Standard 3.NF.1 Understand that a unit fraction has a numerator of one and a non-zero denominator.
a. Understand a fraction 1/*b* as the quantity formed by one part when a whole is partitioned into *b* equal parts.
b. Understand a fraction *a/b* as the quantity formed by a parts of size 1/*b*. *For example: 1/4 + 1/4 + 1/4 = 3/4.*

Concepts and Skills to Master

- Understand unit sized fractional parts as equal-sized pieces of the same whole
- Understand a unit fraction as one of the equal-sized parts of the whole with a one as the numerator
- Understand the denominator as the fractional name determined by the number of equal parts in the whole
- Reason about the size of the fractional part in relation to the number of parts in a whole
- Understand the numerator of a fraction as the number of equal parts being considered
- Build non-unit fractions from unit fractions (¾ is composed of 3 units the size of ¼)

Teacher Note: Third grade is the first time students work with fractions as numbers, including fractional notation as well as representations beyond circles and rectangles. Students should NOT be exposed to representations of fractions as sets until fourth grade.

Related Standards: Current Grade Level	Related Standards: Future Grade Levels
3.NF.2 Understand fractions on number lines **3.NF.3** Explain equivalence and compare fractions **3.G.2** Partition shapes into parts with equal areas	**4.NF.3** Understand fractions as sums of unit fractions **4.NF.1, 2, 4, 5.NF.1–6** Use understanding of fractions and unit fractions to solve operations with fractions **5.NF.7** Divide unit fractions by whole numbers and whole numbers by unit fractions

Critical Student Background Knowledge from Previous Grade Levels

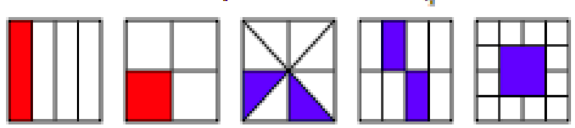
- Partition circles and rectangles into equal shares using the language halves, thirds, and fourths (2.G.3)
- Partition circles and rectangles into equal shares using the language halves and fourths (1.G.3)

Academic Vocabulary

halves (1/2), thirds (1/3), fourths (1⁄4), sixths (1/6), eighths (1⁄8), fraction, unit fraction, numerator, denominator, equal parts

Suggested Models

Area representations of $\frac{1}{4}$



In each representation the square is the whole. The two squares on the left are divided into four parts that have the same size and shape, and so the same area. In the three squares on the right, the shaded area is $\frac{1}{4}$ of the whole area, even though it is not easily seen as one part in a division of the square into four parts of the same shape and size.

Suggested Strategies

- Represent fractions using various contexts (candy bars, fruits, cake), materials (paper, objects), and shapes (circles, squares, rectangles, strips, fraction bars)
- Represent fractions using area of shapes and number lines
- Represent unit fractions and non-unit fractions connecting visual models to fractional notation

Image Source: http://commoncoretools.me/wp-content/uploads/2011/08/ccss_progression_nf_35_2013_09_19.pdf

Develop understanding of fractions as numbers. Denominators are limited to 2, 3, 4, 6, and 8 in third grade.

Standard 3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.
a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line.
b. Represent a fraction *a/b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Recognize that the resulting interval has size *a/b* and that its endpoint locates the number *a/b* on the number line.

Concepts and Skills to Master

- Understand that the interval from 0 to 1 or the interval between consecutive whole numbers can represent a whole
- Recognize the equal parts as unit fractions when the whole between 0 and 1, on a number line has been partitioned into equal parts
- Understand the endpoint labels the length and the fraction
- Identify and represent fractions on a number line

Related Standards: Current Grade Level	Related Standards: Future Grade Levels
3.NF.1 Understand unit fractions and fractions as numbers **3.NF.3** Explain equivalence and compare fractions **3.G.2** Partition shapes into parts with equal areas **3.MD.1** Represent time intervals on a number line **3.MD.4** Measure lengths with halves and fourths of an inch	**4.NF.3** Understand fractions as sums of unit fractions **4.NF.1, 2, 4, 5.NF.1 & 2, 5.NF.4 - 7** Use number lines as models to represent operations with fractions **4.MD.4, 5.MD.2** Make line plots with fractional measurements **5.G.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system **6.NS.5,6,7** Use number lines to reason about and compare positive and negative numbers

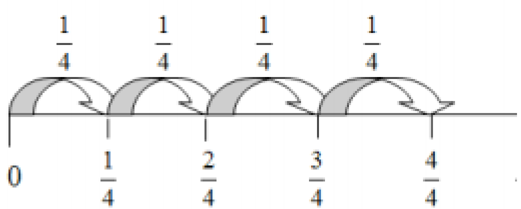
Critical Background Knowledge from Previous Grade Levels

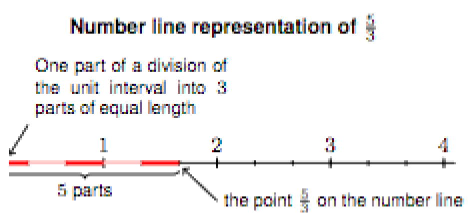
Represent whole numbers as lengths from 0 on a number line diagram (2.MD.6)

Academic Vocabulary

halves (1/2), thirds (1/3), fourths (1/4), sixths (1/6), eighths (1/8), fraction, unit fraction, numerator, denominator, equal parts, interval, endpoint

Suggested Models





Suggested Strategies

- Use a variety of linear models including folding paper strips (sentence strips), string, etc. to reason and justify the location of fractions on a number line
- Connect physical models, to visual bar models, and number lines
- Make connections between number lines, rulers, and time intervals (3.MD.1 and 3.MD.4)

Images Sources: http://commoncoretools.me/wp-content/uploads/2011/08/ccss_progression_nf_35_2013_09_19.pdf, http://www.dpi.state.nc.us/docs/curriculum/mathematics/scos/3.pdf

Develop understanding of fractions as numbers. Denominators are limited to 2, 3, 4, 6, and 8 in third grade.

Standard 3.NF.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
a. Understand two fractions as equivalent if they are the same size, or the same point on a number line.
b. Recognize and generate simple equivalent fractions, such as 1/2 = 2/4, 4/6 = 2/3. *Explain why the fractions are equivalent by using a visual fraction model, for example*.
c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *For example, express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.*
d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. *Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, for example, by using a visual fraction model.*

Concepts and Skills to Master

- Understand equivalent fractions as the same quantity with different names
- Understand equivalence as different names for the same point on a number line
- Represent whole numbers as equivalent fractions (3/3 = 1 and 4/1 = 4)
- Understand comparisons are only valid when the two fractions refer to the same whole
- Compare unit fractions by reasoning that as the number of equal parts in a whole increases, the size of the fractional parts decreases (the larger the denominator, the smaller the size of the part, ex. ½ > ⅛)
- Compare non-unit fractions with the same numerators by reasoning that as the number of equal parts in a whole increases, the size of the fractional parts decreases. The larger the denominator, the smaller the size of the part. (2/4 > 2/6)
- Compare fractions with the same denominators by reasoning that as the number of equal parts being considered (numerator) increases, the size of the fraction increases. The greater numerator is greater because it is made of more unit fractions. (A segment from 0 to ¾ is shorter than a segment from 0 to 5/4, because it measures 3 units of ¼ as opposed to 5 units of ¼. Therefore, ¾ < 5/4.)

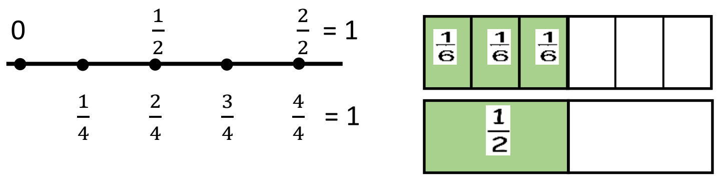
Related Standards: Current Grade Level	Related Standards: Future Grade Levels
3.NF.1 Understand unit fractions and fractions as numbers **3.NF.2** Understand fractions on number lines	**4.NF.1** Generate equivalent fractions, and explain why they are equivalent **4 NF.2** Compare and order fractions by generating equivalent fractions **5.NF.1, 5.NF.2** Add and subtract fractions with unlike denominators, by generating equivalent fractions **6.RP.3** Generate equivalent ratios and compare ratios

Critical Background Knowledge from Previous Grade Levels

- Compare two-digit and three-digit numbers with the symbols >, =, and < (1.NBT.3, 2.NBT.4)
- Measure an object using different units and relate the number of units to the size of the units. The larger the size of the unit, the less units needed. A book is 1 foot or 12 inches. A foot is larger so less feet are needed. Inches are smaller so more inches are needed (2.MD.2)
- Understand that decomposing into more equal shares creates smaller shares (1.G.3)
- Order and compare objects by length (1.MD.1)

Academic Vocabulary

halves (1/2), thirds (1/3), fourths (1/4), sixths (1/6), eighths (1/8), fraction, numerator, denominator, equivalent, equal parts, compare

Suggested Models	Suggested Strategies
Using the number line and fraction strips to see fraction equivalence  Visual models may include: area of various shapes (circles, rectangles, etc.), bar models, number lines, and double number lines	• Use a variety of visual area and linear fraction models to recognize and generate equivalent fractions. • Use a variety of visual area and linear fraction models to compare fractions with the same numerators and same denominators. • Use objects of different sizes and discuss if the fractions may be compared. Is ½ of a small Laffy Taffy the same amount as ½ of a large Laffy Taffy?