
**Pk-5 Number and Operations Descriptions**

***Pk–2 Strand***

**Counting and Cardinality** – The goal of this session is to explore tasks and instructional strategies to support students' development of naming, counting, and comparing numbers. Guided by the mathematical practices identified in the CCSSM, the session will describe questioning techniques to promote students' conceptual knowledge and procedural fluency with numbers. During this session, participants will explore counting principles, examine the differences between rote and rational counters, develop a core understanding of the relationships between numbers and quantities, and examine common misconceptions related to counting and cardinality. CCSSM: K.CC, K.OA

**Number in Context** – In this session, participants will explore numbers in context, emphasizing iterative units for measures such as length, time, and money. The CCSSM Standards for Mathematical Practice will ground this exploration as participants learn strategies to engage students in modeling, reasoning, and using appropriate tools to order, measure, and compare objects of varying lengths; read and write time for analog and digital clocks; and count money. The session will also focus on having students learn to solve and pose mathematical problems in contexts. CCSSM: 1.MD, 2.MD

**Addition and Subtraction** – The focus of this session will be on addition and subtraction of whole numbers and mental strategies to develop students' computational proficiency in adding and subtracting numbers. Through problem-based tasks, teachers will explore addition and subtraction problems types, the commutative and associative properties of addition, and the use of mathematical symbols to represent addition and subtraction problems. CCSSM: K.NBT, 1.NBT, K.OA, 1.OA, 2.OA

**Base 10 and Place Value** – The goals of this session are to understand the characteristics of the base-10 numeration system and children's place value development from counting by ones to grouping in tens and ones. During the session, participants will examine the importance of the positions of the digits in determining the value of two- and three-digit numbers, and the role of composing and decomposing numbers in laying the foundations for students' mathematical readiness to compute. The session will also include ideas for supporting students' computational knowledge through skip-counting by 5s, 10s, 100s. CCSSM: K.NBT, 1.NBT, 2.NBT

***Grades 3–5 Strand***

**Multiplication and Division (1)** – This session will focus on the conceptual development of students' understanding of multiplication and division, with a particular emphasis on developing understandings related to a variety of representations of these operations. These include representations of equal-sized


groups, rectangular arrays, and area models, as well as representations with number lines, including open number lines; expanded forms; and equations. Participants will also discuss strategies for acquiring automaticity with the related multiplication and division facts, and apply the commutative, associative, and distributive properties as strategies for multiplication and division. A variety of problem-based contexts will be used to engage participants, connecting directly to the CCSSM Standards for Mathematical Practice. The mathematical practices and their use in planning, teaching, and formative assessment will be an important consideration for participants as they discuss how they will engage students in grades 3–5 in foundational, number sense–building experiences related to these important operations. CCSSM: 3.OA.1, 2, 3, 4, 5, 6, 7; 4.OA.1, 2

**Multiplication and Division (2)** – This session will extend the previous session related to multiplication and division and focus on the use of strategies based on place value, the properties of operations, and varied representations that lead to access to and fluency with a standard algorithm for multiplication and division. Number sense topics that will receive emphasis are the importance of place value in mental mathematics and estimation strategies in multiplying and dividing whole numbers. Further, participants will consider multiplication as scaling when comparing a product to one factor on the basis of the size of the other factor. A variety of problem-based contexts will be used to engage participants, with a particular emphasis on the CCSSM Standards for Mathematical Practice. The mathematical practices and their use in planning, teaching, and formative assessment will be important considerations for participants as they discuss how they will engage students in grades 3–5 in these important operations. CCSSM: 4.NBT.1, 5, 6; 5.NBT.2, 5, 6; 6.NS.2

**Fractions as Numbers (1)** – The focus of this session will be on fractions as numbers, emphasizing magnitude and equivalence. Participants will engage in problem-based tasks that involve a variety of representations, sharing and proportionality, comparing and ordering equivalent fractions and decimals, and reasoning with ratios and rates. The CCSSM Standards for Mathematical Practice will be an important consideration for participants as they approach the content focus of this session and discuss how they will engage students in using the mathematical practices to develop fraction sense. CCSSM: 2.G.3; 3.G.2; 4.NF.1, 2, 5,6, 7; 6.RP.1

**Fraction Operations (2)** – This session will emphasize understandings critical to operations with fractions and decimals, with particular attention to building fractions from unit fractions, joining and separating parts of the same whole, applying and extending prior knowledge of multiplication and division of whole numbers to fractions and decimals. Participants will engage in problem-based tasks involving a variety of representations for fractions, decimals, and common percents. The CCSSM Standards for Mathematical Practice will be an important consideration for participants as they approach the content focus of this session and discuss how they will engage their students in using the mathematical practices to develop conceptual understanding and computational proficiency with fractions and decimals. CCSSM: 4.NF.3, 4; 5.NF.3, 4, 5, 6, 7; 6.NS.1, 3; 6.RP.3