What’s Your Number?

3.1

Whole-Class Discussion:

Here’s a number trick. You might want a calculator for this:

|  |  |  |
| --- | --- | --- |
| 1).  | **Instructions** | **Current value** |
|  | a). Pick a number between 1 and 9. | a). \_\_\_\_\_\_\_ |
|  | b). Multiply it by 2. | b). \_\_\_\_\_\_\_ |
|  | c). Add 5 to this answer. | c). \_\_\_\_\_\_\_  |
|  | d). Multiply this answer by 50. | d). \_\_\_\_\_\_\_ |
|  | e). If you have already had your birthday in 2012, add 1762.  If you have not had your birthday yet in 2012, add 1761. | e). \_\_\_\_\_\_\_  |
|  | f). Now subtract the four digit year in which you were born.  | f). \_\_\_\_\_\_\_ |
|  | You should have a 3-digit number. The **first digit is \_\_\_\_\_\_** **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The last two digits are \_\_\_\_\_\_\_\_\_** **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!** |  |

We’re going to learn how to design these tricks. **The part we’ll be focusing on is how to make them give back the original number.** It might seem like just a game, but it teaches important skills for solving equations. Try this trick:

|  |  |  |  |
| --- | --- | --- | --- |
| 2). | **Instructions** | **Current value** | **Algebra Tiles** |
|  | a). Pick ANY number | a). \_\_\_\_\_\_ |  |
|  | b). Now add 3. | b). \_\_\_\_\_\_ | We proved that\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | c). Multiply that answer by 2 | c). \_\_\_\_\_\_ |  |
|  | d). Subtract 6 from that answer. | d). \_\_\_\_\_\_ |  |
|  | e). Divide that answer by 2. | e). \_\_\_\_\_\_ |  |
|  |  |  | **Final picture:** |

Individual or Pairs Practice

3). **Please fill in the instructions for each step in this sample number trick.**

Instructions

Algebra Tiles

a).

Pick any number.

b).

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c).

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d).

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e).

Subtract \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

f).

­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Final result.

Does this trick give you back your original number? Please explain your reasoning: \_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

g).

Whole-Class Discussion: How are these tricks examples of doing something and then undoing it?

Our Goal Today

Our goal today is to learn how to write number tricks so the x is by itself at the end of the trick. This skill will help us solve equations, which is the focus of the chapter.

Individual practice:

4). To master our goal, let’s first practice using algebra tiles. The teacher will show some expressions on the powerpoint slides. Try to represent each one using algebra tiles.

a).

b).

c).

d).

e).

f).

g).

h).

i).

j).

k).

Notes on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Property

The Trick Behind Number Tricks

Number tricks have 2 phases:

* First…
* Second…

How could you un-do the number trick that has been built up below?

Instructions

Algebra Tiles

c).

Add 5.

Algebraic Expression

$$3x+5$$

5).

(Please continue in the space below)

b).

Multiply by 3

$$3x$$

a).

Pick a number.

$$x$$

Write a number trick that builds up to the given expression and then gets undone. Use as many rows of the table as you need so that your trick ends with x. Draw a dark line separating the build-up and the undo phases of the trick.

|  |  |  |
| --- | --- | --- |
| 6). Expression: 4(*x* – 3) |  | 7). Another way to do 4(*x* – 3) |
| Description  | Algebraic expression |  | Description  | Algebraic expression |
| Pick a number | *x* |  |  |  |
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Write a number trick that builds up to the given expression and then gets undone . Use as many rows of the table as you need so that your trick ends with x. Draw a dark line separating the build-up and the undo phases of the trick.

|  |  |  |
| --- | --- | --- |
| 8). Expression: $\frac{x}{3}-2$ |  | 9). Expression: 1 + 8x |
| Description  | Algebraic expression |  | Description  | Algebraic expression |
| Pick a number | *X* |  |  |  |
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Write a number trick that builds up to the given expression and then gets undone . Use as many rows of the table as you need so that your trick ends with x. Draw a dark line separating the build-up and the undo phases of the trick.

|  |  |  |
| --- | --- | --- |
| 10). Expression: $\frac{x-7}{5}$ |  | 11). Expression: $2+\frac{x}{6}+8$ |
| Description  | Algebraic expression |  | Description  | Algebraic expression |
|  |  |  |  |  |
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Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Distributive Property Practice

Draw an Algebra Tiles model for each question below:

1).3(x + 4) 2). 3x + 4

Simplify each expression without using pictures. Watch out for negative signs!

**Example**

3). **5**(x – 3)

**(5)**(x) – **(5)**(3)

 5x – 15

4). 6(x + 5)

5). 4(2x – 10)

**Example**

6). **-3**(2x – 10)

**(-3)**(2x) – **(-3)**(10)

 -6x – (-30)

 -6x + 30

7). -5(-7x + 2)

8). -2(3x – 4)

9). -7(-8x + 4)

10). -8(-7a – b)

11).

Which sequence of steps in a number trick would give the algebra tiles shown above?

 a). Pick a number. Add 6. Multiply by 2.

 b). Pick a number. Multiply by 2. Add 6.

Write Your Trick

Please make up one number trick of your own. Make it as complicated as you can. To build up your expression, you must use each operation (addition/subtraction/multiplication/division) at least once, and you must use parentheses.

Instructions

Algebra Tiles

Algebraic Expression

You may continue on the next page

Instructions

Algebra Tiles

Algebraic Expression

(optional)

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