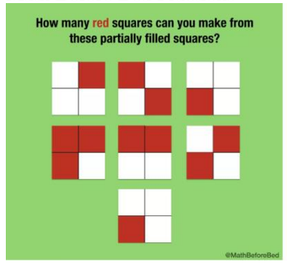
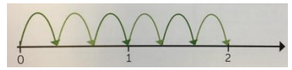
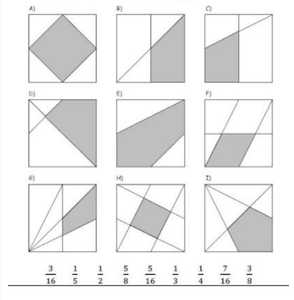
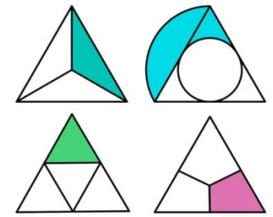
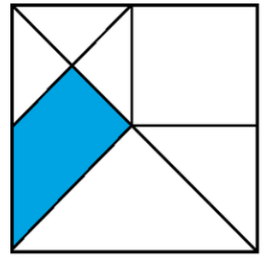
Grade 7 - TLC Thinking Framework - Fractions

Types of Questions	Selecting Tools and Strategies	Representing	Connecting	Problem Solving	Reflecting	Communicating	Reasoning and Proving
Grade 7 Fractions	**Conceptual Thinking** (need to reword the question) Math Before Bed Fractions  **Procedural Thinking** Make as many addition statements using different fractions to make a whole *equivalent fractions to add unlike denominator fractions Practise adding fractions TIPS4M Unit 7 Day 2 Adding Fractions BLM 7.2.1 **Constraint Thinking** Balancing equations with fractions 1 - x = ⅓	**Representative Thinking** Hand out fraction strips, & tangram tiles; let students shade each fraction a different colour, cut out and keep for personal tool. Big idea: benchmark fractions - (1/2 , ⅓, ¼, 1/5., 1/10) **Representative Thinking** TIPS4RM - Unit 7 Day 1 - building patterns with fractions BLM 7.1.1 & 7.1.2 TIPS4M Unit 7 Day 4 Fractions using Relational Rods **Representative Thinking** Fraction Talks - Make your own fraction by shading a section and add to fraction number line **Representative Thinking** You can use a grid to help you add and subtract fractions. For example, This grid has 16 squares. 7 squares are shaded darkly represent $\frac{7}{16}$ 6 squares are shaded lightly represent $\frac{6}{16}$ This grid shows that: $\frac{7}{16} + \frac{6}{16} = \frac{13}{16}$ It also shows that: $\frac{13}{16} - \frac{6}{16} = \frac{7}{16}$ **Representative Thinking** Build your own (BYO) fraction shape - where…. #1 - at least 1/2 is Red at least 1/4 is Blue no more than 1/6 is Yellow #2 - at least 1/4 is Red at least 1/12 is Blue the number of Yellow squares are more than double than the	**Conceptual Thinking** Provide a situation where ⅓ is greater than ½? **Connective Thinking** What calculation do you see in this number line?  (six jumps from 0 to 2) **Conceptual Thinking** There is a test and someone got $\frac{17}{28}$. Without using the standard algorithm, how would you use your knowledge of factors, multiples, equivalent fractions, place value and benchmark numbers to show someone else what percent the person got on the test?	**Procedural Thinking / Conceptual Thinking** In football, the player who kicks the ball is referred to as the punter. During a recent football game, the punter, Khan Kickit, kicked the ball five times. His longest kick was 44 yards and he averaged 35 yards per kick. Each of his kicks was a different positive integer length. Determine the minimum possible length of Khan's shortest kick. **Conceptual Thinking** Fraction Squares - Mix & Match Each diagram below is made by joining corners and midpoints of a square. For each diagram: • Work out the fraction of the square that is shaded • Explain how you worked it out. Try it on your own first, but check that each diagram is one of the fractions at the bottom of the page  **Conceptual Thinking** You have two fractions: a/b is more than c/d. What could the fraction be? Why did those fractions work? **Questions extensions:**	**Reasoning and Proving** Choose two fractions so that when you add them, the sum is $\frac{2}{3}$greater than the difference when you subtract them. What could the fractions be? Are these the only possibilities? How do you know whether these are the only possibilities? How do you know that your strategy will always work in an open-ended fraction operation question? **Reasoning and Proving/Conceptual Thinking** Select a fraction between ¼ or ¾ (do not use a ½) and a decimal. Which represents more? Reflect on your thinking to explain how you know are right.	**Reasoning and Proving** Is the following statement true or false? $\frac{1}{2} + \frac{1}{3} = 1$ How can you justify your thinking? **Reasoning and Proving/Conceptual** Which one doesn't belong? How can you justify your thinking? How does your evidence prove your reasoning?  **Reasoning and Proving/Procedural Thinking?** Solve each example. Use visuals and operations to show your thinking. 6 x 5 = _____ 6 x $\frac{1}{5}$= _____ Explain how these two examples are alike and how they are different.	**Conceptual Thinking / Communicative Thinking** Fraction Talks - Square Puzzle What fraction of the square is shaded? Justify your answer.  Extension questions • How could you shade twice this area ? • How many different ways can you find to shade exactly one-quarter of the shape? • If the entire square has an area of 12 square units, what is the area of the shaded section? • If the shaded section has an area of 6 square units, what is the area of the entire square? **Constraint Thinking/Communicative Thinking** $\frac{1}{2}$is greater $\frac{1}{3}$. Using the visuals below, show whether this statement is true or untrue. 

		number of Red squares #3 - more than 1/2 is Red exactly half the number of Red squares are Blue the remaining is Yellow Key Questions: How many squares did you use? How many squares of each colour did you use? If you use a total of 100 squares, how many ways can you meet all requirements?		What fractions did you try? What about some bigger fractions? What about fractions near 0? (Taken from Teaching Mathematical Thinking Pg 47) **Procedural Thinking** A pizza store makes two sizes of pizzas shaped as rectangles. The large pizza is twice as long and twice as wide as the small pizza. Fadia ate $\frac{3}{4}$of a small pizza and Lori ate $\frac{3}{16}$of a large pizza. Fadia says she ate more pizza because $\frac{3}{4}$is greater than $\frac{3}{16}$. Is she correct? Explain your reasoning. **Procedural Thinking** Nelson Math Focus 7 page 43 Question: *When you add two fractions, the sum is always less than 1? Explain your thinking* Nelson Math Focus 7 page 66 Question 8 TIPS4M Unit 7 Day 3 Adding Fractions w/different denominators BLM 7.3.2 **Procedural Thinking** Brainbashers - Puzzle Fractions Last weekend I was given my pocket money, which is meant to last me all week. On Monday, I spent a quarter of  my money on clothes. On Tuesday, I spent one third of my remaining money on a CD. On Wednesday I spent half of my remaining money on sweets. Finally, on Thursday I spent my last $1.25 on a comic. How much pocket money did I receive?			

				Hint: It might be easier to work backward **Conceptual Thinking / Procedural Thinking** TIPS4M Unit 7 Day 6 Nelson Math Focus 7 page 67 Fraction Tic-Tac-Toe Fraction adding/subtracting game TIPS4M Unit 7 Day Adding and Subtracting Fractions BLM 7.71 Fraction Flag		