

# “Sign” Your Name

## Common Core Standard:

**Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.**

**7.NS.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

## Additional/Supporting Standard(s): N/A

## Standards for Mathematical Practice:

6. Attend to precision.
8. Look for and express regularity in repeated reasoning.

## Student Outcomes:

- I can add integers.
- I can determine the absolute value of a quantity.

## Materials:

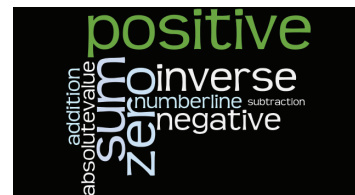
- “Sign” Your Name handout
- Internet access to create a class Wordle of student names; <http://www.wordle.net/>

## Advance Preparation:

- Students should be familiar with signed numbers and how to use a number line to help with signed addition.
- Students need to have an understanding that absolute value is the distance from zero on a number line.

## Directions:

1. Show students the integer Wordle and discuss why some words appear larger and others appear smaller. Tell them that the activity today will allow them to create a class Wordle and that we will mathematically determine the size of our names in the Wordle. The Integer Wordle can be found at the following link: <http://www.wordle.net/show/wrdl/5512350/Integers>
2. Provide students a copy of the “Sign” Your Name handout.
3. Students should complete each question of the task to practice using a number line when adding integers.



4. At the end of the lesson allow students to design a Wordle on the computer with the names of all students in the class. (<http://www.wordle.net/>) Use the absolute value of each student's first name. Have each student type their first name in the Wordle the number of times that equals the absolute value of their name. Print out the class Wordle and display.

Example: JULIE =  $-3 + 8 + (-1) + (-4) + (-8) = -8$ ;  $|-8| = 8$

DAN =  $-9 + (-12) + 1 = -20$ ;  $|-20| = 20$

ALISAN =  $-12 + (-1) + (-4) + 6 + (-12) + 1 = -22$ ;  $|-22| = 22$

NANCY =  $1 + (-12) + 1 + (-10) + 12 = -8$ ;  $|-8| = 8$

Julie will type her name 8 times in the Wordle program. Dan will type his name 20 times, Alisan 22 times and Nancy 8 times. The student whose name has the largest absolute value will appear the largest in the Wordle. The student whose name has the smallest absolute value will appear the smallest in the Wordle.

5. Now have the students create a Wordle that will display the true value of their first name. Student names that have negative values will be typed in backwards to represent the additive inverse value. Since we cannot type a name in Wordle a negative amount of times, the issue of negatives will be addressed by adding one more than the absolute value of the smallest valued name.

Using the example above, ALISAN has the smallest valued name at -22. The absolute value of -22 is 22 then add one more to obtain a new value of 23. Adding 23 to each student's first name value will ensure that the student with the lowest name value will appear as the smallest in the Wordle which will be equal to 1. This same rule will now be applied to all students in the class. Thus, JULIE now has a value of  $-8 + 23$  or 15; DAN will be  $-20 + 23$  or 3; ALISAN is now  $-22 + 23$  or 1, and NANCY is now  $-8 + 23$  or 15. The amount added to each student's name value will depend on the smallest value in each class. The end result should be that the student with the lowest name value will enter their name in the Wordle one time.

Use the same process as in the previous Wordle by having students type their name in the Wordle program with their new value. A cool twist is to have the students whose first name was originally negative (before adding 23 as in our example), type their name in backwards so that it will be clear on the Wordle that their name value was in fact negative.

### Questions to Pose:

#### Before:

- Can you predict which student's name in our class will have the highest value when we apply the given code? Can you predict who will have the lowest valued name?
- What is your reasoning for your predictions?

#### During:

- What patterns did you notice when adding integers on the number line?
- Can we make some general rules for adding integers, those with like signs and those with different signs?
- Would the order of the values in a name matter when finding the total?

After:

- How does your name size on the absolute value Wordle compare to your name size on the adjusted true value Wordle?
- What is the reasoning for the change in your name size?
- What is the reasoning for some names being typed in backwards?

**Possible Misconceptions/Suggestions:**

<b>Possible Misconceptions</b>	<b>Suggestions</b>
Students often misunderstand the value of negative numbers. For example, students often state that $-1 < -10$ , as if the numbers were positive.	Review with students that when comparing two positive integers, the number further to the right on the number line is always larger. The same reasoning applies to negative numbers on the number line. The larger value will always be the one further to the right.

**Special Notes:**

Some student names may require movement or result in a sum larger than the length of the provided number line. Based on the need of your students, a longer number line may be provided for assistance. The goal is for students to develop or recall the patterns when adding integers instead of relying solely on the number line.

**Solutions:**

Solutions will vary.

Adapted from Lawrence Burke

## “Sign” your Name

Letter	Value
A	-12
B	-11
C	-10
D	-9
E	-8
F	-7
G	-6
H	-5
I	-4
J	-3
K	-2
L	-1
M	0

Letter	Value
N	+1
O	+2
P	+3
Q	+4
R	+5
S	+6
T	+7
U	+8
V	+9
W	+10
X	+11
Y	+12
Z	+13

Use the values for each letter in the charts above to find the amounts described below. Do not use a calculator. Use the provided number line and/or show your thinking.

1. The value of your first name:
2. The value of your middle name, if applicable:
3. The value of your last name:
4. The value of your entire name:
5. The absolute value of your first name:
6. The absolute value of your middle name, if applicable:
7. The absolute value of your last name:
8. The absolute value of your full name:
9. The value and absolute value of your teacher's last name:

