# #10143
# BASIC MATH:
# SUBTRACTING INTEGERS

CEREBELLUM CORPORATION, 2001
Grade Level: 7-12
10 mins.
2 Instructional Graphics Enclosed

## DESCRIPTION

Discover the ins and outs of subtracting integers. Covers positive and negative combinations, large numbers, and borrowing. Uses several examples. Standard Deviants School.

## ACADEMIC STANDARDS

### Subject Area: Mathematics

- Standard:  Understands and applies basic and advanced properties of the concepts of numbers
  - Benchmark:  Understands the role of positive and negative integers in the number system (See INSTRUCTIONAL GOALS 2, 3, and 4.)
  - Benchmark:  Understands the basic meaning of place value (See INSTRUCTIONAL GOALS 5.)
  - Benchmark:  Uses models (e.g., number lines, two-dimensional and three-dimensional regions) to identify, order, and compare numbers (See INSTRUCTIONAL GOALS 4.)
- Standard:  Uses basic and advanced procedures while performing the processes of computation
  - Benchmark:  Adds, subtracts, multiplies, and divides whole numbers, fractions, decimals, integers, and rational numbers (See INSTRUCTIONAL GOALS 1, 3, and 6.)

## INSTRUCTIONAL GOALS

1. To define *subtraction* and explain how it is the inverse or reverse of addition.
2. To show how to subtract positive and negative integers using a vertical number line.
3. To explain that subtracting a positive integer is the same as adding a negative integer.
4. To demonstrate the rule that two negatives always make a positive, so that subtracting a negative number is the same as adding the positive number.
5. To review basic place value to the hundreds place.
6. To demonstrate subtraction of larger integers, including borrowing.

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## VOCABULARY

| | | |
|---|---|---|
| 1. addition | 8. hundreds place | 15. reverse |
| 2. borrowing | 9. integer | 16. solution |
| 3. digit | 10. inverse | 17. subtraction |
| 4. difference | 11. minus | 18. take away |
| 5. digit | 12. negative | 19. tens place |
| 6. equal | 13. operation | 20. units place |
| 7. equation | 14. positive | |

## BEFORE SHOWING

1. Do some addition problems involving positive and negative integers and carrying.  Review use of a vertical number line.
2. Review basic subtraction information.
3. Copy and distribute the "Subtracting Integers: Viewing Guide."  (See INSTRUCTIONAL GRAPHICS.)
   a. Encourage the students to follow along on the viewing guide as the concepts are explained in the video.
   b. Explain that there will be time to complete the math problems on the viewing guide during pauses of the video or after viewing.

## DURING SHOWING

1. View the video more than once, with one showing uninterrupted.
2. Pause after the brief explanation that subtracting a positive number is the same as adding the negative of that number (i.e., $3 - 6 = -3$ is the same as $3 + [-6] = -3$).
   a. Answer questions to clarify the meaning.
   b. Allow students time to complete the subtraction problem on their viewing guide.
   c. Do more examples if necessary.
   d. Review briefly the use of a vertical number line for these problems.
3. Pause after the example of subtracting a negative integer (i.e., $3 - [-6] = 9$).
   a. Review that you must move up on a vertical number line (or to the right on a horizontal number line) when subtracting a negative number.
   b. Review the rule that two negatives equal a positive.
   c. Do more examples to be sure that all students understand this process.

## AFTER SHOWING

### Discussion Items and Questions

1. Define *subtraction*.  Explain how it is the inverse or reverse of addition.
2. Explain how a subtracting a positive number is the same as adding the negative of that number.  Give examples.
3. What is the answer or solution of a subtraction problem called?
4. What is the rule about two negatives in an equation?

5. Discuss subtraction with larger numbers.  Review the steps.  Students can complete the math problems on the viewing guide.  Do additional examples if necessary.

## Applications and Activities

1. Use the viewing guide to review the information from the video.  Clarify any remaining questions or issues about subtraction.
2. Note that the viewing guide has "Word Problem Strategies" at the bottom of the page that were not explained in the video.
   a. Read and explain these steps.
   b. Practice each step while doing an addition or subtraction word problem together.
   c. Do additional subtraction word problems to practice these steps.
3. Complete the "Subtracting Integers: Check Your Knowledge" worksheet.  (See INSTRUCTIONAL GRAPHICS.)
4. Use unit, ten, and hundred blocks to show subtraction of large numbers involving borrowing.  Borrow by exchanging 1 digit's blocks for 10 blocks of the digit to the left.
5. In small groups or pairs, write original word problems for subtraction.  Exchange problems with another group and solve.
6. Make individual number lines that include negative integers.  Use the number lines to practice subtracting small positive and negative integers.
7. Play a variation of the card game WAR to practice addition.
   a. Use a regular deck of playing cards.  Assign values to the face cards (J = 11, Q = 12, and K = 13) or remove them.
   b. Each pair of students deals the cards as if playing WAR–the whole deck evenly.  Students do not look at the cards.
   c. Each player flips up two cards and subtracts the two numbers, left to right regardless of the number values, announcing the answer to their partner.
   d. The player with the lowest difference wins the trick.  If the students disagree on an answer, the teacher can be the referee.
   e. Play for a set time and the player with the most cards wins, or play until one player possesses *all* the cards.
   f. To make the game more complex, identify one color of cards as negative and the other as positive.  Play the game the same way.

## CMP RELATED RESOURCES

- *Basic Math:  Dividing Integers  #10137*
- *Basic Math:  Integers and Addition  #10139*
- *Basic Math:  Multiplying Integers  #10141*
- *Integer Operations:  Into the Negative Zone!  Part 1:  Adding and Subtracting #9933*

## World Wide Web

The following Web sites complement the contents of this guide; they were selected by professionals who have experience in teaching deaf and hard of hearing students. Every effort was made to select accurate, educationally relevant, and "kid safe" sites.  However, teachers should preview them before use.  The U.S. Department of Education, the National Association of the Deaf, and the Captioned Media Program do not endorse the sites and are not responsible for their content.

- **ADDING AND SUBTRACTING INTEGERS**

http://www.math.com/school/subject1/lessons/S1U1L11GL.html#sm3

Multiple-page Web site with explanations of adding and subtracting integers using a number line and online practice examples.

- **MATH FORUM: ASK DR. MATH**        http://forum.swarthmore.edu/dr.math/

"Ask Dr. Math" allows users to e-mail questions to Dr. Math and access archived material.  For other materials that relate to this media, click on "Elementary" and then "Subtraction," or choose "Middle School," then "Negative Numbers" or "Word Problems."

- **LINE JUMPER**                        http://www.funbrain.com/linejump

Use this interactive number line to solve addition and subtraction problems with positive and negative integers to +/- 16.

- **MODELING SUBTRACTION OF INTEGERS**

http://www.harcourtschool.com/activity/elab2002/grade_5/018.html

Use an interactive magic square to practice adding and subtracting positive and negative integers.  By clicking on the "Recording Sheet" you not only get a form to work with, you also get instructions for how to do the magic square activity.

- **AAA MATH: SUBTRACTION**               http://www.aaamath.com/sub.html

Find a whole list of subtraction activities, each with an explanation, interactive practice, and games.

## INSTRUCTIONAL GRAPHICS

- SUBTRACTING INTEGERS:  VIEWING GUIDE
- SUBTRACTING INTEGERS:  CHECK YOUR KNOWLEGE

# Subtracting Integers: Viewing Guide

*Basic Math*

### Show your work and solve the problems with the program!
### Your teacher will be asking you for the answers!

## Subtraction

• The reverse of addition.
• Taking away integers.
• The answer is called the **difference.**

## $9 - 7 =$

Subtracting a positive number is the same as adding a negative number.

## $3 - 6 =$                    $3 + (-6) =$

**Borrowing:** Take one away from the digit place to the left and add ten to the number being subtracted from.

$$\begin{array}{r} 13 \\ \underline{-7} \end{array}$$

### The Ant Problem

$$\begin{array}{r} 723 \\ \underline{-287} \end{array}$$

## Word Problem Strategies
Remember R.I.O.T.S.

| | |
|---|---|
| **R**ead | the problem. |
| **I**dentify | what you must solve. |
| *Out of here!* | Remove all unnecessary information. |
| **T**ranslate | the word problem into a math problem; break it down into logical steps. |
| **S**olve | the problem. |

# Subtracting Integers: Check Your Knowledge

Basic Math

Total Score

/ 50

## A.  Mission Subtraction

*Solve each problem. Show your work (3 points each).*

1.  $\begin{array}{r} 12 \\ -(-5) \\ \hline \end{array}$
2.  $\begin{array}{r} 31 \\ -\ 9 \\ \hline \end{array}$
3.  $\begin{array}{r} 87 \\ -78 \\ \hline \end{array}$
4.  $\begin{array}{r} 23 \\ -\ 7 \\ \hline \end{array}$
5.  $\begin{array}{r} 375 \\ -91 \\ \hline \end{array}$

6.  $\begin{array}{r} 35 \\ -(-21) \\ \hline \end{array}$
7.  $\begin{array}{r} 909 \\ -567 \\ \hline \end{array}$
8.  $\begin{array}{r} 871 \\ -\ 96 \\ \hline \end{array}$
9.  $\begin{array}{r} 840 \\ -383 \\ \hline \end{array}$
10. $\begin{array}{r} 6,753 \\ -2,924 \\ \hline \end{array}$

11. $\begin{array}{r} 31,672 \\ -5,493 \\ \hline \end{array}$
12. $\begin{array}{r} 68,310 \\ -43,909 \\ \hline \end{array}$
13. $\begin{array}{r} 9,999 \\ -1,750 \\ \hline \end{array}$
14. $\begin{array}{r} 1,234 \\ -432 \\ \hline \end{array}$

## B.  Word Problems

*Solve each problem. Show your work (2 points each).*

1.  The budget for the school trip was originally $85. First, it was reduced to $66 and then it was reduced even further to $45. By how many dollars was it reduced each time?

2.  Jason has $32 in the bank and writes a check for $25. What is his bank balance after the check is cashed?

3.  If you remove all the "i's" from Mississippi, how many letters does "Mississippi" have?

4.  A ship travelling from San Francisco to Tokyo has a journey 5,497 miles long. If it stops in Honolulu after travelling 2,100 miles, how much farther does the ship have to go?

# Subtracting Integers:
# Check Your Knowledge

Basic Math

## *Answer Key*

| Total Score |
|---|
| / 50 |

## A.  Mission Subtraction

*Solve each problem. Show your work (3 points each).*

1.  $\begin{array}{r} 12 \\ -(-5) \\ \hline 17 \end{array}$

2.  $\begin{array}{r} 31 \\ -\ 9 \\ \hline 22 \end{array}$

3.  $\begin{array}{r} 87 \\ -78 \\ \hline 9 \end{array}$

4.  $\begin{array}{r} 23 \\ -\ 7 \\ \hline 16 \end{array}$

5.  $\begin{array}{r} 375 \\ -91 \\ \hline 284 \end{array}$

6.  $\begin{array}{r} 35 \\ -(-21) \\ \hline 56 \end{array}$

7.  $\begin{array}{r} 909 \\ -567 \\ \hline 342 \end{array}$

8.  $\begin{array}{r} 871 \\ -\ 96 \\ \hline 775 \end{array}$

9.  $\begin{array}{r} 840 \\ -383 \\ \hline 457 \end{array}$

10. $\begin{array}{r} 6,753 \\ -2,924 \\ \hline 3,829 \end{array}$

11. $\begin{array}{r} 31,672 \\ -5,493 \\ \hline 26,179 \end{array}$

12. $\begin{array}{r} 68,310 \\ -43,909 \\ \hline 24,401 \end{array}$

13. $\begin{array}{r} 9,999 \\ -1,750 \\ \hline 8,249 \end{array}$

14. $\begin{array}{r} 1,234 \\ -432 \\ \hline 802 \end{array}$

## B.  Word Problems

*Solve each problem. Show your work (2 points each).*

1.  The budget for the school trip was originally $85. First, it was reduced to $66 and then it was reduced even further to $45. By how many dollars was it reduced each time?

    **1st time:        $85 − $66 = $19**
    **2nd time:      $66 − $45 = $21**

2.  Jason has $32 in the bank and writes a check for $25. What is his bank balance after the check is cashed?

    **$32 − $25 = $7**

3.  If you remove all the "i's" from Mississippi, how many letters does "Mississippi" have?

    **Mississippi has 11 letters and 4 "i's", so 11 − 4 = 7 letters left**

4.  A ship travelling from San Francisco to Tokyo has a journey 5,497 miles long. If it stops in Honolulu after travelling 2,100 miles, how much farther does the ship have to go?

    **5,497 − 2,100 = 3,397 miles to go**