Fractions across Strands and Grades: Sample Tasks

The following chart highlights a sample of mathematics tasks that involve fractions across the strands and grades.

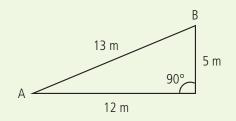|	Primary/Junior/Intermediate	Intermediate/Senior
Number Sense and Numeration	How many blocks did you use to build your structure? How many of those blocks have curved sides? Straight sides? (part-part construct) Pour the water from this container into these three equal-size containers so that there is the same amount of water in each container. Describe how you did it. 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? Determine two fractions that have a sum close to but not exactly 3. Determine two fractions that have a difference close to but not exactly $\frac{3}{5}$. How is sharing four cookies equally among five people different from sharing six cookies equally among seven people?	Store A is offering discounts of $\frac{1}{3}$ while Store B is offering "buy 3, get 1 free." Under which conditions would each store offer the better deal? (MEL 3E) Use appropriate technology to investigate the limiting value of the terms in the sequence $(1 + \frac{1}{1})^1, (1 + \frac{1}{2})^2, (1 + \frac{1}{3})^3, (1 + \frac{1}{4})^4, \ldots$ and the limiting value of the series $4 \times 1 - 4 \times \frac{1}{3} + 4 \times \frac{1}{5} - 4 \times \frac{1}{7} + 4 \times \frac{1}{9} - \ldots$ (MCV 4U) Determine the measurement of the angle by using a primary trigonometric ratio. (multiple courses)

Primary/Junior/Intermediate	Intermediate/Senior

Measurement

How does measuring length on a ruler in different units (i.e., mm, cm) compare with counting by different fractional units (e.g., halves, thirds, fifths) along a number line?

Molly used a small container to fill one larger container exactly full of water. She needed to fill the small container exactly full five times to do this. Describe the relationship of the capacity of the smaller container to the larger container in two different ways.

Arnold measured the dimensions of the classroom. The length is $5\frac{4}{10}$ m and the width is $4\frac{4}{10}$ m. What is the perimeter of the room, in metres?

How does reducing the radius of the base of a cylinder by $\frac{7}{10}$ change the volume of the cylinder?

A plumber must cut a piece of pipe to fit from A to B. Determine the length of the pipe.

(MAP 4C)

Express the following equation in standard form:

$y = \frac{2}{3}x + 8$

Expand and simplify $(\frac{1}{2}x + 1)(3x - 2)$. (MBF 3C)

Express the equation in vertex form.

$\frac{3}{2}x^2 - 14x + 9 = 0$

(MCF 3M)

Geometry and Spatial Sense

How can you use lines of symmetry to help you fold paper into eighths? What other fractions would be easy to create by using lines of symmetry?

Draw a figure on grid paper. Dilate your figure by a factor of $\frac{4}{10}$.

Determine if the expressions $\frac{2x^2 - 4x - 6}{x + 1}$ and $8x^2 - 2x(4x - 1) - 6$ are equivalent. (MCR 3U)

Simplify $\frac{a^3b^2c^3}{\sqrt{a^2b^4}}$ and then evaluate for $a = 4$, $b = 9$, and $c = -3$. Verify your answer by evaluating the expression without simplifying first. Which method for evaluating the expression do you prefer? Explain. (MCT 4C)

I know that the theoretical probability of getting tails is $\frac{1}{2}$. How does that compare with the experimental probability? (MEL 4E)

Patterning and Algebra

Identify the number patterns that you see when counting by a unit fraction on the number line.
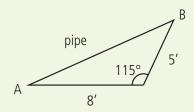
Create a model of $2\frac{4}{10}$. Use your model to identify pairs of fractions that combine to create $2\frac{4}{10}$. What patterns or connections do you see between the different pairs of fractions?

Solve for x: $\frac{3.5}{9} = \frac{x}{15}$

Evaluate $3x + 4y - 2z$, where $x = \frac{4}{10}$, $y = 0.6$, and $z = -1$.

Primary/Junior/Intermediate	Intermediate/Senior
Data Management and Probability Two number cubes each have the numbers 1, 2, 3, 4, 5 and 6 on their faces. How do the probabilities of rolling a sum of 4 and rolling a sum of 7 compare? Noah is playing a game and needs to select one of three spinners. One spinner is partitioned into fourths, one into fifths and one into sevenths. Each spinner has three green sections. He will win if he lands on a green section. Which spinner should he play with if he wants to win?	