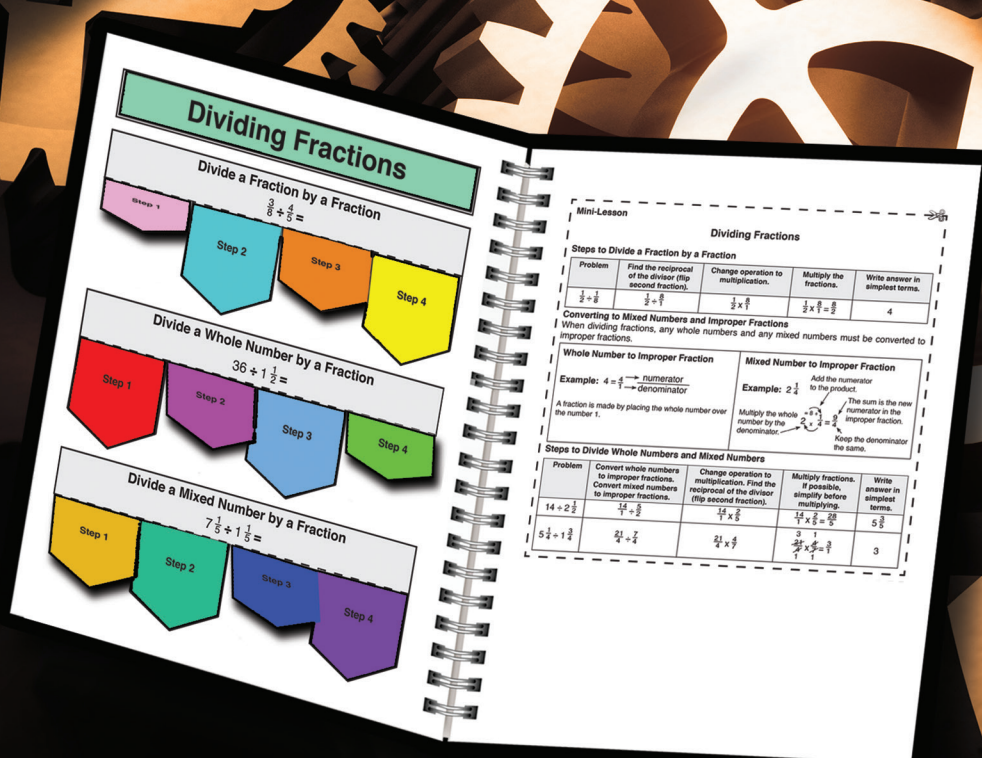# Interactive
Math Notebook:
Grade 6

Number System • **Ratios & Proportions** • **Geometry**
Expressions & Equations • **Statistics & Probability**

Students create a personalized resource for:

- reviewing information

- reinforcing concepts

- studying for tests

About the Authors

Schyrlet Cameron (left) has 34 years of experience as an elementary and middle-school teacher. She has authored or co-authored over 50 teacher resource books. Schyrlet is currently an educational consultant and writer/editor. She has presented workshops at the national, state, and local levels on a variety of topics. Schyrlet holds a Master of Education Degree in Elementary Education and has received recognition for her professionalism in teaching, including the Missouri Science Teacher of the Year Award and the national Excellence in Teaching Elementary Science Presidential Award.

Carolyn Craig (right) has 26 years of experience as an elementary and middle-school teacher. She has co-authored over 30 teacher resource books. Carolyn is currently an educational consultant and writer/editor. She holds a Master of Education Degree in Curriculum. Carolyn has presented workshops on a variety of topics and has received recognition by the Missouri Middle School Association for her collaborative teamwork.

To see these products and more, visit your nearest teacher bookstore or go online at **www.carsondellosa.com** and Shop by Brand for Mark Twain Media, Inc., Publishers.
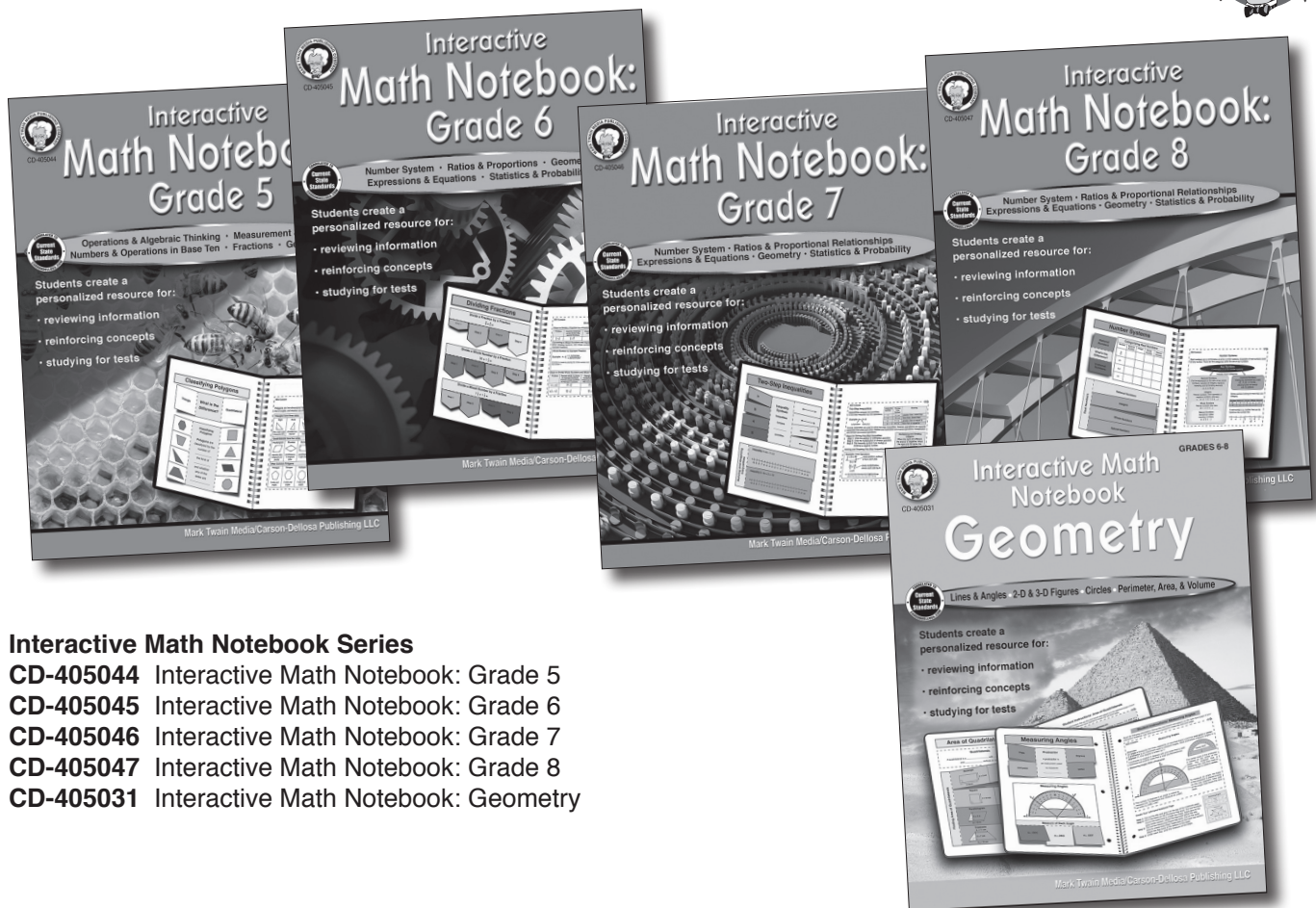
This product has been correlated to current state, national, and Canadian provincial standards. Visit www.carsondellosa.com to search and view its correlations to your standards, or call 800-321-0943 for more information.

Interactive Math Notebook: Grade 6

Authors: Schyrlet Cameron and Carolyn Craig
Editor: Mary Dieterich
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Margaret Brown

Table of Contents

Introduction

The *Interactive Math Notebook: Grade 6* is designed to allow students to become active participants in their own learning. The book lays out an easy-to-follow plan for setting up, creating, and maintaining an interactive notebook.

An interactive notebook is simply a spiral notebook that students use to store and organize important information. It is a culmination of student work throughout the unit of study. Once completed, the notebook becomes the student's own personalized notebook and a great resource for reviewing and studying for tests.

The intent of the book is to help students make sense of new information. Textbooks often present more facts and data than students can process at one time. This book introduces each concept in an easy-to-read and easy-to-understand format that does not overwhelm the learner. The text presents only the most important information, making it easier for students to comprehend. Vocabulary words are printed in boldfaced type.

The book focuses on the critical areas for mathematics in grade six. The 28 lessons cover 5 units of study: Number Systems; Ratios and Proportional Relationships; Expression and Equations; Geometry; and Statistics and Probability. The units can be used in the order presented or in an order that best fits the classroom curriculum. Teachers can easily differentiate units to address the individual learning levels and needs of students. The lessons are designed to support state and national standards. Each lesson consists of two pages that are used to create the right-hand and left-hand pages of the interactive notebook.

- **Input page:** essential information for understanding the lesson concepts and directions for creating the interactive page.
- **Output page:** hands-on activity such as a foldable or graphic organizer to help students process essential information from the lesson.
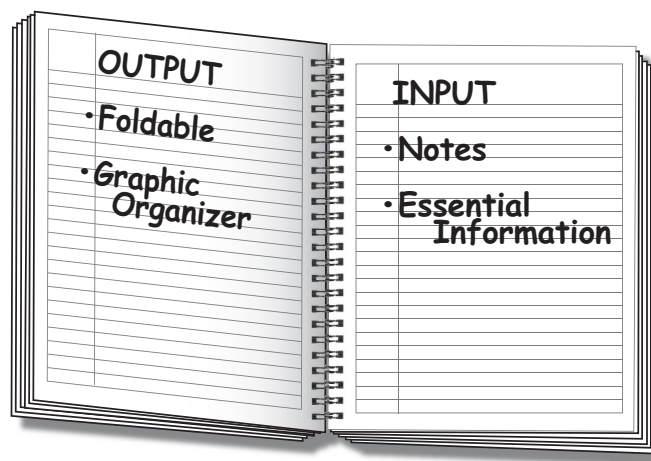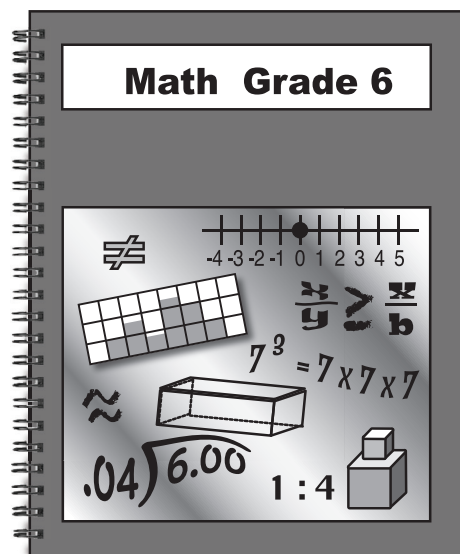
Organizing an Interactive Notebook

What Is an Interactive Notebook?

Does this sound familiar? "I can't find my homework…class notes…study guide." If so, the interactive notebook is a tool you can use to help manage this problem. An interactive notebook is simply a notebook that students use to record, store, and organize their work. The "interactive" aspect of the notebook comes from the fact that students are working with information in various ways as they fill in the notebook. Once completed, the notebook becomes the student's own personalized study guide and a great resource for reviewing information, reinforcing concepts, and studying for tests.

Materials Needed to Create an Interactive Notebook

- Notebook (spiral, composition, or binder with loose-leaf paper)
- Glue stick
- Scissors
- Colored pencils (we do not recommend using markers)
- Tabs

Creating an Interactive Notebook

A good time to introduce the interactive notebook is at the beginning of a new unit of study. Use the following steps to get started.

Step 1: *Notebook Cover*
Students design a cover to reflect the units of study. They should add their names and other important information as directed by the teacher.

Step 2: *Grading Rubric*
Take time to discuss the grading rubric with the students. It is important for each student to understand the expectations for creating the interactive notebook.

Step 3: *Table of Contents*
Students label the first several pages of the notebook "Table of Contents." When completing a new page, they add its title to the table of contents.

Step 4: *Creating Pages*
The notebook is developed using the dual-page format. The right-hand side is the input page where essential information and notes from readings, lectures, or videos are placed. The left-hand side is the output page reserved for foldable activities, charts, graphic organizers, etc. Students number the front and back of each page in the bottom outside corner (odd: LEFT-side; even: RIGHT-side).

Step 5: *Tab Units*
Add a tab to the edge of the first page of each unit to make it easy to flip to the unit.

Step 6: *Glossary*
Students reserve several pages at the back of the notebook where they can create a glossary of domain-specific terms encountered in each lesson.
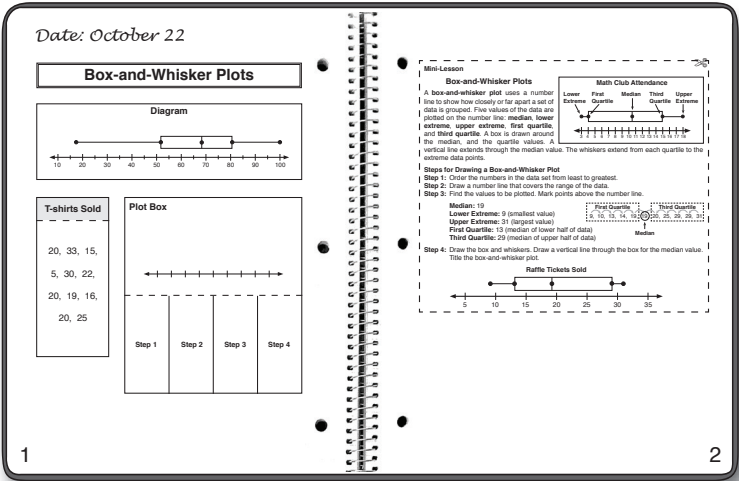
Step 7: *Pocket*
Students need to attach a pocket to the inside of the back cover of the notebook for storage of handouts, returned quizzes, class syllabus, and other items that don't seem to belong on pages of the notebook. This can be an envelope, resealable plastic bag, or students can design their own pocket.

Left-hand and Right-hand Notebook Pages

Interactive notebooks are usually viewed open like a textbook. This allows the student to view the left-hand page and right-hand page at the same time. Traditionally, the right-hand page is used as the input or the content part of the lesson. The left-hand page is the student output part of the lesson. This is where the students have an opportunity to show what they have learned in a creative and colorful way. (Color helps the brain remember information.)

The format of the interactive notebook involves both the right-brain and left-brain hemispheres to help students process information. When creating the pages, start with the left-hand page. First, have students date the page. Students then move to the right-hand page and the teacher-directed part of the lesson. Finally, students use the information they have learned to complete the left-hand page. Above is an example of completed right- and left-hand pages.

Left-Hand Page   **Right-Hand Page**

Interactive Notebook Grading Rubric

Interactive Math Notebook: Grade 6, Grading Rubric				
Category	**4**	**3**	**2**	**1**
Table of Contents	Table of contents is complete.	Table of contents is mostly complete.	Table of contents is somewhat complete.	Attempt was made to include table of contents.
Organization	All pages in correct order. All are numbered, dated, and titled correctly.	Most pages in correct order. Most are numbered, dated, and titled correctly.	Some pages in correct order. Some are numbered, dated, and titled correctly.	Few pages in correct order. Few are numbered, dated, and titled correctly.
Content	All information complete, accurate, and placed in the correct order. All spelling correct.	Most information complete, accurate, and placed in the correct order. Most spelling correct.	Some information complete, accurate, and placed in the correct order. Some spelling errors.	Few pages correctly completed. Many spelling errors.
Appearance	All notebook pages are neat and colorful.	Most notebook pages are neat and colorful.	Some notebook pages are neat and colorful.	Few notebook pages are neat and colorful.
Teacher's Comments:				

Student Instructions: Multi-digit Division

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Multi-digit Division

Standard Form Division Steps

Divide: 21 ⟌ 7,749   21 goes into 77 3 times.
$$3$$

Multiply: 21 ⟌ 7,749   21 x 3 = 63
$$3$$
$$63$$

Subtract: 21 ⟌ 7,749   Subtract from dividend.
$$3$$
$$- 63$$
$$14$$ 77 - 63 = 14

Bring Down: 21 ⟌ 7,749
$$3$$
$$- 63$$
$$144$$

Repeat:
$$369$$
$$21 ⟌ 7,749$$
$$- 63$$
$$144$$
$$- 126$$
$$189$$
$$- 189$$
$$0$$

Continue dividing, multiplying, and subtracting until there are no more numbers in the dividend to bring down.

Parts of a Division Problem

7,749   ÷   21   =   369
Dividend ÷ Divisor = Quotient

or

$$\frac{Quotient}{Divisor \,⟌\, Dividend}$$

Multiplication Table

Hint: Making a multiplication table showing the divisor times the numbers 1–9 is very helpful in finding the quotient for a division problem.

21 x 1 = 21
21 x 2 = 42
21 x 3 = 63
21 x 4 = 84
21 x 5 = 105
21 x 6 = 126
21 x 7 = 147
21 x 8 = 168
21 x 9 = 189

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Fill in the blanks on the *Parts of a Division Problem* piece. Cut out the piece. Apply glue to the back and attach it below the title.

Step 3: Complete the *Multiplication Table* piece. Cut out the piece. Apply glue to the back and attach it at the bottom of the page.

Step 4: Use the *Multiplication Table* piece to complete the equation on the *Standard Form Division* piece. Cut out the piece. Apply glue to the back and attach it at the bottom of the page.

Multi-digit Division

Parts of a Division Problem

1. _____ ÷ 2. _____ = 3. _____

OR   5. _____

4. _____ | 6. _____

Multiplication Table

32 x 1 = _____

32 x 2 = _____

32 x 3 = _____

32 x 4 = _____

32 x 5 = _____

32 x 6 = _____

32 x 7 = _____

32 x 8 = _____

32 x 9 = _____

Standard Form Division
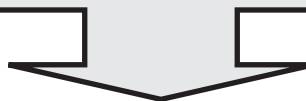
Equation: 9,632 ÷ 32 = _____

Student Instructions: Adding & Subtracting Decimals

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Adding and Subtracting Decimals

Decimal
3.6
↑
decimal point

A **decimal** is a number that expresses a whole divided into equal parts. A **decimal point** is a dot used to separate the ones place from the tenths place. The decimal point is read as *and* in numbers greater than 1.0.

Adding Decimals

When adding decimals, line up the decimal points, then add digits in the same place-value position. You may use zeros as placeholders when necessary.

Example:

Find the sum of 0.429, 8.13, and 792.6.

$$
\begin{array}{r}
0.429 \\
8.130 \\
+\ 792.600 \\
\hline
801.159
\end{array}
$$

Subtracting Decimals

When subtracting decimals, line up the decimal points then subtract digits in the same place-value position. It may be necessary to place zeros at the end of a decimal in order to subtract.

Example:

Find the difference between 99.7 and 16.79.

$$
\begin{array}{r}
\overset{8\ 16\ 10}{99.70} \\
-\ 16.79 \\
\hline
82.91
\end{array}
$$

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Cut out the two *Sum* and the two *Difference* flap books. Apply glue to the back of each gray tab and attach them below the title.

Step 3: Under each flap, correctly show how to add or subtract the decimals.

Adding & Subtracing Decimals	
Sum	**Sum**
93 + 24.08 + 316.5 =	1.37 + 6.127 + 26.73 =
Difference	**Difference**
9 – 7.63 =	70.03 – 14.35 =

Adding & Subtracing Decimals

Sum
93 + 24.08 + 316.5 =

Sum
1.37 + 6.127 + 26.73 =

Difference
9 – 7.63 =

Difference
70.03 – 14.35 =

Student Instructions: Multipying & Dividing Decimals

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Multiplying and Dividing Decimals

Multiplying Decimals

Find 9.74 x 0.28.

factor ⟶	9.74	2 decimal places
factor ⟶	x 0.28	2 decimal places
	7792	
	1948	
product ⟶	2.7272	4 decimal places

Step 1: Multiply as you do with whole numbers. Do not align the decimal points.
Step 2: Count the total number of decimal places in the factors.
Step 3: Place the decimal point in the product by moving left the total number of places counted in the decimal factors.

Dividing Decimals

Dividing a Decimal by a Whole Number

Find 54.6 ÷ 21.

Step 1: Divide as with whole numbers.

Step 2: Place the decimal for the quotient directly above the decimal point in the dividend.

$$
\begin{array}{r}
2.6 \\
21\overline{)54.6} \\
-42 \\
\hline
12\,6 \\
-12\,6 \\
\hline
0
\end{array}
$$

Dividing a Decimal by a Decimal

Find 6 ÷ 0.04.

Step 1: Make the divisor into a whole number. The easy way is to move the decimal point to the right end of the divisor until you are dividing by a whole number.
Step 2: Move the decimal point of the dividend the same number of places to the right.
Step 3: Sometimes, trailing zeros must be added to the dividend to continue dividing.

$$
\begin{array}{r}
150. \\
0.04.\overline{)6.00.} \\
-4 \\
\hline
20 \\
-20 \\
\hline
00
\end{array}
$$

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.
Step 2: Cut out the three flap books, *Multiplying Decimals, Divide a Decimal by a Whole Number,* and *Divide a Decimal by a Decimal*. Apply glue to the back of each gray tab and attach them below the title.
Step 3: Under each flap, correctly show how to multiply or divide the decimals.

Multiplying & Dividing Decimals
Multiplying Decimals
26.43 x 0.08 =
Divide a Decimal by a Whole Number   Divide a Decimal by a Decimal
0.0072 ÷ 9 =   29.76 ÷ 4.8 =
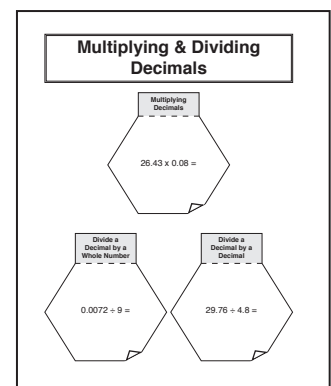
Multiplying & Dividing Decimals

Multiplying Decimals

$26.43 \times 0.08 =$

Divide a Decimal by a Whole Number

$0.0072 \div 9 =$

Divide a Decimal by a Decimal

$29.76 \div 4.8 =$

Student Instructions: Greatest Common Factor & Least Common Multiple

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Greatest Common Factor & Least Common Multiple

A **factor** is any of the numbers that when multiplied together form a product.

$3 \times 2 = 6 \rightarrow$ 6 is a **multiple** of 3.

factors of 6   6 is a **multiple** of 2.

A **multiple** is a number that can be divided by another number without a remainder.

Greatest Common Factor

The **Greatest Common Factor**, or **GCF**, is the **largest** factor that two or more numbers have in common. To find the GCF, list all the factors of each number, and you can see the largest common factor shared by the numbers.

Example: Find the GCF of 12, 15, and 18.
12: 1, 2, 3, 4, 6, 12
15: 1, 3, 5, 15
18: 1, 2, 3, 6, 9, 18   12, 15, and 18 share the factors 1 and 3; **3** is the **GCF**.

Least Common Multiple

The **Least Common Multiple** or **LCM** is the **smallest** multiple two or more numbers have in common. To find the LCM, list multiples of each number, and you can see the smallest common multiple shared by the numbers.

Example: Find the LCM of 4, 6, and 8.
4: 4, 8, 12, 16, 20, 24, 28
6: 6, 12, 18, 24, 30
8: 8, 16, 24, 32   4, 6, and 8 share the multiple 24; **24** is the **LCM**.

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Cut out the *Definitions* flap book. Apply glue to the back of the gray center section and attach it below the title. Under each flap, write the definition.

Step 3: Fill in the boxes on the *Greatest Common Factor* and *Least Common Multiple* piece. Cut out the piece. Apply glue to the back and attach it at the bottom of the page.

Greatest Common Factor & Least Common Multiple

Greatest Common Factor (GCF)	**Definitions**	**Least Common Multiple (LCM)**

Greatest Common Factor & Least Common Multiple

Find	**List**	**GCF or LCM**
GCF of 9, 27, and 45	9: 27: 45:	GCF =
LCM of 3, 6, and 9	3: 6: 9:	LCM =
LCM of 2, 4, and 12	2: 4: 12:	LCM =
GCF of 16 and 24	16: 24:	GCF =

Student Instructions: The Distributive Property

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

The Distributive Property

The **distributive property** of multiplication is a rule that can be used with both addition and subtraction to rewrite an expression in a simpler form. The rule allows you to take the number on the outside of the parentheses and multiply it by each number on the inside of the parentheses and then add to find the sum or subtract to find the difference.

Example: $4(3 + 2)$.

$$4(3 + 2) = 4 \cdot 3 + 4 \cdot 2$$

| Distributive Property Used With Addition	Distributive Property Used With Subtraction
Example 1: $a(b + c) = a(b) + a(c)$ $3(4 + 5) = 3(4) + 3(5)$ $= 12 + 15$ $= 27$	**Example 1:** $a(b - c) = a(b) - a(c)$ $9(7 - 3) = 9(7) - 9(3)$ $= 63 - 27$ $= 36$
Example 2: $(b + c)a = b(a) + c(a)$ $(8 + 5)4 = 8(4) + 5(4)$ $= 32 + 20$ $= 52$	**Example 2:** $(b - c)a = b(a) - c(a)$ $(9 - 2)6 = 9(6) - 2(6)$ $= 54 - 12$ $= 42$

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Fill in the blanks on the *Distributive Property* flap book. Cut out the flap book. Cut on the solid lines to create four flaps. Apply glue to the back of the gray center section and attach it below the title.

Step 3: Under each flap, use the distributive property to rewrite and evaluate the expression.
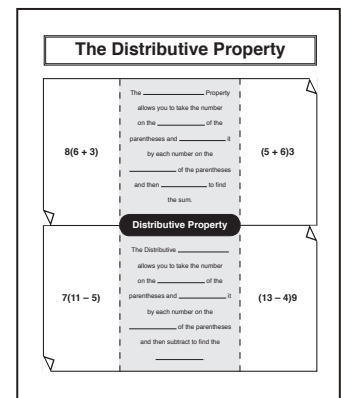
The Distributive Property

8(6 + 3)

The _____ Property allows you to take the number on the _____ of the parentheses and _____ it by each number on the _____ of the parentheses and then _____ to find the sum.

Distributive Property

(5 + 6)3

7(11 − 5)

The Distributive _____ allows you to take the number on the _____ of the parentheses and _____ it by each number on the _____ of the parentheses and then subtract to find the _____.

(13 − 4)9

Student Instructions: Dividing Fractions

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Dividing Fractions

Steps to Divide a Fraction by a Fraction

Problem	Find the reciprocal of the divisor (flip second fraction).	Change operation to multiplication.	Multiply the fractions.	Write answer in simplest terms.
$\frac{1}{2} \div \frac{1}{8}$	$\frac{1}{2} \div \frac{8}{1}$	$\frac{1}{2} \times \frac{8}{1}$	$\frac{1}{2} \times \frac{8}{1} = \frac{8}{2}$	4

Converting to Mixed Numbers and Improper Fractions

When dividing fractions, any whole numbers and any mixed numbers must be converted to improper fractions.

Whole Number to Improper Fraction	**Mixed Number to Improper Fraction**
Example: $4 = \frac{4}{1}$ → numerator → denominator A fraction is made by placing the whole number over the number 1.	Add the numerator to the product. **Example:** $2\frac{1}{4}$ The sum is the new numerator in the improper fraction. Multiply the whole number by the denominator. $2\frac{1}{4} = \frac{8+1}{4} = \frac{9}{4}$ Keep the denominator the same.

### Steps to Divide Whole Numbers and Mixed Numbers

Problem	Convert whole numbers to improper fractions. Convert mixed numbers to improper fractions.	Change operation to multiplication. Find the reciprocal of the divisor (flip second fraction).	Multiply fractions. If possible, simplify before multiplying.	Write answer in simplest terms.
$14 \div 2\frac{1}{2}$	$\frac{14}{1} \div \frac{5}{2}$	$\frac{14}{1} \times \frac{2}{5}$	$\frac{14}{1} \times \frac{2}{5} = \frac{28}{5}$	$5\frac{3}{5}$
$5\frac{1}{4} \div 1\frac{3}{4}$	$\frac{21}{4} \div \frac{7}{4}$	$\frac{21}{4} \times \frac{4}{7}$	$\overset{3}{\underset{1}{\cancel{21}}}{}{\Large/}\overset{}{\underset{1}{\cancel{4}}} \times \overset{1}{\underset{1}{\cancel{4}}}{}{\Large/}\overset{}{\underset{1}{\cancel{7}}} = \frac{3}{1}$	3

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Cut out the *Divide a Fraction by a Fraction, Divide a Whole Number by a Fraction,* and *Divide a Mixed Number by a Fraction* flap books.

Step 3: For each book, cut on the solid lines to create four flaps. Apply glue to the back of each gray tab and attach them below the title. Under each flap, write the steps to solve the problem. Show your work with each step.
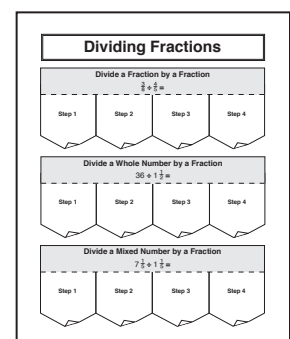
Dividing Fractions

Divide a Fraction by a Fraction

$$\frac{3}{8} \div \frac{4}{5} =$$

Step 1 **Step 2** **Step 3** **Step 4**

Divide a Whole Number by a Fraction

$$36 \div 1\frac{1}{2} =$$

Step 1 **Step 2** **Step 3** **Step 4**

Divide a Mixed Number by a Fraction

$$7\frac{1}{5} \div 1\frac{1}{5} =$$

Step 1 **Step 2** **Step 3** **Step 4**

Student Instructions: Positive & Negative Numbers

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Positive & Negative Numbers

Positive whole numbers (+), their **opposites**, and **zero** are called **integers**. Whole numbers less than zero are called **negative integers (-)**.

Positive integers can appear to the right of zero on a horizontal number line or above zero on a vertical number line. **Negative integers**, written with the symbol "-", appear to the left of zero on a horizontal number line or below zero on a vertical number line. **Zero** is neither positive nor negative.

Negative Integers ← → Positive Integers

-4 -3 -2 -1 0 1 2 3 4

Positive Integers
3
2
1
0
Negative Integers
-1
-2
-3
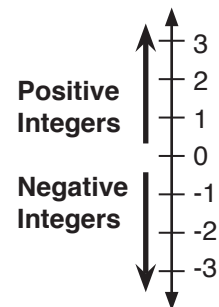
Opposite numbers are the same distance from 0. The sum of opposite numbers is 0. The opposite of zero is zero.

Example: -2 and 2 are opposite numbers.

Opposites

-4 -3 -2 -1 0 1 2 3 4
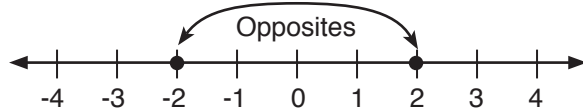
The sum of -2 and 2 is zero.

Opposite of Opposite
The opposite of the opposite of a number is the number itself. The symbol "-" means the opposite of a number.
Example: -(3) = 3.

Graphing Integers
Integers and sets of integers can be graphed on a vertical or horizontal line. A dot (•) is plotted (placed) on the line to label the location of each number. A set of integers is written using braces.

Example: {3, -2, 0}.

Start at zero. Move up the line to locate positive numbers in the set. Move down the line for negative numbers.

3
2
1
0
-1
-2
-3

Create Your Left-Hand Notebook Page
Step 1: Cut out the title and glue it to the top of the notebook page.
Step 2: Fill in the blanks on the *Horizontal Number Line* piece. Cut out the piece. Apply glue to the back and attach it below the title.
Step 3: Graph the set of integers on the *Vertical Number Line* piece. Cut out the piece. Apply glue to the back and attach it below the title.
Step 4: Graph the opposites of the integers listed on the *Opposite Integers* flap book. Cut out the flap book. Cut on the solid lines to create two flaps. Apply glue to the back of the top section and attach it under the *Horizontal Number Line* piece. Under each flap, write the opposite of the opposite.
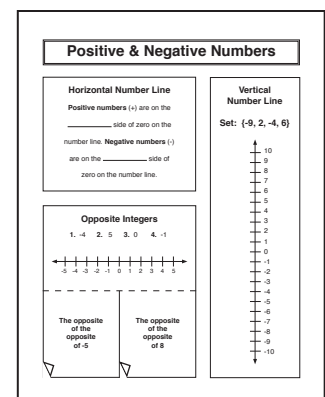
Positive & Negative Numbers

Horizontal Number Line
Positive numbers (+) are on the
_____ side of zero on the
number line. Negative numbers (-)
are on the _____ side of
zero on the number line.

Vertical Number Line
Set: {-9, 2, -4, 6}

Opposite Integers
1. -4   2. 5   3. 0   4. -1

-5 -4 -3 -2 -1 0 1 2 3 4 5

The opposite of the opposite of -5

The opposite of the opposite of 8

Positive & Negative Numbers

Horizontal Number Line

Positive numbers (+) are on the

_____ side of zero on the

number line. **Negative numbers** (-)

are on the _____ side of

zero on the number line.
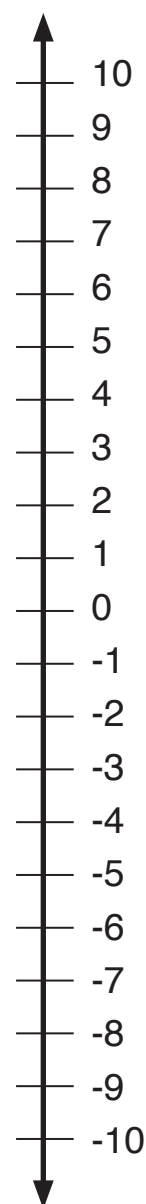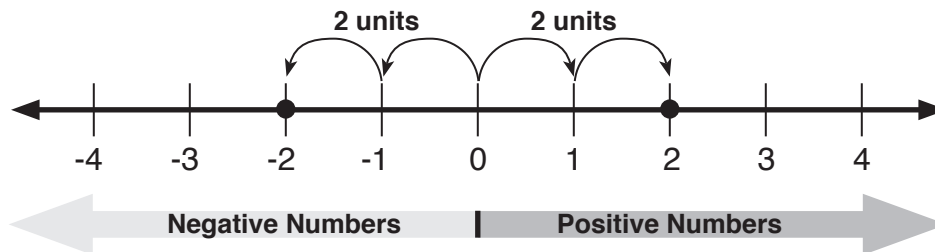
Opposite Integers

1. -4   **2.** 5   **3.** 0   **4.** -1

-5 -4 -3 -2 -1 0 1 2 3 4 5
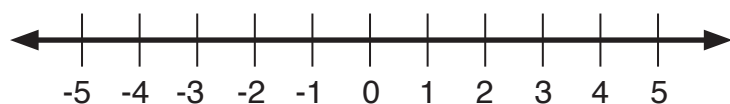
**The opposite
of the
opposite
of -5**

**The opposite
of the
opposite
of 8**

Vertical Number Line

Set: {-9, 2, -4, 6}

10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10

Student Instructions: Absolute Value

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Absolute Value

The **absolute value** of a number can be considered as the distance between the number and zero on a number line. Since distance cannot be negative, **the absolute value of every number will be either positive or zero**. Vertical bars, I I, are used to show absolute value.

The integers -2 and 2 are each 2 units from 0, even though they are on the opposite sides of 0. The absolute value of 2 is 2; it is written with vertical bar symbols, I2I = 2. The absolute value of -2 is 2; it is also written with vertical bar symbols, I-2I = 2. I-2I is read as *absolute value of negative two.*

Evaluating Absolute Value

Evaluate I-2I.	Evaluate I4I + I-6I.	Evaluate I-8I – I2I.

The graph of -2 is 2 units from 0 on the number line above.
 	
Therefore, I-2I = 2.
	I4I + I-6I = 4 + I-6I The absolute value of 4 is 4.
	
	     = 4 + 6 The absolute value of -6 is 6.
	
	     = 10 Simplify.
		I-8I – I2I = 8 – 2
		
		     = 6

Create Your Left-Hand Notebook Page
Step 1: Cut out the title and glue it to the top of the notebook page.
Step 2: Fill in the blanks on the *Definition* piece. Cut out the piece. Apply glue to the back and attach it below the title.
Step 3: Graph the value on the *Absolute Value* piece. Cut out the piece. Apply glue to the back and attach it below the *Definition* piece.
Step 4: Cut out the *Evaluating Absolute Value Expressions* flap book. Cut on the solid lines to create four flaps. Apply glue to the back of the gray center section and attach it at the bottom of the page. Under each flap, evaluate each expression.
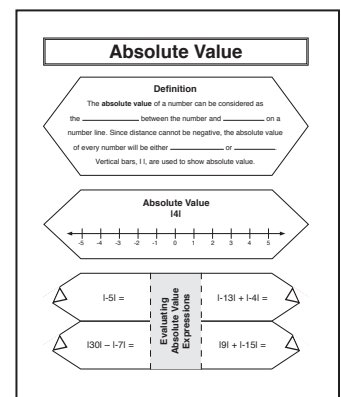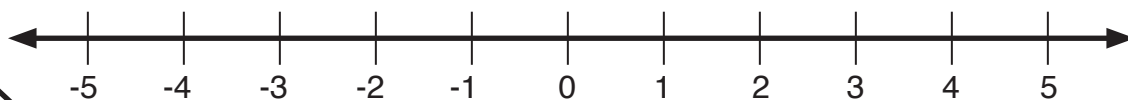
Absolute Value

Definition

The **absolute value** of a number can be considered as the _____ between the number and _____ on a number line. Since distance cannot be negative, the absolute value of every number will be either _____ or _____.

Vertical bars, I I, are used to show absolute value.

Absolute Value
I4I

-5   -4   -3   -2   -1   0   1   2   3   4   5

I-5I =

I-13I + I-4I =

Evaluating Absolute Value Expressions

I30I – I-7I =

I9I + I-15I =

Student Instructions: Integers in the Coordinate Plane

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Integers in the Coordinate Plane

A **coordinate plane** is a grid system formed when the *x*-axis and *y*-axis intersect at their zero points. The axes separate the coordinate plane into four areas called **quadrants**.

Points or dots (•) are plotted in the grid system using two numbers called **coordinates**. A coordinate is always written in a certain order called an **ordered pair** (*x, y*). The first number in the ordered pair is the *x*-coordinate. The second number is the *y*-coordinate. To plot a point for the ordered pair, start at the origin and count along the *x*-axis until you reach the *x*-coordinate: count right for positive numbers, left for negative. Then count along the *y*-axis until you reach the *y*-coordinate: up for positive numbers, down for negative. Place a dot (•) at this location.

You can use the location on the plane or use the *x*- and *y*-coordinates to identify the quadrant where a point is located.

Point	Ordered Pair	*x*-coordinate	*y*-coordinate	Quadrant
A	(3, 4)	positive +	positive +	I
B	(-3, 4)	negative -	positive +	II
C	(-3, -4)	negative -	negative -	III
D	(3, -4)	positive +	negative -	IV
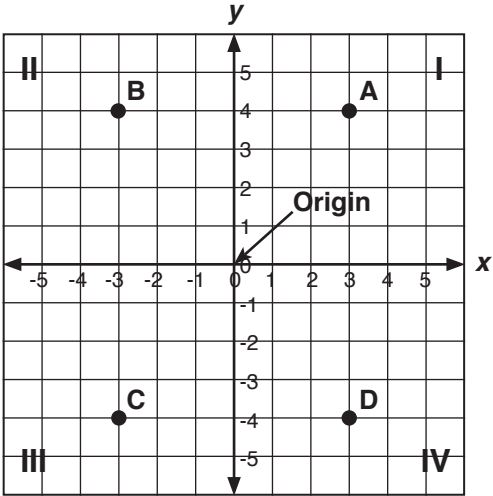
Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Cut out the *Coordinate Plane* flap book. Cut on the solid lines to create five flaps. Apply glue to the back of the grid and attach it below the title. Under each flap, identify the point or name the ordered pair.

Step 3: Cut out the *Quadrants* flap book. Cut on the solid lines to create four flaps. Apply glue to the back of the gray center section and attach it at the bottom of the page. Under each flap, list the points from the *Coordinate Plane* in the correct quadrant.
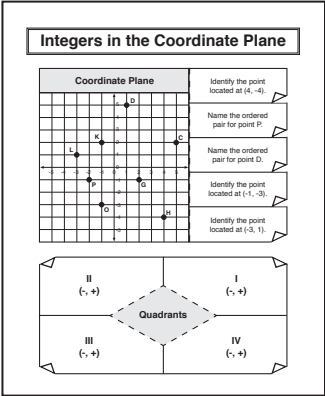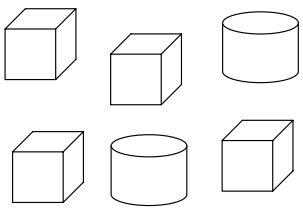
Integers in the Coordinate Plane
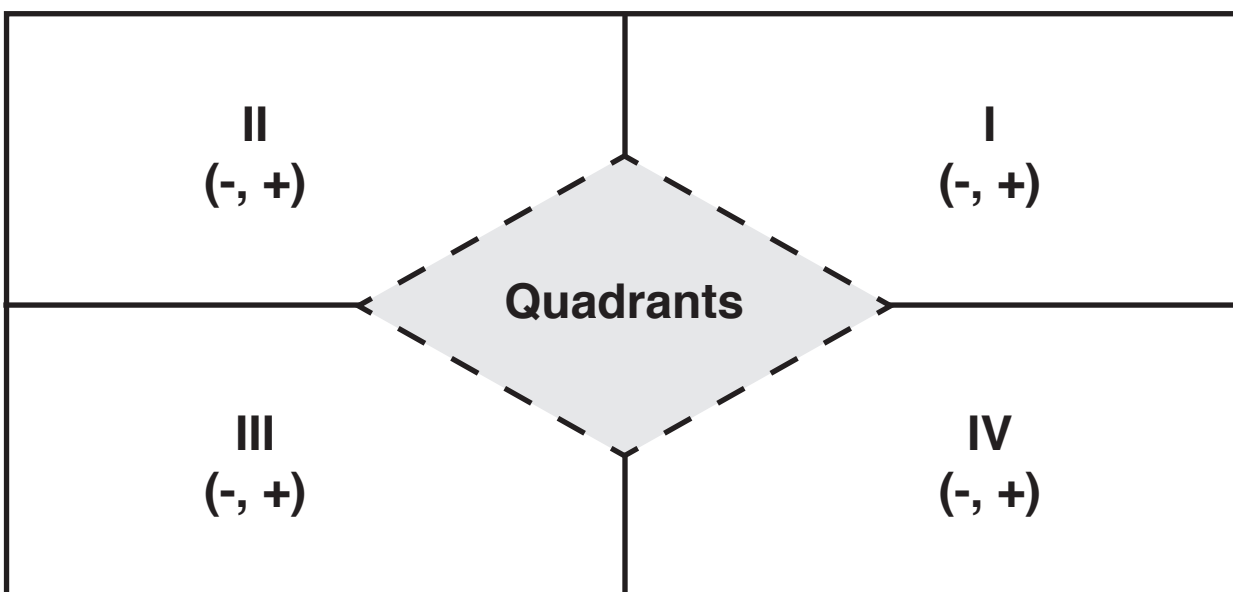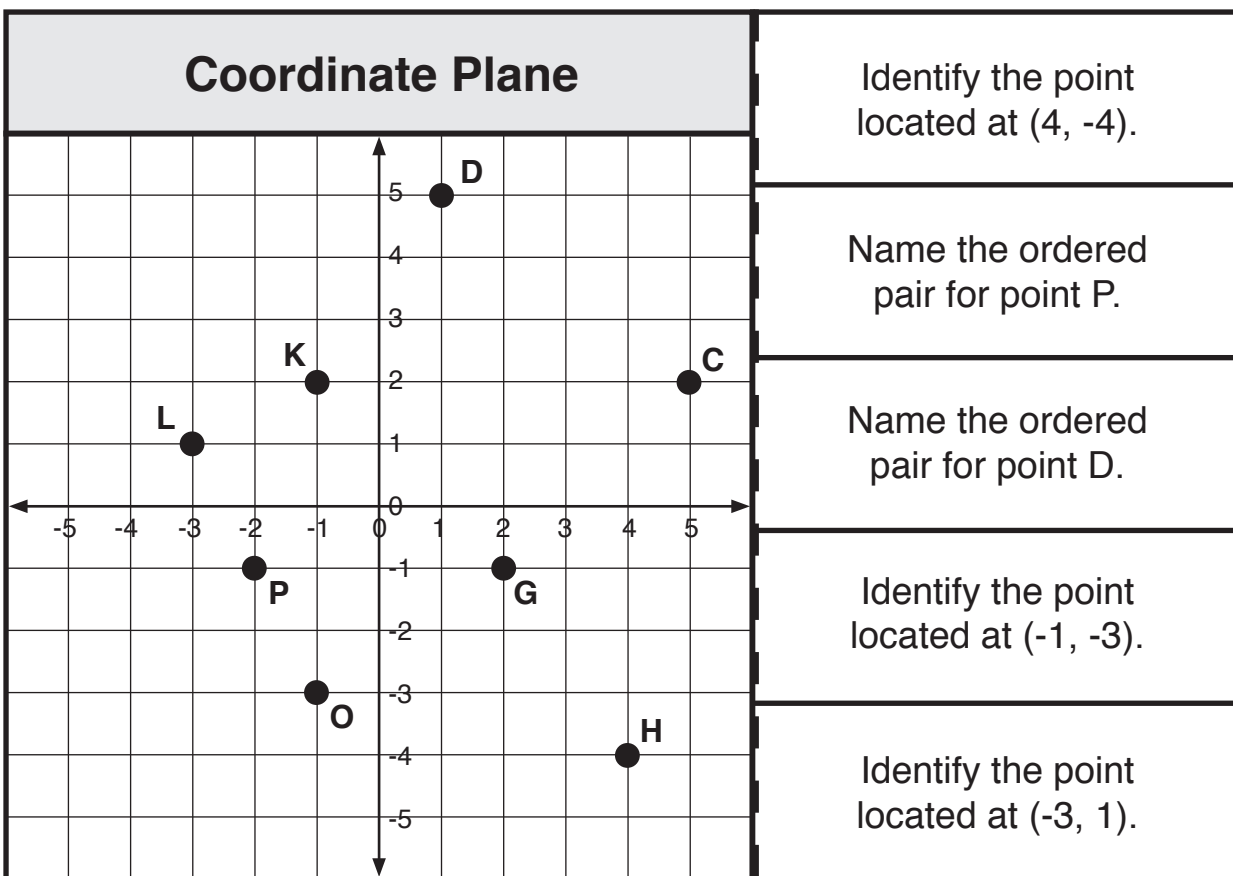
Coordinate Plane	
	Identify the point located at (4, -4).
	Name the ordered pair for point P.
	Name the ordered pair for point D.
	Identify the point located at (-1, -3).
	Identify the point located at (-3, 1).

II (-, +)	**I** (-, +)
Quadrants	
III (-, +)	**IV** (-, +)

Student Instructions: Working With Ratios

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Working With Ratios

A **ratio** is a comparison of two quantities (numbers or measurements). The quantities being compared are called the **terms** of the ratio.

Writing Ratios
When writing ratios, the quantities should be written in the order in which the problem states the terms.

Example: Write the ratio that compares **moons** to **stars**.

Since "moons" is stated first in the problem, it will be stated first in the ratio. This ratio can be written in one of three ways. The values can be separated by using the word "to," using a colon, or writing the ratio as a fraction.

Example: 2 moons to 6 stars   2 moons : 6 stars $\frac{2 \text{ moons}}{6 \text{ stars}}$

When a ratio is written as a fraction, it must be simplified like a fraction.

Example: $\frac{2 \text{ moons}}{6 \text{ stars}} = \frac{1 \text{ moon}}{3 \text{ stars}}$ This means that for every 1 moon, there are 3 stars.

Comparing With Ratios
Ratios can also be used to compare categorical data as in bar diagrams and frequency tables.

Example: Ice cream sales are recorded in the table. Write the ratio that compares the **vanilla sales** to the **total sales**.

Flavor	Number Sold
Chocolate	9
Vanilla	7
Strawberry	5

Vanilla sales: 7   Total sales: 9 + 7 + 5 = 21

The ratio can be written as: 7 to 21, 7:21, or as a fraction $\frac{7}{21} = \frac{1}{3}$.
This means that 1 out of every 3 ice creams sold were vanilla.

Create Your Left-Hand Notebook Page
Step 1: Cut out the title and glue it to the top of the notebook page.
Step 2: Fill in the blanks on the *Definition* piece. Cut out the piece. Apply glue to the back and attach it below the title.
Step 3: Cut out the *Writing Ratios* flap book. Cut on the solid lines to create four flaps. Apply glue to the back of the gray tab and attach it below the *Definition* piece. Under each flap, write the ratio three different ways.
Step 4: Cut out the *Ratio Data Comparison* flap book. Cut on the solid lines to create two flaps. Apply glue to the back of the table section and attach it at the bottom of the page. Under each flap, write the answer.
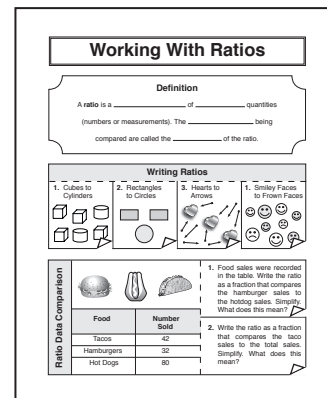
Working With Ratios

Definition
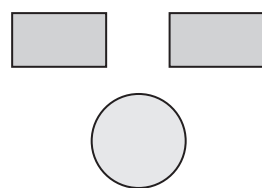
A **ratio** is a _____ of _____ quantities

(numbers or measurements). The _____ being

compared are called the _____ of the ratio.

Writing Ratios
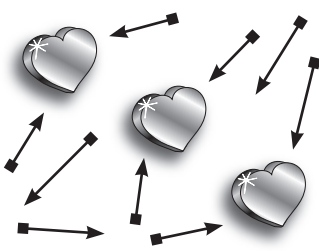
1. Cubes to Cylinders

2. Rectangles to Circles

3. Hearts to Arrows

1. Smiley Faces to Frown Faces

Ratio Data Comparison

Food	Number Sold
Tacos	42
Hamburgers	32
Hot Dogs	80

1. Food sales were recorded in the table. Write the ratio as a fraction that compares the hamburger sales to the hotdog sales. Simplify. What does this mean?

2. Write the ratio as a fraction that compares the taco sales to the total sales. Simplify. What does this mean?

Student Instructions: Rate & Unit Rate

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Rate & Unit Rate

A **rate** is a ratio that compares **two** quantities that are in different **units**. For example, if you paid 99¢ for a 16-ounce soda, the rate could be written as 99¢:16 ounces or $\dfrac{99¢}{16\text{-ounces.}}$ The first term is measured in cents; the second term in ounces.

A **unit rate** is a ratio for **one** unit. Written as a fraction, it has a denominator of 1 unit. For example, 40 beats per minute written as a fraction would be $\dfrac{40\text{ beats}}{1\text{ minute.}}$

Converting Ratio, Rate, and Unit Rate

A ratio can be converted to a rate by placing the first term over the second term. To convert a rate to a unit rate, divide both the numerator and denominator of the rate by the denominator.

Example:	**Ratio**	**Rate**		**Unit Rate**
	60 miles:3 minutes =	$\dfrac{60\text{ miles}}{3\text{ minutes}}$	$\begin{array}{c}(\div 3)\\(\div 3)\end{array}$ =	$\dfrac{20\text{ miles}}{1\text{ minute}}$

Word Problem Example 1: Jim picked 39 apples in 3 minutes. Write this rate as a unit rate.

First, write the rate as a fraction.	$\dfrac{39\text{ apples}}{3\ \text{ minutes}}$ $\begin{array}{c}(\div 3)\\(\div 3)\end{array}$ = $\dfrac{13\text{ apples}}{1\ \text{ minute}}$
Next, compare the number of apples to the number of minutes.	So, the unit rate is $\dfrac{13\text{ apples}}{1\ \text{ minute}}$ or 13 apples per minute.
Then divide.	

Word Problem Example 2: Sue bought 4 concert tickets for $104. What is the cost per unit (per ticket)?

$$\dfrac{\$104}{4\text{ tickets}}\ \begin{array}{c}(\div 4)\\(\div 4)\end{array} = \dfrac{\$26}{1\text{ ticket}}\qquad \text{So the cost per unit, or per ticket, is \$26.}$$

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Cut out the four *Question* flap pieces. Apply glue to the back of the gray tabs and attach them below the title. Under each flap, write the answer.

Rate & Unit Rate

Question

What is a rate?

Provide an example.

Question

What is a unit rate?

Provide an example.
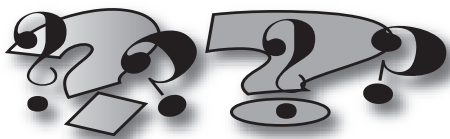
Question

How do you convert a rate to a unit rate?

Provide an example.

Question

Joe made $36.25 in 5 hours. How much did he make in 1 hour?

Show your work.

Student Instructions: Percents

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

✂

Mini-Lesson

Percents

A **percent** is a ratio that compares a number to 100.

Example: 35% means
　　　　35 out of 100
　　　　　or
　　　　$\frac{35}{100}$

A grid or bar diagram model can also show percent.

Examples: Models of 35%
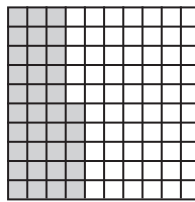
0%　　　35%　　　　　100%

Percents as Fractions

Example: Write 35% as a fraction.

Step 1: Write the percent as a rate per 100.

$$35\% = \frac{35}{100}$$

Step 2: Simplify. Divide the numerator and the denominator by the GCF. 5 is the GCF of 35 and 100. So divide by 5.

$$\frac{35 \div 5}{100 \div 5} = \frac{7}{20}$$

Fractions as Percents

Example: Write $\frac{9}{12}$ as a percent.

Step 1: Simplify. Divide the numerator and the denominator by the GCF.

$$\frac{9 \div 3}{12 \div 3} = \frac{3}{4}$$

Step 2: Write equivalent ratio.　$\frac{3}{4} = \frac{?}{100}$

Step 3: Find the unknown value.

$\frac{3 \times 25}{4 \times 25} = \frac{75}{100}$　Since 4 x 25 = 100, multiply 3 by 25 to find ?.

$= \frac{75}{100}$ or 75%

Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.
Step 2: Fill in the blanks and shade the grid model on the *Percents* arrow flap piece. Cut out the piece. Apply glue to the back of the gray tab and attach it below the title. Under the flap, draw and shade a bar diagram that shows the same percent as the grid model.
Step 3: Cut out the *Percents as Fractions* and *Fractions as Percents* flap books. For each book, cut on the solid lines to create two flaps. Apply glue to the back of each gray tab and attach them at the bottom of the page. Under each flap, write the answer.
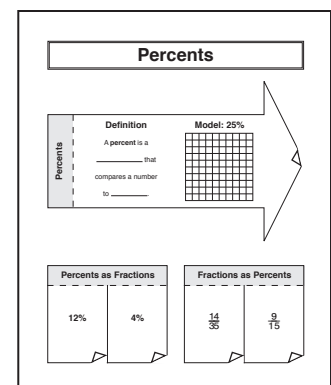
Percents

Percents

Definition

A **percent** is a

_____ that

compares a number

to _____.

Model: 25%
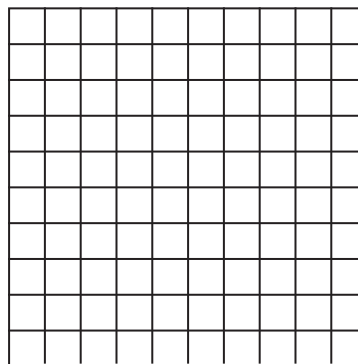
Percents as Fractions

12%	4%

Fractions as Percents

$\dfrac{14}{35}$	$\dfrac{9}{15}$

Student Instructions: Converting Measurements Using Ratios

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Converting Measurements Using Ratios

Ratios can be used to convert measurement units. To convert a unit of measure, you need to multiply or divide by a conversion factor. A **conversion factor** is a ratio that shows the relationship between the two different units in the ratio. A conversion factor is always equal to 1. For example, when converting ounces to pounds, we know 16 ounces = 1 pound. Therefore, the conversion factor is $\frac{16 \text{ ounces}}{1 \text{ pound}}$.

Steps for Converting Measurements

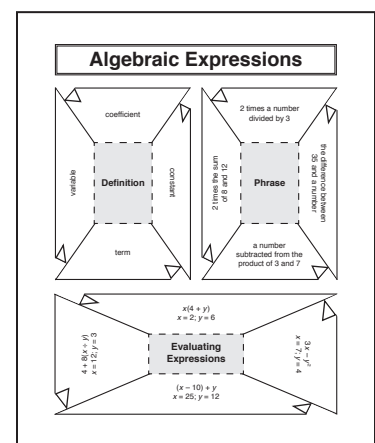| **Rule #1:** To convert from a LARGER unit to a SMALLER unit, MULTIPLY.	**Rule #2:** To convert from a SMALLER unit to a LARGER unit, DIVIDE.
Example: 45 meters to centimeters (large to small)	**Example:** 15 feet to yards (small to large)
Step 1: Write the problem with the conversion factor.	**Step 1:** Write the problem with the conversion factor.
1 meter = 100 centimeters, so the conversion factor is $\frac{100 \text{ cm}}{1 \text{ m}}$.	1 yard = 3 feet, so the conversion factor is $\frac{1 \text{ yard}}{3 \text{ feet}}$.
Step 2: Cancel out like units of measure. **Step 3:** Multiply by the conversion factor.	**Step 2:** Cancel out like units of measure. **Step 3:** Multiply by the conversion factor. **Step 4:** Divide.
$45 \text{ m} \times \frac{100 \text{ cm}}{1 \text{ m}} = 4{,}500 \text{ cm}$	$15 \text{ ft.} \times \frac{1 \text{ yd.}}{3 \text{ ft.}} = \frac{15 \text{ yd.}}{3 \text{ ft.}} = 5 \text{ yd.}$
So, 45 meters = 4,500 centimeters.	So, 15 feet = 5 yards.

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Cut out the *Converting Measurements Using Ratios* flap book. Cut on the solid lines to create four flaps. Apply glue to the back of the gray tab and attach it below the title. Under each flap, convert the measurement. Refer to a Measurement Conversion Chart for a conversion factor. Write the correct rule number on the front of the flap.

Step 3: Cut out the two *Rule* pieces. Apply glue to the back and attach them below the title.

Converting Measurements Using Ratios

Convert
$3\frac{1}{2}$ tons to pounds
Rule #_____

Convert
24 quarts to gallons
Rule #_____

Convert
4 miles to yards
Rule #_____

Convert
15 liters to milliliters
Rule #_____

Rule #1
To convert from a **LARGER** unit to a **SMALLER** unit, **MULTIPLY**.

Rule #2
To convert from a **SMALLER** unit to a **LARGER** unit, **DIVIDE**.
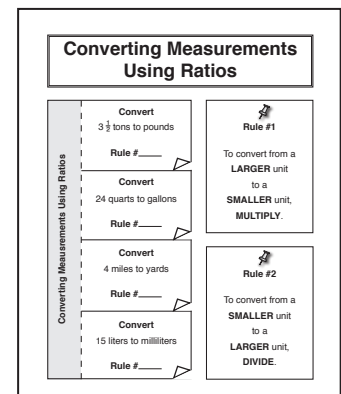
Converting Measurements Using Ratios

Converting Measurements Using Ratios

Convert

$3\frac{1}{2}$ tons to pounds

Rule #_____

Convert

24 quarts to gallons

Rule #_____

Convert

4 miles to yards

Rule #_____

Convert

15 liters to milliliters

Rule #_____

Rule #1

To convert from a

LARGER unit

to a

SMALLER unit,

MULTIPLY.

Rule #2

To convert from a

SMALLER unit

to a

LARGER unit,

DIVIDE.

Student Instructions: Exponents

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Exponents

An **exponent** refers to the number of times a number is multiplied by itself. It is the small number written above and to the right of a **base number**.

Example: base number $\longrightarrow$ 4^3 $\longleftarrow$ **exponent**

The exponent tells you how many times a base number is used as a factor. The number 4 is used 3 times as a factor. So, 4 x 4 x 4 = 48. **Power** is the name given to the combination of the base number and exponent. So, 4^3 is a power. The word *power* is read between the base number and the exponent. So, 4^3 would be read as **"four to the power of three."**

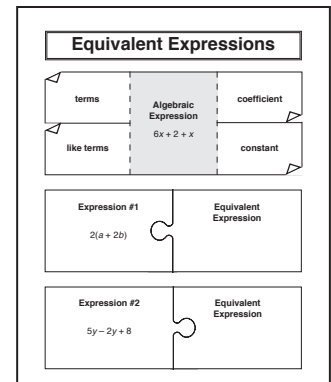| Writing Products as Powers	Writing Powers as Products
Writing a product as a power means you are counting the number of times a factor is used and making it the exponent for the factor.	Writing a power as a product means you are writing it in expanded form.
Example: Write 9 x 9 x 9 x 9 x 9 using an exponent, and then find the value. 9 x 9 x 9 x 9 x 9 = 9^5 or 59,049 (9 is used as a factor 5 times)	**Example:** Write 8^3 as a product of the same factor and then find the value. $8^3 = 8 \times 8 \times 8$ = 512

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Fill in the blanks on the *Exponents* flap book. Cut out the flap book. Cut on the solid lines to create six petal flaps. Apply glue to the back of the gray center section and attach it below the title.

Step 3: Under each petal flap, write the product as a power and find the value or write the power as a product and find the value.

Exponents

3 x 3 x 3

2^7

4^6

Exponents

An **exponent** refers

to the number of

_____ a number

is _____ by

itself.

7 x 7

9 x 9 x 9 x 9

6^5
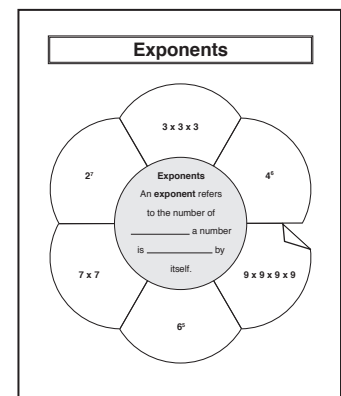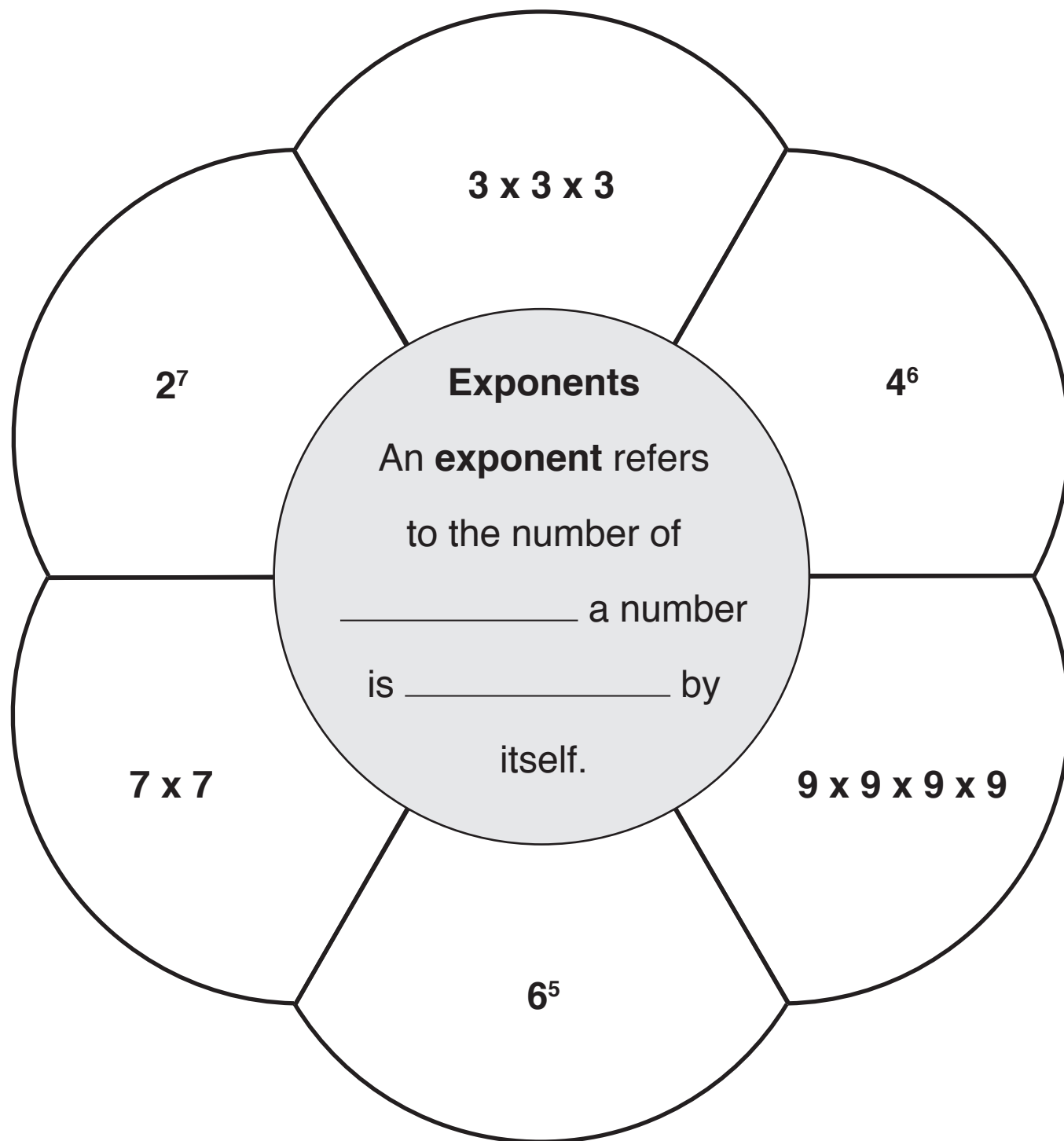
Student Instructions: Algebraic Expressions

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Algebraic Expressions

An **algebraic expression** is a mathematical phrase. It consists of numbers and at least one **variable** (letters like x or y) and one operation (+, −, •, ÷). An expression does not contain equality (=) or inequality (≠) signs For example, $2x + 3$.

Parts of an Algebraic Expression

variable: a letter that represents an unknown value

coefficient: a number used to multiply a variable $\longrightarrow \underbrace{2x} + \underbrace{3} \longleftarrow$ **constant:** a number that does not change

term: parts of an expression; a number, a variable, or the product of a number and variable

Translating Expressions

The operation(s) in an expression are identified by key words and mathematical phrases.

- Addition: sum, increase, more than
- Subtraction: difference, less than, decrease
- Multiplication: product, times, double
- Division: quotient, divide

Mathematical Phrase	Expression
2 more than 3	$2 + 3$
6 less than x	$x - 6$
the product of 4 and a number	$4n$ or $4 \cdot n$
the quotient of 12 and x	$\frac{12}{x}$ or $12 \div x$

Evaluating Expressions

To **evaluate** an algebraic expression, you replace the variables with numbers and then perform the operation(s). Remember to follow the order of operations when working with expressions.

Examples:

$$x + 15, \text{ when } x = 14$$
$$x + 15 = 14 + 15$$
$$= 29$$

$$(x - 12) + y, \text{ when } x = 22, y = 9$$
$$(x - 12) + y = (22 - 12) + 9$$
$$= 10 + 9$$
$$= 19$$

## Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Cut out the *Definition* flap book. Cut on the solid lines to create four flaps. Apply glue to the back of the gray center section and attach it below the title. Under each flap, write the definition.

Step 3: Cut out the *Phrase* flap book. Cut on the solid lines to create four flaps. Apply glue to the back of the gray center section and attach it below the title. Under each flap, write the expression.

Step 4: Cut out the *Evaluating Expressions* flap book. Cut on the solid lines to create four flaps. Apply glue to the back of the gray center section and attach it at the bottom of the page. Under each flap, evaluate the expression with the values given.

Algebraic Expressions

coefficient

variable

Definition

constant

term

---

2 times a number
divided by 3

2 times the sum
of 8 and 12

Phrase

the difference between
35 and a number

a number
subtracted from the
product of 3 and 7

$x(4 + y)$
$x = 2; y = 6$

$4 + 8(x \div y)$
$x = 12; y = 3$

**Evaluating
Expressions**

$3x - y^2$
$x = 7; y = 4$

$(x - 10) + y$
$x = 25; y = 12$
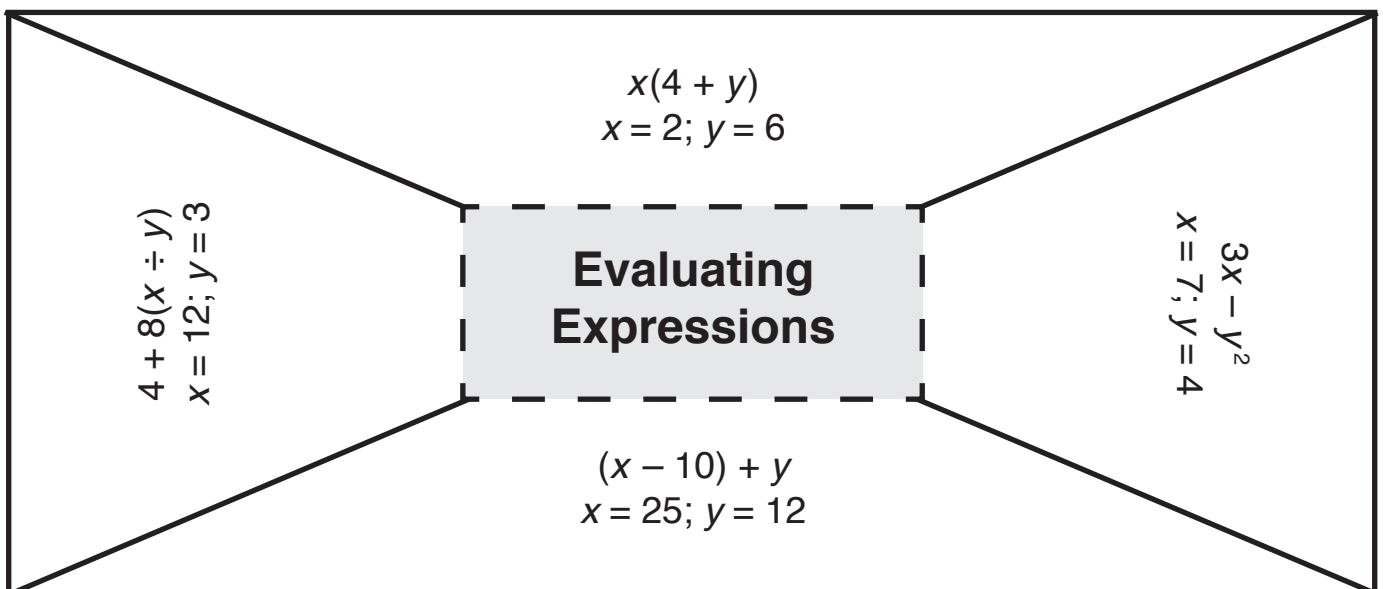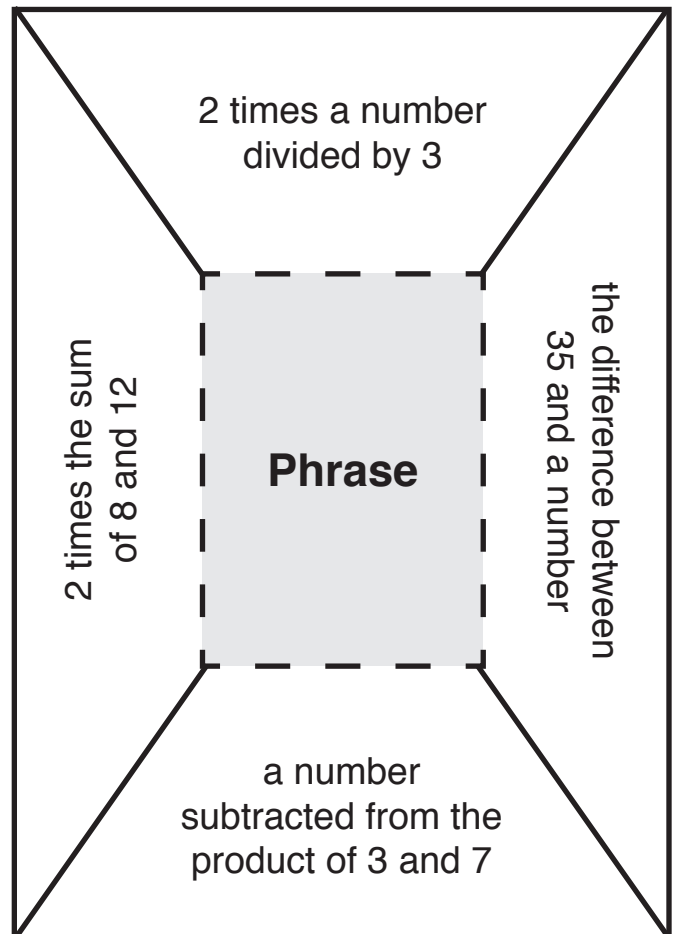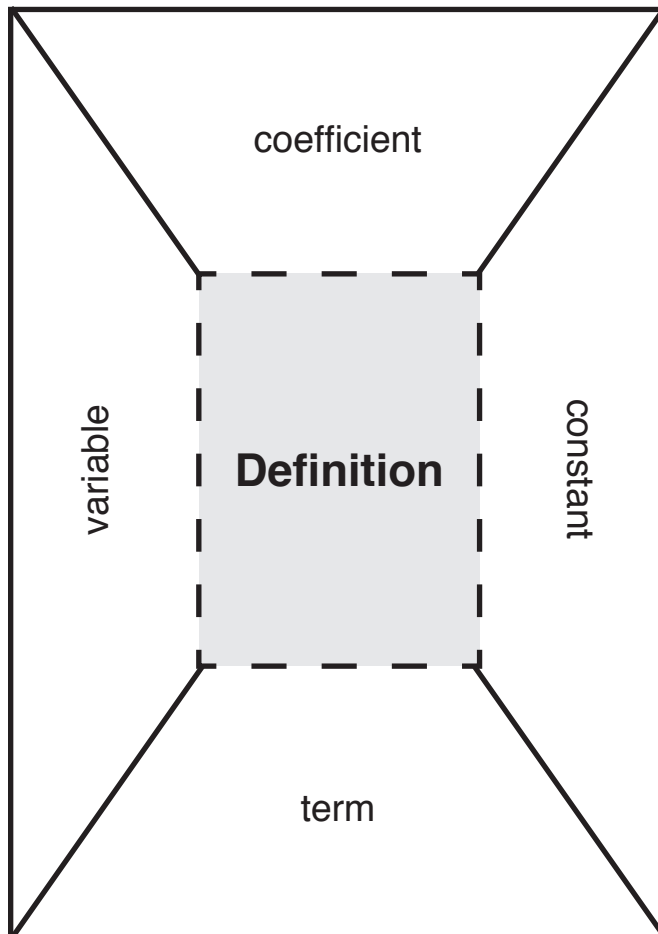
Student Instructions: Equivalent Expressions

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Equivalent Expressions

Equivalent expressions are expressions that look different but are the same.

Example: $x + x + x = 3x$ **Example:** $4(x - y) = 4x - 4y$

Parts of an Algebraic Expression

An algebraic expression is divided into parts called **terms**.

Like terms contain the same **variables** (a letter that represents an unknown value).

A **coefficient** is a number used to multiply a variable.

A **constant** is a term without a variable.

Terms

$$4x + 5 + x$$
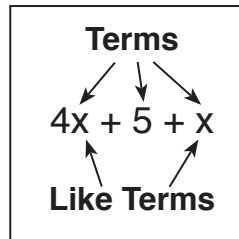
Like Terms

The **terms** are $4x$, 5, and x.

The **like terms** are $4x$ and x.

The **coefficient** is 4.

The **constant** is 5.

Strategies for Writing Equivalent Expressions

Combine variables and constants.

Example: $2n \cdot 4n = 6n$

Example: $r + r + 3 + 5 = 2r + 8$

Example: $2x + 5x + 7y + 9x - 4y = 16x + 3y$

The distributive property can be used to write an equivalent expression.
$$a(b + c) = ab + ac.$$

Example: $2(b + 3) = 2b + 6$

The distributive property also works if there is subtraction inside the parentheses.

Example: $6(4x - 3y) = 24x - 18y$

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Cut out the *Algebraic Expression* flap book. Cut on the solid lines to create four flaps. Apply glue to the back of the gray center section and attach it below the title. Under each flap, write the part of the expression named.

Step 3: Complete the *Expression #1* and *Expression #2* pieces. Cut out the pieces. Apply glue to the backs and attach them at the bottom of the page.

Equivalent Expressions	
terms	coefficient
Algebraic Expression $6x + 2 + x$	
like terms	constant
Expression #1 $2(a + 2b)$	Equivalent Expression
Expression #2 $5y - 2y + 8$	Equivalent Expression

Equivalent Expressions

terms	Algebraic Expression	coefficient
like terms	$6x + 2 + x$	constant

Expression #1

$2(a + 2b)$

Equivalent Expression

Expression #2

$5y - 2y + 8$

Equivalent Expression

Student Instructions: Solving One-Variable Addition & Subtraction Equations

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Solving One-Variable Addition & Subtraction Equations

An **equation** is a mathematical sentence showing two expressions are equal. It consists of numbers and variables (letters like x or y) and operations ($+$, $-$, $\cdot$, $\div$). An equation contains an equal sign ($=$). Equations can be solved.

Solving equations means to replace a variable (a letter representing an unknown value) with a value (number) that results in a true sentence. The **solution** is the value that replaces the variable in the equation.

Example:

$3 + x = 7$	x is the variable
$3 + 4 = 7$	4 is the value of the variable.
$7 = 7$	The sentence is true.

4 is the solution.

Steps for Solving Equations With Addition and Subtraction

Use **inverse operations** or opposite operations to get the variable alone on one side of the equation. Addition and subtraction are inverse operations; one "undoes" the other.

Step 1: Use the inverse operation to find the value of the variable.
Step 2: Rewrite the equations.

| Solving an Addition Equation	Solving a Subtraction Equation
Solve for x.	Solve for y.
$x + 6 = 12$ (Use the inverse operation.	$y - 4 = 10$ (Use the inverse operation.
$\underline{-6 = -6}$ Subtract 6 from both sides.)	$\underline{+4 = +4}$ Add 4 to both sides.)
$x \quad = \ 6$	$y \quad = 14$
$x = 6$ (Rewrite the equation.)	$y = 14$ (Rewrite the equation.)

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.
Step 2: Fill in the blanks on the *Definition* piece. Cut out the piece. Apply glue to the back and attach it below the title.
Step 3: Cut out the *Solving Equations* flap book. Cut on the solid lines to create three flaps. Apply glue to the back of the gray tab and attach it below the title. Under each flap, write the term used in the equation.
Step 4: Complete the *Solve for n* and *Solve for x* pieces. Cut out the pieces. Apply glue to the backs and attach them at the bottom of the page.
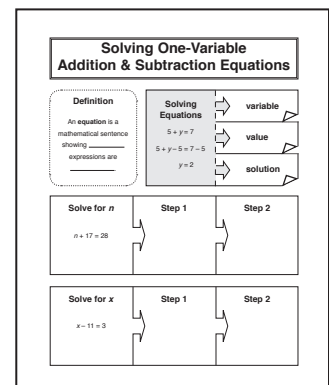
Solving One-Variable Addition & Subtraction Equations

Definition

An **equation** is a mathematical sentence showing —————— expressions are ——————.

Solving Equations

$5 + y = 7$

$5 + y - 5 = 7 - 5$

$y = 2$

→ **variable**

→ **value**

→ **solution**

Solve for n	Step 1	Step 2
$n + 17 = 28$		

Solve for x	Step 1	Step 2
$x - 11 = 3$		

Student Instructions: Solving One-Variable Multiplication & Division Equations

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Solving One-Variable Multiplication & Division Equations

An **equation** is a mathematical sentence showing two expressions are equal. It consists of numbers and variables (letters like x or y) and operations $(+, -, \cdot, \div)$. An equation contains an equal sign $(=)$. Equations can be solved.

Solving equations means to replace a variable (a letter representing an unknown value) with a value (number) that results in a true sentence. The **solution** is the value that replaces the variable in the equation.

Example:	$12y = 60$ y is the variable
	$12 \cdot 5 = 60$ **5** is the value of the variable.
	$60 = 60$ The sentence is true.
	5 is the solution.

Steps for Solving Equations With Multiplication and Division

Use **inverse operations** or opposite operations to get the variable alone on one side of the equation. Multiplication and division are inverse operations; one "undoes" the other.

Step 1: Use the inverse operation to find the value of the variable.
Step 2: Rewrite the equations.

Solving a Multiplication Equation
Solve for n.

$2n = 6$ (Use the inverse operation. Divide
$\dfrac{2n}{2} = \dfrac{6}{2}$ both sides by 2. The 2s on the left
side of the equation cancel each
other out. On the right side,
$6 \div 2 = 3$.)
$n = 3$ (Rewrite the equation.)

Solving a Division Equation
Solve for y.

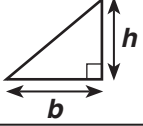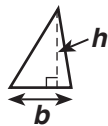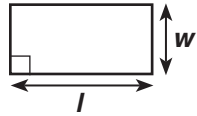$\dfrac{y}{12} = 4$ (Use the inverse operation.
Multiply both sides by 12.
The 12s on the left side of the
$\dfrac{y \cdot 12}{12} = 4 \cdot 12$ equation cancel each other out.
On the right side, $4 \cdot 12 = 48$.)

$y = 48$ (Rewrite the equation.)

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Solve the equations on the *Multiplication Equation* and *Division Equation* pieces. Show the steps for solving each equation. Cut out the two pieces. Apply glue to the back of each piece and attach them below the title.

Solving One-Variable Multiplication & Division Equations
Multiplication Equation   Solve for y. $12y = 144$
Step 1   Step 2
Division Equation   Solve for x. $\frac{x}{2} = 32$
Step 1   Step 2

Solving One-Variable Multiplication & Division Equations

Multiplication Equation

Solve for *y*.

$$12y = 144$$

Step 1

Step 2

Division Equation

Solve for *x*.

$$\frac{x}{2} = 32$$

Step 1

Step 2

Student Instructions: Graphing Inequalities

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.
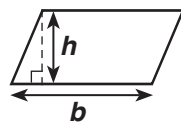
Mini-Lesson

Graphing Inequalities

Inequalities compare two quantities. They identify quantities as *less than* or *greater than* using symbols. Inequalities can be true or false. For example, $4 < 8$ is true because 4 is less than 8.

Solving One–Step Inequalities
An inequality can be solved by finding the value of the variable.

Example: $y + 2 < 9$; $y = 8$

Step 1: Write the inequality. $y + 2 < 9$

Step 2: Replace variable. $8 + 2 < 9$ (False)

Step 3: Simplify. $10 \not< 9$

 Since 10 is not less than 9, 8 is not a solution.

Example: $12 \leq 16 - x$; $x = 4$

Step 1: Write the inequality. $12 \leq 16 - x$

Step 2: Replace variable. $12 \leq 16 - 4$ (True)

Step 3: Simplify. $12 \leq 12$

 Since $12 = 12$, 4 is a solution.

Graphing Inequalities
The solution to an inequality can be graphed on a number line as a ray ($\longrightarrow$). A ray with an open circle ($\circ$) as an endpoint means the value is not included in the solution. An open circle represents less than ($<$) and greater than ($>$). An endpoint with a closed circle ($\bullet$) means the value is included in the solution. It represents less than or equal to ($\leq$) and greater than or equal to ($\geq$).

Example: The inequality is $n > 2$. All numbers greater than 2 make this true.

The open circle means 2 is not a solution.
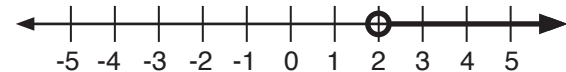
Example: The inequality is $n \leq 4$. All numbers 4 and less make this true.

The closed circle means 4 is included in the solution.

Create Your Left-Hand Notebook Page
Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Cut out the *Inequality Symbols* and *Graphing Symbols* flap books. For each book, cut on the solid lines to create four flaps. Apply glue to the back of each gray tab and attach them below the title. Under each flap, write the definition.

Step 3: Cut out the *Write Inequalities* flap book. Cut on the solid lines to create two flaps. Apply glue to the back of the gray tab and attach it near the bottom of the page. Under each flap, write the inequality.

Step 4: Graph the two inequalities on the *Graph Inequalities* piece. Cut out the piece. Apply glue to the back and attach it at the bottom of the page.
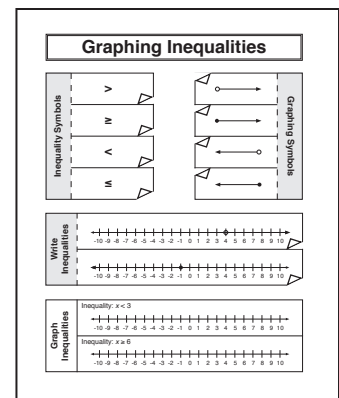
Graphing Inequalities

Inequality Symbols

>

≥

<

≤

Graphing Symbols

Write Inequalities

Graph Inequalities

Inequality: $x < 3$

Inequality: $x \geq 6$

Student Instructions: Independent & Dependent Variables

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Independent & Dependent Variables

A **variable** is a symbol (letter of the alphabet) used to represent an unknown number in an equation. There are two types of variables: independent and dependent.

Example: A **constant** does not change.

Independent variable (*x*) ⟶ $x + 2 = y$ ⟵ **Dependent variable (*y*)**
causes change.   changes.

A **function** shows a mathematical relationship between the values of the independent (*x*) and dependent (*y*) variables. An equation is written to represent the relationship.

Example: John is paid $2 more than the number of bags of peanuts he sells.
    Step 1: Identify the variables and the constant.   **Step 2:** Write the equation.
          Independent variable (*x*) = bags of peanuts sold $y = x + 2$
          Dependent variable (*y*) = money earned
          Constant = $2

In a function, the independent variable is known as the **input** value. The dependent variable is known as the **output** value. A **function** rule is a pattern between the input-output values. A **function table** is a way to organize the input, output, and function rule. When creating a table, the independent variable (*x*) is placed in the first column and the dependent variable (*y*) in the last column. The center column contains the rule.

Function Table		
Input (*x*)	Function Rule $y = x + 2$	Output (*y*)
0	$0 + 2 = y$	2
1	$1 + 2 = y$	3
2	$2 + 2 = y$	4
3	$3 + 2 = y$	5
4	$4 + 2 = y$	6

The input and output values are ordered pairs (*x*, *y*). Each ordered pair can be plotted on a graph. The points are connected with a line.
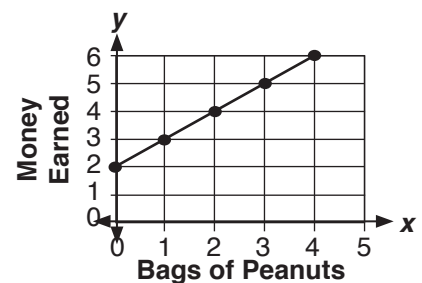
## Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.
Step 2: Cut out the *Causes Change In* piece. Apply glue to the back and attach it below the title.
Step 3: Cut apart the six word pieces. Apply glue to the back of each piece and attach them in the correct column on the *Causes Change In* piece.
Step 4: Complete both the *Function Table* and the graph pieces. Cut out the pieces. Apply glue to the back of each piece and attach them at the bottom of the page.

Independent & Dependent Variables

Independent Variable (x)	Causes Change In	Dependent Variable (y)

test scores	time spent studying

hours worked	money earned

cell phone bill	minutes used

Function Table

A car travels at a constant speed of 50 miles per hour.

Time Hours Traveled Input (x)	Function Rule $y = 50x$	Distance Miles Traveled Output (y)
1		
2		
3		
4		

Miles Traveled Over Time at 50 Miles Per Hour
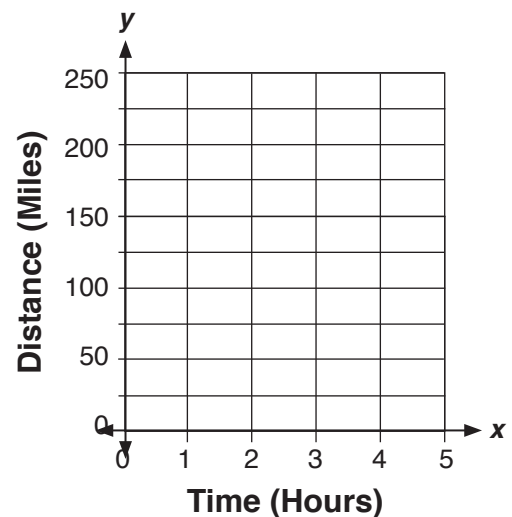
Student Instructions: Area of Polygons

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Area of Polygons
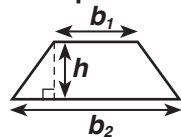
Terms You Need to Know

- The **area** is the amount of space a figure occupies.

- Area is measured in **square units** (sq. units) such as square inches (in.²) or square centimeters (cm²).

- A **polygon** is a figure formed by joining three or more line segments at their endpoints.

- A **triangle** is a three-sided polygon.

- A **quadrilateral** is a polygon with four sides and four vertices or corners. Quadrilaterals include rectangles, parallelograms and trapezoids.

- A **formula** is a group of mathematical symbols that are used to solve a problem. A formula can be used to find the area of a polygon. Replace the variables (letters that represent unknown numbers) with the known measurements. Then solve the problem.

Polygons	Formulas for Finding Area
Right Triangle	$Area = \frac{1}{2}b \times h$ b = base, h = height
Acute Triangle	$Area = \frac{1}{2}b \times h$ b = base, h = height
Rectangle	$Area = l \times w$ l = length, w = width
Parallelogram	$Area = b \times h$ b = base, h = height
Trapezoid	$Area = \frac{1}{2}(b_1 + b_2) \times h$ b_1 = base 1, b_2 = base 2, h = height
Irregular Polygon	Break the figure into regular polygons. Find the area of each polygon. Add the areas.

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Fill in the blank on the *Finding Area* flap book. Cut out the flap book. Apply glue to the back of the gray center section and attach it below the title.
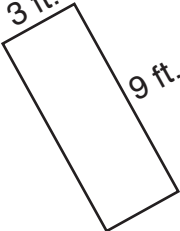
Step 3: Under each flap, write the formula and find the area.

Area of Polygons

1. 3 ft. 9 ft.

2. 10 m 4 m

3. 9 in. 8 in.
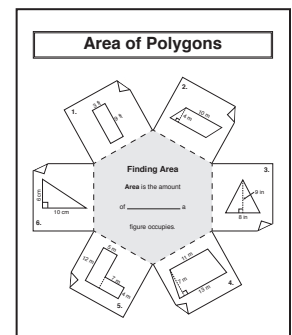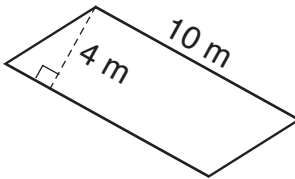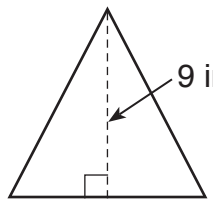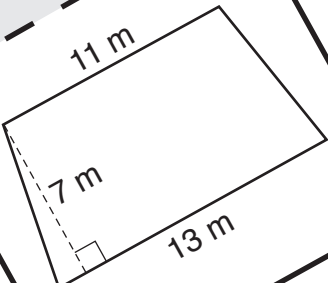
Finding Area
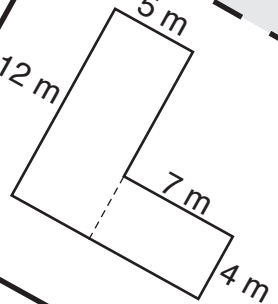
Area is the amount

of _____ a

figure occupies.

6. 6 cm 10 cm

5. 5 m 12 m 7 m 4 m

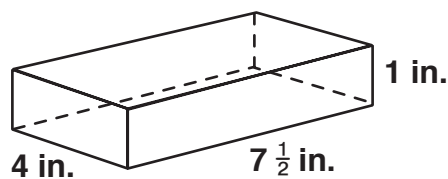**4.** 11 m 7 m 13 m
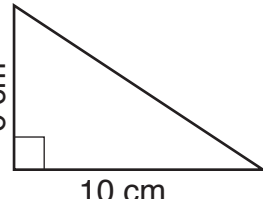
Student Instructions: Graphing Polygons

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Graphing Polygons

The points at which the edges of a polygon meet are called **vertices**. The points form coordinates (*x*, *y*). The first number indicates the point on the *x*-axis, and the second number is the point on the *y*-axis. Given the vertices, you can draw a polygon in a coordinate plane.

Example: Polygon *ABCD* has the vertices
    A(-6, 7), *B*(4, 7), *C*(8, -2), and *D*(-2, -2)

Step 1: Plot vertices in the coordinate plane.
Step 2: Connect vertices with straight lines.

Find Perimeter
The coordinates can be used to find the length of each side, and then added to find the perimeter.

   Rule 1: When *x*-coordinates are the same, subtract the *y*-coordinates.
   Rule 2: When *y*-coordinates are the same, subtract the *x*-coordinates.

Example: Polygon *WXYZ* has the vertices
    W(-3, 7), *X*(8, 7), *Y*(8, -8), and *Z*(-3, -8)

Step 1: Find width by subtracting *x*-coordinates.
  WX: -3 − 8 = 11 units   *ZY*: -3 − 8 = 11 units
Step 2: Find length by subtracting *y*-coordinates.
  WZ: 7 − (-8) = 15 units *XY*: 7 − (-8) = 15 units
Step 3: Add length of all sides to find perimeter.
  P = 11 + 11 + 15 + 15 or 52 units
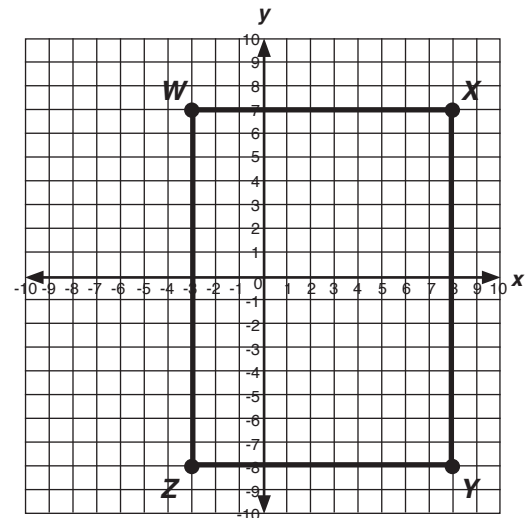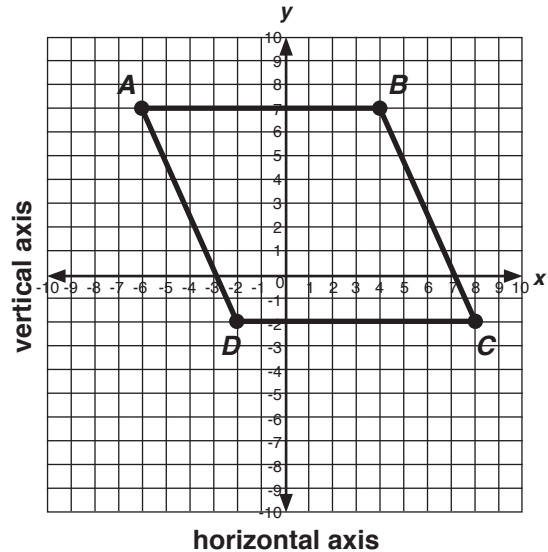
horizontal axis

Create Your Left-Hand Notebook Page
Step 1: Cut out the title and glue it to the top of the notebook page.
Step 2: Plot and connect the given points in the coordinate plane on the *Plot Points* piece. Apply glue to the back and attach it below the title.
Step 3: Fill in the blanks on the *Polygon ABCD* flap piece. Apply glue to the back of the gray tab. Attach it at the bottom of the page. Under the flap, write the length of each side and find the perimeter.
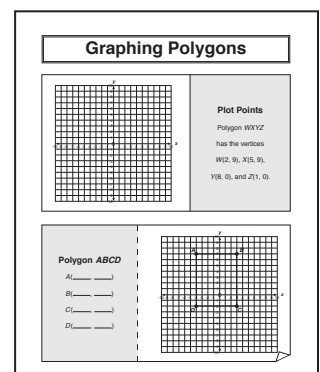
Graphing Polygons
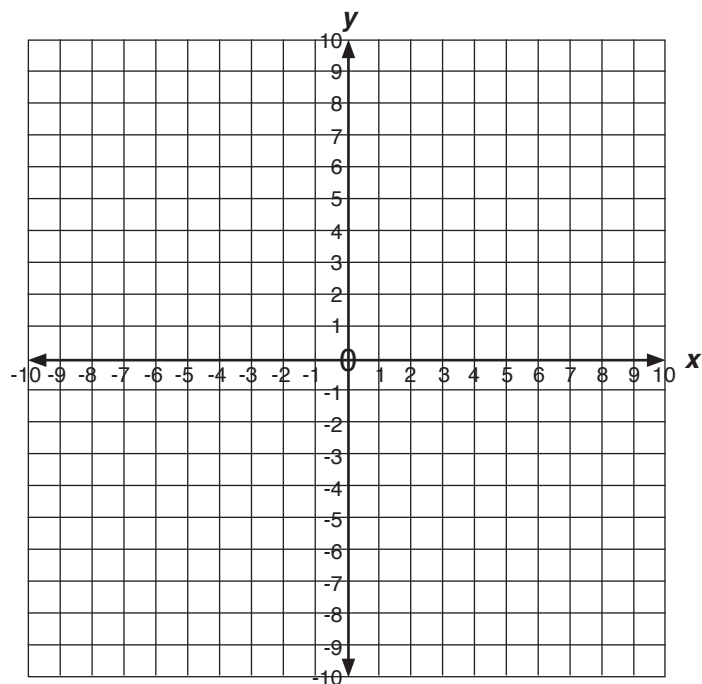
Plot Points

Polygon *WXYZ*

has the vertices

W(2, 9), *X*(5, 9),

Y(8, 0), and *Z*(1, 0).

Polygon *ABCD*

A(_____, _____)

B(_____, _____)

C(_____, _____)

D(_____, _____)
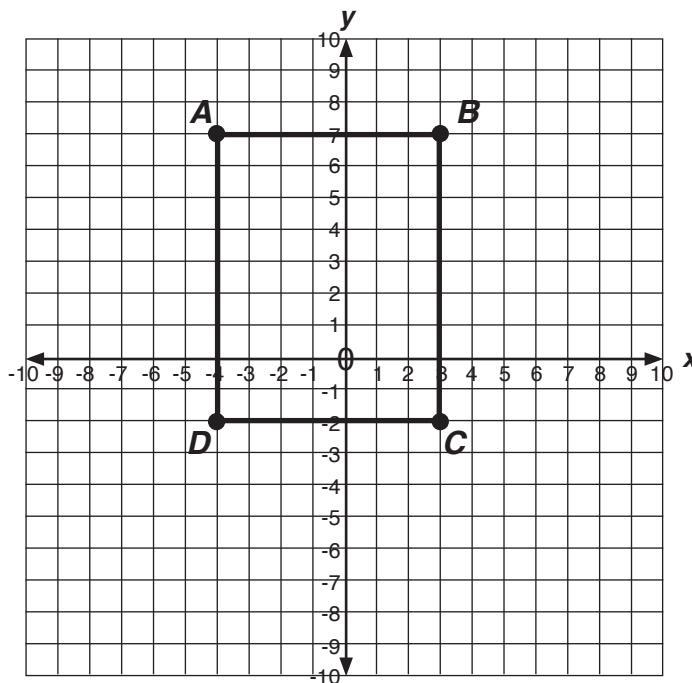
Student Instructions: Volume of a Rectangular Prism

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Volume of a Rectangular Prism

A **rectangular prism** is a three-dimensional figure with six lateral faces that are rectangles. The **volume** of a rectangular prism is the amount of space inside the figure. Volume is measured in **cubic units** such as in.^{3}, ft.^{3}, cm^3, and m^3.

Measurements of a Rectangular Prism
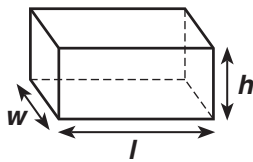
length (*l*): the longest side of the flat surface, on top or bottom
width (*w*): the shorter side of the flat surface, on top or bottom
height (*h*): the part of the rectangular prism that rises up

Two Formulas for Finding Volume of Rectangular Prisms

Formula 1: $V = l \times w \times h$.
Step 1: Multiply the length, width, and height of the figure.
Step 2: State your answer in cubic units.

Formula 2: $V = B \times h$.
Step 1: Find the area of the base (*B*) by multiplying the length times the width of the figure.
Step 2: Multiply the area of the base times the height of the figure.
Step 3: State your answer in cubic units.

Example:
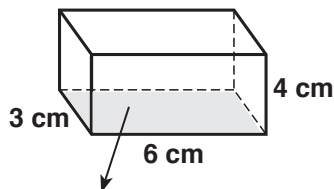
3 cm   4 cm   6 cm

Area of base (*B*) = *l* x *w*

$V = l \times w \times h$
$V = 6 \times 3 \times 4$ or
$V = 72$ cm^3

$V = B \times h$
$V = (6 \times 3) \times 4$
$V = 72$ cm^3

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Fill in the blank on the *Definition* piece. Cut out the piece. Cut on the solid lines to create three flaps. Apply glue to the back of the gray tab and attach it below the title. Under each flap, write the definition.

Step 3: Cut out the *Find Volume* flap book. Cut on the solid lines to create four flaps. Apply glue to the back of the gray center section and attach it at the bottom of the page. Under each flap, write the formula and find the volume.
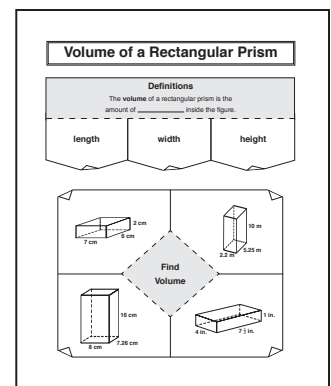
Volume of a Rectangular Prism

Definitions

The **volume** of a rectangular prism is the

amount of _____ inside the figure.

length	width	height

1.

2 cm

6 cm

7 cm

2.

10 m

5.25 m

2.2 m

Find Volume

16 cm

8 cm

7.26 cm

1 in.

4 in.

$7\frac{1}{2}$ in.
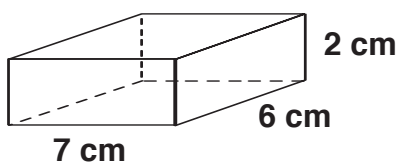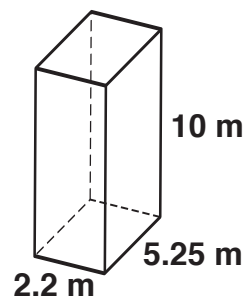
3.

4.
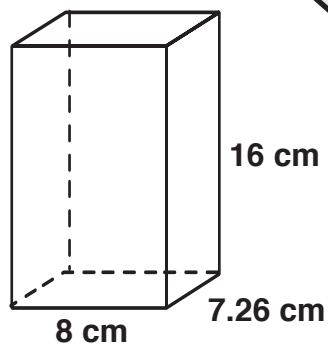
Student Instructions: Surface Area

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Surface Area

The **surface area (SA)** of a three-dimensional figure is the total area of its faces. It is measured in **square units** such as in.^{2}. A model, also known as a **net**, is used to show each face of the figure.

| 3-Dimensional Figure	Step 1: Draw a model. Label each face with a letter of the alphabet.	Step 2: Use a formula to find the area of each face.	Step 3: Add the area of all faces.
Rectangular Prism 2 in. 3 in. 9 in.	A B E C F D	Find the area of each rectangle. $A = l \times w$	A: 3 x 9 = 27 B: 2 x 9 = 18 C: 3 x 9 = 27 D: 2 x 9 = 18 E: 3 x 2 = 6 F: 3 x 2 = 6 **SA = 102 in.^{2}**
Triangular Prism 7 cm 6 cm 5 cm 12 cm 4 cm	C A D B E base base	1. Find the area of each triangle. $A = \frac{1}{2} \cdot b \cdot h$ 2. Find the area of each rectangle. $A = l \times w$	A: $\frac{1}{2}$(4 x 6) = 12 B: $\frac{1}{2}$(4 x 6) = 12 C: 7 x 12 = 84 D: 4 x 12 = 48 E: 5 x 12 = 60 **SA = 216 cm^2**
Pyramid 8 m 5 m 5 m	B E A C D base	1. Find the area of the base. $A = l \times w$ 2. Find the area of each triangle. $A = \frac{1}{2} \cdot b \cdot h$	A: 5 x 5 = 25 B: $\frac{1}{2}$(5 x 8) = 20 C: $\frac{1}{2}$(5 x 8) = 20 D: $\frac{1}{2}$(5 x 8) = 20 E: $\frac{1}{2}$(5 x 8) = 20 **SA = 105 m^2**

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Complete the steps for finding surface area on the *Rectangular Prism*, *Triangular Prism*, and *Pyramid* pieces.

Step 3: Cut out the three pieces. Apply glue to the backs and attach them below the title.
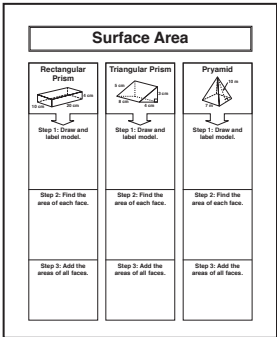
Surface Area

Rectangular Prism
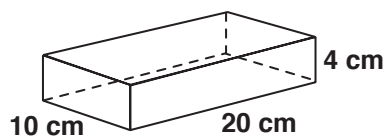
Step 1: Draw and label model.

Step 2: Find the area of each face.

Step 3: Add the areas of all faces.

Triangular Prism
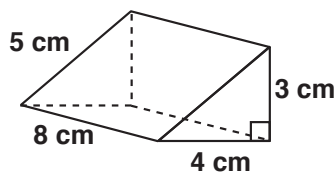
Step 1: Draw and label model.

Step 2: Find the area of each face.

Step 3: Add the areas of all faces.

Pryamid
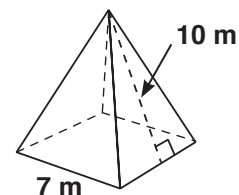
Step 1: Draw and label model.

Step 2: Find the area of each face.

Step 3: Add the areas of all faces.

# Student Instructions: Measures of Center

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Measures of Center

The **measure of center** or measure of central tendency is a way to describe the center of a set of data with a single number. Mean, median, and mode are called measures of center.

Finding Measures of Center
First order the data from least to greatest and then find the measure of center.

The **mean** is the average of a group of numbers. It is found by first finding the sum of all the values in the set of numbers. Then divide the sum by the total number of values in the set.

Example:	2, 3, 5, 6, 9	**Explanation:** 25 is the sum of the five numbers. To find the average of the five numbers, divide 25 by 5. The quotient is 5. Therefore, the mean is **5**.
	$2 + 3 + 5 + 6 + 9 = 25$	
	$25 \div 5 = \mathbf{5}$	

The **mode** is the number in a data set that occurs most often.

Example:	2, **3**, **3**, 5, 6, 9	**Explanation:** 3 is the number that occurs most often. Therefore, the mode is **3**.

The **median** is the number that is in the exact middle of the data set.

If a data set has an odd number of values, the median is the middle number.

Example 1: 2, 3, **5**, 6, 9	**Explanation:** 5 is the middle number. Therefore, **5** is the median.

If a data set has an even number of values, there will be two numbers in the middle. Find the average of those two numbers, and that is the median.

| **Example 2:** 4, 5, 7, **8**, **9**, 12, 14, 16	**Explanation:** 8 and 9 are the numbers in the middle. 17 is the sum of the two middle numbers. 17 is divided by 2. The quotient is 8.5. Therefore, **8.5** is the median.

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Cut out the *Measures of Center* flap book. Apply glue to the back of the gray center triangle and attach it below the title.

Step 3: Under each flap, order the set of data and then find the measure of center indicated.

Measures of Center

Median
5, 8, 6,
2, 7, 9, 12

Measures of Center

Mean
14, 12, 16,
20, 16, 14, 18, 40

Mode
11, 18, 12, 20,
12, 16, 17, 15

Measures of Center

Median

5, 8, 6,
2, 7, 9, 12

Measures
of
Center

Mean

14, 12, 16,
20, 16, 14, 18, 40

Mode

11, 18, 12, 20,
12, 16, 17, 15
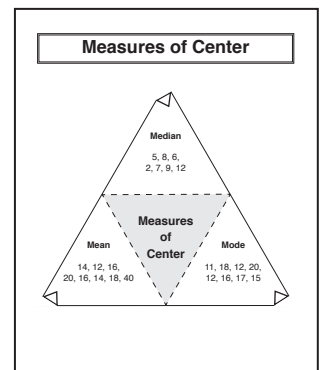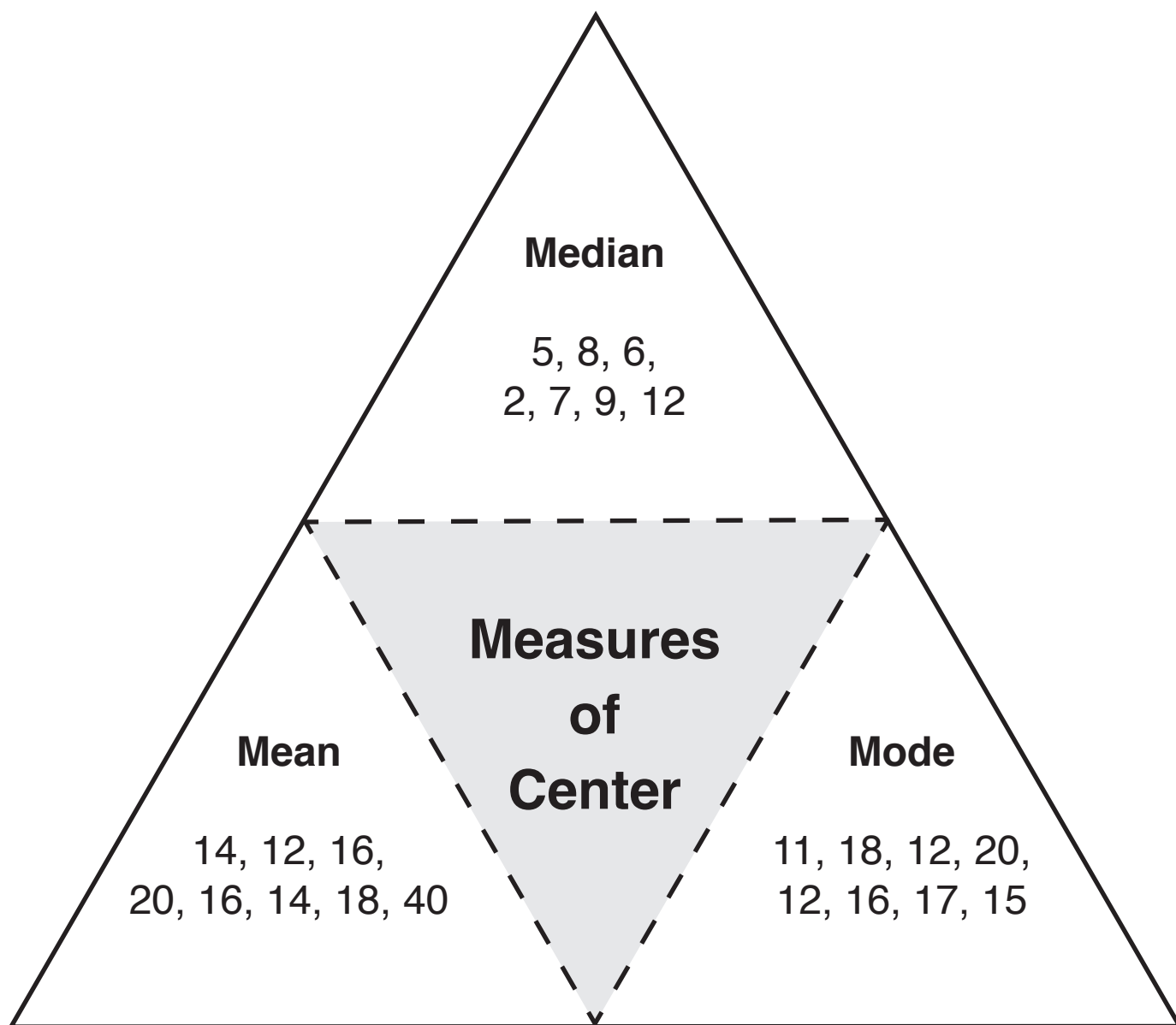
Student Instructions: Measures of Variability

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

✂

Mini-Lesson

Measures of Variability

A **measure of variability** is a single number that describes the spread of a set of data.

Range is the difference between the greatest and least values in the set of data.
Step 1: Put numbers in order: **9**, 34, 43, 64, 91, **98**
Step 2: Subtract least from greatest value. 98 – 9 = 89, therefore the range is **89**.

Interquartile Range is the distance between the first and third quartiles of the set of data.
Step 1: Put the numbers in order. 1, 2, 5, 6, 7, 11, 12, 15, 18, 19, 27.
Step 2: Find the median. If the data has an odd number of values, the median is the middle number. If the data has an even number of values, there will be two numbers in the middle. Find the average of those two numbers, and that is the median. 1, 2, 5, 6, 7, **11**, 12, 15, 18, 19, 27.
Step 3: Place parentheses around the numbers above and below the median. This makes Q1 and Q3 easier to identify. (1, 2, 5, 6, 7), 11, (12, 15, 18, 19, 27).
Step 4: Find the median for both Q1 and Q3. (1, 2, **5**, 6, 7), 11, (12, 15, **18**, 19, 27).
Q1 = 5 and **Q3 = 18**.
Step 5: Subtract Q1 from Q3 to find the interquartile range. 18 – 5 = **13**.

Mean Absolute Deviation (MAD) is the average difference between each value and the mean in a set of data. Find MAD for the data: 65, 85, 80, 70.
Step 1: Find the mean. First, put the numbers in order and add the values. Second, divide the answer by the number of values. The mean is 75.
      First: 65 + 70 + 80 + 85 = 300   **Second:** 300 ÷ 4 = 75
Step 2: Find the absolute value of deviations (differences) from the mean. Subtract each value from the mean. 75 – 65 = **10**   75 – 70 = **5**   80 – 75 = **5**   85 – 75 = **10**
Step 3: Find the average of all the absolute values of the deviations. First, add all values. Second, divide the answer by the number of values. The mean absolute deviation is 7.5.
      First: 10 + 5 + 5 + 10 = 30   **Second:** 30 ÷ 4 = **7.5**

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.
Step 2: Cut out the *Data* circle flap book. Cut on the solid lines to create three flaps.
Step 3: Under each flap, find the measure of variability for the data given. Show your work for each step.

Measures of Variability

Range

IQR

Data

31, 24, 12,

53, 38, 19, 26

MAD
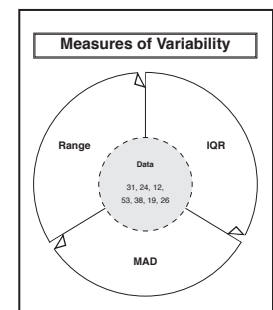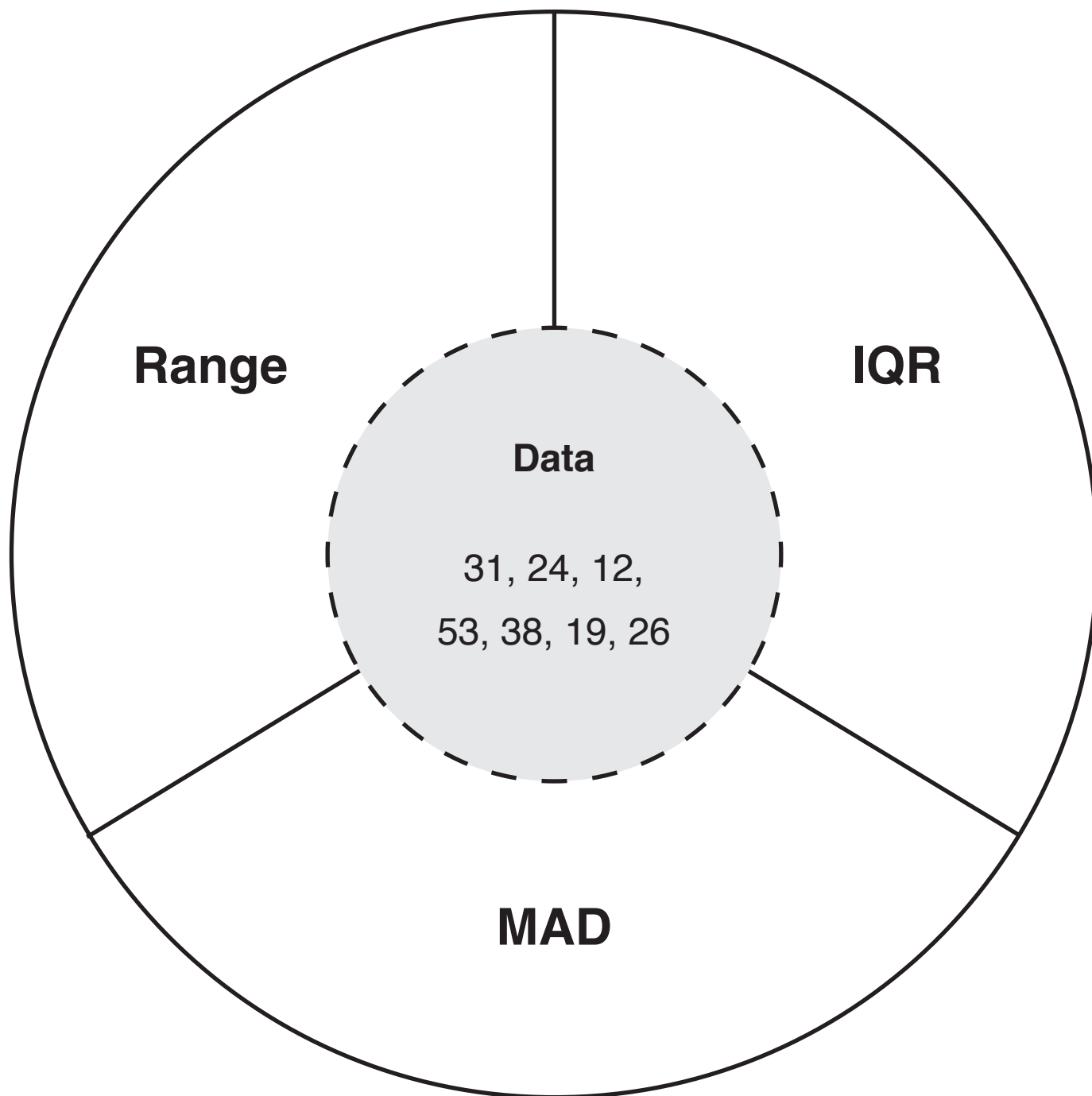
Student Instructions: Box-and-Whisker Plots

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Box-and-Whisker Plots

A **box-and-whisker plot** uses a number line to show how closely or far apart a set of data is grouped. Five values of the data are plotted on the number line: **median**, **lower extreme**, **upper extreme**, **first quartile**, and **third quartile**. A box is drawn around the median and the quartile values.

Math Club Attendance

A vertical line extends through the median value. The whiskers extend from each quartile to the extreme data points.
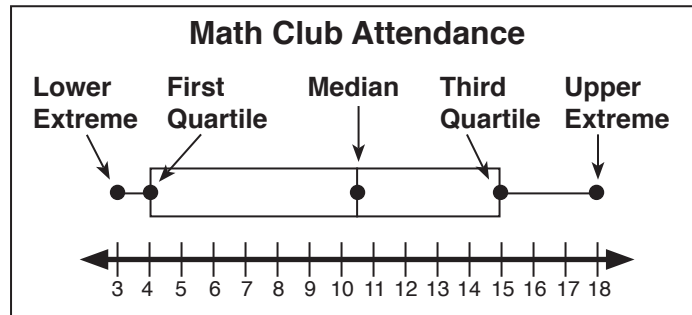
Steps for Drawing a Box-and-Whisker Plot
Step 1: Order the numbers in the data set from least to greatest.
Step 2: Draw a number line that covers the range of the data.
Step 3: Find the values to be plotted. Mark points above the number line.

Median: 19
Lower Extreme: 9 (smallest value)
Upper Extreme: 31 (largest value)
First Quartile: 13 (median of lower half of data)
Third Quartile: 29 (median of upper half of data)

First Quartile   **Third Quartile**
9, 10, 13, 14, 19, (19) 20, 25, 29, 29, 31
Median
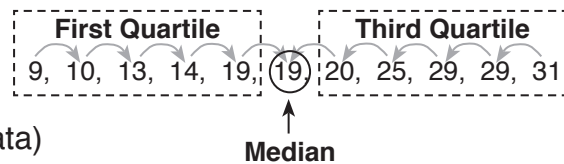
Step 4: Draw the box and whiskers. Draw a vertical line through the box for the median value. Title the box-and-whisker plot.

Raffle Tickets Sold
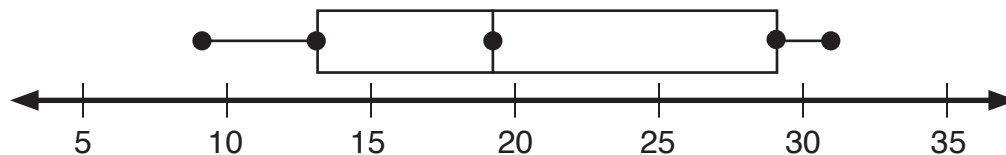
5   10   15   20   25   30   35

Create Your Left-Hand Notebook Page
Step 1: Cut out the title and glue it to the top of the notebook page.
Step 2: Cut apart the word pieces and glue to the *Diagram* piece to label each part. Cut out the piece. Apply glue to the back and attach it below the title.
Step 3: Cut out the *T-shirts Sold* flap piece. Apply glue to the back of the gray tab and attach it at the bottom of the page. Under the flap, order the data set from least to greatest.
Step 4: Add a title and use the ordered data set to complete the *Plot Box* flap book. Cut out the book. Cut on the solid lines to create four flaps. Under each flap, explain the step.
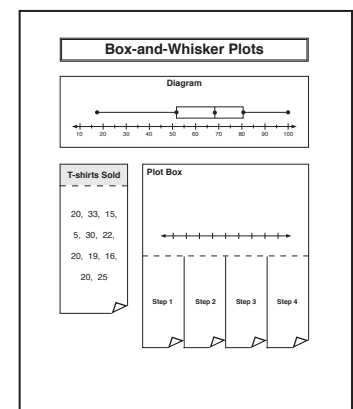
Box-and-Whisker Plots

median	lower extreme	upper extreme	first quartile	third quartile

Diagram
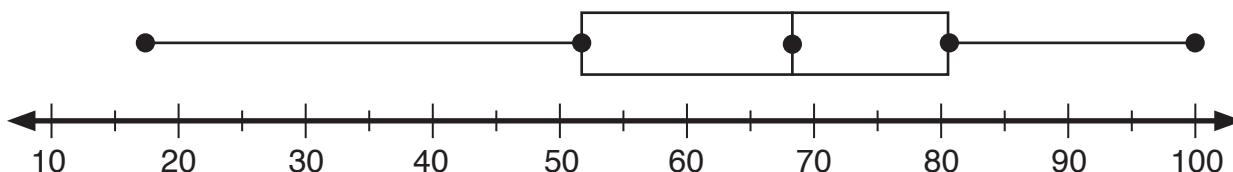
T-shirts Sold

20, 33, 15,

5, 30, 22,

20, 19, 16,

20, 25

Plot Box

Step 1	Step 2	Step 3	Step 4

Student Instructions: Histograms

Read the following information. Cut out the mini-lesson and attach it to the right-hand page of your interactive notebook. Use what you have learned to create the left-hand page.

Mini-Lesson

Histograms

A **histogram** is a special kind of bar graph that displays numerical data that has been organized into equal intervals. These intervals allow you to see the frequency distribution of the data, or the number of times a value occurs in a set of data. A histogram has no spaces between bars, all bars have the same width, and intervals with a frequency of 0 have a bar height of 0.

Steps for Creating a Histogram

Step 1: Create a frequency distribution table to organize data found in the data table. Chose a scale that makes the intervals easy to compare.

Step 2: Title graph and label horizontal and vertical axes. The horizontal axis should show the intervals from the frequency distribution table. The vertical axis shows the frequency.

Step 3: Draw a bar for each interval.

Data Table

Number of Books Read by Students

7	21	45	16	27	50
2	14	20	25	9	7
8	50	21	11	22	18
3	15	12	25	13	46
44	25	41	47	15	22

Histogram

Number of Books Read by Students
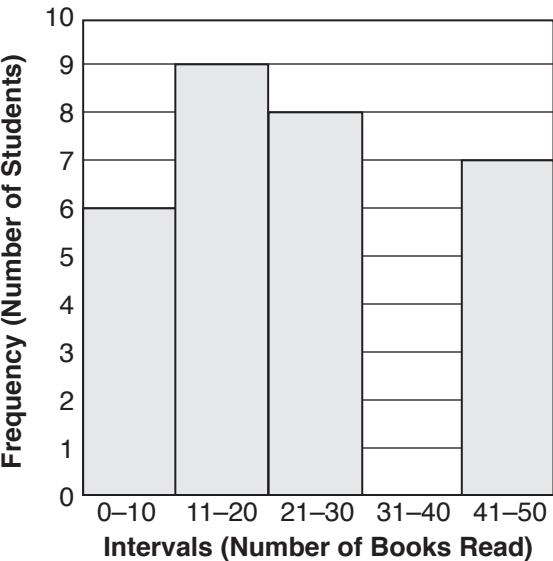
Frequency Distribution Table

Number of Books Read (Intervals)	Number of Students (Frequency)
0–10	~~IIII~~ I
11–20	~~IIII~~ IIII
21–30	~~IIII~~ III
31–40	
41–50	~~IIII~~ II

Create Your Left-Hand Notebook Page

Step 1: Cut out the title and glue it to the top of the notebook page.

Step 2: Use the *Data Table* piece to complete the *Frequency Distribution Table* piece. Cut out both pieces. Apply glue to the back of each piece and attach them below the title.

Step 3: Complete the *Math Test Scores* piece to represent the data. Cut out the piece. Apply glue to the back and attach it at the bottom of the page.

Histograms

Data Table

Math Test Scores

75	48	46	35	71
49	31	51	57	49
84	85	79	85	83
55	39	88	89	55
31	72	34	37	30
77	51	31	38	54
33	98	54	53	71
84	79	75	35	50
41	35	77	71	33
37	57	33	71	77

Frequency Distribution Table

Scores	Frequency
30–39	
40–49	
50–59	
60–69	
70–79	
80–89	
90–99	

Math Test Scores

Frequency

Test Scores (Intervals)

Answer Keys

Answers are limited to those not presented as part of the mini-lessons on each "Student Instructions" page.

Multi-digit Division (p. 5)
Parts of a Division Problem:
1. dividend, 2. divisor, 3. quotient, 4. divisor,
5. quotient, 6. dividend
Multiplication Table: 32, 64, 96, 128, 160, 192, 224, 256, 288
Standard Form Division: 301

Adding & Subtracting Decimals (p. 7)
Sums: 433.58, 34.227 *Differences:* 1.37, 55.68

Multiplying & Dividing Decimals (p.9)
Multiplying Decimals: 2.1144
Divide a Decimal by a Whole Number: 0.0008
Divide a Decimal by a Decimal: 6.2

Greatest Common Factor & Least Common Multiple (p. 11)
GCF = 9; LCM = 18; LCM = 12; GCF = 8

The Distributive Property (p. 13)
$8(6 + 3) = 8(6) + 8(3)$; $(5 + 6)3 = 5(3) + 6(3)$
$\quad\quad = 48 + 24 \quad\quad\quad\quad = 15 + 18$
$\quad\quad = 72 \quad\quad\quad\quad\quad\quad = 33$
$7(11 - 5) = 7(11) - 7(5)$; $(13 - 4)9 = 13(9) - 4(9)$
$\quad\quad = 77 - 35 \quad\quad\quad\quad = 117 - 36$
$\quad\quad = 42 \quad\quad\quad\quad\quad\quad = 81$

Dividing Fractions (p. 15)
Divide a Fraction by a Fraction:

Step 1: $\frac{3}{8} \div \frac{5}{4}$ 　　　　Step 2: $\frac{3}{8} \times \frac{5}{4}$

Step 3: $\frac{3}{8} \times \frac{5}{4} = \frac{15}{32}$ 　　Step 4: $\frac{15}{32}$

Divide a Whole Number by a Fraction:

Step1: $\frac{36}{1} \div \frac{3}{2}$ 　　　　Step 2: $\frac{36}{1} \times \frac{2}{3}$

Step 3: $\frac{\overset{12}{\cancel{36}}}{1} \times \frac{2}{\underset{1}{\cancel{3}}} = \frac{24}{1}$ 　　Step 4: 24

Divide a Mixed Number by a Fraction:

Step1: $\frac{36}{5} \div \frac{6}{5}$ 　　　　Step 2: $\frac{36}{5} \times \frac{5}{6}$

Step 3: $\frac{\overset{6}{\cancel{36}}}{\underset{1}{\cancel{5}}} \times \frac{\overset{1}{\cancel{5}}}{\underset{1}{\cancel{6}}} = \frac{6}{1}$ 　　Step 4: 6

Positive and Negative Numbers (p. 17)
Vertical Number Line: {-9, 2, -4, 6}
Opposite Integers:
1. 4, 2. -5, 3. 0, 4. 1
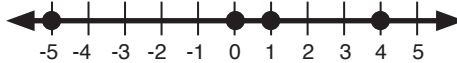
The opposite of the opposite of -5 is -5.
The opposite of the opposite of 8 is 8.

Absolute Value (p. 19)
Absolute Value:

Evaluating Absolute Value Expressions:
|-5| = 5 　　　　　|-13| + |-4| = 13 + |-4|
$\quad\quad\quad\quad\quad\quad\quad = 13 + 4$
$\quad\quad\quad\quad\quad\quad\quad = 17$

|30| − |-7| = 30 − |-7| 　　|9| + |-15| = 9 + |-15|
$\quad\quad = 30 - 7 \quad\quad\quad\quad = 9 + 15$
$\quad\quad = 23 \quad\quad\quad\quad\quad\quad = 24$

Integers in the Coordinate Plane (p. 21)
Coordinate Plane: H, (-2, -1), (1, 5), O, L
Quadrants: I points D, C; II points K, L
III points P, O; IV points G, H

Working With Ratios (p. 23)
Writing Ratios:
1. 4 cubes to 2 cylinders; 4 cubes : 2 cylinders, $\frac{4 \text{ cubes}}{2 \text{ cylinders}}$ or $\frac{2}{1}$
2. 2 rectangles to 1 circle; 2 rectangles : 1 circle, $\frac{2 \text{ rectangles}}{1 \text{ circle}}$ or $\frac{2}{1}$
3. 3 hearts to 9 arrows; 3 hearts : 9 arrows, $\frac{3 \text{ hearts}}{9 \text{ arrows}}$ or $\frac{1}{3}$

4. 6 smiley faces to 3 frown faces;
   6 smiley faces : 3 frown faces; $\dfrac{6 \text{ smiley faces}}{3 \text{ frown faces}}$ or $\dfrac{2}{1}$

Ratio Data Comparison:

1. $\dfrac{32}{80}$ or $\dfrac{2}{5}$ This means for every 2 hamburgers sold, 5 hotdogs were sold.

2. $\dfrac{42}{154}$ or $\dfrac{21}{77}$ This means that 21 out of 77 sales were tacos.

Rate & Unit Rate (p. 25)
$\dfrac{\$36.25}{5 \text{ hours}} \dfrac{(\div 5)}{(\div 5)} = \dfrac{\$7.25}{1 \text{ hour}}$
So, Joe made $7.25 in an hour.

Percents (p. 27)
Grids and bars may vary. One example is given.

0%   25%   50%   75%   100%
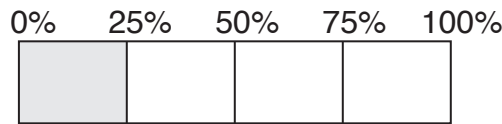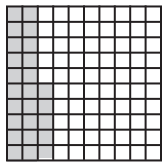
Percents as Fractions: $\dfrac{3}{25}$, $\dfrac{1}{25}$
Fractions as Percents: 40%, 60%

Converting Measurements Using Ratios (p. 29)
7,000 lbs. Rule #1; 6 gallons Rule #2;
7,040 yds. Rule #1; 15,000 mL Rule #1.

Exponents (p. 31)
(clockwise from top) $3^3 = 27$;
$4 \times 4 \times 4 \times 4 \times 4 \times 4 = 4,096$; $9^4 = 6,561$;
$6 \times 6 \times 6 \times 6 \times 6 = 7,776$; $7^2 = 49$;
$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 128$.

Algebraic Expressions (p. 33)
Phrases: (clockwise from top)
$2(n \div 3)$; $35 - n$; $(3 \times 7) - n$; $2(8 + 12)$
Evaluating Expressions: (clockwise from top)
20; 5; 27; 36

Equivalent Expressions (p. 35)
Algebraic Expression:
Terms: $6x$, 2, x Coefficient: 6
Like Terms: $6x$, x Constant: 2
Expression #1: $2a + 4b$ *Expression #2:* $3y + 8$

Solving One-Variable Addition & Subtraction Equations (p. 37)
Solving Equations: Variable: y; Value: 2;
Solution: 2
Solve for n:
  Step 1: $n + 17 = 28$ Step 2: $n = 11$
  $ -17 = -17$
  $\overline{n = 11}$
Solve for x:
  Step 1: $x - 11 = 3$ Step 2: $x = 14$
  $ +11 = +11$
  $\overline{x = 14}$

Solving One-Variable Multiplication & Division Equations (p. 39)
Multiplication Equation:
  Step 1: $\dfrac{12y}{12} = \dfrac{144}{12}$ Step 2: $y = 12$
Division Equation:
  Step 2: $\dfrac{x \cdot 2}{2} = 32 \cdot 2$ Step 2: $x = 64$

Graphing Inequalities (p. 41)
Write Inequalities: $x > 4$; $x \le -1$
Graph Inequalities:

$x < 3$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

$x \ge 6$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
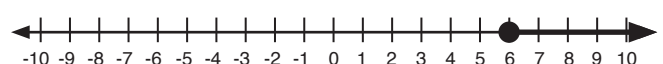
Independent & Dependent Variables (p. 43)
Causes Change In:
time spent studying/test scores;
hours worked/money earned;
minutes used/cell phone bill
Function Table:
1; $y = 50 \cdot 1$; 50
2; $y = 50 \cdot 2$; 100
3; $y = 50 \cdot 3$; 150
4; $y = 50 \cdot 4$; 200

Miles Traveled Over Time at 50 Miles Per Hour
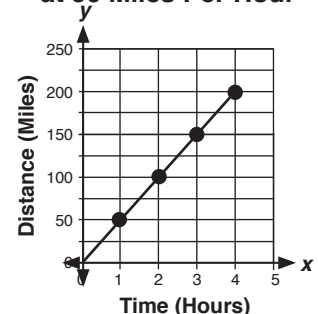
Area of Polygons (p. 45)

1. $A = l \times w$, $A = 27$ ft.^{2} 2. $A = b \times h$, $A = 40$ m^2
3. $A = \frac{1}{2}b \times h$, $A = 36$ in.^{2}
4. $A = \frac{1}{2}(b_1 + b_2) \times h$, $A = 84$ m^2
5. $A = (l \times w) + (l \times w)$, $A = 88$ m^2
6. $A = \frac{1}{2}b \times h$, $A = 30$ cm^2

Graphing Polygons (p. 47)

Plot Points:
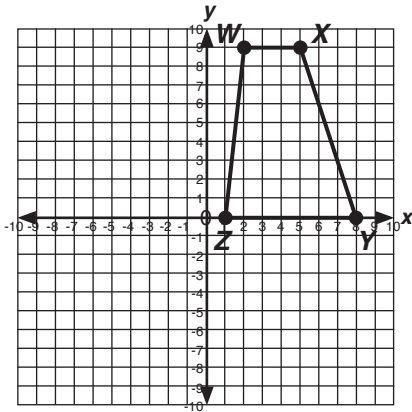
Polygon ABCD: A(-4, 7), *B*(3, 7), *C*(3, 2),
D(-4, -2); Side *AB* = 7; Side *AD* = 9;
Side *DC* = 7; Side *BC* = 9; *P* = 32 units

Volume of a Rectangular Prism (p. 49)

1. 84 cm^3; 2. 115.5 m^3; 3. 929.28 cm^3; 4. 30 in.^{3}

Surface Area (p. 51)

Models may vary.
Rectangular Prism: *Triangular Prism:*

A: 20 x 10 = 200   A: $\frac{1}{2}(4 \times 3) = 6$

B: 20 x 4   = 80   B: $\frac{1}{2}(4 \times 3) = 6$

C: 20 x 10 = 200   C: 8 x 5 = 40

D: 20 x 4 = 80   D: 8 x 3 = 24

E: 10 x 4 = 40   E: 8 x 4 = 32

F: 10 x 4 = 40   *SA* = 108 cm^2

SA = 640 cm^2

Pyramid:
A: 7 x 7 = 49

B: $\frac{1}{2}(7 \times 10) = 35$

C: $\frac{1}{2}(7 \times 10) = 35$

D: $\frac{1}{2}(7 \times 10) = 35$

E: $\frac{1}{2}(7 \times 10) = 35$

SA = 189 m^2

Measures of Center (p. 53)

Median: 7; *Mean:* 18.75; *Mode:* 12

Measures of Variability (p. 55)

IQR:
  Step 1: 12, 19, 24, 26, 31, 38, 53
  Step 2: 12, 19, 24, **26**, 31, 38, 53
  Step 3: (12, **19**, 24), 26, (31, **38**, 53)
  Step 4: Q1 = 19 and Q3 = 38
  Step 5: 38 − 19 = 19, IRQ = 19
MAD:
  Step 1: 12 + 19 + 24 + 26 + 31 + 38 + 53 = 203
    $\frac{203}{7} = 29$
  Step 2: 29 − 12 = 17
      29 − 19 = 10
      29 − 24 = 5
      29 − 26 = 3
      31 − 29 = 2
      38 − 29 = 9
      53 − 29 = 24
  Step 3: 17 + 10 + 5 + 3 + 2 + 9 + 24 = 70
    $\frac{70}{7} = 10$ MAD = 10

Range: 53 − 12 = 41

Box and Whisker Plots (p. 57)

T-shirts Sold: 5, 15, 16, 19, 20, 20, 20, 22, 25, 30, 33
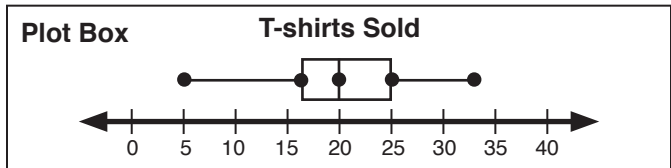
Histograms (p. 59)

Scores	Frequency
30–39	JHT JHT JHT
40–49	JHT
50–59	JHT JHT
60–69	
70–79	JHT JHT //
80–89	JHT //
90–99	/

Interactive Math Notebook: Grade 6 is designed to allow students to become active participants in their own learning by creating an interactive math notebook. The instructions given in the book lay out an easy-to-follow plan for setting up, creating, and maintaining an interactive notebook for studying math concepts common in grade six. The lessons cover units of study in number systems, ratios and proportions, geometry, expressions and equations, and statistics and probability. This interactive approach to diagraming math concepts gives students many opportunities to utilize models and demonstrate their knowledge through artistic creation, labeling, and verbal explanation. Students are encouraged to be creative, use color, and work with manipulatives to gain a greater understanding of the topics covered.

- ✔ Helps students record, store, and organize essential information

- ✔ Serves as a resource for review and test prep

- ✔ Involves both right-brain and left-brain activities for processing new information

- ✔ Correlated to current national, state, and provincial standards