

Name: _____

Introduction to Algebra Tiles

Algebra tiles will help you visually see the concepts and principles used in Algebra.

Each small square tile represents the value of 1. The red (grey) side of the tile represents the value of -1

1. Use the small square tiles to represent each number below. Make a sketch of your model.

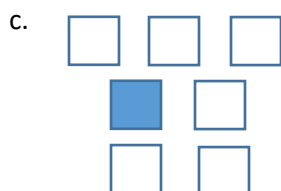
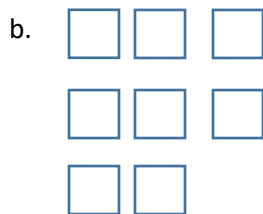
a. 7

c. 4 degrees below zero

b. -5

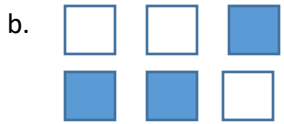
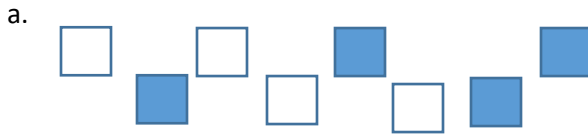
d. 8 feet above sea level

2. What number does each model represent?



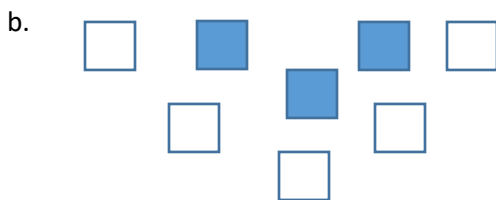
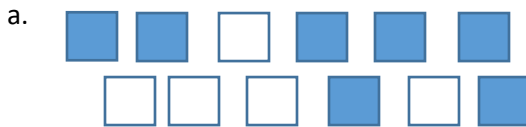
One of the basic rules in algebra is “You can only add zero” to an equation or an expression. Look at this visually with algebra tiles.

3. Write an expression for each diagram.



In the previous two problems you saw and represented zero pairs. Using zero pairs you can model many different values.

4. Remove (cross out) the zero pairs and determine the value of each integer modeled.

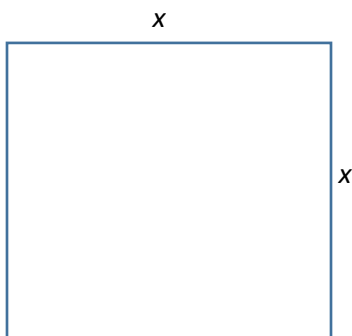


5. Using zero pairs (you must use both color tiles) model these integers.

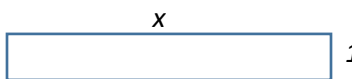
a. 3

b. -7

We will use the value of x to represent the length of the larger tiles. Then we can name each of the Algebra tiles using the area of each as follows:



This is the x^2 tile because the area of the tile is $x \cdot x = x^2$



This is the x tile because the area of the tile is $1 \cdot x = x$



This is the unit tile because the area of the tile is $1 \cdot 1 = 1$

We can use these tiles together to represent quadratic algebra expressions.

6. Use Algebra Tiles to represent the following polynomials

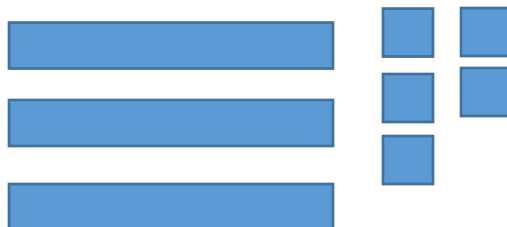
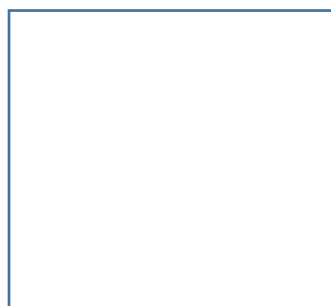
a. $x^2 + 3x + 4$

b. $3x^2 + 7x$

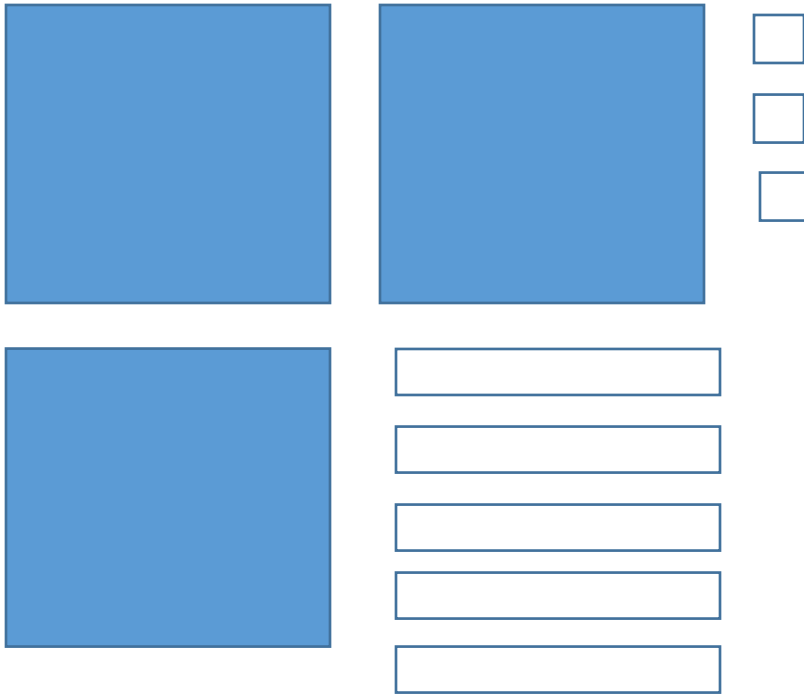
If you use the red side of the tile you can model negative values.

7. Write the polynomial represented by the following models.

a.



b.



Above we named the large length x and the small length 1 . We can name the length other names if we are representing different polynomials.

8. State what you would name the tiles and then represent the following polynomials:

a. $3c^2 + 4cd - 2d^2$

Large Square _____

Rectangle _____

Small Square _____

Adding with Algebra Tiles

- Use Algebra Tiles to model the following sums (Sketch your answer):
 - $5 + (-5) =$
 - $4 + 0 =$
 - $-3 + 3 =$
 - $0 + (-7) =$
- If the sum of two integers is zero, then the two numbers are _____
- Use Algebra Tiles to model the following sums (Sketch your answer):
 - $7 + 4 =$
 - $(-3) + (-5) =$
 - $5 + 8 =$
 - $(2x^2 + 4x) + (5x^2 + 3x) =$
- Use Algebra Tiles to model the following sums (Sketch your answer):
 - $5 + (-3) =$
 - $-7 + 9 =$
 - $8 + (-4) =$
 - $(4x^2 - 7x + 2) + (-5x^2 + 4x + 5) + (3x^2 - 4)$

Subtracting with Algebra Tiles

Use Algebra Tiles to model the following subtraction problems. Sketch your answer. Remember, you may need to add zero pairs to determine your answers.

1. $7 - 4$

2. $-4 - (-5)$

3. $5 - 7$

4. $-6 - 4$

5. $7 - (-3)$

6. $4 - 6$

Now, let's look at the similarity between addition and subtraction. As you are doing these problems do each row together. Use Algebra Tiles to model each problem, and sketch your answer. Again, you may need to add zero pairs to model the problem.

1. $-4 - (-3)$

2. $-4 + 3$

Multiplying with Algebra Tiles

Use Algebra Tiles to model the following multiplication problems. Be sure to sketch your answers.

1. 6×3

2. 4×2

3. -5×3

Use Algebra Tiles to model the following multiplication problems. Make sure to draw the resulting rectangle and **state the dimensions and resulting algebraic expression**.

1. $3(x + 5)$

2. $4(x - 2)$

Use Algebra Tiles to model the following multiplication problems. Make sure to draw the resulting rectangle and **state the dimensions and resulting algebraic expression**.

1. $x(x + 4)$

2. $x(2x + 3)$

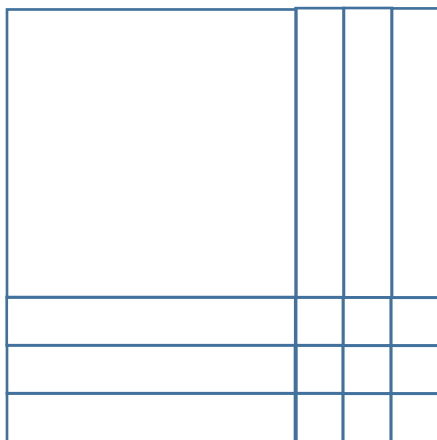
3. $3x(x + 4)$

4. $(2x + 1)(x + 4)$

Factoring with Algebra Tiles

1. What two ways can the following be written as?

a.

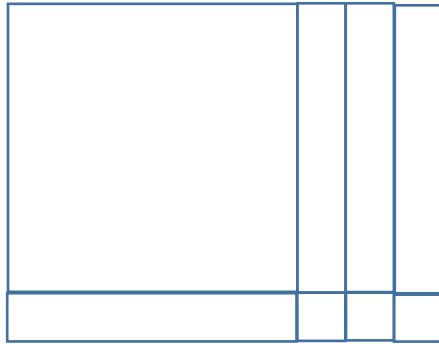


Use Algebra Tiles to represent the following perfect squares. Write another expression that represents each. Sketch your answers.

a. $(x + 2)^2$

We can do the same thing with rectangles. What two ways can the following be written as?

b.



Select Algebra Tiles for each term in the following trinomials. Create a square or a rectangle with the tiles. Sketch your answers. Determine the dimensions of each and write down the factors.

b. $x^2 + 6x + 9$

c. $4x^2 + 12x + 9$

d. $x^2 - 6x + 9$

e. $x^2 + 3x + 2$

f. $x^2 - 1$