Cluster 6: Making Connections to Decimal Notation

Duration: 1-2 weeks

Content Standards
This list includes standards that will be addressed in this cluster, but not necessarily mastered, since all standards are benchmarks for the end of the year. Please note strikethroughs and recommendations in the Important Considerations section for more information.

Extend understanding of fractions.

Understand decimal notation for fractions and compare decimal fractions.
NC.4.NF.6
Use decimal notation to represent fractions.
- Express, model and explain the equivalence between fractions with denominators of 10 and 100.
- Use equivalent fractions to add two fractions with denominators of 10 or 100.
- Represent tenths and hundredths with models, making connections between fraction and decimals.

NC.4.NF.7
Compare two decimals to hundredths by reasoning about their size using area and length models, and recording the results of comparisons with the symbols >, =, or <. Recognize that comparisons are valid only when the two decimals refer to the same whole.

Mathematical Practices:
1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning.

What is the mathematics?
In this cluster, students explore decimal numbers via their connection to decimal fractions. Students will express quantities using both fraction and decimal notation. Students apply the same reasoning to decimal numbers as developed through their fraction work.

- Students will represent tenths and hundredths with models and make connections between the meaning of fractions and decimals. (ex: Models may include a number line, decimal grids, tenth/hundredth circles; Make connections between fractions with denominators of 10 and 100 on place value chart).
- Students will use the correct language to describe decimals (ex: Say 'three tenths' instead of 'point three' when describing 0.3).
- Students will use models to verify equivalence (ex: use number line and show fraction on top and decimal notation on bottom) to express equivalence between fraction and decimal form (e.g. 3/10 = 0.3)
- Students will use decimal notation in reference to the number line and decimal grid models to solve problems and communicate their thinking.

- Students will compare decimal numbers using area models, number lines, benchmark numbers, and/or understanding of equivalence, to compare and order decimals.
- Students will understand that, like fraction notation, decimal comparisons are valid only when comparing to the same whole.
- Students will use greater than, less than, and equal symbols to record comparisons.

Important Considerations:

- Helping students make connections between mathematical ideas is important. Use concrete examples and models to connect students understanding of fractions to decimal fractions to decimal notation. (ex: In a context, discuss and show a visual model students are familiar with-- a chocolate bar, pizza, meter, etc. Discuss the meaning of the model related to numerator and denominator. Repeat modeling, but this time dividing the model into tenths. Students should identify one portion as 1/10. Explain that there is another notation for expressing tenths. Introduce notation and verbally express both representations as "one-tenth")
- While the decimal point is a convention, it is based on understanding the structure of the place-value system. It is important for students to understand that the decimal point serves a very important purpose of separating whole numbers from parts (ex: dollars and cents, whole object from part of an object, scores/time, etc.).
- Measurement and money contexts provide students with concrete examples exploring tenths and hundredths that can support student understanding and reasoning about decimals.
- It is important to provide opportunities to explore various representations and forms of decimals (ex: 0.31 thirty-one hundredths is also 3 tenths and 1 hundredth; 0.30 can be described as 3 tenths or thirty-hundredths).