

The Number System: <u>Unit 1 – Part 1:</u> Adding & Subtracting Integers

How can we classify different numbers, describe what they represent and their relationship with each other?

| Standard | Description |
|----------|--|
| 7.NS.1 | Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers. → 1a: Describe situations in which opposite quantities combine to make o. → 1b: Show that a number and its opposite have a sum of o (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. → 1c: Understand subtraction of rational numbers as adding the additive inverse → 1d: Apply properties of operations as strategies to add and subtract rational numbers. |
| 7.NS.3 | Solve real-world and mathematical problems involving the four operations with rational numbers. |

| Packet Completion Rubric | | | | | |
|--|---|--|---|---|--|
| 4 | 3 | 2 | 1 | 0 | |
| Workbook demonstrates significant effort. Student utilizes notes to help extend their thinking, writing questions, comments or reactions to the content. | Workbook demonstrates some effort. Student takes notes but could further understanding by questioning and interacting with the material. | Workbook shows little effort. Student takes notes sporadically, and could benefit from greater consistency with the material. | Workbook shows little to no effort. Student does not take notes and must demonstrate future interaction with the material to aid understanding. | Workbook is entirely incomplete or not turned in. | |

Grading Breakdown: 3.5 - 4 = A 3 - 3.4 = B 2.5 - 2.9 = C 2 - 2.4 = D 0 - 1.9 = F

I am a person who believes in **asking questions**, in not conforming for the sake of conforming. I am deeply dissatisfied - about so many things, about injustice, about the way the world works - and in some ways, my dissatisfaction drives my storytelling.

Chimamanda Ngozi Adichie

Unit 1 Part 1 Guiding Question:



| Lesso | on Object | ives |
|-----------------------------|--------------------------------------|--|
| Le After co lesson, c | esson ompleting a heck the box | I can After completing each lesson, you are on the right track if you can confidently state "I can" |
| | 1.1 | explore the properties of integers |
| | 1.2 | utilize the Floats & Anchors model to understand the properties of integers |
| | 1.3 | create and use a number line to understand the properties of integers |
| | 1.4 | determine the absolute value of a number |
| | 1.5 | use models to solve and explain problems using integers |

| Unit 1 | Lesson 1.1 |
|----------------------|--|
| DO-NOW | Riddle 1: Riddle 2: Riddle 3: |
| Homework Reminder | This is where you will shade in the box if you turned in your homework. There is no homework due today! :) <i>"We become what we repeatedly do." - Sam Covey</i> |
| Check-In | How are you doing today? What mathematical ideas are you wondering about today? What problems are you trying to solve? |

What is an integer? Write down any ideas, guesses or predictions you have!

What are operations?

THE FOUR BASIC MATH OPERATIONS ARE ...

HOW DO THEY HELP US MANIPULATE NUMBERS?

HOW DO THEY HELP US TO BALANCE NUMBER SENTENCES?

| WHAT IS ADDITION? | WHAT IS SUBTRACTION? | | |
|-------------------|----------------------|--|--|
| | | | |
| | | | |
| | | | |
| The inverse is | | | |



| Exploratory Activity |
|--|
| Temperoture Stotion: Explain your answers using words, pictures and evidence |
| Wahiawa, HI |
| What is the temperature at 3pm? |
| How do you know? |
| |
| Reykjavik, Iceland |
| How much did the temperature change from 5:30pm to 7pm? Why? |
| What is the temperature by 9pm? Why? |
| |
| <u>New Delhi, India</u> |
| How much did the temperature change? |
| What is the temperature at 3pm? How do you know? |
| What operation is represented by a decrease in temperature? An increase? |
| |
| |
| What is one take-away you learned at this station? |
| |

Running Station: Explain your answers using words, pictures and evidence.

- 1. Where did Rebecca start and end her run?
- 2. How many meters did she run in total?
- 3. Please explain how Rebecca ended and started in the same place, but ran 400 meters.
- 4. Did Matthias or Rebecca run more? How do you know?
- 5. Where did Maritza end her run? Please draw a diagram to support your answer.
- 6. Where did Miguel end his run and how much did he run in total?
- 7. Where did Samanta end her run and how much did she run in total?
- 8. Where did Nik end his run and how much did he run in total?



Pause and Think: Even though Miguel ended his run at -100m, does that mean he ran a distance of -100m? If not, how far did he run? Explain.

What were similarities of the stations?

What were some differences between the stations?

THE FOUR MINUTE MILE AND GROWTH MINDSET



In 1940-something, Louis Zamperini of the book and film of the same name, *Unbroken*, was training to run a 4-minute mile before he was drafted by the United States Military.

On May 6, 1954, Roger Bannister busted through the four-minute barrier with a time of three minutes, fifty-nine and four-tenths of a second. Prior to this achievement, runners around the world sought to break the record since at least 1886. The challenge

involved the most brilliant coaches and gifted athletes in North America, Europe, and Australia. "For years milers had been striving against the clock, but the elusive four minutes had always beaten them," one coach noted. "It had become as much a psychological barrier as a physical one. And like an unconquerable mountain, the closer it was approached, the more daunting it seemed."

When Bannister broke the mark, even his most ardent rivals breathed a sigh of relief. *At last, somebody did it!* And once they saw it could be done, they did it too. Just 46 days Bannister's feat, John Landy, an Australian runner, not only broke the barrier again, with a time of 3 minutes 58 seconds. Then, just a year later, three runners broke the four-minute barrier *in a single race*. Over the last half century, more than a thousand runners have conquered a barrier that had once been considered hopelessly out of reach.

How does this story relate to growth mindset?

Lesson 1.2



Unit 1

| Floats and Anchors |
|---|
| Today, we are going to continue our exploration of integers while trying to steal treasure from your partner! |
| Partner's Name: |
| My partner's favorite color is: |
| My partner's favorite thing about Hawai'i is: |

Complete the Cartoon

The cartoon below shows a pirate ship during one turn in the Floats and Anchors game. In the empty box, draw the ship at the end of the turn (include *cargo* and *position*). Below each picture, write a description of what is happening mathematically. Then write math sentences to match the given story shown by the cartoon, one for the *floats and anchors* and one for the boat's position relative to *sea level*.



Link: https://tinyurl.com/yxuoo9gz

- 1. How do the balloons and weights relate to the floats and anchor game you just played?
 - 2. What happens when you take away a weight? Why?

3. Explain 6 - (-3) using balloons and weights OR floats and anchors.

4. Look at some of the "Common Sense Explanations." Choose one and summarize it in your own words.

5. Now practice!

| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | 1: | | 2: | | 3: | |
|---|----|------|----|------|----|------|
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | | 0 | | -4 | | 0 |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | | + 3 | | + 5 | _ | + 2 |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | 4: | | 5: | | 6: | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | | 2 | | 2 | | 2 |
| 7: 8: 9: -4 4 5 | | + -4 | | + 5 | | + -2 |
| 7: 8: 9: -4 4 5 | | | | | | |
| -4 4 5 | 7: | | 8: | | 9: | |
| | | -4 | | 4 | | 5 |
| + -1 + -1 + -2 | | + -1 | | + -1 | | + -2 |



| Unit 1 | Lesson 1.3 | | | | |
|---|---|--|--|--|--|
| DO-NOW | Question 1: What will happen if I add 5 floats and 7 anchors to my ship? | | | | |
| | Question 2: Write a number story that represents the following number sentence \rightarrow | | | | |
| | 5 - 7 = -2 | | | | |
| | Question 3: Draw a visual integer representation that depicts the number sentence above. | | | | |
| Homework Reminder | Shade in this box if you turned in your homework. "We become what we repeatedly do." - Sam Covey | | | | |
| Check-In | How are you doing today? | | | | |
| | What mathematical ideas are you wondering about today? What problems are you trying to solve? | | | | |
| Number Line | S | | | | |
| What is a numb | oer line? | | | | |
| | | | | | |
| Why do we use number lines? | | | | | |
| | | | | | |
| How can we use a number line for addition and subtraction problems? | | | | | |
| | | | | | |
| Use the number - 3 + 8 - 4 + 2 6 - 8 | The below to solve the following number sentences. 3 = | | | | |

Using Real-World Number Lines

Directions: Write and solve a number sentence to match the following scenario. Explain how you arrived at each answer using words or pictures.

Scenario 1: Mrs. Flett and Ms. Kimmel went snorkeling with sharks last fall. They mostly swam at the surface of the water with the sharks swimming below, but Mrs. Flett decided she wanted to get a closer look. She took a big breath in and dove 8 ft below the surface toward one of the sharks. What is her current diving position?

Scenario 2: Mrs. Flett tracked the shark at that level. After a few moments, she swam 3 ft back toward the surface and stopped to look at a tuna that was swimming around. At what depth is Mrs. Flett swimming now?

Scenario 3: Ms. Nepshinsky had \$25 dollars in her checking account on Friday. On Saturday, she went to TJ Maxx and made a purchase of \$30. What is the new balance of Ms. Nepshinsky's checking account?

Scenario 4: On Monday, Ms. Nepshinsky received \$20 from a babysitting job. She immediately deposited this babysitting money into her checking account. What is Ms. Nepshinsky's new checking account balance?

Connecting Back Explain each of the following number sentences using the floats and anchors method from vesterday and then use the number line you created to solve.

| 18 + 7 = | 18 - 3 = |
|------------|-------------|
| -20 + 10 = | 2 - (-15) = |

Directions:

- > Each group will receive a set of task cards with different problems using integers.
- First, you must solve the task card <u>using a number line</u> in the space provided in your workbook. Be sure to circle your answer!
- > Then, you will write a number story that corresponds with the completed number sentence.
- > Be prepared to share your favorite number story with the class!



| | | | Lesson 1.4 | |
|----------------------|---|---|-------------------------|--|
| DO-NOW | Find a solution for each number sentence below. Justify your answer using a number line, floats and anchors, or a visual integer model. | | | |
| | 1. 4 + (-2) = | 2 10 + 3 = | 3 6 + (-3) = | |
| | 41+(-8) = | 5. 2 - (-7) = | 6. 1 - 5 = | |
| Homework Reminder | Shade in this box if "We become what u | you turned in your home repeatedly do." - Sa | work. m Covey | |
| Check-In | How are you doing today? | | | |
| | What mathematical ideas are you wondering | about? What problems a | re you trying to solve? | |
| Think About It | 1 | | | |
| What do the num | nbers in each of the following number pai -1 and 1 -15 and 15 | rs have in common? -234 and 2 | 34 | |
| In othe | er words, both numbers have the same | | | |
| ABSOLUTE V | ALUE: | | | |
| OPPOSITE quan | -6 is 6 away from zero, so the absolute value of -6 is 6 the second | $6 \rightarrow$ 2 3 4 5 6 7 8 9 is 6 away from zero, so the absolute value of 6 is 6 | | |

| Number Talks | |
|---|--|
| Think: My thoughts or understanding at this time → | Pair: What I understand my partner is telling me → |
| Share as a Small Group: Our common understandin and what was most import | ng after talking, what we can share with others, cant from our discussion → |
| INTEGER SUMS AND DIFFERENCES Directions: Use the integers -3 to 3, at most one time true. | each, to fill in the blanks to make each equation |
| | More Problems on the Next Page! |



HOW DO INTEGERS INTERACT WITH EACH OTHER WHEN USING ADDITION AND SUBTRACTION?

| Math Journal |
|---|
| |
| When it comes to math, I find it difficult to |
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| How do integers interact with each other when using addition and subtraction? |
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| Unit 1 | Lesson 1.5 | | | | | | |
|----------------------|--|--|--|--|--|--|--|
| DO-NOW | Solve all of the addition sentences below. a. $-4 + 10$ b. $-6 + 22$ c. $8 + (-18)$ d. $-5 + (-7)$ | | | | | | |
| | Now, write a story that corresponds with at least two of the sentences from above. <i>Be creative :)</i> | | | | | | |
| | <i>a</i> . | | | | | | |
| | b. | | | | | | |
| | | | | | | | |
| Homework Reminder | Shade in this box if you turned in your homework. "We become what we repeatedly do." - Sam Covey | | | | | | |
| Check-In | How are you doing today? | | | | | | |
| | What mathematical ideas are you wondering about today? What problems are you trying to solve? | | | | | | |

Mixed Review: Adding AND Subtracting

Directions: Solve each of the following number sentences. Write an explanation by using a number line, floats and anchors, a visual integer model, or a number story.

1+(-4)

7-9

-13 + -19

3 - (-11)

- 6 + 15 - 20

Why is it important that we show and explain our work?

Practice

1. If Nicole runs 400m and then stops and turns around and runs 600m, how much does she run in total? Why? Draw a picture and explain.

2. The temperature was -3° C on Friday and dropped overnight by 9° C. What was the temperature on Saturday morning?

3. On the number line below, the numbers *m* and *n* are the same distance from 0. Which of the following equation is correct:

a.
$$m + n = 0$$

b. $m - n = 0$
c. $m = n$
d. $m/n = 1$

4. Values for variables a, b, and c are graphed on the number line shown below. Use the graph to evaluate the expressions in the table. Place a check in one column for each row in the table to indicate whether the expression is less than o, equal to o, or greater than o. The first row has been completed for you as an example.

| a ++ + + + | <i>b c</i> | | | | |
|------------------------------|-----------------|------------|-----|-------|-----|
| | D | Expression | < 0 | = 0 | > 0 |
| | | a - b | 1 | | |
| | | a + b | | | |
| | | b - c | | | |
| | | c – a | | | |
| | | a + c | | | |
| 5. Does addition make a nun | ıber bigger? | | | | |
| Always | Sometimes | | | Never | |
| Explain: | | | | | |
| 6. Does subtraction make a r | number smaller? | | | | |
| Always | Sometimes | | j | Never | |
| Explain: | | | | | |
| | | | | | |

Directions: As a team, read the scenario that follows and find solutions to each problem below. Be sure to show your work!



Some of the Wheeler Middle School teaching team decided to try out for the PATRIOTS!!!!! They each are allowed one rushing attempt against the Patriots defense. The table below summarizes the results of their attempts to run the ball against the Patriots defense. If it is positive, they gained yards toward the endzone. If it was negative, they lost yards toward the endzone.

| DelGreco | -8 | Nakamoto | -19 | Chun | +2 |
|-----------|-----|----------|-----|----------|-----|
| Minehira | +24 | Walje | +18 | Kaiser | -26 |
| Tachiyama | -13 | Wagner | +37 | Hamilton | +6 |

Use the table above to answer the following addition problems. Show both your expression and answers below. CIRCLE your final answer. *Example: Koki* + *Hamilton* = $18+6 = 24 \leftarrow answer$

| 1. | Wagner + Kaiser | 6. | Hamilton + DelGreco |
|----|----------------------|-----|-------------------------------|
| 2. | Tachiyama + Nakamoto | 7. | Chun + Nakamoto |
| 3. | Tachiyama + Wagner | 8. | Kaiser + Hamilton |
| 4. | Walje + Minehira | 9. | DelGreco + Nakamoto + Walje |
| 5. | Minehira + Kaiser | 10. | Tachiyama + Hamilton + Kaiser |

Answers & Work:

| 1. | 6. | | |
|---|-----|--|--|
| | | | |
| 2. | 7. | | |
| | | | |
| 3. | 8. | | |
| | | | |
| 4. | 9. | | |
| | | | |
| 5. | 10. | | |
| | | | |
| Which group or pair should make the team and WHY? | | | |
| | | | |

Workbook Reflection

Answer the question as completely as possible, using evidence from what we have learned this unit. Justify your response with examples and evidence from throughout the packet.

How can we classify different numbers (integers vs. rational numbers), describe what they represent (their value) and their relationship with each other (the operations being performed)?

Choose one of the following models and describe it. Include visuals to support your answer.

- Number Lines
- Floats and Anchors
- Visual Integer Models

What lesson most challenged your thinking?

What would you have done differently?

Flip through your packet, and look to see if you shaded the box every day for turning in your homework. How many days did you shade it in?

| Lesson 1 | Lesson 2 | Lesson 3 | Lesson 4 | Lesson 5 | |
|----------|----------|----------|----------|----------|--|
|----------|----------|----------|----------|----------|--|

If you didn't finish it each night, consider why \rightarrow

Would you like to come in during lunch or recess for support?