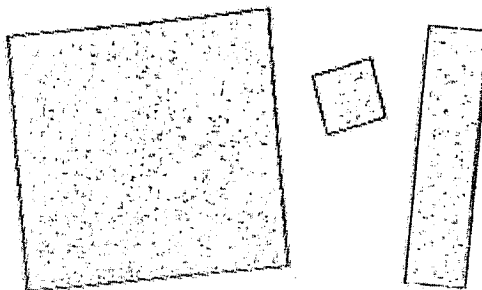
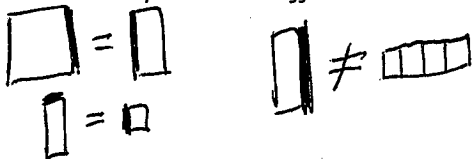


Algebra Tiles

1. What can you conclude about each of the tiles?

- Which shapes have the same side lengths?
- Which shapes have different side lengths?



2. The smallest tile has a side length of 1 unit.

- Can you use the unit tile to find the exact side lengths of the other shapes? Why or why not?

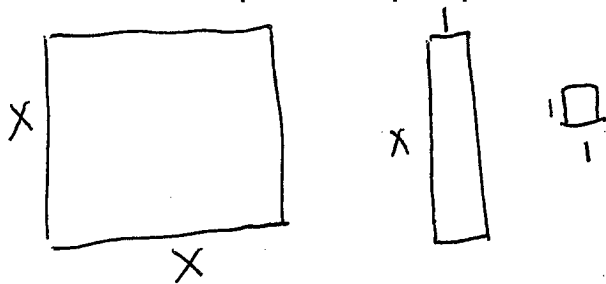
No you cannot because the tiles do not line up exactly.

The  shape actually equals x.

These are imperfect manipulatives because variables vary.

However, we can still use them to learn more about combining like terms, reading and writing expressions and equivalent expressions.

3. Trace all three shapes in the space provided below. Label the each of the side lengths.



4. Write an expression that shows the area of each shape.

$$x \cdot x = x^2$$

$$x \cdot 1 = x$$

$$1 \cdot 1 = 1$$

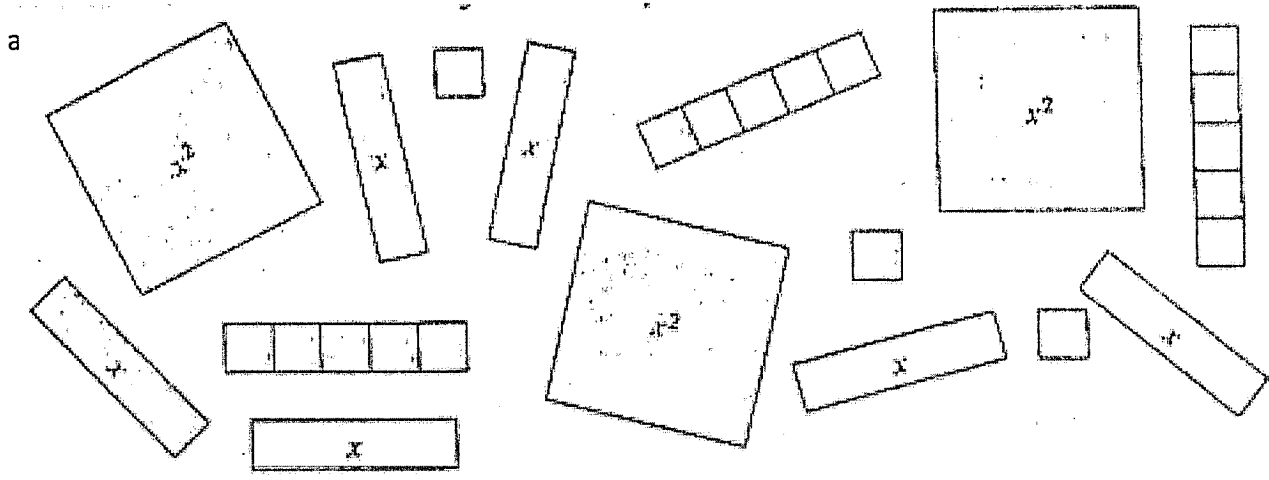
5. Write an expression that shows the perimeter of each shape.

$$x + x + x + x = 4x$$

$$x + x + 1 + 1 = 2x + 2$$

$$1 + 1 + 1 + 1 = 4$$

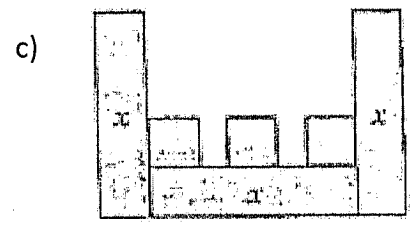
6. Use mathematical symbols (numbers, variables and operations) to record the **area** of each collection of tiles.



$$3x^2 + 6x + 18$$

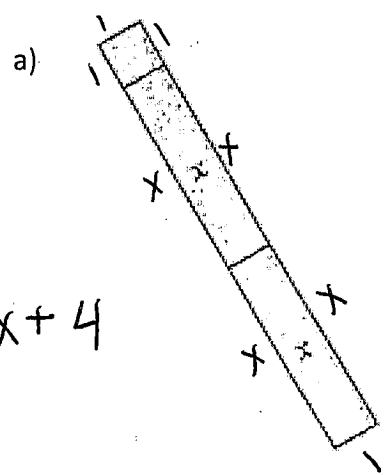


$$x^2 + x + 2$$

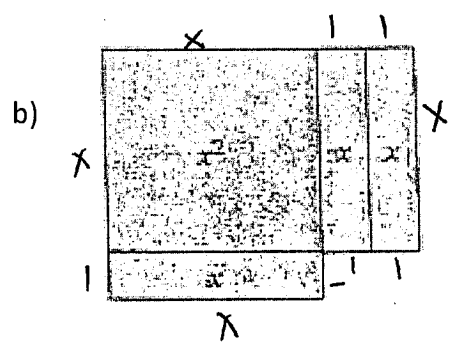


$$3x + 3$$

7. Use mathematical symbols (numbers, variables and operations) to record the **perimeter** of each collection of tiles.

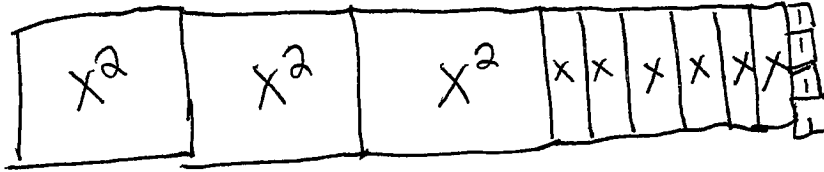


$$4x + 4$$

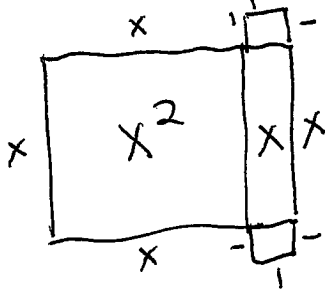


$$4x + 6$$

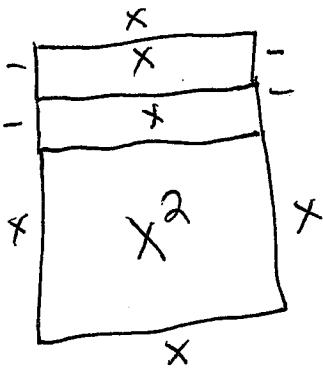
8. Create a shape with an area of $3x^2 + 6x + 4$. Draw it in the space below.



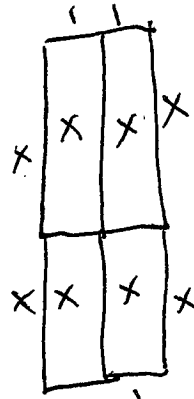
9. Create a shape with a perimeter of $4x + 6$. Draw it in the space below.



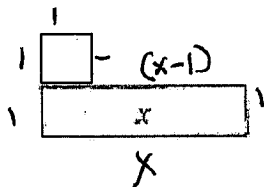
10. Create two figures with the same perimeter using different sets of tiles. Draw both of your figures below and show your work.



$$4x + 4$$



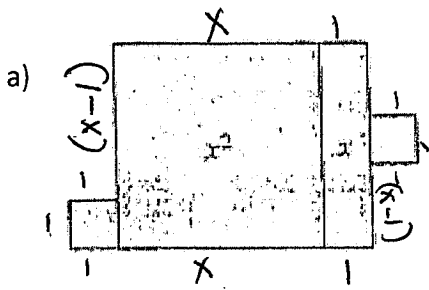
11. How could we write an expression for the perimeter of this shape? Justify your answer.



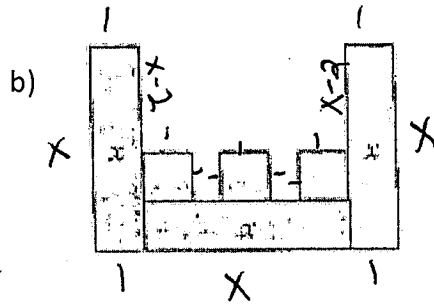
$$x + (x - 1) + 5$$

Because one of the "one tiles" covers part of the x length, we know that that side is $x - 1$.

12. Find the perimeter of the collection of tiles below.



$$2x + 2(x-1) + 8$$



$$3x + 2(x-2) + 11$$

13. Use algebra tiles to help you figure out which of the following expressions are equivalent? Why? If an expression has no match, write two equivalent expressions to match it.

a) $2(x+4)$ $a = b$

b) $8 + 2x$

c) $2x + 4$ \leftarrow not equivalent $(x+x+4)$ $(2x+2+2)$

d) $3(x+3) - (4+x)$ $= 2x + 5 \leftarrow$ not equivalent $((3x+9) - 4x)(2x+5)$

e) $x+4$ \leftarrow Not equivalent $(x+1+1+1+1)$
 $(x+2+2)$