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DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Mathematics

Quarter 3
Lesson
5

Lesson Exemplar for Mathematics Grade 7
Quarter 3: Lesson 5 (Week 5)
SY 2024-2025

Development Team

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MATHEMATICS / QUARTER 3 / GRADE 7

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners should have knowledge and understanding of the four operations with integers.
B. Performance Standards	By the end of the quarter, the learners are able to perform the four operations with integers. (NA)
C. Learning Competencies and Objectives	**The learners add and subtract integers; using concrete models (e.g., counters, integer chips), pictorial models (e.g., bar models, number lines), and with integers written as numerals.** 1. The learners add integers as numerals and use concrete models and pictorial models. 2. The learners subtract integers as numerals and use concrete models and pictorial models.
D. Content	Adding and Subtracting Integers
E. Integration	

II. LEARNING RESOURCES
Teachtastic. (2021). *How To Effectively Teach Adding Integers for Seventh Grade Math.* https://www.teachtasticiep.com/post/how-to-effectively-teach-adding-integers-for-seventh-grade-math Third Space Learning. (2023). *Adding and subtracting integers.* https://thirdspacelearning.com/us/math-resources/topic-guides/number-and-quantity/adding-and-subtracting-integers/ Oryx learning. (2023). *Subtracting Integers Using Integer Chips.* https://oryxlearning.com/learn/subtracting-integers-using-integer-chips/ Teachtastic. (2023). *How To Teach Subtracting of Integers for Seventh Grade Math.* https://www.teachtasticiep.com/post/how-to-teach-subtracting-of-integers

III. TEACHING AND LEARNING PROCEDURE		**NOTES TO TEACHERS**
A. Activating Prior Knowledge	**DAY 1** **1. Short Review** **Option 1: Questions for discussion:** 1. What are whole numbers, and how do we use them daily? What about integers?	**(5 minutes)** 2. Draw a simple number line on the board and have volunteers come up and place numbers in the correct spots.

	2. Can anyone remind us how a number line works? Where would we find number 5? Where does zero fit on this line? What about –8? 3. If I have 5 mangoes and I get three more, how many do I have now? What if I eat 2 of them? You may also give this engaging classroom activity: **Option 2: "Number Line Relay"** Instructions: 1. Create a large number line on the floor of the classroom using a string or a tape. Mark the center point clearly as zero. 2. Create groups with 5-8 members. 3. Give each group a set of index cards with whole numbers. Include a mix of positive and negative whole numbers since they have already learned in the previous lesson the integers. 4. One at a time, learners from each group come up to the number line and place their cards where they think the number should go. 5. As each student places a card, they should state whether they are adding (moving to the right) or subtracting (moving to the left) from the previous number placed by their group. 6. Once all numbers are placed, discuss as a class how well the learners did. Correct any misplacements. **2. Feedback (Optional)** Ask students to reflect on the activity and what it helped them remember about whole numbers and the number line.	3. Use the number line to visually add and subtract, moving to the right to add and to the left to subtract. The prior knowledge that must be activated are: a. understanding of whole numbers and integers, b. familiarity of the number line, including the concept of zero as a starting point and the ability to locate numbers on a number line, and c. mastery of the basic addition and subtraction with whole numbers. **(15 minutes)** Materials: a. a long piece of string or tape to create a number line on the floor. b. index cards or sticky notes with whole numbers written on them. c. markers or chalk to mark points on the number line.
B. Establishing Lesson Purpose	**1. Lesson Purpose** **Integers in Our Everyday Life** Scenarios: 1. Miguel, a Grade 7 student in the Philippines, receives a weekly allowance from his parents and earns extra money by doing chores. However, he also has expenses throughout the week. Let's explore how Miguel manages his allowance using addition and subtraction of integers. Week's Transactions:	**(15 minutes)** The objective of this activity is to introduce the importance of learning addition and subtraction of integers through scenarios that are rooted in aspects of everyday life in the Philippines.

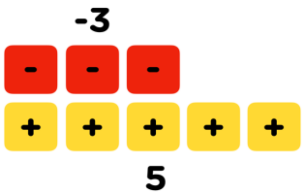
	Starting Allowance: Miguel starts the week with P200. Earnings and Expenses: • Monday: Earns P50 for washing the car. • Tuesday: Spends P20 on a snack from the sari-sari store. • Wednesday: Earns P30 for helping with groceries. • Thursday: Spends P40 on jeepney fares. • Friday: Buys a birthday gift for a friend, spending P70. Problem: Calculate Miguel's remaining allowance at the end of the week.	Miguel's remaining allowance at the end of the week is P280 – P130 = P150.
	2. Cristof, a Grade 7 student, loves playing traditional Filipino games with his friends after school. Today, they decide to play "Sipa", a game where players keep a small rattan ball in the air using their feet. Points are scored for skillful moves, but points are lost for mistakes. Game Rules and Scoring: Earning points: • successfully keeping the sipa in the air: +2 points each time. • performing a special trick: +5 points. Loosing points: • Sipa falls to the ground: –3 points • incorrect move or foul: –2 points Cristof's Game Round: • Starts the game with 0 points • Keeps the sipa in the air 3 times (+2 points each) • Performs a special trick (+5 points) • Makes two incorrect moves (–2 points each) • Lets the sipa fall once (–3 points) Problem: Calculate Cristof's total score at the end of his game round.	Cristof's total score at the end of his game round is: 0 + 2+ 2 + 2+ 5 – 2 – 2 - 3 = 4 points
	Questions for discussion: 1. How do you think the skills Miguel used in managing his allowance can help you in your daily life? Can you think of other situations where you need to add or subtract money? Possible answers: • The skills Miguel used can help in daily life by enabling us to keep track of our financial situation, understand our spending habits, and	

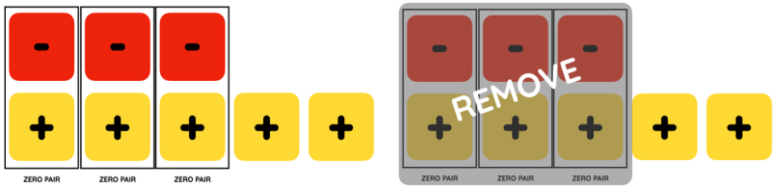
budget effectively. This can lead to responsible money management and financial planning.
- Other situations where we need to add or subtract money could include calculating change when shopping, figuring out if we have enough money to purchase something, or planning how much to save each week from our income.

2. Why do we consider spending money as subtracting integers? How does this differ from earning or receiving money?
   Possible answers:
   - We consider spending money as subtracting integers because it represents a decrease in the amount of money we have. When we spend, we are giving money away, which means our total available funds go down.
   - This differs from earning or receiving money, which increases our total funds, represented by adding integers. When we earn money, the amount we have goes up, so we add to our total.

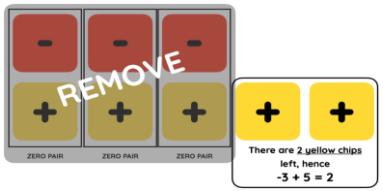
3. Besides Sipa, can you think of other games or sports where the scoring system involves adding and subtracting points?
   Possible answers:
   - Many team sports, like basketball and football, involve adding points for goals or baskets made and sometimes subtracting points for penalties or fouls.
   - Board games or card games often involve points gained for successful moves and points lost for mistakes, like in "Monopoly" or "Uno."

4. How does understanding integers make playing games more interesting or fair? Do you think it's important to know these math concepts to enjoy these games?
   Possible answers:
   - Understanding integers makes playing games more interesting because it adds a layer of strategy; players must think about how to gain positive points while avoiding actions that could lead to losing points.
   - It also makes games fairer because the scoring system is consistent and everyone follows the same rules for gaining or losing points.

	• Knowing these math concepts is not necessarily essential to enjoy games, but it enhances the experience by allowing a clear understanding of how scores are calculated and what is needed to win. It also prevents disputes about the scorekeeping. **2. Unlocking Content Area Vocabulary** **Integers** are numbers that include the natural numbers, their opposites (the negative integers), and zero.	
C. Developing and Deepening Understanding	**SUB-TOPIC 1: Addition of Integers using Concrete Models (Integer Chips)** **1. Explicitation** Begin by reviewing the definition of integer, positive, negative, and sum. Adding integers using integer chips is a hands-on way to visualize and understand the process of combining positive and negative numbers. Here's a step-by-step guide on how to use integer chips, which are typically represented by two different colors (e.g., red for negative integers and yellow for positive integers):  **Steps:** 1. **Identify the integers:** Determine the integers you are adding together. Each integer will be represented by a set number of chips: positive integers by yellow chips and negative integers by red chips. **2. Worked Example** *Example*: Add –3 and 5  2. **Represent each integer:** For the first integer, take the corresponding number of yellow chips if it's positive, or red chips if it's negative. Do the same for the second integer you are adding to the first. Put all the chips from both integers together in one group. 3. **Pair off zero pairs:** Find pairs of one yellow chip and one red chip. Each pair represents zero (since one positive and one negative of the same value cancel each other out). Remove all zero pairs from the group. This process is sometimes referred to as 'making zero' or 'finding the zero pairs.'	**(15 minutes)** Review is optional. If this part of the lesson falls on the second day, then a review of the previous discussion may be necessary. You may access this site: https://www.teachtasticiep.com/post/how-to-effectively-teach-adding-integers-for-seventh-grade-math This website has an embedded YouTube video showing how to use integer chips to add integers. Another helpful resource for adding and subtracting integers using integer chips and number line: https://thirdspacelearning.com/us/math-resources/topic-guides/number-and-quantity/adding-and-subtracting-integers/



4. **Counting the remaining chips:** After all zero pairs have been removed, count the number of chips you have left.
   - If you have yellow chips left, the sum is a positive integer. The number of yellow chips represents the magnitude of the sum.
   - If you have red chips left, the sum is a negative integer. The number of red chips represents the magnitude of the sum.
   - If there are no chips left, the sum is zero.



3. Lesson Activity

Activity 1: Adding Integers Using Integer Chips

See worksheet for the activity which students will accomplish

You can use indigenous or local materials to make the integer chips, such as *tansan* or softdrink caps.

(15 minutes)

Answer: (Activity 1)
1. -2
2. 3
3. -1
4. -4
5. 0
6. 2
7. 0
8. -4

DAY 2

SUB-TOPIC 2: Addition of Integers using Pictorial Models (Number Line)

1. Explicitation

Recall that the numbers being added are called the addends. The result is called the sum. Each number on the number line has two characteristics:

- a distance from 0 (absolute value) and
- a direction from 0 (positive or negative)

The distance from 0 is represented by the numerical part of the number (like the 3 in the number –3), and its direction is represented by the + or – sign in front of the number. Addition of numbers on the number line can be visualized by thinking in terms of distance and direction from 0.

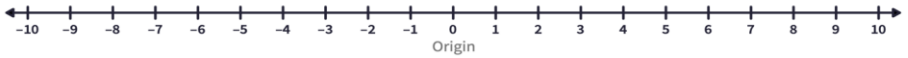
Steps:

1. Draw a number line: Start by drawing a horizontal line on a piece of paper. Mark equally spaced points along the line, labeling them with integers in

Begin Day 2 with recalling of concepts covered in the previous day.

(15 minutes)

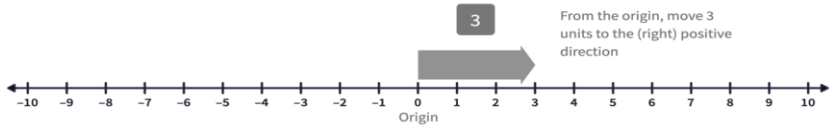
sequence both in the positive direction (to the right) and in the negative direction (to the left), starting from zero in the middle.



2. From the origin, move according to the first integer: If the first integer is positive, move to the right from the origin by the number of spaces that corresponds to the magnitude of the first integer. If the first integer is negative, move to the left from the origin by the number of spaces that corresponds to the magnitude of the first integer.

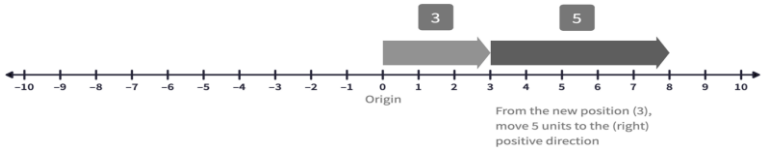
2. Worked Example

For example, the sum 3 + 5 on the number line is:

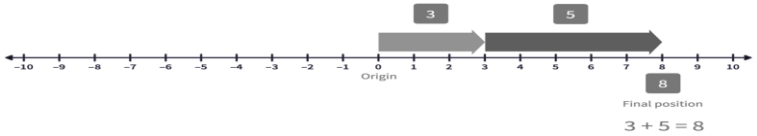


The first number is 3, which tells us to "start at the origin and move 3 units in the positive direction."

1. Move according to the second integer: From the new position, adjust your location based on the second integer: If the second integer is positive, move further to the right by the number of spaces equal to the second integer. If the second integer is negative, move to the left by the number of spaces equal to the absolute value of the second integer.

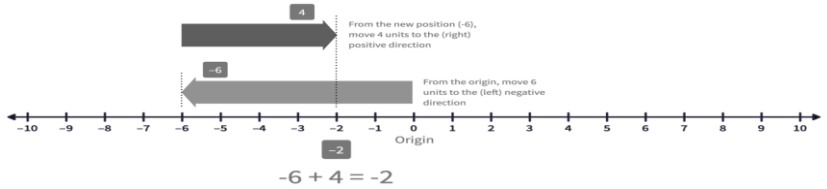


2. Identify the final position and determine the sum. The point where you end up on the number line after making both moves represents the sum of the two integers.



3. Look at the number at your final position. This number is the result of the addition of the two integers.

Illustrative example 2: Find –6 + 4.



3. Lesson Activity **(15 minutes)**

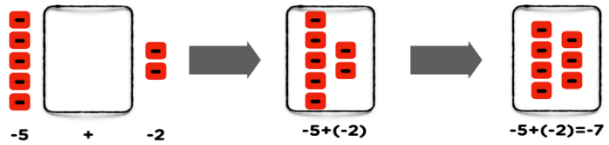
Activity No. 2: Adding Integers using Number Line

See worksheet for the activity which students will accomplish

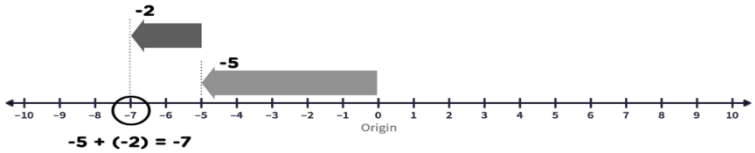
Addition of Integers Written as Numerals **(20 minutes)**

Adding integers with the same sign: To add integers with the same sign, add their absolute values. Give the result the same sign as the integers.

Illustrative example: Find –5 + (–2).
Solution: –5 + (–2) = –7
Check using Integer Chips:



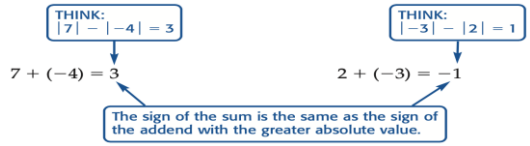
Check using Number Line.



Adding integers with different signs: To add integers with different signs, subtract their absolute values. Give the result the same sign as the integer with the greater absolute value.

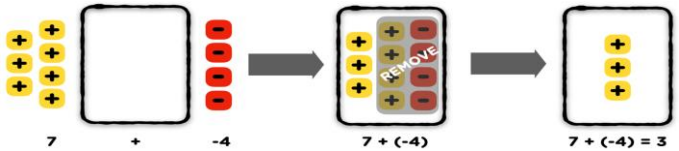
Illustrative Examples:

1. 7 + (–4) = 3
2. 2 + (–3) = –1

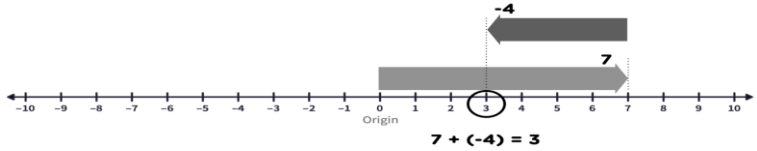


Check 7 + (–4) = 3 using:

(a) integer chips



(b) number line



DAY 3

Activity 3: Integer Addition War (Card Game)

See worksheet for the activity which students will accomplish

Begin Day 3 with recalling of concepts covered in the previous day.
(25 minutes)

Subtracting Integers

Present these questions to the students:

- 20 – 30 = ?
- 20 + (–30) = ?

Both are equal to –10. Tell the students that from the two given examples, subtracting 30 provides the same result as adding –30. This reasoning is used to define subtraction, which allows the use of the rules for addition to do subtraction problems. Here is the definition:

Subtraction: If a and b represent any two numbers, then it is always true that

a - b = a + (-b)

To subtract b — Add its opposite, -b

In words: Subtracting a number is equivalent to adding its opposite.

Helpful resources for teaching subtraction of integers:
https://oryxlearning.com/learn/subtracting-integers-using-integer-chips/

https://www.teachtasticiep.com/post/how-to-teach-subtracting-of-integers

(25 minutes)

Illustrative example: Find –7 – 2.

Solution: a = –7 and b = 2 (if b = 2, then its opposite is –2)

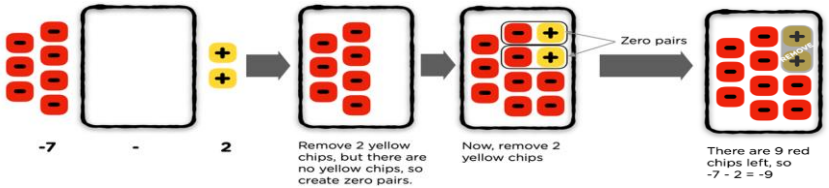
$$a - b = a + (-b)$$

$$-7 - 2 = -7 + (-2) = -9$$

Using integer chips:

Steps:

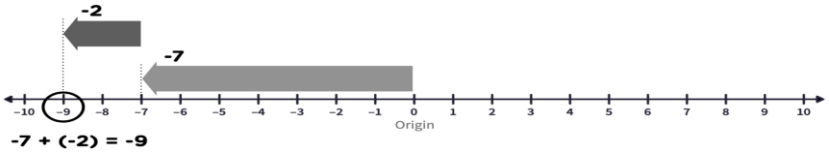
1. Determine the integers involved in the subtraction problem.
2. The first number in the subtraction (the minuend) should be represented using chips.
3. Remove as many chips as indicated by the subtrahend. If the colored chips of the subtrahend are not present, create zero pairs and then remove the chips as indicated by the subtrahend.
4. The remaining chips represent the answer.



Using number line:

Steps:

1. Draw a number line
2. From the origin, move according to the first integer (the minuend).
3. Move according to the second integer (subtrahend). Typically, subtracting a positive number means moving to the left. However, when subtracting a **negative number**, do the **OPPOSITE**, meaning move to the right.
4. Identify the final position. The final position (point) on the number line is the answer.

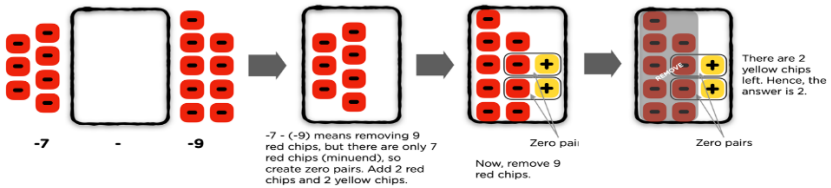
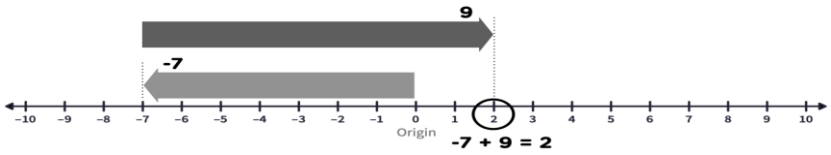


Illustrative example: Find –7 – (–9).

Solution: a = –7 and b = –9

$$a - b = a + (-b)$$

$$-7 - (-9) = -7 + 9 = 2$$

	Using integer chips:  **Using number line:**  From the origin, move 7 units to the left since the minuend is –7. Then, from –7, move 9 units to the right since we are subtracting a –9. The last position is 2. Therefore, the answer for –7 – (–9) is 2. **Activity 4: Integer Maze Challenge** *See worksheet for the activity which students will accomplish*	Give this as a homework.
D. Making Generalizations	**DAY 4** **1. Generalization questions for group discussion:** 1. How do the methods of integer chips, number lines, and using numerals differ in helping you understand addition and subtraction of integers? Which method do you find most effective and why? 2. What key concepts must you remember when adding or subtracting integers, regardless of the method used? 3. Were there any particular challenges you faced when using each of these methods? How did you address these challenges? 4. How does transitioning from a concrete method like integer chips to an abstract method like using numerals change your approach to solving integer problems? 5. How can you apply the methods of adding and subtracting integers in real-world situations? Can you provide an example?	Begin Day 4 with checking the homework given in the previous day. **(15 minutes)**

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		NOTES TO TEACHERS
A. Evaluating Learning	**1. Formative Assessment** **A. True or False** 1. –7 + (–2) equals –9. 2. Subtracting a negative number is the same as adding a positive number. 3. The sum of any integer and its opposite is always zero. 4. –3 – (–3) equals zero. **B. Multiple Choice:** Choose the correct answer for each problem. 1. What is the result of –5 + 10? a. –15 c. –5 b. 5 d. 15 2. What is the result of 7 – (–4)? a. 3 c. –3 b. 11 d. –11 **C. Fill in the Blank:** Complete each integer operation. 1. _____ – (–6) = 9 2. –8 + _____ = –2 **D. Short Answer:** Solve the following problems and show your work. 1. A student takes a jeepney to school, which costs Php 9. After school, they take another jeepney to a sari-sari store, which costs an additional Php 9. On the way home, they realize they have a coupon that gives them a Php 9 discount on the ride. What is the total amount spent on jeepney rides for the day? 2. Mount Apo is the highest point in the Philippines at about 2,954 meters above sea level. If a hiker starts at an elevation of 1,200 meters and ascends 500 meters on the first day, and then descends 650 meters the next day, what is the hiker's final elevation? **2. Homework (Optional)**	**(35 minutes)** **Answer for A:** 1. True 2. True 3. True 4. True **Answer for B:** 1. b (5) 2. b (11) **Answer for C:** 1. 9 2. –2 **Answer for D:** 1. PHP 9 2. 1,050m The teacher may give homework for mastery of the lesson

<table>
<tr><td rowspan="5">B. Teacher's Remarks</td><td>Note observations on any of the following areas:</td><td>Effective Practices</td><td>Problems Encountered</td><td rowspan="5">The teacher may take note of some observations related to the effective practices and problems encountered after utilizing the different strategies, materials used, learner engagement, and other related stuff.

Teachers may also suggest ways to improve the different activities explored/lesson exemplar.</td></tr>
<tr><td>strategies explored</td><td></td><td></td></tr>
<tr><td>materials used</td><td></td><td></td></tr>
<tr><td>learner engagement/ interaction</td><td></td><td></td></tr>
<tr><td>others</td><td></td><td></td></tr>
<tr><td>C. Teacher's Reflection</td><td colspan="3">Reflection guide or prompt can be on:
• <u>principles behind the teaching</u>
How did the different methods cater to varied learning styles within the classroom?
Which method particularly helped visual, auditory, or kinesthetic learners?

• <u>students</u>
Did the students engage differently with the material when presented through the various methods?
Which method encouraged the most active participation?

• <u>ways forward</u>
What did you learn about your teaching through this lesson?
How might this influence your approach to teaching other mathematical concepts?</td><td>Teacher's reflection in every lesson conducted/facilitated is essential and necessary to improve practice. You may also consider this as an input for the LAC/Collab sessions.</td></tr>
</table>