Standards Writing Team. *Progressions for the Common Core State Standards in Mathematics* (draft). Web. 20 June 2012. <<http://ime.math.arizona.edu/progressions/>>.

Webb, L. Norman. *Depth of Knowledge Levels for Four Content Areas*. Unpublished paper. 2002.