**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per.\_\_\_\_\_\_\_**

**U1 CW #5** Translating and Writing Expressions

Today we are going to review how to translate numbers and words into algebraic expressions. This skill will come in handy when working with word problems or real life situations.

You are used to translating numbers and words into numerical expressions. Think about this...

**

Pay close attention to the "key words" that represent the different mathematical operations. We are used to seeing the words, plus, sum, difference, minus, product...

Some more examples are:



The good news is that these very same words that we use to write numerical expressions are going to be used to write algebra expressions; the only difference is we will be using variables. Instead of "8 plus 9" (with two given numbers), you would see, "a number plus 9".

We don't know exactly "what number", so we would use a variable (usually x) to indicate that it can be any number.

**Directions**: Write an algebraic expression from each verbal phrase. Let x be “a number”.

|  |  |  |
| --- | --- | --- |
| 1. A number increased by five
 | 1. A number plus six
 | 1. Three more than twice a number
 |
| 1. Seven less than a number
 | 1. The difference between eight and four
 | 1. Nine more than half a number
 |
| 1. The product of four and a number
 | 1. Six divided by a number
 | 1. Twelve times a number minus 3
 |
| 1. A number divided by fourteen then increased by two
 | 1. The sum of twelve and a number divided by three
 | 1. A number decreased by eleven, doubled, then added to one hundred
 |

**Directions**: Write an algebraic expression from each real-life situation.

1. Arturo has eight fewer Funko Pops in his collection than Julie as in hers. Let p represent the number of Pops in Julie’s collection. Write an expression to represent the number of Pops in Arturo’s collection.
2. Let c represent the number of cookies on a plate. Three friends share all of the cookies on the plate equally. Write an expression that represents the number of cookies each friend eats.
3. The length of a rectangle is twice it’s width. Write an expression to show the value of the perimeter of the rectangle. (Hint: draw a picture)

Let’s try one with more details:

1. Tony and his friends went to a fast food restaurant for lunch. They ordered and ate 3 cheeseburgers, 2 chicken sandwiches, and 4 large fries. A chicken sandwich has 200 fewer calories than a cheeseburger. A large fry has 50 fewer calories than a cheeseburger.
	1. Part of the expression that represents the total number of calories consumed by Tony and his friends is shown below. Fill in the remaining pieces of the expression on the lines provided and simplify the expression.

calories in a cheeseburger

# of chicken sandwiches

calories in a large fry

 $\\_\\_\\_\\_\\_\\_(c)+2(\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_)+\\_\\_\\_\\_\\_\\_\\_(c-50)$

* 1. Write the expression above in its most simplified form.
	2. If a cheeseburger has 550 calories, how many calories did the friends consume?
1. A group of friends goes to a movie at the MegaPlex. Each friend purchases a movie ticket that costs $9.25, a small popcorn that costs $3.50, and a medium drink that costs $2.25.
	1. Circle the expression(s) below that represent the **total amount of money spent** by the group if *f* represents the number of friends that went to the movie.

 *There may be more than one answer*.

$ 9.25+3.50+2.25$ $ f(9.25+3.50+2.25)$ $f+15.00$

 $ f+9.25+3.50+2.25$ $ 9.25f+3.5f+2.25f$ $15.00f$

* 1. How much money will **each person** spend? How do you know?
	2. If 5 friends go to the movie, how much money will the **entire group** spend? Show your thinking.
1. Emma is playing a popular video game and is determined to beat the high score. The game saves her place so that each time she plays it again she picks up in the same place with the same number of points. Emma downloads the video game on Monday night and starts playing, scoring a bunch of points. On Tuesday, she scores an additional 500 points. On Wednesday she doubles her score from the previous day. On Thursday, she scores the same number of points that she scored on Monday.
2. Write an expression for the number of points that Emma scores each day:
* Monday: \_\_\_\_\_\_\_\_\_\_\_\_\_
* Tuesday: \_\_\_\_\_\_\_\_\_\_\_\_\_
* Wednesday: \_\_\_\_\_\_\_\_\_\_\_
* Thursday: \_\_\_\_\_\_\_\_\_\_\_\_
1. Miguel’s teacher asks him to write an expression that represents Emma’s total score after she is done playing on Thursday. Miguel writes the following expression:

$$2(p+500)+p$$

 Miguel’s teacher lets him know that his expression is correct.

Nevaeh writes the following expression to represent Emma’s score on Thursday:

$$2p+1000+p$$

The teacher lets her know that she is also correct. How did Nevaeh represent the problem differently than Miguel?

1. Can you think of another expression to represent Emma’s score on Thursday?
2. If Emma scored 700 points on Monday, evaluate each of the three expressions above to determine how many points Emma has on Thursday. Show your work!

THINK, PAIR, SHARE: What do you notice about the answers to each of the three different expressions? Why do you think you got those results? Would it matter which method you choose to write the expressions and evaluate the answer?

1. Aria and her friends are playing a game. The expressions below represent the amount of money each player has at the end of the game where *m* is the amount of money a player started with.
	1. Match each player to the correct expression.

|  |
| --- |
| **Expressions** |
| 1. $2(3m-100)$

**Player:**  | 1. $\frac{m}{2}+100-25$

**Player:** | 1. $2m-100-25$

**Player:** |
| 1. $\frac{(m+100)}{2}-25$

**Player:** | 1. $2\left(m-100\right)-25$

**Player:** | 1. $2(\frac{m}{3}-100)$

**Player:** |

b. If each player started the game with $1,000, who won the game?

|  |
| --- |
| **Player Scenarios** |
| Peta collects the following cards:* You are doing a great job at work and just received a bonus. Double the amount of money you currently have.
* It’s time to pay property taxes. Pay the bank $100.
* It’s the first day of school. Pay the store $25 for school supplies.
 | Miya collects the following cards:* Congratulations! Your art submission won first place. Collect $100.
* Your house was damaged in a flood. Pay half of your remaining money for repairs.
* You got a parking ticket. Pay $25.
 |
| Aria collects the following cards:* It’s time to pay property taxes. Pay the bank $100.
* You are doing a great job at work and just received a bonus. Double the amount of money you currently have.
* It’s the first day of school. Pay the school $25 for supplies.
 | Hadley collects the following cards:* You won the lottery! Triple the amount of money your currently have.
* It’s time to pay property taxes. Pay the bank $100.
* You are doing a great job at work and just received a bonus. Double the amount of money you currently have.
 |
| Lea collects the following cards:* Your house was damaged in a flood. Pay half of your remaining money for repairs.
* Congratulations! Your art submission won first place. Collect $100.
* You got a parking ticket. Pay $25.
 | Sierra collects the following cards:* Your two sisters want to join the game. Divide the money you currently have between the three of you.
* It’s time to pay property taxes. Pay the bank $100.
* You are doing a great job at work and just received a bonus. Double the amount of money you currently have.
 |