TLC Framework - Fractions

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Ontario Curriculum Overall Expectations:

Grade 3:

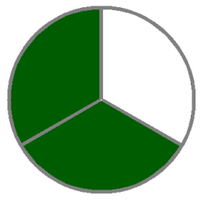
- Read, represent, compare and order whole numbers to 1000, and use concrete materials to represent fractions and money amounts to $10

Grade 4:

- Read, represent, compare, and order whole numbers to 10 000, decimal numbers to tenths, and simple fractions, and represent money amounts to $100
- Demonstrate an understanding of magnitude by counting forward and backwards by 0.1 and by fractional amounts

<table>
<tr><th>Curriculum Specific Expectations</th><th>Diagnostic Assessment</th><th colspan="3">Connections to PRIME
(focus: phases 1 through 3, which correlate with academic grades K through 5)</th><th>Summative Task</th></tr>
<tr><td rowspan="4">Grade 3:
- divide whole objects and sets of objects into equal parts, and identify the parts using fractional names (e.g., one half; three thirds; two fourths or two quarters), without using numbers in standard fractional notation

Grade 4:
- represent fractions using concrete materials, words, and standard notation, and explain the meaning of the denominator as the number of the fractional parts of a whole or a set, and the numerator as the number of fractional parts being considered
- compare and order fractions (.i.e., halves, thirds, fourths, fifths, tenths) by considering the size and the number of fractional parts (e.g., ⅝ is greater than ⅜ because there are more parts in ⅝; ¼ is greater than ⅛ because the size of the part is larger in ¼
- compare fractions to the benchmarks of 0, ½, and 1 (e.g., ⅛ is closer to 0 than to 1/2 ; ⅝ is more than ½)
- demonstrate and explain the relationship between equivalent fractions, using concrete materials (e.g., fraction circles, fraction strips, pattern blocks) and drawings (e.g., “I can say that 3/6 of my cubes are white, or half of the cubes are white. This means that 3/6 and ½ are equal.”)
- count forward by halves, thirds, fourths, and tenths to beyond one whole, using concrete materials and number lines
- determine and explain, through investigation, the relationship between fractions (i.e., halves, fifths, tenths) and decimals to tenths, using a variety of tools (e.g., concrete materials, drawings, calculators) and strategies (e.g., decompose ⅗ into 4/10 by dividing each fifth into two equal parts to show that ⅗ can be represented as 0.4)</td><td colspan="5">Numbers -
Concept 1: Numbers tell how many or how much.
Concept 3: There are different, but equivalent, representations for a number.</td></tr>
<tr><td>Look fors:
Can students identify fractions of an area?
Can students identify fractions of a set?
Do students represent fractions using a variety of models?
Are students able to describe how two fractions are alike?

Questions:
 
What fraction do you see?

Name a fraction that is similar in some way to the fraction above.

Fractions have more than one name.

Represent that fraction in two ways.

 
What fraction do you see?

Name a fraction that is similar in some way to the fraction above.

Represent that fraction in two ways.

Model a fraction that is greater than a half.</td><td>Phase 1:
<u>Concept 1:</u>
Student counts one at a time, and uses, compares, recognizes, and describes whole numbers to 10 as well as the fraction one half in the context of sharing a region
Indicator 7: Use the name “one half” to describe or model half of a region, pictorially or concretely, in the context of sharing</td><td>Phase 2:
<u>Concept 1:</u>
This students counts efficiently by grouping and counting on, and uses, compares, recognizes and describes more numbers, including simple fractions of regions, such as ½, ⅓ and ¼
Indicator 6: Names and interprets simple fractions to identify parts of a region modelled concretely and pictorially (e.g., ¼)

<u>Concept 3:</u>
This students describes numbers correctly, applies simple intuitive ratios, knows viewpoint can change an ordinal description, and creates simple models of fractional equivalence
Indicator 11: Recognizes and creates concrete and pictorial models of some fractional equivalents (e.g., covers a concrete model of ½ with 2/4 and recognizes the equivalence)</td><td>Phase 3:
<u>Concept 1:</u>
This student uses many groupings to count and to identify numbers to 1000. She/He uses, comparese, recognizes, and describes numbers to 1000 and some fractions and decimals.
Indicator 4: Names and interprets simple fractions to identify parts of a regions and parts of a set, modelled concretely and pictorially (e.g., ⅛)
Indicator 5: Creates fraction representations/models for very simple fractions using partitioning in familiar contexts, concretely or pictorially (e.g., ⅜)
Indicator 6: Names and interprets fractions and decimals to describe parts of a region divided into tenths or hundredths, modelled concretely or pictorially
Indicator 7: Demonstrates a sense of the relative size of fractions with the same denominator

<u>Concept 3:</u>
This student considers a number as a multiple of another number, represents and interprets simple ratios, and creates models of more equivalent fractions.
Indicator 11: Recognizes and creates pictorial models of an increasing number of fractional equivalents (e.g., can draw pictures to show that ⅓ = 2/6, that ¼ = 2/8)</td><td rowspan="3">Assessment Questions:

Twelve members of a team are holding a vote to decide whether their team should enter a weekend competition. 7/12 of the team vote in favour of entering the competition. Is 7/12 closer to 0, 1/2, or 1? Explain your reasoning so that others will understand your thinking.
(Guide to Effective Instructions - Fractions)

A coach agrees to enter teams in a swim meet if at least 1/2 of the members on each team vote in favour of doing so. Here are the numbers of team members who voted in favour of entering the meet: • Mackerels: 12 out of 15 • Snappers: 9 out of 13 • Angelfish: 8 out of 14 • Trout: 11 out of 16 Which teams will enter the meet?
(Guide to Effective Instructions - Fractions)</td></tr>
<tr><td>Manipulatives:
Counters
Cuisinaire rods
Linking cubes
Game materials
10-frames
Fraction pieces
Coins or play coins</td><td>Manipulatives:
Base ten materials & place value mats
Coins or play coins
Calculators
Pattern blocks</td><td>Manipulatives:
Square tiles
Coins or play coins
Place value mats
Calculators
Pattern blocks</td></tr>
<tr><td>Relating Multiplication, Division and Fraction
There are 18 students in dance. The dance teacher wants to arrange the students in rows for the dance recital. Show half of the students in the front row. How many students are in the back row?

Representing Fractions
Model a half in as many ways as possible.

Understanding Fractions
Ms. Koltun made a diagram to show how students get to school. There are the same number of students that take the bus as students who walk. What would the diagram look like?</td><td>Relating Multiplication, Division and Fraction
There are 24 students in Mrs. Lowe’s Grade 3 class. She divides the class into 4 equal groups. Make a drawing to show the 24 students divided into 4 equal groups. One of these groups goes to the library. What fraction of the groups goes to the library? Justify your answer. (EQAO, 2016)

Representing Fractions (partitioning)
Model $\frac{3}{5}$ using an area model (pattern blocks)

Representing Fractions (as a part of a set)
Show $\frac{3}{5}$ as a fraction of a set. (comparative thinking)
Example:</td><td>Understanding Fractions (dividing in equal parts)
What do you know about the fraction two-thirds ($\frac{2}{3}$)?

Using pattern blocks, determine how many ___ fit into ___? (e.g., how many triangles cover the area of a hexagon?)

Shawna was walking a number line and counting by sixths. She stopped between 2 and 3. What number might she have stopped on? Are there other possibilities?
(http://www.edugains.ca/resourcesMath/CE/LessonsSupports/Fractions/SupportDocs/FractionsAcrossStrands.pdf)</td></tr>
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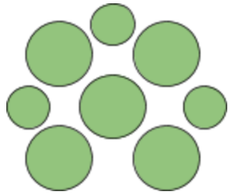
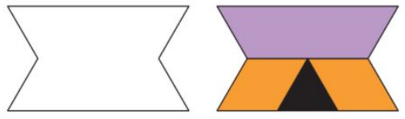
		There are the same number of boys and girls in the class. What do you know about the total?	 or  or 	Store A is offering discounts of 1 3 while Store B is offering "buy 3, get 1 free." Under which conditions would each store offer the better deal? (http://www.edugains.ca/resourcesMath/CE/LessonsSupports/Fractions/SupportDocs/FractionsAcrossStrands.pdf) **Representing Fractions (partitioning)** Jessica brought some money for her day at the medieval theme park. She spent her money as shown below: Lunch: $\frac{2}{6}$ of the money Souvenirs: $\frac{1}{6}$ of the money Ride tickets: $\frac{3}{6}$ of the money Model the fraction of the money that Jessica spent on ride tickets. Write the fraction and the words. What fraction of her money has Jessica *not* spent at the end of the day? (RPM, Number Card #31) You have a rectangular cake. You cut the cake into 10 pieces. You gave away 7 pieces. What fraction of the cake is left? What fraction of the cake did you give away? You have a pentagonal cake. You cut the cake into some pieces. You have 2 pieces left. What fraction of the cake is left? What fraction of the cake did you give away? Is $\frac{2}{5}$ greater or less than $\frac{2}{4}$? How do you know?	

1. Maia used triangle pattern blocks to create this outline.

   Then she coloured in parts.



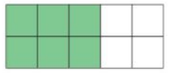
   Use fractions and decimals to describe each colour in Maia's design.

   Explain your thinking.

(RPM, Number Card #37)

Representing Fractions (as a part of a set)
Model the following fractions: $\frac{3}{8}$, $\frac{2}{5}$, $\frac{4}{7}$, $\frac{1}{4}$, $\frac{4}{6}$

How many blocks did you use to build your structure? How many of those blocks have curved sides? Straight sides?
(http://www.edugains.ca/resourcesMath/CE/LessonsSupports/Fractions/SupportDocs/FractionsAcrossStrands.pdf)

				How is sharing four cookies equally among five people different from sharing six cookies equally among seven people? (http://www.edugains.ca/resourcesMath/CE/LessonsSupports/Fractions/SupportDocs/FractionsAcrossStrands.pdf) **Equivalent Fractions** Investigating equivalent fractions with pattern blocks. The hexagon is a whole. Show a half in many ways as possible. Model two equivalent fractions. Name 50 in another way. (e.g., two 25's. Five 10's, ten 5's) Is $\frac{2}{5}$ another name for $\frac{4}{10}$? Justify your thinking. Select a fraction that is greater than $\frac{7}{10}$? How do you know? 1. What fraction of each whole rectangle is green? Write each fraction using numbers and words.  rectangle A  rectangle B Which rectangle has the greater fraction of green? How do you know? (RPM Number Card #32) 1. The Grades 4, 5, and 6 classes were each given the same amount of mural paper to decorate the hall.  The Grade 4 class painted $\frac{3}{4}$ of their paper, the Grade 5 class painted $\frac{3}{5}$ of their paper, and the Grade 6 class painted $\frac{3}{10}$ of their paper. Use diagrams to help you order the fractions from smallest to greatest. Show your work. (RPM Number Card #33) **Relating Fractions to Decimals**  What is this fraction? Is it close to O or 1? How do you know?	

				On Omar's birthday cake there are 2 red candles, 3 blue candles, 4 yellow candles, and 1 green candle. Write decimals and fractions that tell about the candles on the cake. (RPM Number Card #33)	