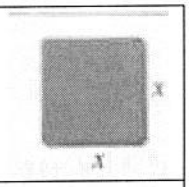
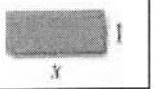
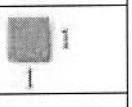
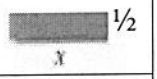
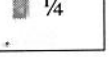
Exploration Sec. 3.4
Using Algebra Tiles

For this investigation, you will need the Algebra Tiles and the grid mat. The two colors do not have any significance in meaning and will probably need to be mixed to complete this exercise.

#1. Given: 1 individual X^2 and 2 individual $X's$, put them together to form a larger square using the least number of tiles. The only additional tiles that may be used to complete the larger square are the small squares with a value of "1" or fractions of the value of "1".

LEAVE THE TILES INTACT IN THE FORM OF THE LARGER SQUARE. WHEN MOVING ON TO PROBLEM #2, USE DIFFERENT TILES TO COMPLETE IT.

BELOW: Sketch A Copy Of The Arrangement Of The Tiles On The Grid.

Model x^2 with a square tile that is x units long on each side	x^2 -tile	
Model x with a rectangular tile that is x units long and 1 unit wide	x-tile	
Model a constant with a square tile that is 1 unit long on each side	Unit (1) tile	
Model ½ -x with a rectangular tile that is x units long and ½ unit wide.	½x- tile	
Model ¼ with a fourth of the constant square tile this 1x1.	¼ -tile	

A-NAG

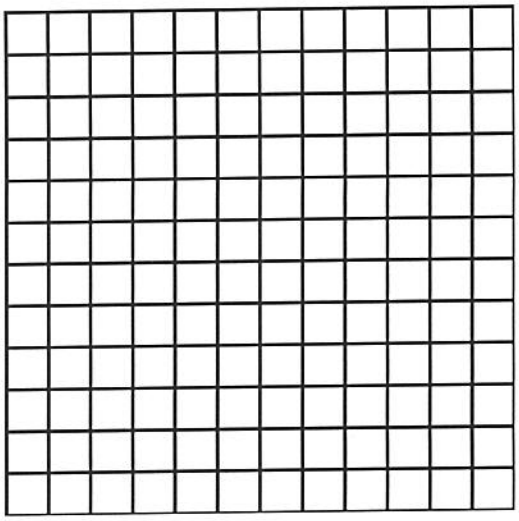
Below, write the Algebra expression for the larger square that you completed with the tiles.

Factor the above expression

Rewrite as a Binomial Squared

$(\quad)^2$

G-NAG



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Using Algebra Tiles

#2. Leave problem #1intact and use new tiles to compose the following. **Given:** 1 individual X^2 and 6 individual X's put them together to form a larger square using the least number of tiles. The only additional tiles that may be used to complete the larger square are the small squares with a value of "1" or fractions of the value of "1".

LEAVE THE TILES INTACT IN THE FORM OF THE LARGER SQUARE. WHEN MOVING ON TO PROBLEM #3, USE DIFFERENT TILES TO COMPLETE IT.

BELOW: Sketch A Copy Of The Arrangement Of The Tiles On The Grid.

A-NAG

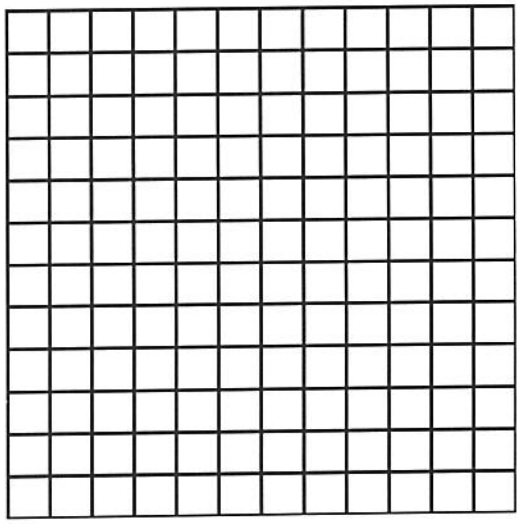
Below, write the Algebra expression for the larger square that you completed with the tiles.

Factor the above expression

Rewrite as a Binomial Squared

$(\quad)^2$

G-NAG



#3. Leave problem #2 intact and use new tiles to compose the following. **Given:** 1 individual X^2 and 10 individual X's ,put them together to form a larger square using the least number of tiles. The only additional tiles that may be used to complete the larger square are the small squares with a value of "1" or fractions of the value of "1".

LEAVE THE TILES INTACT IN THE FORM OF THE LARGER SQUARE. WHEN MOVING ON TO PROBLEM #4, USE DIFFERENT TILES TO COMPLETE IT.

ON NEXT PAGE: Sketch A Copy Of The Arrangement Of The Tiles On The Grid.

Exploration Sec. 3.4
Using Algebra Tiles

A-NAG

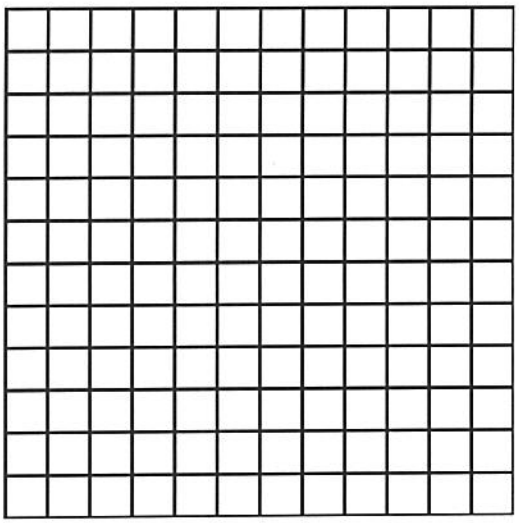
Below, write the Algebra expression for the larger square that you completed with the tiles.

Factor the above expression

Rewrite as a Binomial Squared

$(\quad)^2$

G-NAG



#4. Leave problem #3 intact and use new tiles to compose the following. **Given:** 1 individual X^2 and 5 individual X's, put them together to form a larger square using the least number of tiles. The only additional tiles that may be used to complete the larger square are the small squares with a value of "1" or fractions of the value of "1". (**HINT**: You may have to trade in a piece for other pieces. You must have the equivalent to 1 X^2 and 3 individual X's .)

LEAVE THE TILES INTACT IN THE FORM OF THE LARGER SQUARE. WHEN MOVING ON TO PROBLEM #5, USE DIFFERENT TILES TO COMPLETE IT.

BELOW: Sketch A Copy Of The Arrangement Of The Tiles On The Grid.

A-NAG

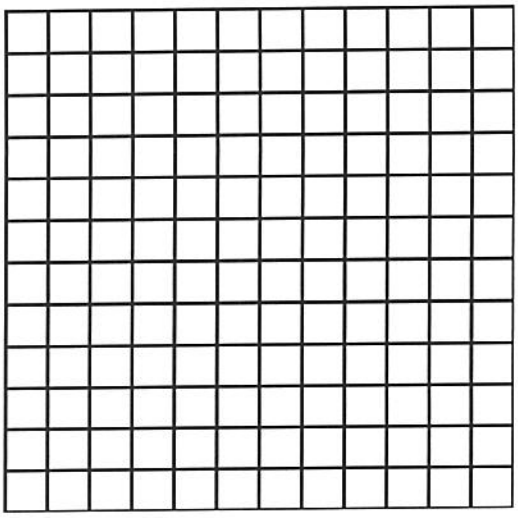
Below, write the Algebra expression for the larger square that you completed with the tiles.

Factor the above expression

Rewrite as a Binomial Squared

$(\quad)^2$

G-NAG



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Using Algebra Tiles

#5. Leave problem #4 intact and use new tiles to compose the following. **Given:** 1 individual X^2 and 5 individual $X's$, put them together to form a larger square using the least number of tiles. The only additional tiles that may be used to complete the larger square are the small squares with a value of "1" or fractions of the value of "1". (**HINT**: You may have to trade in a piece for other pieces. You must have the equivalent to 1 X^2 and 5 individual $X's$.)

LEAVE THE TILES INTACT IN THE FORM OF THE LARGER SQUARE. WHEN MOVING ON TO PROBLEM #6, USE DIFFERENT TILES TO COMPLETE IT.

BELOW: Sketch A Copy Of The Arrangement Of The Tiles On The Grid.

A-NAG

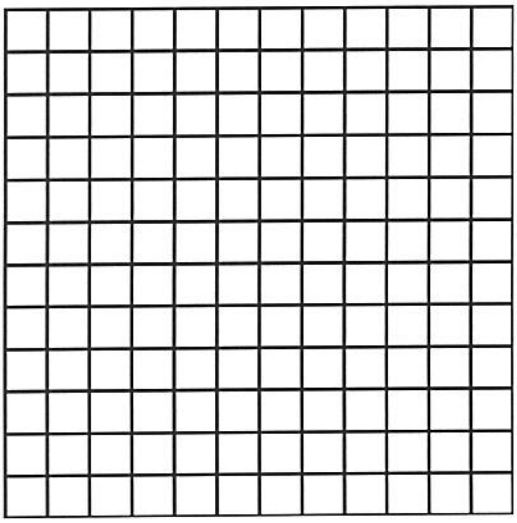
Below, write the Algebra expression for the larger square that you completed with the tiles.

Factor the above expression

Rewrite as a Binomial Squared

$(\quad)^2$

G-NAG



#6. In looking at your data (i.e. the five squares that you completed), find a pattern for the number of "1" tiles that must be added to the given expression to complete the square.

Write a conjecture of the pattern which you discovered for how many "1" tiles that must be added to complete the square for the given expressions

Try This

Using the conjecture you made in #6, complete the square of the following expressions without the use of the tiles.

$x^2 + 8x$ $\qquad$ $x^2 + 9x$