1.NBT: NUMBER & OPERATIONS IN BASE TEN

Cluster Statement: B: Understand place value.

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.)

Standard Text	Standard for Mathematical Practices	Students who demonstrate understanding can:
1.NBT.B.2: Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: • **1.NBT.B.2.A: 10 can be thought of as a bundle of ten ones — called a "ten."** • **1.NBT.B.2.B: The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.** • **1.NBT.B.2.C: The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).**	SMP 4: Students can model with mathematics by using concrete materials to represent numbers including 10, 20, 30, ..., 90 as groups of ten with no ones. SMP 7: Students can look for and make use of structure by connecting words to the written numeral, such as 4 tens and 2 ones is written as 42.	• Represent 10 as ten ones. • Represent numbers 11 to 19 as a ten and some ones. • Represent two-digit numbers using physical tools, drawings, and number names (2 tens is 20, 2 tens and 7 ones is 27). • Explain the value of each digit in a two-digit number (place value). • Locate a two-digit number on a hundred chart and number line.
		Depth of Knowledge: 2
		Bloom's Taxonomy: Apply and Analyze
Standard Text **1.NBT.B.3: Compare two two-digit numbers based on meanings of the tens and one's digits, recording the results of comparisons with the symbols >, =, and <.**	**Standard for Mathematical Practices** SMP 4: Students can model with mathematics by using materials such as objects on place value charts, tens frames, hundreds chart and number lines to compare two 2-digit numbers. SMP 6: Students can attend to precision by describing the comparison using terms including greater than, more than, less than, fewer than, equal to, and same as.	**Students who demonstrate understanding can:** • Determine when a two-digit number is greater than, less than, or equal to another two-digit number. • Explain why a two-digit number is greater than, less than, or equal to another two-digit number using physical models, hundred charts, number lines, and drawings. • Compare two two-digit numbers using place value understanding. • Record the comparison using the symbols >, <, and =.
		Depth of Knowledge: 2

		Bloom's Taxonomy: Apply and Analyze
Previous Learning Connections • Connect to composing and decomposing using ten ones and some more ones. **(K.NBT.1)** • Connect to working with values between 1 and 10 and identifying whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, as well as comparing two numbers between 1 and 10. **(K.CC.6-7)**	**Current Learning Connections** • Connect to applying place value strategies of breaking apart numbers into tens and ones to help with adding and subtracting within 100. **(1.NBT.4,6)** • Connect to using the concept of tens and ones to mentally find 10 more or 10 less. **(1.NBT.5)**	**Future Learning Connections** • Connect to applying place value concepts to a larger range of numbers to include numbers to 1000. **(2.NBT.1-4)**

Clarification Statement:
- 1.NBT.B.2: More generally, first graders learn that the two **digits** of a **two-digit number** represent amounts of **tens** and **ones**, e.g., 67 represents 6 tens and 7 ones. Saying 67 as "6 tens, 7 ones" as well as "sixty-seven" can help students focus on the tens and one's structure of written **numerals**.
- 1.NBT.B.3: Grade 1 students use their **base-ten** work to help them recognize that the digit in the **tens place** is more important for determining the size of a two-digit number. Correctly placing the **<** and **>** **symbols** is a challenge for early learners. Accuracy can improve if students think of putting the wide part of the symbol next to the **larger** number.

Common Misconceptions
● Students may count tens and ones separately, such as 10, 20, 1, 2, 3 instead of 10, 20, 21, 22, 23.

● Students may not recognize that in two-digit numbers the position of the digit determines its value.

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 provides additional time for confusion to happen with new mathematical ideas when studying understanding place value because place value is a foundational skill that students need to have a strong understanding, so allowing students time to explore any confusions would help them to clear up those confusions and build a deeper understanding of place value.

        Pre-teach (intensive): *What critical understandings will prepare students to access the mathematics for this cluster?*
            • K.NBT. A.1: This standard provides a foundation for work with understanding place value because students begin to decompose numbers from 11 to 19 into tens and ones. 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

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

- For example, learners engaging with understanding place value benefit when learning experiences include ways to recruit interest such as creating socially relevant tasks because students need to be able to discuss and talk about their learning with their peers, especially with the foundational skill of place value. Students need to be able to complete social tasks that involve comparing two numbers as they continue to understand the concept of place value.

Build

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

- For example, learners engaging with understanding place value benefit when learning experiences attend to students' attention and affect to support sustained effort and concentration such as providing feedback that is frequent, timely, and specific because place value is a foundational skill that students need to have a strong understanding of so they need to receive frequent feedback to ensure they are progressing and being able to demonstrate their understanding of place value while comparing numbers two two-digit numbers..

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 understanding place value benefit when learning experiences attend to the linguistic and nonlinguistic representations of mathematics to ensure clarity can comprehensibility for all learners such as <pre-teaching vocabulary and symbols, especially in ways that promote connection to the learners' experience and prior knowledge because it is important for students to know and understand the meaning of a "ten" and "one". Also, students need to know and understand the symbols when comparing two two-digit numbers. The connection of more than or less than can be made to the student's background knowledge of counting in sequence from any given number.

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 understanding place value benefit when learning experiences attend to the multiple way's students can express knowledge, ideas, and concepts such as using physical manipulatives (e.g., blocks, 3D models, base-ten blocks) because it is important for students to use manipulatives when building their understanding of place value. Students need to be able to see how many ones make a ten. Also, when comparing numbers, it would be important for students to see the numbers with base-ten blocks as they compare.

Internalize

Self-Regulation: *How will the design of the learning strategically support students to effectively cope and engage with the environment?*

- For example, learners engaging with understanding place value benefit when learning experiences set personal goals that increase ownership of learning goals and support healthy responses and interactions (e.g., learning from mistakes), such as using activities that include a means by which learners get feedback and have access to alternative scaffolds (e.g., charts, templates, feedback displays) that support understanding progress in a manner that is understandable and timely because students need to be able to have access to various scaffolds as they work to understand place value. Some students might need to use a place value chart, while others will need base-ten blocks to support their understanding.

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?*
- For example, students may benefit from re-engaging with content during a unit on understanding place value by revisiting student thinking through a short mini-lesson because students might have some minor confusions on how to decompose numbers into tens and ones. Students should be using manipulatives, such as base-ten blocks, while building their understanding of place value. The use of a place value chart with base-ten blocks can help to solidify the student's understanding.

Re-teach (intensive) : *What assessment data will help identify content needing to be revisited for intensive interventions?*
- For example, some students may benefit from intensive extra time during and after a unit understanding place value by confronting student misconceptions because students need to have a strong understanding of place value so it is important to clarify any misconceptions the student might have. It is important to utilize manipulatives so students can visually see the concept as well.

Extension Ideas

What type of extension will offer additional challenges to 'broaden' your student's knowledge of the mathematics developed within your HQIM?
- For example, some learners may benefit from an extension such as open ended tasks linking multiple disciplines when studying understanding place value because an open ended task would allow students to explore and have a deeper understanding of place value, which will benefit them in the future.

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?

Building Procedural Fluency from Conceptual Understanding: Instruction should build from conceptual understanding to allow students opportunities to make meaning of mathematics before focusing on procedures. When new learning begins with procedures it privileges those with strong prior familiarity with school mathematics procedures for solving problems and does not allow learning to build for more methods for solving tasks that occur outside of school mathematics. For example, when studying understanding place value, the types of mathematical tasks are critical because students need to have a strong understanding of place value before they begin to use numbers procedurally. It is important to utilize manipulatives when building a student's understanding of place value, so they can visually see the concept as well. Engage students in learning by building on their experiences and provide multiple options for how students can interact with instructional

content. Use consistent spoken and body language with all students to avoid unconscious bias in verbal or nonverbal cues. A teacher randomly draws from popsicle sticks with student names when asking questions. This ensures all students have an equal chance of participating in the whole class discussion.

Standards Aligned Instructionally Embedded Formative Assessment Resources:
Source: https://achievethecore.org/coherence-map/1/4/17/17
Roll & Build
Provided by Illustrative Mathematics
Materials
For each pair:
- ▫ 2 ten-sided dice with the numbers 0 to 9 or two spinners with the numbers 0 to 9
- ▫ Base-10 blocks, linking cubes, or bundled and loose popsicle sticks
- ▫ Paper and pencil

Play
Student A rolls the dice.

Student B makes a number using the values on the dice as digits and both students write it on the paper. For example, if student A rolled a 3 and a 4, the number can be 34 or 43.

Student A represents the number with the tens and one's blocks/popsicle sticks.

Student B counts the blocks to check that they correctly represent the number.

Both students draw a picture of the tens and ones on the paper.

The students should take turns.

This type of assessment question requires students to practice representing two-digit numbers with concrete objects to reinforce the meaning of the tens digit and the ones digit. This task works best in partners; however, it can be played individually. The teacher should show the students how to play using an overhead projector or the white board before the students start. This is just an example.

Relevance to families and communities:	**Cross-Curricular Connections:**
During a unit focused on understanding place value, 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, students can make the connection that two two-digit numbers have ones and tens, so 5 tens and 4 ones is 54. Families can play "I spy" number game. Make connections with two two-digit numbers, use vocabulary words greater than, less than, and equal to instead of bigger or smaller numbers. Connect the vocabulary words with the symbol greater than >, less than <, and equal to = whenever possible.	Science: In first grade the NGSS state students should "make observations at different times of year to relate the amount of daylight to the time of year." Consider providing a connection for students to compare number of hours daylight during different times of the year. Art: Even though there is a difference between illustrating or drawing and pictorial representation in math, students do need significant experience with concrete representations to develop the idea of place value. Consider providing a connection where they can create pictures that include groups of ten objects together and then single ones (such as a bouquet of flowers and single flowers or a bunch of balloons and single balloons).