

Interactive Notebooks

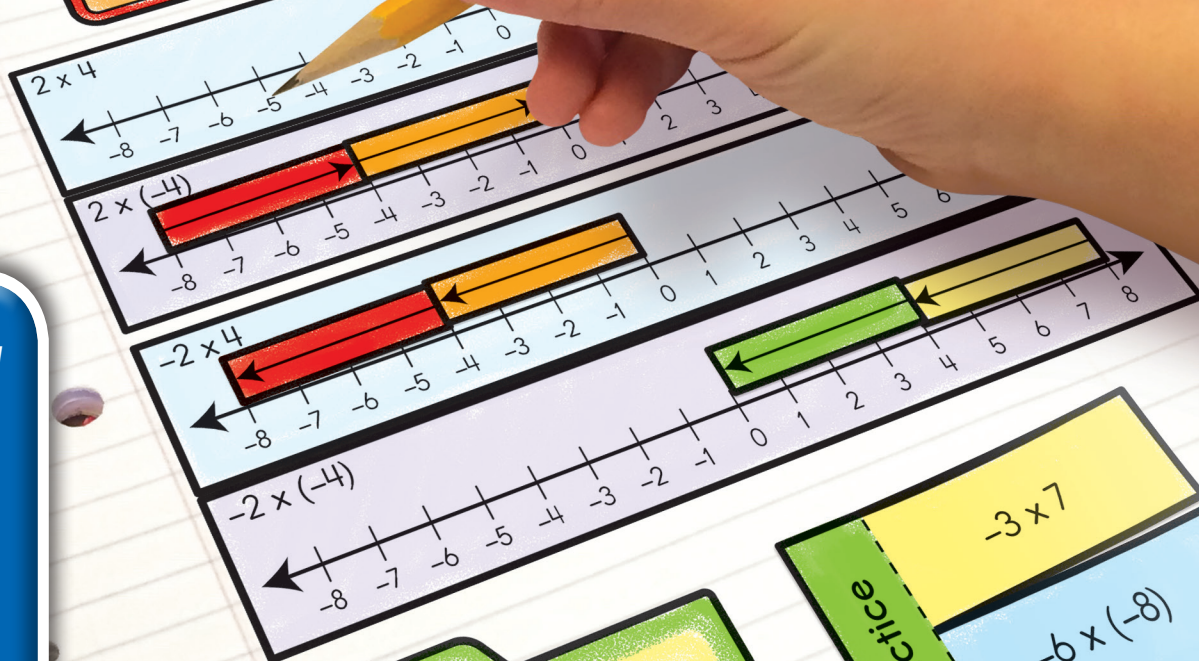
Grade
7

MATH



Multiplying Integers

To multiply integers, use repeated addition.
when the first factor is positive,
the first factor is negative,
the first repeated subtraction.



- Ideal for organizing information and applying learning
- Perfect for addressing the needs of individual learners
- Includes step-by-step instructions for each page
- Great for introducing new math topics

Hints

Same Signs:
Positive Product

Practice

-3×7

$-6 \times (-8)$

Integers and Absolute Value

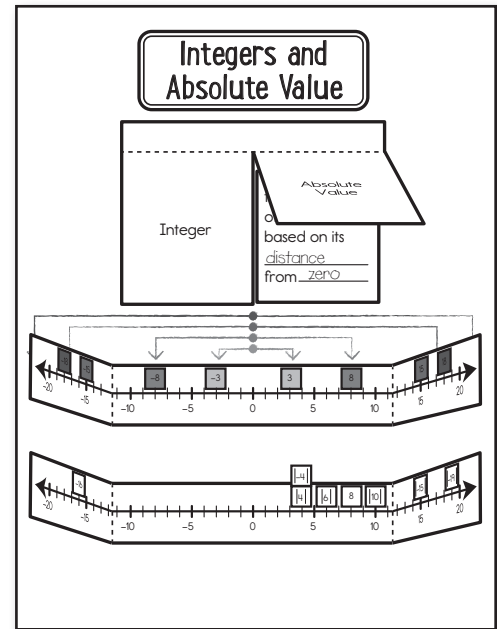
Introduction

Write $+3$ and -3 on the board. Have students discuss the relationship between the numbers. Draw a number line on the board and have students describe where each number should be placed. Distribute index cards with other integer pairs. Have each student find the student with her opposite number. Then, have them add each pair of integers to the number line.

Creating the Notebook Page

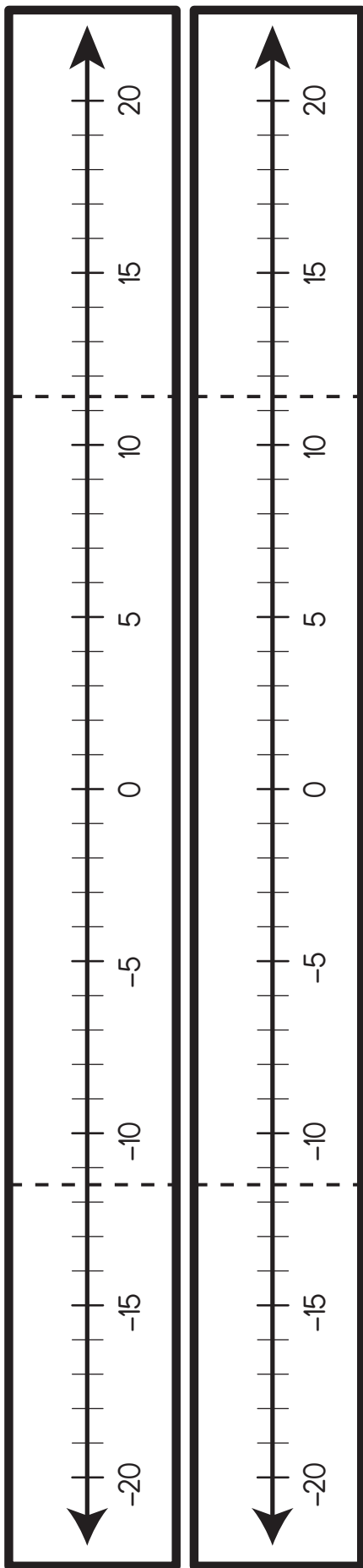
Guide students through the following steps to complete the right-hand page in their notebooks.

1. Add a Table of Contents entry for the Integers and Absolute Value pages.
2. Cut out the title and glue it to the top of the page.
3. Cut out the flap book. Cut on the solid line to create two flaps. Apply glue to the back of the top section and attach it to the page below the title.
4. Cut out the two definition pieces and complete the definitions. (a **positive** or **negative whole** number; the **magnitude** of a **number** based on its **distance** from **zero**) Glue each square under the appropriate flap.
5. Cut out one of the number lines. Fold in on the dashed lines. Apply glue to the back of the center section and attach it to the page below the flap book, leaving a few lines of space between.
6. Cut out the four pairs of opposite integers. Glue each integer to the appropriate place on the number line.
7. Shade each set of opposite values with a different color. Then, draw color-coded arrows from zero to each value. Discuss how opposite quantities always have a sum of zero.
8. Cut out the remaining number line. Fold in on the dashed lines. Apply glue to the back of the center section and attach it to the page below the first number line.
9. Cut out the remaining numbers. Glue each absolute value to the correct place on the number line.



Reflect on Learning

To complete the left-hand page, have students describe two situations in which integers can be used in real life. Then, have students describe two situations in which absolute value can be used in real life.



Integers and Absolute Value

Integer

Absolute Value

a _____
or _____
_____ number

the _____
of a _____
based on its
_____ from _____

3	8	15	18
-3	-8	-15	-18

10	-15	-4	8
4	-16	-19	6

Working with Rational Numbers

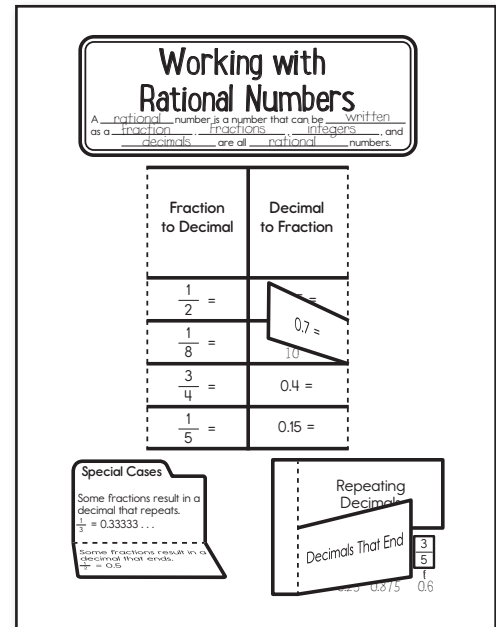
Introduction

Write 2 , 5 , $\frac{7}{8}$, 0.25 , $1\frac{2}{5}$, and 6.78 on the board. Then, have students work with partners to sort them into three categories. Have them identify what is similar and different about each group and share their thinking with the class. Explain that although these numbers are written in different forms, they all can be described as rational numbers.

Creating the Notebook Page

Guide students through the following steps to complete the right-hand page in their notebooks.

1. Add a Table of Contents entry for the Working With Rational Numbers pages.
2. Cut out the title and glue it to the top of the page.
3. Complete the sentences. (A **rational** number is a number that can be **written** as a **fraction**. **Fractions**, **integers**, and **decimals** are all **rational** numbers.)
4. Cut out the shutter fold piece. Cut on the solid lines to create ten flaps. Flip over the piece so that the blank side is faceup. Fold each flap in on the dashed lines. Flip the piece back over and apply glue to the gray glue section. Attach the shutter fold to the page below the title.
5. Open the top two flaps and write the steps to convert between number forms. (Fraction to Decimal: 1. Rewrite as a division problem. 2. Divide. Decimal to Fraction: 1. Rewrite the digits over the appropriate power of 10. 2. Simplify.) Then, convert the number on each flap and write the answer under the flap.
6. Cut out the *Special Cases* folder. Fold in on the dashed line. Apply glue to the back of the folder and attach it to the bottom left side of the page.
7. Cut out the flap book. Cut on the solid line to create two flaps. Apply glue to the back of the left section and attach it to the bottom right side of the page.
8. Cut out the fraction pieces and glue each one under the correct flap. Then, convert each fraction to a decimal.



Reflect on Learning

To complete the left-hand page, have students explain why it is helpful to convert between number forms. Have students explain two real-life situations in which they might use this skill.

Answer Key

Repeating Decimals: $\frac{2}{3}$, 0.666666 ; $\frac{1}{12}$, 0.083333 ; $\frac{1}{6}$, 0.166666 ; Decimals Ending in Zero: $\frac{1}{4}$, 0.25 ; $\frac{7}{8}$, 0.875 ; $\frac{3}{5}$, 0.6

Working with Rational Numbers

A _____ number is a number that can be _____ as a _____, _____, and _____ are all _____ numbers.

Decimal to Fraction		Fraction to Decimal
0.25 =	glue	$\frac{1}{2} =$
0.7 =		$\frac{1}{8} =$
0.4 =		$\frac{3}{4} =$
0.15 =		$\frac{1}{5} =$

Special Cases

Some fractions result in a decimal that repeats.
 $\frac{1}{3} = 0.33333 \dots$

Some fractions result in a decimal that ends.
 $\frac{1}{2} = 0.5$

Repeating
Decimals

Decimals That End

$\frac{2}{3}$	$\frac{1}{4}$
$\frac{7}{8}$	$\frac{1}{12}$
$\frac{1}{6}$	$\frac{3}{5}$

Adding Integers

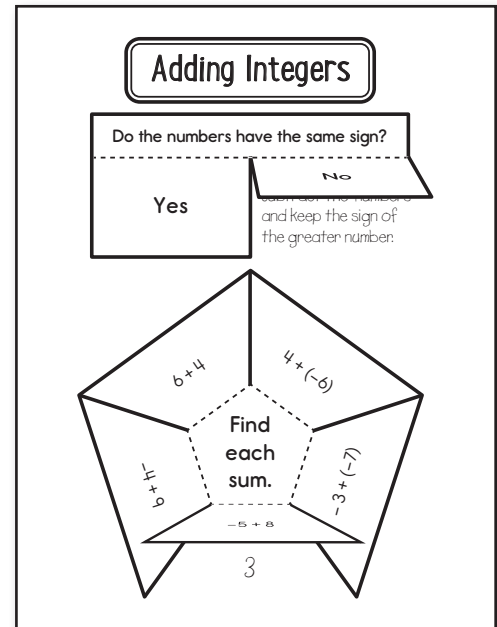
Introduction

Draw a number line on the board that runs from 0 to 8. Demonstrate how to use the number line to find the sum of $3 + 5$. Draw a number line on the board that runs from 0 to -8 . Have students work with partners to find the sum of $-3 + (-5)$ and mark their answers on the number line. Allow time for students to explain their answers to the class.

Creating the Notebook Page

Guide students through the following steps to complete the right-hand page in their notebooks.

1. Add a Table of Contents entry for the Adding Integers pages.
2. Cut out the title and glue it to the top of the page.
3. Cut out the *Do the numbers have the same sign?* flap book. Cut on the solid line to create two flaps. Apply glue to the back of the top section and attach it to the page below the title.
4. Under each flap, write the procedure for adding integers. (Yes: Add the numbers and keep the sign. No: Subtract the numbers and take the sign of the greater number.)
5. Cut out the pentagon-shaped flap book. Cut on the solid lines to create five flaps. Apply glue to the back of the center section and attach it to the bottom of the page.
6. Solve each problem and write the answer under the flap.



Reflect on Learning

To complete the left-hand page, have students solve the following problems to illustrate integer addition using number lines: $5 + (-3)$; $-8 + 2$; $-2 + (-7)$.

Answer Key

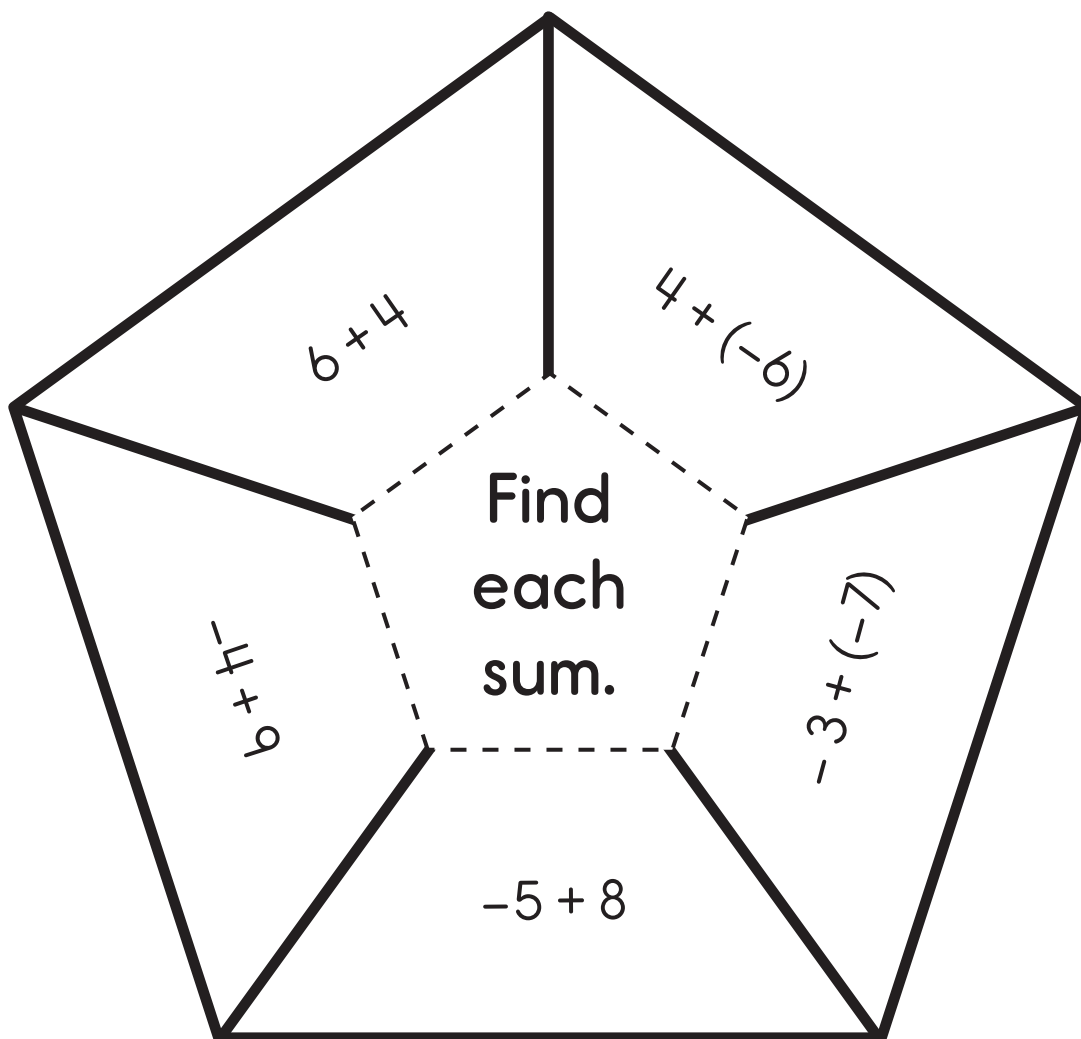
Clockwise from top left: 10; -2 ; -10 ; 3; 5

Adding Integers

Do the numbers have the same sign?

Yes

No



Subtracting Integers

Introduction


Write -3 on the board. Have students work in small groups to brainstorm different ways they could describe this number. Answers may include: *the negative sign could represent subtraction, as in $5 - 3$; the number could be described as 3 places below zero on a number line; and the number could be described as the opposite, or additive inverse, of 3.*

Creating the Notebook Page

Guide students through the following steps to complete the right-hand page in their notebooks.

1. Add a Table of Contents entry for the Subtracting Integers pages.
2. Cut out the title and glue it to the top of the page.
3. Complete the explanation. (To **subtract** integers, use integer **addition** and the **additive inverse** of the **subtrahend**.)
4. Cut out the star. Glue it on the top left side of the page.
5. Cut out the smaller rectangle. Apply glue to the back of it and place it on the top right side of the page.
6. Discuss the meaning of the hint on the star. (Change the operation to addition by adding a line to the subtraction symbol and then change the sign of the integer.) Then, use a colored pen or pencil to change each integer subtraction problem to an addition problem with the additive inverse of the subtrahend.
7. Cut out the flap book. Cut on the solid lines to create six flaps. Apply glue to the back of the left section and attach it to the bottom of the page.
8. On each flap, rewrite the problem from the left column as an addition problem with the additive inverse as the subtrahend. Then, solve the problem under the flap.

Subtracting Integers
 To subtract integers, use integer addition and the additive inverse of the subtrahend.



Add a line and change the sign.

$4 + (-6)$	$-3 + (-2)$
$-5 + (+7)$	$6 + (+3)$

Solve each problem.	$-6 - (-5)$	$-6 + 5$
	$-3 - 13$	$-3 + (-13)$
	$-6 - 9$	$-6 + (-9)$
	$5 - 18$	$5 + (-18)$
	$-1 - (-11)$	$-1 + 11$
	$32 - 35$	$32 + (-35)$

Reflect on Learning

To complete the left-hand page, have students explain why the additive inverse has to be used when subtracting integers.

Answer Key

$-6 + 5 = -1$; $-3 + (-13) = -16$; $-6 + (-9) = -15$; $5 + (-18) = -13$; $-1 + 11 = 10$; $32 + (-35) = -3$

Subtracting Integers

To _____ integers, use integer _____ and the _____ of the _____.

Add a line
and change
the sign.

$$4 - 6$$

$$-3 - 2$$

$$-5 - (-7)$$

$$6 - (-3)$$

Solve each problem.

$$-6 - (-5)$$

$$-3 - 13$$

$$-6 - 9$$

$$5 - 18$$

$$-1 - (-11)$$

$$32 - 35$$

Adding and Subtracting Using Mathematical Properties

Introduction

Review the associative, commutative, equality, and identity properties. Then, write $4 + 1 + 5$ on the board. Have students work with partners to brainstorm different ways to write the expression without changing its value.

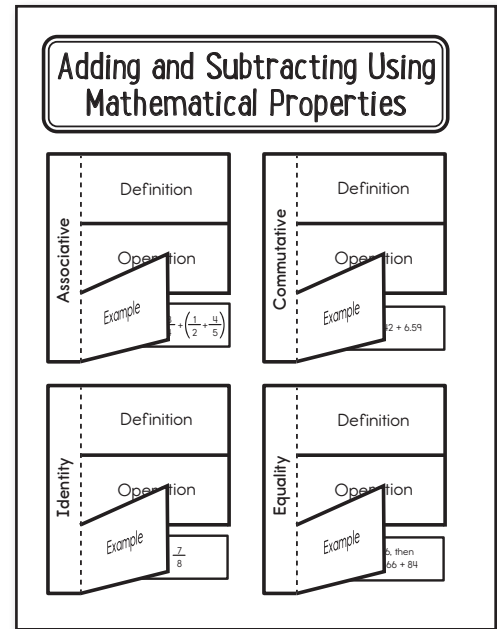
Creating the Notebook Page

Guide students through the following steps to complete the right-hand page in their notebooks.

1. Add a Table of Contents entry for the Adding and Subtracting Using Mathematical Properties pages.
2. Cut out the title and glue it to the top of the page.
3. Cut out the four flap books. Cut on the solid lines to create three flaps on each. Apply glue to back of each left section and attach it to the page.
4. Under the first flap of each flap book, write a definition of the property and indicate which operations it is used for. (Associative: when three or more numbers are added, the sum is the same regardless of how the addends are grouped; addition; Commutative: when two or more numbers are added, the sum is the same regardless of the order of the addends; addition; Equality: A number can be added or subtracted on both sides to get an equal equation; addition and subtraction; Identity: the sum or difference of any number and zero is the original number; addition and subtraction)
5. Cut out the example pieces. Glue each example under the correct flap.

Reflect on Learning

To complete the left-hand page, have students write and label two more examples for each property.



Adding and Subtracting Using Mathematical Properties

Associative			Commutative		
Example	Operation	Definition	Example	Operation	Definition

Equality			Identity		
Example	Operation	Definition	Example	Operation	Definition

$\left(\frac{3}{4} + \frac{1}{2}\right) + \frac{4}{5} = \frac{3}{4} + \left(\frac{1}{2} + \frac{4}{5}\right)$	$\text{If } 37 + 29 = 66, \text{ then } 37 + 29 + 84 = 66 + 84$
$6.59 + 7.42 = 7.42 + 6.59$	$\frac{7}{8} - 0 = \frac{7}{8}$