Cluster 7: Partitioning and Telling Time to the Hour and Half Hour

Duration: 3 weeks

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

NC.1.MD.3
Tell and write time in hours and half-hours using analog and digital clocks.
NC.1.G.3
Partition circles and rectangles into two and four equal shares.
• Describe the shares as halves and fourths, as half of and fourth of.
• Describe the whole as two of, or four of the shares.
• Explain that decomposing into more equal shares creates smaller shares.

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?
- This unit begins with experiences in partitioning circles and rectangles into halves and fourths. Then the understanding of partitioning is applied to learn to tell time to the hour and half hour.
- Students have an intuitive understanding of fair shares. Building on their experiences through discussions of fair-sharing lead to an understanding of equal partitioning through experiences with paper folding and geoboards. As students' partition rectangles and circles into two and four shares, they should describe the shares they've created using the language of 'halves', 'half of', 'fourth' and 'fourth of'. It is not the expectation that fractions should be written formally at this time (Ex: ¼)
- Students recognize that a whole is two of the halves put together or four of the fourths put together (ex. If I cut my sandwich in half, when I put the two halves together I have the whole sandwich. When I cut it into fourths, I put the four pieces together to make the whole sandwich.).
- Students understand that sharing equally into more pieces means each piece will be smaller (ex. If I share my sandwich with one friend, my piece will be bigger than if I share with three friends).
- Use the concept of partitioning to help students learn to tell time to the hour and half hour. Students often struggle with placement of the hour hand when drawing time to the half-hour. The work done in partitioning helps to support student understanding of hand placement as "half-past" the hour number.

Important Considerations:
- Students need to be involved in problems involving sharing and breaking down things so that it is "fair." Initial attempts to share often result in partitions that are not "equal" and provide opportunities to discuss "equal" and "fair." Take the time to discuss the meaning of fair-sharing in mathematics versus "fair" in real life situations. For example, four children

sharing a pizza might each get a one-fourth piece as a "fair share." But if Dad and three children are sharing the same pizza, what is "fair" may be to give Dad a larger portion.

- Folded paper and geoboards provide opportunities to discuss multiple ways to partition and various representations (ex. "Fold your paper in half" will always result in different outcomes. Is the fold line vertical or horizontal? Is one way right? Are they both halves?).
- Use concepts of partitioning to relate to telling time to the half hour.
- Students often struggle with placement of the hour hand when drawing time to the half-hour. The work done in partitioning helps to support student understanding of hand placement as "half-past" the hour number.
- Spend time discussing what happens to the big hand on the clock as the little hand goes from one hour to the next. When the big hand is at 12, the little hand is pointing exactly at a number. When the big hand is at 6, the little hand is halfway between numbers.
- Students may benefit from work with one handed clocks. Remove the minute hand from a clock and ask students to predict where the minute hand might be based on the location of the hour hand.
- Digital clocks permit students to read times easily, but they don't easily relate to the benchmarks of time. For example, it's difficult for children to realize that 10:58 is nearly 11 o'clock.
- Students may need help in understanding the placement of the colon on the digital display.