Overview

Lesson Plan #1 Title: Ace it! Lesson Seven

Attached Supporting Documents for Plan #1:

Teacher's Manual and reproductions of student worksheets to support the following lesson objective:

- Add integers with like and unlike signs.

Lesson Plan #2 Title: Ace it! Lesson Nine

Attached Supporting Documents for Plan #2:

Teacher's Manual and reproductions of student worksheets to support the following lesson objective:

- Subtract positive integers from positive and negative integers.

Lesson Plan #3 Title: Ace it! Lesson Twenty-six

Attached Supporting Documents for Plan #3:

Teacher's Manual and reproductions of student worksheets to support the following lesson objective:

- Multiply integers with like and unlike signs.

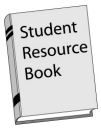
lesson seven

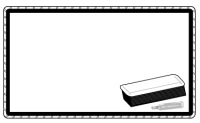
LESSON OBJECTIVE:
Add integers with like and unlike signs.

Introduction	Direct Skill Instruction and Guided Practice	Summary/Closure	Fact Practice
5 mins.	25 mins.	10 mins.	7 mins.

Lesson:

- ❑ Student Resource Books: Student Resource Sheets (Lesson 7)
- ❑ Dry-erase boards and dry-erase markers
- ❑ Two-color counters





Fact Practice:
(Select one of these sets of materials for the Math Facts Games.)

- ❑ Individual Student Flashcards
- ❑ Buzz
- ❑ Math War or Salute!
  - Playing cards
- ❑ Soccer Ball Facts
  - Soccer ball
- ❑ Math Scramble
  - Index cards, each with a number 0–9; cards with the operations
- ❑ BINGO
  - Flashcards
  - BINGO boards, and tokens or colored squares
- ❑ Around the World
  - Triangle or regular flashcards

Vocabulary Definitions:
This lesson assumes that students know the following vocabulary words:

- positive integer
- negative integer
- opposites

absolute value — The distance of a number from zero; the positive value of a number.
Examples: The absolute value of –6 is 6; the absolute value of 7 is 7.

additive inverse — For any number x, the number that gives zero when added to x.
Examples: The additive inverse of 4 is –4; the additive inverse of –10 is 10.

Welcome:


3 mins.

Greet students by name and take attendance.

Introduction:


5 mins.

A. Access Prior Knowledge

On your dry-erase board:

- ***Write an example of a positive integer and show it to me.*** (Possible answers: 6, 732, 985.)
- ***Write an example of a negative integer and show it to me.*** (Possible answers: –8, –19, –77.)
- ***Write an example of numbers that are opposites***. (Possible answers: 12 and –12, 800 and –800.)

Everyone, show me on your dry-erase boards which number is larger:

- ***–7 or –5?*** (–5)
- ***2 or –18?*** (2)
- ***0 or –100?*** (0)

B. Explain Connection to New Skill

You already know how to add positive integers. You also know how to subtract a positive integer from a larger positive integer.

On your dry-erase board:

- ***Add 13 + 56.*** (69)
- ***Subtract 298 from 657.*** (359)

In the next few lessons, we will explore the addition and subtraction of integers, both positive and negative.

C. State Lesson Objective

During today's lesson, we are going to add integers with like and unlike signs.

Direct Skill Instruction and Guided Practice:

In your Student Resource Book, below the Lesson Objective for Lesson Seven, you will see a Vocabulary Box that lists two vocabulary terms and their definitions. Let's look at these terms together.

- ***Raise a hand to define*** **absolute value.** (The distance of a number from zero; the positive value of a number.)

- ***Raise a hand to give me an example of*** **absolute value.** (The absolute value of –10 is 10.)

- ***Raise a hand to give me the*** **absolute value** ***of 3.*** (3)

Remember that the **absolute value** ***of a number is not the same as the opposite. The*** **absolute value** ***is always positive, whether the original number was positive or negative.***

- ***Raise a hand to give me the definition of*** **additive inverse.** (The additive inverse of any number x is the number that gives zero when added to x.)

- ***Raise a hand to give me an example of a number and its*** **additive inverse.** (–8 and 8)

In our previous lesson, we used a vocabulary word that is very similar to **additive inverse.**

- ***Raise a hand to remind me of that word.*** (Opposites.)

Good! Let's talk about some rules that we use when working with **absolute values.** ***I want to find the*** **absolute value** ***of –7. I write this kind of problem like this:***

NOTE: Write |–7| = ____ on your board or dry-erase board.

- ***On the count of three, everyone remind me whether an* absolute value *is always positive or always negative. One, two, three!*** (Positive.)

- ***Everyone tell me in a whisper: What is the* absolute value *of –7?*** (7)

That's right. The rules for computing absolute value are:

$|a| = a$ ***if*** $a \geq 0$

$|a| = -a$ ***if*** $a < 0$

NOTE: Write these rules on your board or dry-erase board.

Let's practice a few more computations of* absolute value *using these rules.

- ***Raise a hand to give me an example of an integer that is greater than or equal to zero.*** (Answers will vary.)
  NOTE: Write the integer given to you on your board or dry-erase board with the absolute value symbols around it.

We can see that the* absolute value *of this positive integer is simply the integer itself. NOTE: Finish the absolute value computation on your board or dry-erase board.

- ***Raise a hand to give me an example of an integer that is less than zero.*** (Answers will vary.)
  NOTE: Write the integer given to you on your board or dry-erase board with the absolute value symbols around it.

To find the* absolute value *of this integer, which is a negative integer, we place a negative symbol in front of it. The two negative symbols cancel each other out and we have a positive integer. NOTE: Write these steps on your board or dry-erase board.

Now that we know how to find the* absolute values *of integers, let's work on some addition problems. We'll start with the very basics.

Divide into pairs. You and your partner will need a dry-erase board and a set of two-color counters. Let the yellow side of a counter represent a positive 1 and the red side of a counter represent a negative 1.

- ***With your partner, represent the following problem using your two-color counters: 3 + 5.*** (One partner should count out three positive counters, and the other should count out five positive counters.)

- ***Raise a hand to tell me how many total positive counters you have.*** (8)

- ***Write the answer in the table of your Student Resource Book under Part I of the Guided Practice section for Lesson Seven.*** (8)

- ***Now, using the color counters again, try the second problem in the Guided Practice Section of your Student Resource Book, Part I.*** (One partner should show three positive counters, the other five negative counters.)
  NOTE: While students are working, copy the problem onto the board without the answer: 3 + –5 = _____.

- ***On the count of three, tell me how many positive color counters you have. One, two, three!*** (3)

- ***On the count of three, tell me how many negative color counters you have. One, two, three!*** (5)

Now, we already know that positive 1 and negative 1 are* additive inverses*, which add to zero. So, each time we have both a positive and a negative counter on the table, they cancel each other out by making zero. NOTE: On your board, draw three positive and five negative counters. Demonstrate how the counters cancel one another out.

You should always have only one type of counter, either all positive or all negative, at the end of the problem.

- ***So, after canceling out the positive and negative counters, what do you have left? Raise a hand to tell me.*** (2 yellow, or negative, color counters.)

- ***On the count of three, everyone tell me the answer to the problem 3 + –5. One, two, three!*** (–2)

Complete the rest of the table with your partner. I'll give you a few minutes, and then we'll check the answers together. Remember to use your counters.

NOTE: Circulate around the room for a few minutes, making sure the students understand. Check the answers together by calling on student volunteers. Refer to the Teacher Resource Sheet for Lesson Seven.

When we are adding integers in real life, we may not always have counters handy. Let's discuss the rules for adding integers. Do you add or subtract the **absolute values*****? How do you know what sign to give the answer? What if you are adding an integer to its*** **additive inverse*****?***

- ***Raise a hand to give me an example of adding two positive integers. You do not need to give me the answer yet.*** (Answers will vary.) NOTE: Write the example on the board or dry-erase board.

These are the kinds of addition problems we are used to solving. The rule is simple. Add the positive integers together. The answer stays positive. NOTE: Solve the problem and write the answer on your board or dry-erase board.

- ***Raise a hand to give me an example of adding two negative integers.*** (Answers will vary.)
  NOTE: Write the example on the board or dry-erase board.

For this type of problem, we use **absolute values*****. First, we find the*** **absolute value** ***of each integer.*** NOTE: Complete this step on your board using the example given.

Next, we add the two **absolute values*****.*** NOTE: Complete this step on your board using the example given.

Finally, we place a negative sign in our answer. NOTE: Complete this step on your board using the example given.

Let's try another example together. NOTE: Write the problem –25 + –13 = _____ on your board or dry-erase board.

- ***When I point to you, tell me the first step in solving this problem.*** (Find the absolute values.)
  NOTE: Point to the class.

- ***When I point to you, tell me the next step in solving this problem.*** (Add the absolute values.)
  NOTE: Point to the class.

- ***When I point to you, tell me the last step in solving this problem.*** (Place a negative sign in the answer.)
  NOTE: Point to the class.

- ***Complete the problem on your dry-erase board. When you are finished, hold up your board so I can see your answer.*** (–38)

Good job!

- ***Raise a hand to give me an example of adding two integers with different signs.*** (Answers will vary.)
  NOTE: Write the example on the board or dry-erase board.

For this type of problem, we also use **absolute values**. ***First, we find the absolute value of each integer.*** NOTE: Complete this step on your board using the example given.

Next, we find the difference between their **absolute values**. NOTE: Complete this step on your board using the example given.

And finally, the answer gets the sign of the integer with the greater **absolute value**. NOTE: Complete this step on your board using the example given.

NOTE: If the students seem confused, it may help to use the number line in their Student Resource Book, Lesson Five, to demonstrate the problems in the table.

Let's try another example together. NOTE: Write the problem –15 + 20 = _____ on your board or dry-erase board.

Raise a hand to tell me:

- ***What is the first step in solving this problem?*** (Find the absolute values of the integers.)

- ***What is the next step?*** (Find the difference between the absolute values.)
  NOTE: Emphasize that this step involves finding the difference between the absolute values.

- ***What is the last step in solving this problem?*** (Figure out which integer has the greatest absolute value and use its sign in the answer.)

- ***Complete the problem on your dry-erase board. When you are finished, hold up your board to show me your answer.*** (5)

There is one more type of problem we need to discuss. Suppose you have a situation in which you need to add an integer to its **additive inverse*****?***

- ***Raise a hand if you can think of a rule for this type of problem.***
  (Possible answer: When you add additive inverses, the answer is always zero.)
  NOTE: If students struggle to answer, direct them to review the definition of additive inverse.

Now practice applying these rules. In your Student Resource Book, Lesson Seven, complete the problems in the Guided Practice section, Parts II and III. You may work with your partner to complete Part II.

Summary/Closure:

10 mins.

A. Define Vocabulary Words

In your Student Resource Book, Lesson Seven, in the Summary/Closure section, there are some questions on today's vocabulary terms. Take a few minutes to define the vocabulary terms and give examples.

B. Summarize What We Learned Today

Let's summarize the skill that we have been working on today. In your Student Resource Book, in the Summary/Closure section, write the rules for adding integers in your own words.

When you are finished, turn to your partner and share your answers.

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C. Apply Skill

NOTE: On the board or dry-erase board, write the problem –5 + 5.

- ***When I point to the dry-erase board, read the problem I've written, in a whisper.*** (Negative 5 plus 5.)
  NOTE: Point to the board.

- ***Tell me the sum on the count of three. One, two, three!*** (0)

- ***Raise a hand to tell me what a pair of numbers like 5 and –5 is called.*** (Additive inverses; opposites.)

- ***On your dry-erase board, show me the sum of –9 + 7.*** (–2)

- ***On your dry-erase board, write the problem –100 + 60, and show me the answer.*** (–40)

Everyone tell me in a whisper:

- ***What is the*** **absolute value** ***of –8?*** (8)

- ***What is the*** **absolute value** ***of 8?*** (8)

Fact Practice:

7 mins. Operation: Multiplication

Fact Activity: _____

Count/Record Tokens:

5 mins. Count and record tokens in the Student Resource Book.

Lesson Objective: Add integers with like and unlike signs.

Vocabulary Box

absolute value — The distance of a number from zero; the positive value of a number. Example: The absolute value of –6 is 6. The absolute value of 7 is 7.

additive inverse — For any number *x,* the number that gives zero when added to *x*. Examples: The additive inverse of 4 is –4; the additive inverse of –10 is 10.

Guided Practice

Directions: Complete the following practice problems with your partner. Your teacher will review the answers. Make sure you show all your work.

I. Solve each addition problem to complete the table. Use your two-color counters.

3	+	5	=	*(8)*
3	+	–5	=	*(–2)*
–3	+	–5	=	*(–8)*
–3	+	5	=	*(2)*
–7	+	4	=	*(–3)*
–2	+	3	=	*(1)*

II. Solve each addition problem.

1. –12 + 8 = _____ *(–4)*
2. –25 + –32 = _____ *(–57)*
3. 49 + –17 = _____ *(32)*

III. Solve each addition problem. Please work independently.

1. –5 + –106 = _____ *(–111)*
2. 78 + (–78) = _____ *(0)*
3. –134 + 65 = _____ *(–69)*

Summary/Closure

A. Vocabulary Words

For each vocabulary term listed, write a definition, and then give two examples of each.

absolute value — (*The distance of a number from zero; the positive value of a number. Examples: The absolute value of –6 is 6; the absolute value of 7 is 7.)*

additive inverse — (T*he additive inverse of any number x is the number that gives zero when added to x. Examples: The additive inverse of 4 is –4; the additive inverse of –10 is 10.)*

B. Summarize What We Learned Today

For each type of addition problem, write a rule in your own words. Be sure to include whether to add or subtract the absolute values and how you know the sign of the answer.

positive + positive *(Sample response: Add them; keep the answer positive.)*

negative + negative *(Sample response: Add the absolute values; keep the answer negative.)*

positive + negative *(Sample response: Subtract the absolute values; the answer gets the sign of the number with the larger absolute value.)*

lesson seven – student resource sheet

Lesson Objective: Add integers with like and unlike signs.

Vocabulary Box

absolute value — The distance of a number from zero; the positive value of a number.
Example: The absolute value of –6 is 6. The absolute value of 7 is 7.

additive inverse — For any number *x,* the number that gives zero when added to *x*.
Examples: The additive inverse of 4 is –4; the additive inverse of –10 is 10.

Guided Practice

Directions: Complete the following practice problems with your partner. Your teacher will review the answers. Make sure you show all your work.

I. Solve each addition problem to complete the table. Use your two-color counters.

3	+	5	=	
3	+	–5	=	
–3	+	–5	=	
–3	+	5	=	
–7	+	4	=	
–2	+	3	=	

II. Solve each addition problem.

1. –12 + 8 =_____

2. –25 + –32 =_____

3. 49 + –17 =_____

III. Solve each addition problem. Please work independently.

1. –5 + –106 =_____

2. 78 + (–78) =_____

3. –134 + 65 = _____

Summary/Closure

A. Vocabulary Words
For each vocabulary term listed, write a definition, and then give two examples of each.

absolute value —

additive inverse —

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B. Summarize What We Learned Today
For each type of addition problem, write a rule in your own words. Be sure to include whether to add or subtract the absolute values and how you know the sign of the answer.

positive + positive

negative + negative

positive + negative

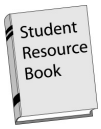
lesson nine

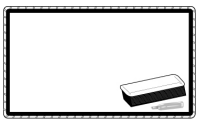
LESSON OBJECTIVE:
Subtract positive integers from positive and negative integers.

Introduction	Direct Skill Instruction and Guided Practice	Summary/Closure	Fact Practice
5 mins.	25 mins.	10 mins.	7 mins.

Lesson:

- ❑ Student Resource Books: Student Resource Sheets (Lesson 9)
- ❑ Dry-erase boards and dry-erase markers
- ❑ Two-color counters





Fact Practice:

(Select one of these sets of materials for the Math Facts Games.)

- ❑ Individual Student Flashcards
- ❑ Buzz
- ❑ Math War or Salute!
  - Playing cards
- ❑ Soccer Ball Facts
  - Soccer ball
- ❑ Math Scramble
  - Index cards, each with a number 0–9; cards with the operations
- ❑ BINGO
  - Flashcards
  - BINGO boards, and tokens or colored squares
- ❑ Around the World
  - Triangle or regular flashcards

Vocabulary Definitions:

This lesson assumes that students know the following vocabulary words:

- positive integer
- negative integer
- opposites
- absolute value
- additive inverse

additive identity — The number zero, because the sum of zero and any number is that number. Example: 6 + 0 = 6.

Welcome:

 3 mins.

Greet students by name and take attendance.

Introduction:

 5 mins.

A. Access Prior Knowledge

- ***Raise a hand if you can remind me what we learned in our previous class.*** (Possible answer: We added integers with different signs.)

On your dry-erase board:

- ***Add 3 + –2.*** (1)
- ***Add 7 + 12.*** (19)
- ***Add –4 + –6.*** (–10)
- ***Add –18 + 12.*** (–6)
- ***Add –27 + –63.*** (–90)

B. Explain Connection to New Skill

You already know how to add positive and negative integers. You also understand that additive inverses add to make zero.

- ***Raise a hand to give an example of additive inverses.*** (Possible answers: –5 and 5, –8 and 8, –12 and 12.)
  NOTE: Call on several students.

In today's lesson, we are going to use those skills for subtraction problems.

C. State Lesson Objective

We are going to subtract positive integers from positive and negative integers.

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Direct Skill Instruction and Guided Practice:

In your Student Resource Book, below the Lesson Objective for Lesson Nine, you will see a Vocabulary Box that lists a new vocabulary term and its definition.

- ***Raise a hand to describe*** **additive identity.** (Zero, because the sum of zero and any number is that number.)

- ***Raise a hand to tell me the sum of +1 plus -1.*** (Zero.)

Divide into pairs. You and your partner will need a set of two-color counters and the integer mat in the Guided Practice section of your Student Resource Book. Remember that the yellow side of the counter represents a positive 1, and the red side of the counter represents a negative 1.

Let's start with a basic problem you already know how to solve, 10 – 4. NOTE: Write the problem on your board or dry-erase board.

Place 10 yellow counters on the positive side of the integer mat. NOTE: Draw the integer mat on a dry-erase board or chalkboard, and demonstrate each step of the problem by drawing positive and negative counters or using + and – signs.

Take away four counters to represent subtracting positive 4.

- ***Everyone, when I point to the board, tell me how many counters are left.*** (6)
  NOTE: Point to the board.

- ***Record the answer in Part I of the Guided Practice section of your Student Resource Books.*** (6)

Now, let's try a problem that you haven't done before, 5 – 6. NOTE: Write the problem on your board or dry-erase board.

Start by placing five yellow counters on the positive side of the integer mat. We can't take away six because there aren't enough counters on the mat. This is where the ideas of additive inverse and **additive identity** ***come in.***

- ***Raise a hand to tell me which of these ideas means that we can add zero to a number without changing it.*** (Additive identity.)

Positive 1 and negative 1 are additive inverses, and together equal zero, so we can add them to our mat without changing the total value of our counters. Add one yellow counter to the positive side, and add one red counter to the negative side.

NOTE: The students should now have six yellow counters and one red counter on each of their mats. Continue to demonstrate on the board.

We now have six positive counters on the mat and can complete our subtraction problem. The next step is to remove six positive counters. We do this because we need to subtract positive 6. NOTE: Refer to the problem on your board, 5 – 6.

- ***When I snap my fingers, tell me the solution to 5 – 6.*** (–1)
  NOTE: Snap your fingers.

Good! You can check your answer using the number line. Start at zero, and count five units to the right to show positive 5, and then move six units to the left to show subtraction of 6. You should, again, get negative 1 for your answer. When you use the number line, remember that moving to the left represents subtraction and moving to the right represents addition.

Let's try another subtraction problem using color counters and the integer mat. NOTE: Write the problem – 2 – 3 = _____ on your board or dry-erase board.

- ***Raise a hand to tell me the first step in solving the problem.*** (Place two red counters on the negative side.)

We can't take away three positives, so we need to think about using the idea of **additive identity.**

- ***Raise a hand to tell me our next step.*** (Place three positive counters and three negative counters on the mat.)
  NOTE: If students are confused, refer to additive identity for the integer three.

NOTE: Check to make sure each student now has five red counters and three yellow counters on the mat. Continue to demonstrate on your board.

- ***Take away the three positive counters to complete the problem. Raise a hand to share your result.*** (–5)

- ***Check your answer using the number line. Show me a "thumbs up" if your answer matches.*** (Students should put up their thumbs.)

Now, using the integer mat, work with your partner to "model" the last problem in this section, 3 – 7. Check your answer using the number line.
NOTE: Give students about a minute to work.

- ***Raise a hand to share your result.*** (–4)

Another way to subtract integers is to rewrite each problem as an addition problem. For instance, when we subtract 5 – 6, we can write the problem as 5 + (–6). NOTE: Write these two problems on your board or dry-erase board.

If you solve the problem the same way as we did in previous lessons, you see that the result is the same.

- ***Raise a hand to tell me the first step in solving the problem this way.*** (Find the absolute value of each integer.)
  NOTE: Complete this step on your board. You may need to ask students to refer back to Lessons 7 and 8.

- ***Raise a hand to tell me the next step.*** (Find the difference between the absolute values.)
  NOTE: Complete this step on your board.

- ***Raise a hand to tell me the last step in solving this problem.*** (Give the answer the sign of the integer with the greater absolute value.)
  NOTE: Complete this step on your board.

NOTE: You may also want to review the steps from the previous lesson for adding two negative integers.

On your dry-erase board:

- ***Write 18 – 23 as an addition problem.*** (18 + (–23))

- ***Solve the problem and hold up your dry-erase board when you are finished.*** (–5)

- ***Write –32 – 4 as an addition problem.*** (–32 + (–4))

- ***Solve the problem and hold up your dry-erase board when you are finished.*** (–36)

Please complete Parts II and III of the Guided Practice. I'll give you a few minutes, and then we'll check the answers together.

NOTE: Circulate among the students for a few minutes, making sure the students understand. Check the answers together by calling on student volunteers. Refer to the Teacher Resource Sheet for Lesson Nine.

Summary/Closure:

A. Define Vocabulary Words

In your Student Resource Book, Lesson Nine, in the Summary/Closure section, there are some questions on today's vocabulary term. Take a few minutes to define the vocabulary term and give an example.

B. Summarize What We Learned Today

Let's summarize the skill that we have been working on today. In your Student Resource Book, in the Summary/Closure section, write your own subtraction problem and solve it.

When you are finished, turn to your partner and share your answers.

C. Apply Skill

NOTE: On the board or dry-erase board, write the problem –8 – 12 = _____.

- ***When I point to the dry-erase board, read the problem, I've written, in a whisper, and give the solution.*** (–8 – 12 = –20)

On your dry-erase board:

- ***Subtract 17 – 21. When you are finished, hold up your board so I can see your answer.*** (–4)

- ***Subtract –4 – 25. When you are finished, hold up your board so I can see your answer.*** (–29)

lesson nine

Fact Practice:

7 mins.

Operation: Multiplication

Fact Activity: _____

Count/Record Tokens:

5 mins.

Count and record tokens in the Student Resource Book.

Lesson Objective: Subtract positive integers from positive and negative integers.

Vocabulary Box

additive identity — The number zero, because the sum of zero and any number is that number. Example: 6 + 0 = 6.

Guided Practice

Directions: Complete the following practice problems with your partner. Your teacher will review the answers. Make sure you show all your work.

I. Use the integer mat and two-color counters to solve each problem. Check each answer using the number line.

1. 10 – 4 =_____ *(6)*
2. 5 – 6 =_____ *(–1)*
3. –2 –3 =_____ *(–5)*
4. 3 – 7 =_____ *(–4)*

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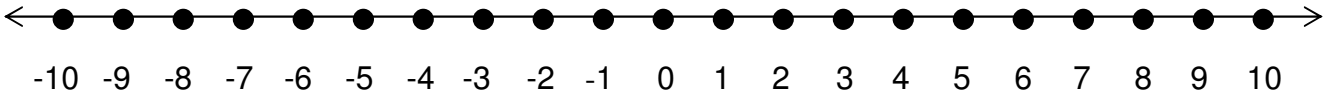
lesson nine – teacher resource sheet

Integer Mat

Negative	Positive



II. Rewrite each problem as an addition problem, then solve. Use the number line to check your answers. You may need to extend the number line by filling in more negative integers.

1. –7 – 8 =_____ *(–15)*
2. 10 – 16 =_____ *(–6)*
3. 3 – 8 =_____ *(–5)*
4. –9 – 4 =_____ *(–13)*

III. Rewrite each problem as an addition problem, then solve. Please work on your own.

1. –34 –12 =_____ *(–46)*
2. 47 – 52 =_____ *(–5)*
3. 102 – 256 =_____ *(–154)*

Summary/Closure

A. Vocabulary Words

For the vocabulary term listed, write a definition in your own words. Then tell how it relates to subtracting integers.

additive identity — *(Possible answer: Zero, because adding it to any number gives the same number. When you add a positive and a negative counter, you are keeping the net value of the counters the same.)*

B. Summarize What We Learned Today

Write a sample problem in which you subtract a positive integer from a negative integer, and then solve it. Explain how you solved the problem.

(Possible answer: –8 – 11 = –19. I rewrote the problem as an addition problem, –8+ (–11).)

lesson nine – student resource sheet

Lesson Objective: Subtract positive integers from positive and negative integers.

Vocabulary Box

additive identity — The number zero, because the sum of zero and any number is that number. Example: 6 + 0 = 6.

Guided Practice

Directions: Complete the following practice problems with your partner. Your teacher will review the answers. Make sure you show all your work.

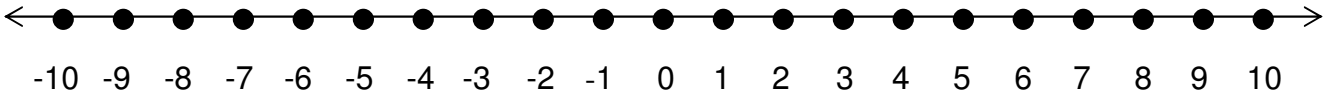
I. Use the integer mat and two-color counters to solve each problem. Check each answer using the number line.

1. 10 – 4 = _____
2. 5 – 6 = _____
3. –2 –3 = _____
4. 3 – 7 = _____

Integer Mat

Negative	Positive

lesson nine – student resource sheet



II. Rewrite each problem as an addition problem, then solve. Use the number line to check your answers. You may need to extend the number line by filling in more negative integers.

1. –7 – 8 = _____
2. 10 – 16 = _____
3. 3 – 8 = _____
4. –9 – 4 = _____

III. Rewrite each problem as an addition problem, then solve. Please work on your own.

1. –34 –12 = _____
2. 47 – 52 = _____
3. 102 – 256 = _____

Summary/Closure

A. Vocabulary Words

For the vocabulary term listed, write a definition in your own words. Then tell how it relates to subtracting integers.

additive identity —

B. Summarize What We Learned Today

Write a sample problem in which you subtract a positive integer from a negative integer, and then solve it. Explain how you solved the problem.

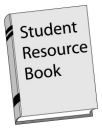
lesson twenty-six

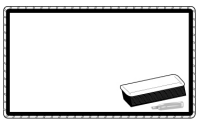
LESSON OBJECTIVE:
Multiply integers with like and unlike signs.

Introduction	Direct Skill Instruction and Guided Practice	Summary/Closure	Fact Practice
5 mins.	25 mins.	10 mins.	7 mins.

Lesson:

- ❑ Student Resource Books: Student Resource Sheets (Lesson 26)
- ❑ Dry-erase boards and dry-erase markers





Fact Practice:
(Select one of these sets of materials for the Math Facts Games.)

- ❑ Individual Student Flashcards
- ❑ Buzz
- ❑ Math War or Salute!
  - Playing cards
- ❑ Soccer Ball Facts
  - Soccer ball
- ❑ Math Scramble
  - Index cards, each with a number 0–9; cards with the operations
- ❑ BINGO
  - Flashcards
  - BINGO boards, and tokens or colored squares
- ❑ Around the World
  - Triangle or regular flashcards

Vocabulary Definitions:
This lesson assumes that students know the following vocabulary words:

- product
- absolute value
- factor
- inverse operation

integers — The set of numbers containing zero, the natural numbers, and all the negatives of the natural numbers. Examples: –4, 0, 28.

negative integer — An integer that is less than zero. Examples: –1, –17, –78.

positive integer — An integer that is greater than zero. Examples: 5, 8, 11.

Welcome:


3 mins.

Greet students by name and take attendance.

Introduction:


5 mins.

A. Access Prior Knowledge

In the past, we added and subtracted* integers*. Let's review those skills.

On your dry-erase board:

- ***Show me the solution to –4 + 3.*** (–1)
- ***Now show me the solution to 8 – (–7).*** (15)
- ***Show me the solution to –2 – (–9).*** (7)

B. Explain Connection to New Skill

You already know how to add and subtract integers. You also know how to multiply two or more numbers.

On your dry-erase board:

- ***Multiply 10 × 34.*** (340)
- ***Multiply 2 × 9 × 24.*** (432)

C. State Lesson Objective

Today we are going to use those skills to help us learn another skill, multiplying* integers *with like and unlike signs.

lesson twenty-six

Direct Skill Instruction and Guided Practice:

In your Student Resource Book, below the Lesson Objective for Lesson Twenty-Six, you will see a Vocabulary Box that lists three review terms that we learned in previous lessons.

- ***Raise a hand to remind me what*** **integers** ***are.***
  (The set of numbers containing zero, the natural numbers, and all the negatives of the natural numbers.)

- ***Stand up if you think zero is not an*** **integer.**
  (Students should not stand up.)

That's right, zero is considered an **integer.**

- ***Raise a hand to remind me what a*** **negative integer** ***is.***
  (An integer that is less than zero.)

- ***Raise a hand to remind me what a*** **positive integer** ***is.***
  (An integer that is greater than zero.)

When we multiply **integers** ***with different signs, we follow rules just like when we add or subtract*** **integers** ***with different signs.***

In your Student Resource Book, record the following information in the Guided Practice section.

SAME SIGNS, POSITIVE
DIFFERENT SIGNS, NEGATIVE

NOTE: Copy the information onto your board so the students can see exactly what to write.

When you multiply **integers** ***with the same signs, the answer is always positive. So, even when you multiply two*** **negative integers,** ***the answer will be positive because the two*** **integers** ***share the same sign.***

- ***On the count of three, everyone tell me what sign the answer will be if I multiply one*** **positive integer** ***times one*** **negative integer.** ***One, two, three!*** (Negative.)

That's correct, when we multiply two **integers** ***with different signs, the answer is always negative.***

Let's see how these rules work by trying a few problems together.

In the Guided Practice section, the first problem reads: -5×7. To solve this problem, we multiply the absolute value of each factor. Then we use the appropriate rule to place the correct sign in our product.

- ***Everyone tell me in a whisper: What is the absolute value of -5?*** (Five.)

- ***On the count of three, tell me the absolute value of seven. One, two, three!*** (Seven.)

So, we multiply those two absolute values together.

- ***Raise a hand to tell me the product of 5×7.*** (35)

- ***Raise a hand to tell me whether the 5 and the 7, in the original problem, have the same signs or different signs.*** (Different signs.)

- ***Stand up if you think the answer is going to be positive 35. You do not need to solve the proportions.***
  (Students should not stand up.)

That's right. When multiplying two **integers** ***with different signs, the resulting product is always negative.***

- ***Record the answer in your Student Resource Book.*** (–35)

Let's look at the second problem, -9×-10.

- ***When I snap my fingers, tell me the absolute value of -9.*** (9)
  NOTE: Wait a second, then snap.

- ***On the count of three, everyone tell me the absolute value of -10. One, two, three!*** (10)

- ***Everyone whisper the answer to 9×10.*** (90)

- ***Raise a hand to tell me whether the answer is positive or negative.***
  (Positive.)

- ***Raise a hand to explain why the answer is positive.***
  (Both 9 and 10 are negative; they have the same sign.)

- ***On your dry-erase board, solve the third problem, 8×-12. When you are finished, hold up your board so I can see your answer.***
  (–96)

Before you work on your own, let's try the fourth problem together, -4×3 x -2.

It is important to remember that our rules work only when we are multiplying a pair of* integers*. When you have more than two* integers*, you must multiply two* integers *at a time and use the rule that applies each time.

For this problem, we begin by multiplying -4 × 3.
NOTE: Write -4 × 3 on your board or dry-erase board.

- ***When I snap my fingers, everyone tell me the answer.*** (-12)
  NOTE: Wait a moment, then snap.

Good! Next we multiply -12 × -2.

- ***Everyone tell me the answer in a whisper.*** (24)

That's correct! Our final answer is positive because we ended up multiplying two* integers *with the same sign.

Checking answers to math problems is always a good idea. To check our answers to multiplication problems, we use division, which is the inverse operation of multiplication. The same* integer *rules that apply to multiplication apply to division. For example, if you are dividing* integers *with different signs, divide the absolute values, and the answer is negative.

Let's check our answer to the first problem, -5 × 7, together. Our answer was -35. So, to check it, we divide 35 by either factor. To keep it simple, let's work backward from right to left. So, we'll divide -35 by 7.

- ***Raise a hand to tell me the answer, explaining how you got that answer.***
  (-5; I divided the absolute values, so I divided 35 by 7, which gave me 5. Then because the integers had different signs, the answer is negative 5.)

- ***Show me a "thumbs up" if you think our answer checked out correctly.***
  (Students should put up their thumbs.)

Right, since our answer was the other factor in our original problem, we know that our answer is correct.

With a partner, check the answers to the other problems in Part I of the Guided Practice section. Remember, if you have more than two* integers *in a problem, check the answer by dividing two at a time from right to left. Then finish the problems in Part II of the Guided Practice section on your own. When you are finished, we'll review the answers together.

NOTE: Circulate as the students work. After they have finished, check the answers by calling on student volunteers. Refer to the Teacher Resource Sheet for Lesson Twenty-Six.

Summary/Closure:

A. Define Vocabulary Words

You will use the headings* Positive Integer *and* Negative Integer *to classify* integers *and solutions. Write the* integers *and problems under the correct headings.

B. Summarize What We Learned Today

Explain in your own words how to multiply more than two* integers *together. Then write an example problem and solve it.

C. Apply Skill

On your dry-erase board, solve the following problems. Hold up your board when you are finished solving each problem:

- ***–15 × –5.*** (75)
- ***–7 × –6 × 3.*** (126)
- ***4 × 5 × –9.*** (–180)

lesson twenty-six

Fact Practice:

7 mins.

Operation: Multiplication

Fact Activity: _____

Count/Record Tokens:

5 mins.

Count and record tokens in the Student Resource Book.

Lesson Objective: Multiply integers with like and unlike signs**.**

Vocabulary Box

integers — The set of numbers containing zero, the natural numbers, and all the negatives of the natural numbers. Examples: –4, 0, 28.

negative integer — An integer that is less than zero. Examples: –1, –17, –78.

positive integer — An integer that is greater than zero. Examples: 5, 8, 11.

Guided Practice

MULTIPLICATION RULES
SAME SIGNS *(POSITIVE)*

DIFFERENT SIGNS *(NEGATIVE)*

Directions: Complete the following practice problems. Your teacher will review the answers. Make sure you show all your work.

I. Work with a partner to multiply each set of integers and check each answer.

1. $-5 \times 7 =$ _____ *(–35)*

2. $-9 \times -10 =$ _____ *(90)*

3. $8 \times -12 =$ _____ *(–96)*

4. $-4 \times 3 \times -2 =$ _____ *(24)*

II. Multiply each set of integers and check your answers. Please work on your own.

1. $-8\times-13\times-6=$ _____ *(–624)*

2. $-5\times-12\times10\times-17=$_____ *(–10,200)*

3. $-18\times-19\times38=$_____ *(12,996)*

4. $45\times32\times-5=$_____ *(–7,200)*

Summary/Closure

A. Vocabulary Words

Classify the integers and problems below by writing them under the correct heading.

-4, 18, -2×3, –15, $-7\times-10\times3$

POSITIVE INTEGER	NEGATIVE INTEGER
$(-7\times-10\times3)$ *(18)*	*(– 4)* *(-2×3)* *(– 15)*

B. Summarize What We Learned Today

Explain, in your own words, how to multiply more than two integers with different signs. Then write and solve an example problem in which you multiply three integers, two of which have different signs.

(Possible answer: Multiply the integers one pair at a time, following the rule for multiplying integers. Examples will vary.)

lesson twenty-six – student resource sheet

Lesson Objective: Multiply integers with like and unlike signs.

Vocabulary Box

integers — The set of numbers containing zero, the natural numbers, and all the negatives of the natural numbers. Examples: –4, 0, 28.

negative integer — An integer that is less than zero. Examples: –1, –17, –78.

positive integer — An integer that is greater than zero. Examples: 5, 8, 11.

Guided Practice

MULTIPLICATION RULES

SAME SIGNS _____

DIFFERENT SIGNS _____

Directions: Complete the following practice problems. Your teacher will review the answers. Make sure you show all your work.

I. Work with a partner to multiply each set of integers and check each answer.

1. $-5 \times 7 =$ _____

2. $-9 \times -10 =$ _____

3. $8 \times -12 =$ _____

4. $-4 \times 3 \times -2 =$ _____

II. Multiply each set of integers and check your answers. Please work on your own.

1. $-8 \times -13 \times -6 =$ _____

2. $-5 \times -12 \times 10 \times -17 =$ _____

3. $-18 \times -19 \times 38 =$ _____

4. $45 \times 32 \times -5 =$ _____

Summary/Closure

A. Vocabulary Words
Classify the integers and problems below by writing them under the correct heading.

$-4,\ 18,\ -2 \times 3,\ -15,\ -7 \times -10 \times 3$

POSITIVE INTEGER	NEGATIVE INTEGER

B. Summarize What We Learned Today
Explain, in your own words, how to multiply more than two integers with different signs. Then write and solve an example problem in which you multiply three integers, two of which have different signs.