3rd Grade Mathematics Curriculum Considerations
SBAC preparedness throughout the year

This document highlights concepts and ideas for supporting and reinforcing student understanding throughout the entire school year. Waiting until these concepts are introduced, developed or secured in our instructional resource materials may not provide enough instructional opportunities for all students.

Time

Standard(s):

- 3.MD.A.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Consideration: Students have fewer opportunities to tell time using analog clocks outside of school. While students begin working with analog & digital clocks in 1st grade; in third grade telling time to the minute and working with elapsed time are not explored until Topic 14. Students would benefit from ongoing and purposeful experiences with using time throughout the school year.

Prior Learning:
2.MD.C.7 Tell and write time from analogue and digital clocks to the nearest five minutes, using a.m. and p.m.
First grade Number Corner has a full month on developing understanding of a.m. and p.m. The 2nd grade instructional materials provide 3 lessons in which students tell time to the nearest five minutes on analogue and digital clocks, develop understanding of a.m. and p.m. times and use the language *quarter past*, *half past* and *quarter to,* to describe time.

Suggestions for supporting/reinforcing understanding:
Throughout the year, ask students to tell time to the nearest 5-minutes and slowly begin working on telling time to the nearest minute. Bring attention to a.m. and p.m. activities in the real-world including the school day. Provide opportunities for students to describe time using the terms *quarter past*, *half past* and *quarter to* for relevant situations within the school day. Once students demonstrate readiness and are able to tell time to the minute, consider asking them to determine small intervals of elapsed time. For example, if the time is 11:45 and they go to lunch at 12, ask them what time it is and how many minutes until lunch. After students have officially had the learning opportunities provided in Topic 14, continue these opportunities to meet grade level expectations.

Money

Standard(s):

- 3.NBT.A.3 Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations.
- 3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Consideration: Children have fewer opportunities to reinforce money concepts in the real-world as Debit/credit, electronic payment and/or barter methods are commonly used in today's society. Some students may not have had enough learning opportunities to demonstrate understanding of these standards due to insecure understanding of money (value of, combinations of, contexts involving money).

Prior Learning:
2.MD.C.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately.

Suggestions for supporting/reinforcing understanding:
Whenever possible connect concepts of place value (e.g. 60¢ has 6 tens so I could use 6 dimes), play with different coin and bill combinations to make a total amount, use money context to solve two-step problems, and connect multiplication equations that have a factor of 5 or 10 to nickels and dimes.

Geometry

Standard(s):

- 3.G.A.1 Reason with shapes and their attributes. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Consideration: Demonstrating understanding of this standard requires use of precise academic vocabulary in order to classify shapes using their attributes. A task such as classifying a square can help to illustrate why vocabulary is such an important component of geometry. Students need to recognize that a square can be classified as several different shapes. As an example, a square is also a parallelogram because it meets the requirements that the shape must:

- be a polygon (and the all the attributes for a polygon)
- have four sides (be a quadrilateral)
- have 2 pairs of parallel sides
- opposite sides are the same length
- opposite angles are the same size.

Then, in addition, students must recognize there are additional attributes required to make the shape a square. Despite working on geometric concepts and terminology, if the rigor has not been established in prior grade levels, this may become overwhelming and present a significant language load.

Prior Learning: 2.G.A.1 Reason with shapes and their attributes.
Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

Suggestions for supporting/reinforcing understanding:
Consider implementing something like a Geometry Corner (Vertex) in your classroom or as an occasional routine where students could solve Geometry Riddles on geoboards, sort, or explore examples and non-example activities using the terms:

polygon	parallelogram	right angle(s)	angle(s) closed
sides	vertices	pentagon	hexagon
quadrilateral	triangle	rectangle	square
rhombus	trapezoid		

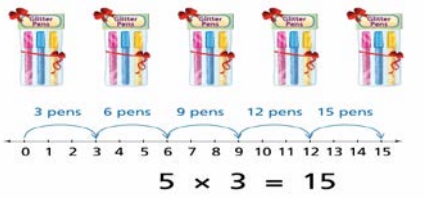
Critical Mathematical Models

Van de Walle, Karp, Lovin, and Bay-Williams (2014) state the following in regards to the relevance of mathematical models,

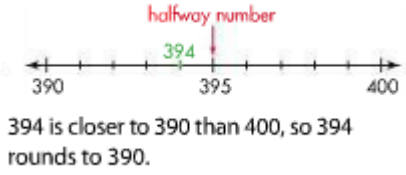
> Models or representations, whether they are conventional or not, give learners something they can use to explore, reason, and communicate as they engage in problem-based tasks… **Because different representations can illuminate different aspects of a mathematical idea, multiple representations should be explored and encouraged.** The more ways students are given to think about and test an emerging idea, the better they will correctly form and integrate it into a rich web of concepts and thereby develop a relational understanding (p. 23).

Identifying critical mathematical models may appear contradictory to the above statement. The suggestion is not that other models presented in the instructional materials be disregarded, but rather that the following models be used consistently and connected to the other models as appropriate. With the exception of Fraction Strips, these models have the ability to represent several mathematical concepts across multiple domains.

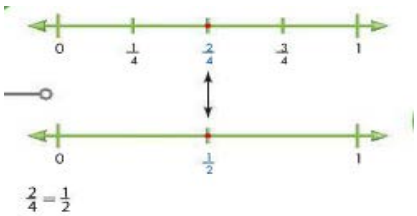
Number Lines: Number lines are a useful model because they can be used to model all four operations and fractions. However, they can be problematic for younger students as there is a shift from counting collections to counting continuous unit lengths. In third grade it is imperative that students be familiar with using the number line to represent addition, subtraction, multiplication, division and fractions as future grade level work will build on this model. Fourth graders locate decimals on number lines and use them for measurements. Fifth graders will use perpendicular number lines on coordinate grids. (Van de Wall, et.al. 2014)



Visual Learning Animation (VLA)
Lesson 1-2

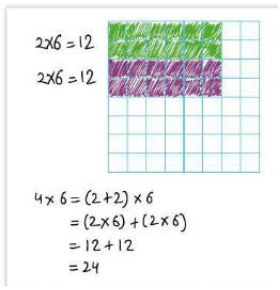


VLA
Lesson 8-3

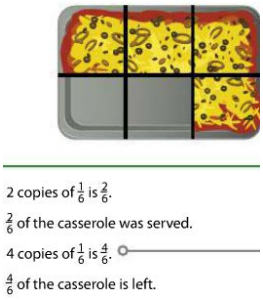


VLA
Lesson 13-2

Area Model: The area model is a useful tool for representing strategies for multiplication and division. As well as, developing understanding of equal partitions for fractions and meaning of unit fractions.



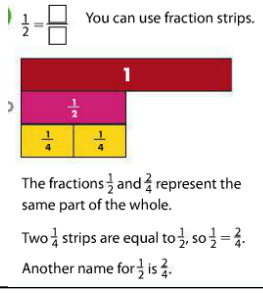
Intervention Activity
Lesson 3-3



VLA
Lesson 12-2

Bar Diagrams: Bar diagrams are extremely helpful in representing the operations and different problem types. Instructional suggestions as well as examples and explanations of bar diagrams for the different problem types and operations can be found on TE p. F31-F35.

Fraction Strips: The use of physical models in fraction tasks are critical for developing understanding of fractions as numbers. Fraction strips provide a physical model of a whole, equal parts, iterations of the unit fraction, identifying equivalent fractions and comparing fractional quantities. Fraction strips also support the eventual use of the number line.



VLA
Lesson 13-1