**Main Problem #6**

Topic: *Multiply with Fractions*

Problem: Your long lost cousin, Conor McGregor, plans to give you and two relatives, Banshee and Sophie, land as part of his will, even though he is still 18 years old. According to his will,

* you will be given a piece of land measuring $2\frac{6}{7}$kilometers by $\frac{4}{5}$kilometers,
* Banshee will be given a piece of land measuring $\frac{9}{4}$kilometers by $\frac{5}{8}$kilometers,
* and Sophie will be given a piece of lang measuring$1\frac{7}{10}$kilometers by $1\frac{2}{5}$kilometers.

Q. Assume each land is shaped like a rectangle. For each person, calculate the area of their land and model each answer with an area model.

*Hint: Think about the distributive property when modeling the final area.*

A1. To calculate the areas, we need to multiply the sides (or length and width) of each land. To optimize the process, let's convert the mixed numbers into improper fractions.

* You: $2\frac{6}{7}⋅\frac{4}{5}=\frac{20}{7}⋅\frac{4}{5}=\frac{80}{35}=2\frac{10}{35}=2\frac{2}{7}$kilometers squared.
* Banshee: $\frac{9}{4}⋅\frac{5}{8}=\frac{45}{32}=1\frac{13}{32}$kilometers squared.
* Sophie: $1\frac{7}{10}⋅1\frac{2}{5}=\frac{17}{10}⋅\frac{7}{5}=\frac{119}{50}=2\frac{19}{50}$kilometers squared.

\*\*Teachers, please remember to review Area Models with Fractions.

The area can be calculated by counting the regions shaded twice and dividing that number by the product of the two denominators.

Blue represents the shaded regions of length. Green represents the shaded regions of the width. White is represents non-shaded regions. If a region is shaded twice (by blue and green), the result is Black.

The area model for you land: $\frac{80}{35}$

The area model of Banshee’s land: $\frac{45}{32}$

The area model of Sophie’s land: $\frac{119}{50}$

For this model, we can to use to Distribute Property to model this scenario. Drawing the area model of $1\frac{7}{10}⋅1\frac{2}{5}$is tricky and can be complicated. The easiest way to do it would be to split one of the two fractions into a whole number and a proper fraction, and form an expression that requires the distributive property. Students can choose whichever fraction to split.

The following model follows the expression: $1\frac{7}{10}⋅(1+\frac{2}{5})$. We can sum the regions covered.