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Lesson 9: Writing Addition and Subtraction Expressions

Student Outcomes

* Students write expressions that record addition and subtraction operations with numbers.

Lesson Notes

Individual white boards are recommended for this lesson.

Classwork

Example 1 (3 minutes)

MP.2

Example 1

Create a bar diagram to show plus .

How would this look if you were asked to show plus ?

There would be tiles and then tiles.

Are these two expressions equivalent?

Yes. Both and have a sum of .

Example 2 (3 minutes)

 **Example 2**

**How can we show a number increased by ?**

 **or**

**Can you prove this using a model? If so, draw the model.**

**Yes. I can use a bar diagram.**

Example 3 (3 minutes)

MP.2

 **Example 3**

**Write an expression to show the sum of and .**

 **or**

**Which property can be used in Examples 1–3 to show that both expressions given are equivalent?**

**The commutative property of addition**

Example 4 (3 minutes)

 **Example 4**

**How can we show minus ?**

* **Draw a bar diagram to model this expression.**
* **What expression would represent this model?**
* **Could we also use ?**

**No. If we started with and tried to take away, the models would not match.**

Example 5 (3 minutes)

Example 5

How can we write an expression to show less than a number?

* Start by drawing a diagram to model the subtraction. Are we taking away from the or the unknown number?

We are taking away from the unknown number.

* We are starting with some number and then subtracting .
* What expression would represent this model?

MP.2

***The expression is .***

**Example 6 (3 minutes)**

 **Example 6**

**How would we write an expression to show the number being subtracted from the sum of and ?**

* **Start by writing an expression for “the sum of and .”**

**or**

* **Now, show being subtracted from the sum.**

 **or**

Example 7 (3 minutes)

 **Example 7**

**Write an expression to show minus the sum of and.**

**Why are parentheses necessary in this example and not the others?**

**Without the parentheses, only is being taken away from , where the expression says that should be taken away from .**

Replace the variables with numbers to see if is the same as .

If students do not see the necessity for the parentheses, have them replace the variables with numbers to see whether is the same as .

Here is a sample of what they could try:

, ,

 or

Exercise ([Desmos)](https://teacher.desmos.com/activitybuilder/custom/5ddc0ce4a2694028c93dedf1)

Students should use Desmos to complete a sort with the information in the table. Then they can transfer the answers to their graphic organizer.

Exercise – [Desmos Matching Activity](https://teacher.desmos.com/activitybuilder/custom/5ddc0ce4a2694028c93dedf1)

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| --- | --- | --- |
| **Verbal** | **Expression 1** | **Expression 2 –****if possible!** |
| the sum of and  |  |  |
|  increased by  |  |  |
| the sum of , , and  |  |  |
|  less than  |  |  |
|  decreased by the sum of and  |  |  |
| the sum of and reduced by  |  |  |
|  more than the sum of and  |  |  |
| w decreased by  |  |  |
|  less than the sum of and  |  |  |
| the difference of and  |  |  |

What do you notice about the sentences that don’t have two expressions? Why do you think that is?

Answers will vary, students should recognize that the addition expressions are easily written a second way.

Closing (7 minutes)

* Write the following in words.
	+ Answers will vary; the sum of and
	+ Answers will vary; the sum of and
	+ Answers will vary; minus
	+ Answers will vary; minus
* Is equivalent to ? Is equivalent to ? Explain.
	+ *is equivalent to . Both of these expressions would evaluate to the same number regardless of the numbers substituted in for and . However, and will not have the same result. I would be starting with a new total amount and taking away a different amount as well. The values of each expression would be different, so the expressions would not be equivalent. For example, , and . However, , but .*

Exit Ticket (5 minutes)

Name Date

Lesson 9: Writing Addition and Subtraction Expressions

Exit Ticket

1. Write an expression showing the sum of and a number .
2. Write an expression showing less than the number .
3. Write an expression showing the sum of a number and a number minus .

Exit Ticket Sample Solutions

1. Write an expression showing the sum of and a number .

 ***or***

1. Write an expression showing less than the number .
2. Write an expression showing the sum of a number and a number minus .

Problem Set Sample Solutions

1. Write two expressions to show a number increased by . Then, draw models to prove that both expressions represent the same thing.

and

1. Write an expression to show the sum of and .

 or

1. Write an expression to show less than .
2. Write an expression to show the sum of and reduced by .
3. Write an expression to show less than , plus .
4. Write the following expressions in words. Answers will vary.