Name: _____

Summer Math Packet

INCOMING 6TH GRADE

$2 > -3$ ∞ $+ -$

$0.999... = 1$ $\times \div$

$\pi \approx 3.14$ 5^2

$\sqrt{2}$ $1 + 2 \cdot 3$

$(1 - 2) + 3$

$5(2 + 2)$ $101_2 = 5_{10}$

- Please show all work on binder paper - prove how you arrived at your answers. If you did the work in your head, write sentences to explain your thought process
- Please keep your work neat and organized
- Please bring this completed packet and your work with you to your first day of school

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Lesson 1 Reteach

Factors and Multiples

The **greatest common factor (GCF)** of two or more numbers is the greatest of the common factors of the numbers. The smallest number that is a multiple of two or more whole numbers is the **least common multiple (LCM)** of the numbers.

Example 1
Find the GCF of 12 and 30.

Make an organized list of the factors for each number.

Factors of 12: 1, 2, 3, 4, 6, 12

Factors of 30: 1, 2, 3, 5, 6, 10, 15, 30.

The common factors are 1, 2, 3, and 6. The greatest is 6.

So, the GCF of 12 and 30 is 6.

Example 2
Find the LCM of 6 and 15.

List the multiples of each number.

Multiples of 6: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, ...

Multiples of 15: 15, 30, 45, 60, ...

Notice that 30 and 60 are common multiples.

The least common multiple of 6 and 15 is 30.

Exercises
Find the GCF of each set of numbers.

1. 6, 12 _____

2. 28, 42 _____

3. 44, 55 _____

4. 35, 20, 15 _____

Find the LCM of each set of numbers.

5. 5, 6 _____

6. 6, 8 _____

7. 4, 10 _____

8. 15, 12 _____

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Lesson 1 Reteach

Decimals and Fractions

Decimals like 0.58, 0.12, and 0.08 can be written as fractions.

To write a decimal as a fraction, you can follow these steps.

1. Identify the place value of the last decimal place.
2. Write the decimal as a fraction using the place value as the denominator, and simplify.

Example 1

Write 0.5 as a fraction in simplest form.

$0.5 = \frac{5}{10}$ 0.5 means five tenths.

$= \frac{\cancel{5}^{1}}{\cancel{10}_{2}}$ Simplify. Divide the numerator and denominator by the GCF, 5.

$= \frac{1}{2}$ So, in simplest form, 0.5 is $\frac{1}{2}$.

Example 2

Write 0.35 as a fraction in simplest form.

$0.35 = \frac{35}{100}$ 0.35 means 35 hundredths.

$= \frac{\cancel{35}^{7}}{\cancel{100}_{20}}$ Simplify. Divide the numerator and denominator by the GCF, 5.

$= \frac{7}{20}$ So, in simplest form, 0.35 is $\frac{7}{20}$.

Example 3

Write $\frac{3}{5}$ as a decimal.

Since 5 is a factor of 10, write an equivalent fraction with a denominator of 10.

$$\frac{3}{5} \overset{\times 2}{=} \frac{6}{10} = 0.6$$

So, $\frac{3}{5} = \frac{6}{10}$.

Exercises

Write each decimal as a fraction or mixed number in simplest form.

1. 0.9
2. 0.8
3. 0.27
4. 0.75
5. 0.34
6. 0.125
7. 0.035
8. 0.008

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Write each fraction or mixed number as a decimal.

9. $1\frac{3}{8}$ **10.** $1\frac{5}{8}$ **11.** $3\frac{5}{16}$ **12.** $4\frac{9}{20}$

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Lesson 1 Reteach

Add and Subtract Decimals

Example 1

Find the sum of 3.25 and 12.6.

Estimate $3.25 + 12.6 \approx 3 + 13$ or 16.

$$\begin{array}{r} 3.25 \\ +\ 12.60 \\ \hline \end{array}$$

Line up the decimal points. Annex a zero so that both numbers have the same number of decimal places.

$$\begin{array}{r} 3.25 \\ +\ 12.60 \\ \hline 15.85 \end{array}$$

Add as you would add whole numbers. Place the decimal point.

The sum is 15.85.

Example 2

Find the difference of 26.82 and 12.15.

Estimate $26.82 - 12.15 \approx 27 - 12$ or 15.

$$\begin{array}{r} 26.82 \\ -\ 12.15 \\ \hline \end{array}$$

Line up the decimal points.

$$\begin{array}{r} 26.82 \\ -\ 12.15 \\ \hline 14.67 \end{array}$$

Subtract as with whole numbers.

The difference is 14.67.

Exercises

Find each sum or difference.

1. $3.1 + 9.4$
2. $4.88 + 8.1$
3. $14.05 + 9.2$
4. $6.008 + 0.22$
5. $5 - 3.12$
6. $75.23 - 50.09$
7. $9 - 7.7$
8. $0.62 - 0.35$

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Lesson 1 Reteach

Estimate Products of Fractions

Numbers that are easy to divide mentally are called **compatible numbers**. One way to estimate products involving fractions is to use compatible numbers.

Example 1

Estimate $\frac{2}{3} \times 8$.

Estimate $\frac{2}{3} \times 8$. Make it easier by finding $\frac{1}{3} \times 8$ first.

$\frac{1}{3} \times 9 =$ Change 8 to 9 since 3 and 9 are compatible numbers.

$\frac{1}{3} \times 9 = 3$ $\frac{1}{3}$ of 9, or 9 divided by 3, is 3.

$\frac{2}{3} \times 9 = 6$ Since $\frac{1}{3}$ of 9 is 3, $\frac{2}{3}$ of 9 is 2 × 3 or 6

So, $\frac{2}{3} \times 8$ is *about* 6.

Another way to estimate products is by rounding fractions to 0, $\frac{1}{2}$, or 1. If the fraction has a numerator much smaller than the denominator round to 0. If the numerator is about half of the denominator, round to $\frac{1}{2}$. If the numerator and denominator are almost the same round to 1.

Example 2

Estimate $\frac{1}{3} \times \frac{5}{6}$.

$\frac{1}{3} \times \frac{5}{6} \rightarrow \frac{1}{2} \times 1 = \frac{1}{2}$

So, $\frac{1}{3} \times \frac{5}{6}$ is *about* $\frac{1}{2}$.

You can estimate the product of mixed numbers by rounding to the nearest whole number.

Example 3

Estimate $3\frac{1}{4} \times 5\frac{7}{8}$.

Since $3\frac{1}{4}$ rounds to 3 and $5\frac{7}{8}$ rounds to 6, $3\frac{1}{4} \times 5\frac{7}{8} \rightarrow 3 \times 6 = 18$.

So, $3\frac{1}{4} \times 5\frac{7}{8}$ is *about* 18.

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Exercises

Estimate each product.

1. $\frac{1}{5} \times 24$
2. $\frac{1}{3} \times 16$
3. $\frac{3}{8} \times 17$
4. $\frac{4}{7}$ of 20
5. $\frac{7}{8} \times \frac{3}{5}$
6. $\frac{11}{12} \times \frac{1}{3}$
7. $\frac{1}{9} \times \frac{1}{12}$
8. $\frac{11}{12} \times \frac{6}{7}$
9. $3\frac{7}{8} \times 10\frac{1}{10}$
10. $2\frac{4}{5} \times 6\frac{1}{12}$
11. $4\frac{7}{8} \times 2\frac{9}{10}$
12. $7\frac{2}{7} \times 5\frac{3}{4}$

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Lesson 1 Reteach

Integers and Graphing

An **integer** is a number from the set {..., –4, –3, –2, –1, 0, 1, 2, 3, 4, ...}. Integers greater than 0 are **positive integers.** Integers less than 0 are **negative integers.** Always use the negative sign (–) to indicate a negative number.

Example 1
Write an integer for each situation.

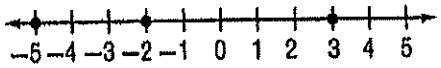
a. 16 feet under the ground
Because it is *under* the ground, the integer is –16.

b. a gain of 5 hours
Because it is a *gain*, the integer is 5.

To graph an integer on a number line draw a point on the number line at its location. A set of integers is written using braces such as {–5, –2, 3}.

Example 2
Graph the set of integers {–5, –2, 3} on a number line.

Draw a number line. Draw a dot at the location of –5, of –2, and of 3.



Exercises
Write an integer for each situation.

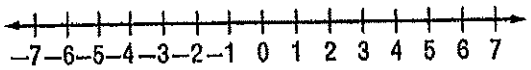
1. a profit of $60

2. a decrease of 10°

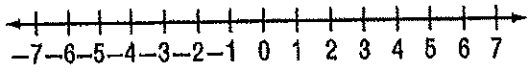
3. a loss of 3 yards

4. a gain of 12 ounces

5. Graph the set {–6, 5, –4} on a number line.



6. Graph the set {–5, 1, –3} on a number line.



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Lesson 1 Reteach

Powers and Exponents

A product of like factors can be written using a **base**, the number used as a factor, and an **exponent**, which tells how many times the base is used as a factor. Numbers expressed using exponents are called **powers**. For example, 100 and 1,000 are powers of 10 because they can be written 10^2 as and 10^3.

Example 1

Write $4 \times 4 \times 4 \times 4 \times 4$ using an exponent.

$4 \times 4 \times 4 \times 4 \times 4 = 4^5$ 4 is used as a factor five times.

Example 2

Write 3^4 as a product of the same factor. Then find the value.

The base is 3. The exponent is 4. So, 3 is used as a factor four times.

$3^4 = 3 \times 3 \times 3 \times 3$ Write 3^4 as a product.

$= 81$ Multiply.

Exercises

Write each product using an exponent.

1. $4 \times 4 \times 4$

2. $7 \times 7 \times 7 \times 7 \times 7$

3. $9 \times 9 \times 9 \times 9$

4. $8 \times 8 \times 8 \times 8 \times 8 \times 8$

5. $1 \times 1 \times 1 \times 1$

6. $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

Write each power as a product of the same factor. Then find the value.

7. 5^3

8. 6^2

9. 2^8

10. 3^6

11. 1.1^4

12. 0.7^3

13. **MAMMALS** There are about 10^3 species of bats in the world. Write 10^3 as a product of the same factor. Then find the value.

14. **LANDSCAPE** The deepest point of the Grand Canyon in Arizona is a little over 18^3 feet deep. How deep is the canyon at this point?

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Lesson 1 Reteach

Equations

An **equation** is a mathematical sentence showing two expressions are equal. An equation contains an **equals sign, =.** Some equations contain variables. When you replace a variable with a value that results in a true sentence, you **solve** the equation. The value for the variable is the solution of the equation.

Example 1
Solve $14 - p = 6$ using guess, check, and revise.

Guess the value of p, then check it.

Try 7.	Try 6.	Try 8.
$14 - p = 6$	$14 - p = 6$	$14 - p = 6$
$14 - 7 \neq 6$	$14 - 6 \neq 6$	$14 - 8 = 6$
revise	revise	yes

The solution is 8 because replacing p with 8 results in a true sentence.

Example 2
Solve $15 \div m = 5$ mentally.

$15 \div m = 5$	Think 15 divided by what number is 5?
$15 \div 3 = 5$	You know that $15 \div 3 = 5$.
$5 = 5$	

The solution is 3.

Exercises
Identify the solution of each equation from the list given.

1. $h + 19 = 56$; 36, 37, 38
2. $31 + x = 42$; 9, 10, 11
3. $k - 4 = 13$; 16, 17, 18
4. $34 - b = 17$; 16, 17, 18
5. $5w = 30$; 5, 6, 7
6. $63 = 7k$; 7, 8, 9
7. $36 \div s = 9$; 4, 5, 6
8. $x \div 3 = 8$; 23, 24, 25

Solve each equation mentally.

9. $j + 3 = 9$
10. $14 + n = 19$
11. $23 + x = 29$
12. $31 - h = 24$
13. $m - 5 = 11$
14. $3m = 27$
15. $56 = 7b$
16. $14 \div f = 2$
17. $j \div 8 = 4$

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Lesson 1 Reteach

Function Tables

A **function rule** describes the relationship between the input and output of a **function**. The inputs and outputs can be organized in a **function table**.

Example 1
Complete the function table.

Input (x)	$x - 3$	Output (y)
9	$9 - 3$	
8	$8 - 3$	
6	$6 - 3$	

The function rule is x - 3. Subtract 3 from each input.

Input		Output
9	$-3 \rightarrow$	6
8	$-3 \rightarrow$	5
6	$-3 \rightarrow$	3

$\rightarrow$

Input (x)	$x - 3$	Output (y)
9	$9 - 3$	6
8	$8 - 3$	5
6	$6 - 3$	3

Example 2
Find the input for the function table.

Input (x)	$4x$	Output (y)
		0
		4
		8

Work backward to find the input. Since the rule is $4x$, divide each output by 4.
The inputs are 0, 1, and 2.

Exercises
Complete each function table.

1.

Input (x)	$2x$	Output (y)
0		
2		
4		

2.

Input (x)	$4 + x$	Output (y)
0		
1		
4		

Find the input for each function table.

3.

Input (x)	$x + 2$	Output (y)
	$1 + 2$	3
	$2 + 2$	4
	$5 + 2$	7

4.

Input (x)	$x + 2$	Output (y)
	$2 \div 2$	1
	$6 \div 2$	3
	$10 \div 2$	5

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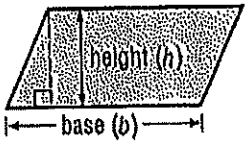
Lesson 1 Reteach

Area of Parallelograms

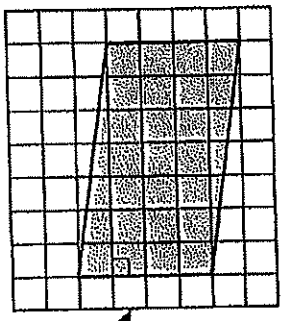
Words	The area A of a parallelogram is the product of any base b and its height h.		
Symbols	$A = bh$	**Model**	

Example 1

Find the area of the parallelogram.

$A = bh$	Area of parallelogram
$A = 4 \times 7$	Replace b with 4 and h with 7.
$A = 28$	Multiply.

The area is 28 square units or 28 units^2.



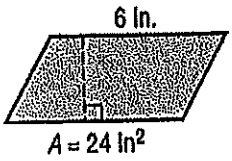
The base is 4 units, and the height is 7 units.

Example 2

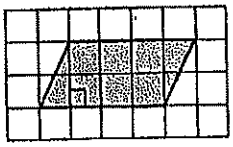
Find the height of the parallelogram.

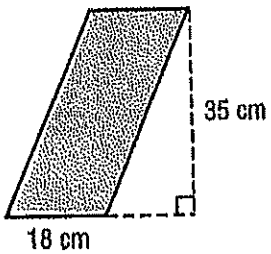
$A = bh$	Area of parallelogram
$24 = 6 \cdot h$	Replace A with 24 and b with 6.
$\frac{24}{6} = \frac{6h}{6}$	Divide each side by 6.
$4 = h$	Simplify.

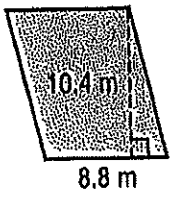
So, the height is 4 inches.



Find the area of each parallelogram.

1. 

2. 

3. 

4. Find the height of a parallelogram if its base is 9 feet and its area is 27 square feet.

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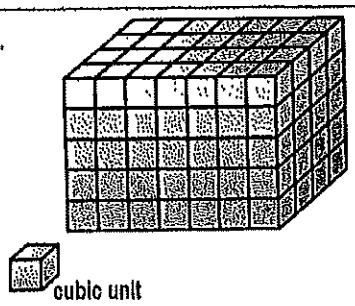
Lesson 1 Reteach

Volume of Rectangular Prisms

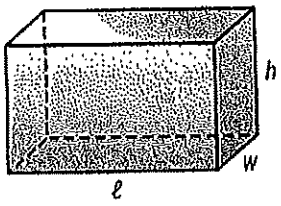
The amount of space inside a three-dimensional figure is the **volume** of the figure. Volume is measured in **cubic units**. This tells you the number of cubes of a given size it will take to fill the prism.



The volume V of a rectangular prism is the product of its length ℓ, width w, and height h.

Symbols $V = \ell wh$

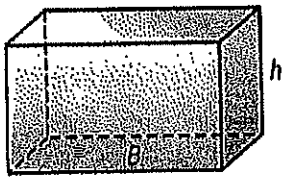
Model



You can also multiply the area of the base B by the height h to find the volume V.

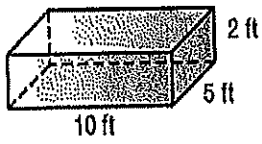
Symbols $V = Bh$

Model



Example

Find the volume of the rectangular prism.



Method 1 Use $V = \ell wh$.

$V = \ell wh$

$V = 10 \times 5 \times 2$

$V = 100$

The volume is 100 ft^3.

Method 2 Use $V = Bh$.

$V = Bh$

$V = 50 \times 2$

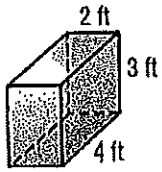
$V = 100$

The volume is 100 ft^3.

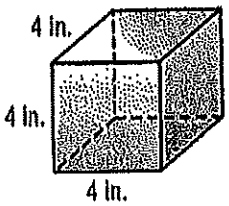
Exercises

Find the volume of each prism.

1.



2.



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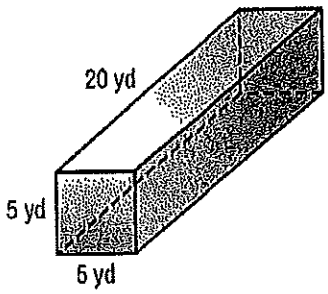

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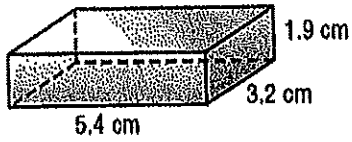

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Lesson 1 Reteach

Mean

The mean of a data set is the sum of the data divided by the number of pieces of data.

Example

The pictograph shows the number of members on four different swim teams. Find the mean number of members for the four different swim teams.

$$\text{mean} = \frac{9+11+6+10}{4}$$
$$= \frac{36}{4} \text{ or } 9$$

Swim Team Members	
Amberly	
Carlton	
Hamilton	
West High	

Key: = 1 swimmer

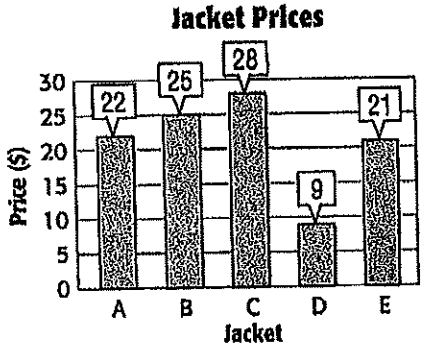
Exercises

Find the mean for each set of data.

1.

Month	Snowfall (in.)
Nov.	20
Dec.	19
Jan.	20
Feb.	17
Mar.	4

2.



3.

Number of Bicycles	
Smiths	
Castros	
Lius	

Key: = 1 bicycle

4.

Checker Pieces	
A	
B	
C	
D	

Key: = 1 checker piece

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Lesson 1 Reteach

Line Plots

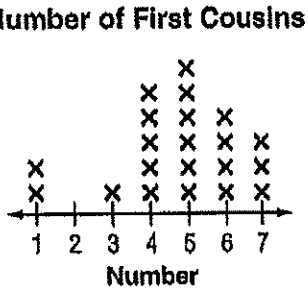
One way to give a picture of data is to make a line plot. A **line plot** is a visual display of a distribution of data values where each data value is shown as a dot or other mark. A line plot is also known as a **dot plot.**

Example

FAMILY Students in one class recorded how many first cousins each student had. Here are the results:

Number of First Cousins						
6	5	1	7	3	4	4
5	1	5	5	4	7	5
5	6	7	6	4	6	4

Draw and label a number line that includes the least and greatest data values. Place as many X's above each number as there are responses for that number.

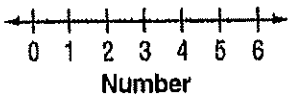


Exercises

PHONECALLS **For the next month, the fifth-graders kept a record of how many times they called one of their first cousins on the phone. Here are the results:**

2, 0, 2, 1, 1, 3, 4, 2, 2, 3, 4, 3, 6, 0, 3, 2, 1, 2, 3, 1, 2

1. Record the results in the line plot below.



Use the line plot for Exercises 2 and 3.

2. How many students made at least one phone call to a first cousin?

3. Find the median, mode, range, and any outliers shown in the line plot.

Dear Incoming 6th Graders,

Please choose one fiction and one non-fiction book for your summer reading. You may choose any book that is grade-appropriate. Go to https://www.arbookfind.com/ to confirm the grade level for the books you would like to read. While you are not limited to books that are only 6.0 and above, books that are less than a 4.5 reading level should not be chosen for this project. While you are reading your books, use the following pages to take detailed notes. We will complete a project using your books during the first weeks of the school year. I look forward to hearing about the wonderful reading you are doing this summer!

Mrs. McCoy

Sixth Grade

Name_____

Notes: Fiction

Directions: Use the following outline to help you take notes on your summer reading book. Since these are your notes, you need not write in complete sentences; however, you may want to include page numbers next to your information so you can refer back to the information at a later date.

Title: _____

Author: _____

Grade level:_____

Number of pages:_____

Setting:

• Describe the setting (where it took place) of the book-use details from the story.

_____

_____

_____

_____

Main Characters:

• Who are the main characters?

• What important information (details) would you like to remember about these characters?

_____

_____

_____

_____

Conflict (a struggle between opposing forces or a problem):

• What is the main conflict?

• Who is involved?

• How is the conflict resolved?

_____

_____

_____

_____

Theme/s (an underlying lesson about life or human nature that the writer is trying to pass on to the reader. In folktales, this is called "the moral of the story.")

• What is/are the theme/s of this story? What "lesson/s" do you think the author was trying to share with you?

_____

_____

_____

_____

Your Opinion about the Book:

• What did you like about the book? dislike? Would you read another book on this subject?

_____

_____

_____

_____

Sixth Grade

Name_____

Notes: Nonfiction

Directions: Use the following outline to help you take notes on your summer reading book. Since these are your notes, you need not write in complete sentences; however, you may want to include page numbers next to your information so you can refer back to the information at a later date.

Title: _____

Author: _____

Grade level: _____

Number of pages: _____

Topic: (Who or what is the book about?) Use details from the book. _____

_____

_____

_____

_____

_____

Write 4-5 facts you've learned about the topic: _____

_____

_____

_____

_____

_____

Setting:

• Describe the setting (where it took place) of the book-use details from the book.

_____

_____

_____

_____

_____

Theme/s (an underlying lesson about life or human nature that the writer is trying to pass on to the reader.)

• What is/are the theme/s of this book? What "lesson/s" do you think the author was trying to share with you?

_____

_____

_____

_____

_____

Your Opinion about the Book:

• What did you like about the book? dislike? Would you read another book on this subject?

_____

_____

_____

_____