Direction for Modeling a Mixed Number by a Mixed Number

Hint: A few of the numbers that make squares (square numbers) are 4, 9, 16, 25, and 36.

a. Begin by deciding how many squares your whole will be. In the first question the fraction is $1\frac{1}{2} \times 2\frac{1}{4}$, so your square can be any of the square numbers that both denominators will go into. I would use 16, since you really can't cut a 2 x 2 square into four parts easily.

b. Round both mixed numbers up to next whole number. 2 x 3

c. Going vertical, draw two 4 x 4 squares.

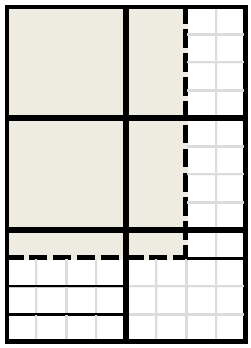
d. Going horizontally, draw two 4 x 4 squares. (You should have a total of 3 squares going down for the first problem. Remember they already have drawn one.)

e. Continue making 4 x 4 boxes until you have completed your array. (You should have 2 wholes by 3 wholes)

f. Looking at the vertical side of your array it is time to take the last whole and break it up to show the mixed number. Divide the last row up into fractional parts. For problem one, you will divide the 4 x 4 boxes up into two equal parts. (I would recommend that they do this in a different color or with a dotted line so they do not confuse the whole box with the boxes divided up into fractions.)

g. Looking at the horizontal side of your array it is time to take the last whole and break it up to show the mixed number. Divide the last row up into fractional parts. For problem one, you will divide the 4x4 boxes up into four equal parts. (I would recommend that they do this in a different color or with a dotted line so they do not confuse the whole box with the boxes divided up into fractions.)emi th

h. Shade in $1\frac{1}{2} \times 2\frac{1}{4}$. When you are finished your array should like this….



i. Finally add up the parts.

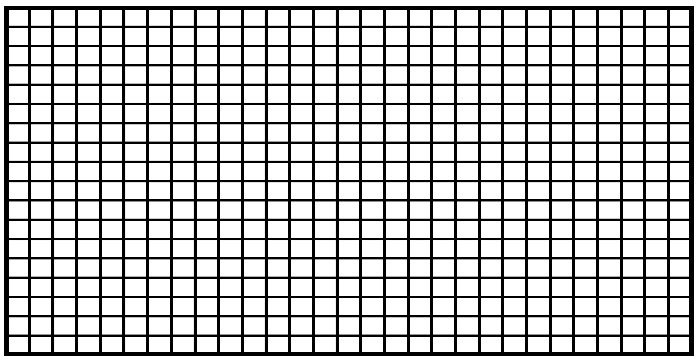
$1 + 1 + \frac{1}{4} + \frac{1}{2} + \frac{1}{2} + 2/16 = 3\ 6/16$

You may want to have the children draw on the model and write all the wholes they see. Talk about how $\frac{1}{2} + \frac{1}{2}$ equals 1 so they can count that as a whole. Then discuss how many 16ths are in $\frac{1}{4}$. They could write that in the model to show that there are 6/16 total.

Modeling a Mixed Number times a Mixed Number using Arrays (24.NF.6)

Name: _____

1. **A cake calls for 2 $\frac{1}{4}$ cups of sugar. If I'm making 2 $\frac{1}{2}$ cakes, how much flour do I need?**

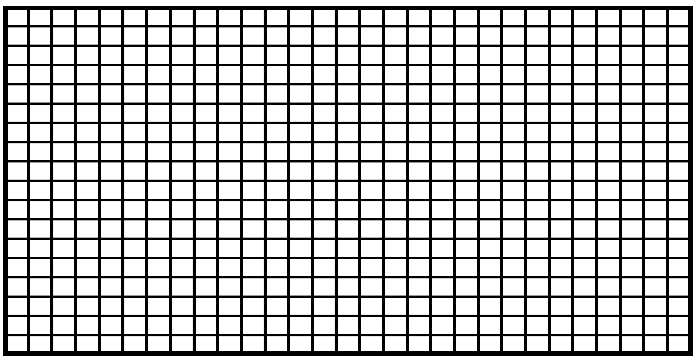


Algorithm:

Equation: _____

Equation number 2: _____

2. **Grace bought fabric that was 1 1/4 by 1 5/6 yards. How many yards of fabric did she buy?**

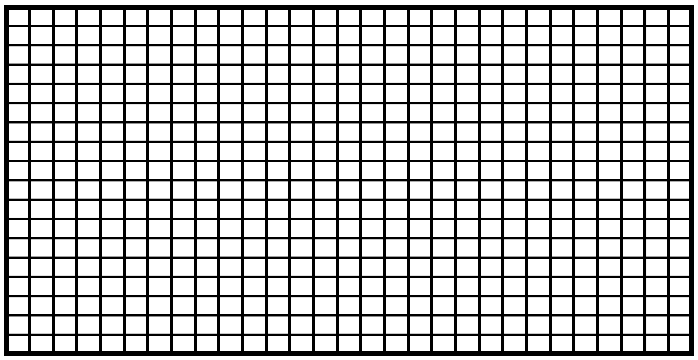


Algorithm:

Equation: _____

Equation number 2: _____

3. **A gardener has 3 1/3 flower beds planted. If 5/6 of the flower beds are red roses, how much of the flower beds are planted with red roses?**

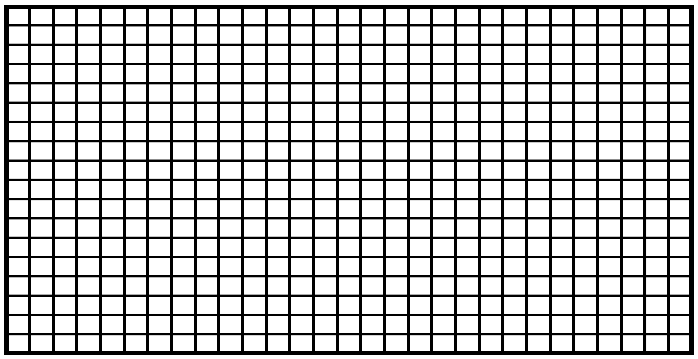


Algorithm:

Equation: _____

Equation number 2: _____

4. **A backyard is 2 ½ yards long. If it is ½ yards wide as it is long, what is the area of that backyard? (Before you draw the model you have to figure out the width of the backyard.)**



Algorithm:

Equation: Equation_____

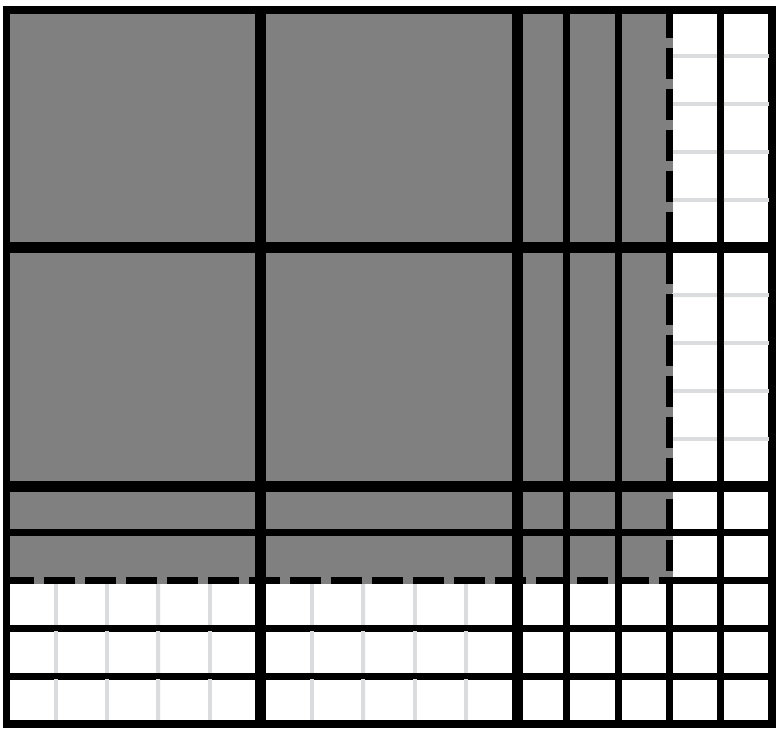
Equation number 2: _____

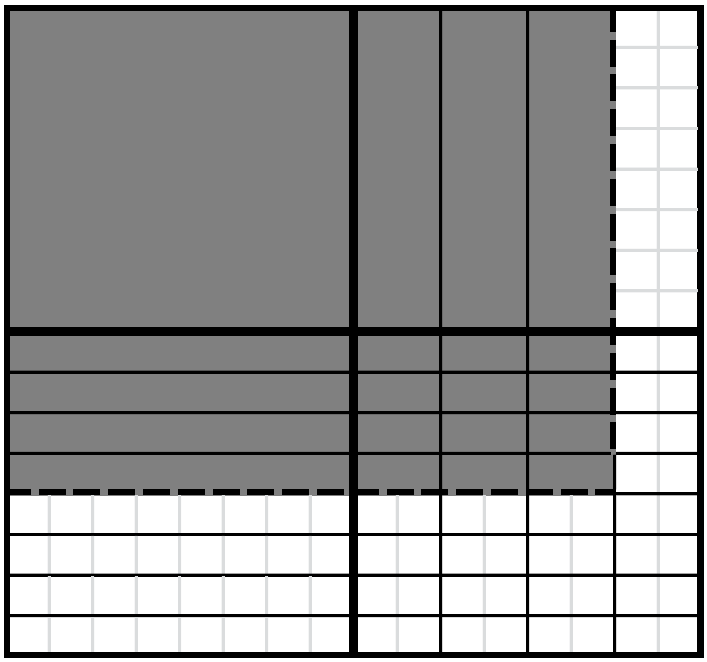
Multiplication using arrays

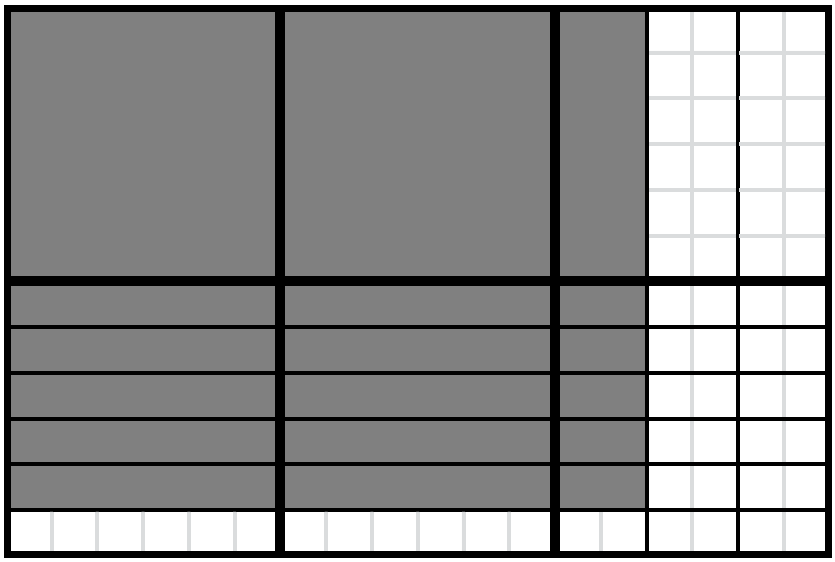
Name: _____

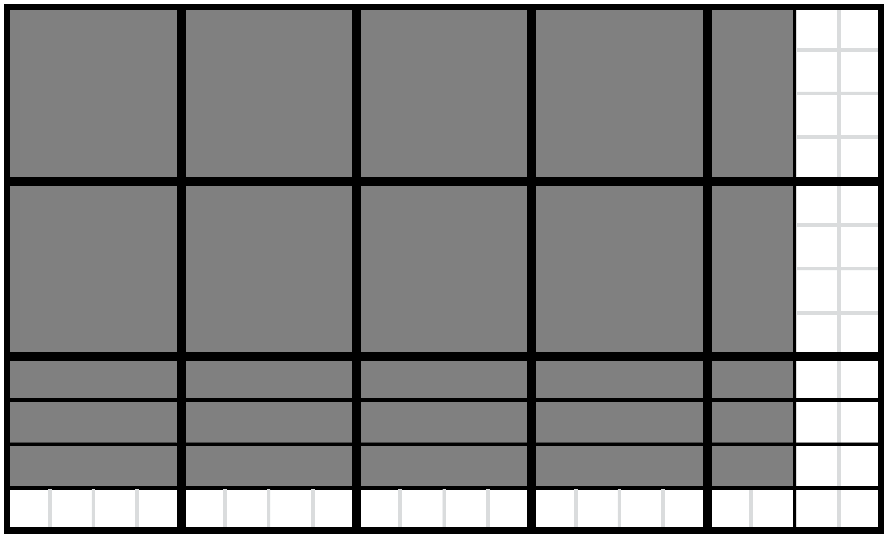
Cut out each array and place them on a poster. Next to your array include these five things.

1. Write down at least five things you notice about each array.
2. Include the equation the array represents.
3. Explain how you solved the equation using the array.
4. Prove your answer with the algorithm.
5. Create a word problem for your equation.









Answers for word problems:

1. 5 5/8 cups of sugar
2. 2 7/24 yards
3. 2 14/18 or 2 7/9 of the flower beds are red roses
4. $2\frac{1}{2} \times 1\frac{1}{4} = 3\ 1/8$

Answers for arrays:

1. 2 3/5 x 2 2/5 = 6 6/25
2. $1\frac{3}{4} \times 1\ 4/8 = 1\ 28/32 = 1\ 7/8$
3. 2 1/3 x 1 5/6 = 4 5/18
4. $4\frac{1}{2} \times 2\frac{3}{4} = 12\ 3/8$