

Tutor's Pal Book 1 By Sandra J. Ellingsen Copyright © 2016 by Sandra J. Ellingsen. Los Angeles, CA. All rights reserved. www.mathstudyhelp.com September 28, 2016



PREFACE

This book gets the best results when gone through from beginning to end. This assures you will not have missed something you will need to know to solve later problems. Be sure to do chapter 1, the Introduction, to see how to use this workbook. Each chapter is also designed to be stand-alone, though you may need to know previous materials also.

Students using these books should be able to add, subtract, multiply, and divide quickly. If not, have them practice these skills by working problems, and using flash cards.

This workbook can also help to find what topics, and what areas within those topics the student doesn't understand. If a student knows all the material, they should be able to go through this book quickly and easily with very little help if any.

These workbooks are great summer study tools, as they cover basics to help the student do their best with new topics during the school year.

These workbooks are in a series as follows.

- Book 1: Numbers, Arithmetic, Place Value, Symbols, Word Problems, and Factoring
- Book 2: Fractions
- Book 3: Decimals, Ratios, Proportions and Percent
- Book 4: Exponents, Roots, Scientific Notation, Rounding, Multiplication & Division Short-Cuts and Statistics
- Book 5: Measurement
- Book 6: Geometry
- Book 7: Pre-Algebra: Integers
- Book 8: Pre-Algebra: Order of Operations, Properties, Expressions and Equations

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Tutor's Pal Book 1

What chapter 1 is all about.

This chapter explains the vocabulary approach to math, why the book is written the way it is, who will benefit, and how to do each of the different sections in the books. Study this chapter before continuing on to chapter 2.

Why a vocabulary approach?

This book is written as a vocabulary based approach to mathematics. As a tutor with over 10 years of experience, I have found that students have trouble because they do not understand various words related to their math studies. This makes it impossible for them to understand the materials they are reading or hearing the teacher discuss.

For example if a student doesn't know what the word "power" means, they will have trouble with exponents. The teacher will say, "What is three to the power of 2?" The student will not understand the question and not be able to solve the problem or learn how to solve exponential problems.

Why learn simple concepts first?

This book is designed to thoroughly teach basic middle school level mathematics. Mathematics builds from simple concepts, to more complex ones. The complex ones are always built on one or more earlier simpler concepts. Students must know basic arithmetic very well in order to succeed with these books. They must know their multiplication tables by heart, and know division by heart as well. These workbooks will then teach middle school level materials thoroughly and as a result the student will be prepared for pre-algebra. I have had a few students who could not reduce fractions. I discovered in each case the problem was they were weak in multiplication and division. Reducing 35/42 was difficult because they couldn't instantly recall that $5 \times 7 = 35$ and $6 \times 7 = 42$, so $35 \div 7 = 5$ and $42 \div 7 = 6$. If they instantly knew the division problems, then the fraction could be quickly reduced to 5/6.

Who will benefit from these workbooks?

This book can also be used as a thorough review of middle school level mathematics for the pre-algebra or algebra student, or the adult student facing a math test years after taking any math classes. I often give my prealgebra or algebra students sections of these workbooks as a review of a basic concept because I see they are having trouble with the more advanced materials because of it. For example, a student was having trouble with algebra problems involving measurements. They didn't know what "meter", "centimeter", or "kilometer" were, or how they were related. I reviewed this with them until they were able to then solve the algebra problems.

Learn the basics first!

Again, I want to stress how important it is to learn the basics thoroughly and completely, before moving on. I have noticed over the years how once a student's math grade starts to go down to a B or C, it will keep getting worse each year. They will begin to hate math. I have tutored students in this situation that had a D. I would review earlier materials that they were having trouble with, as well as helping them understand the new materials. Their grades would gradually improve, with some working up to getting A's. These students start to like math again tool

Adults can also benefit.

It is never too late to learn. I tutored a 42 old college student who had not done well in math, and who didn't remember any algebra. He needed to pass algebra to graduate from college. He considered math his worst subject. I reviewed the vocabulary and concepts for middle school level math first, using these workbooks. We reviewed topics like percentages, exponents and decimals. Next we worked on pre-algebra concepts. He was then able to pass the placement test and get into the algebra class. He started liking math and his confidence grew. He couldn't believe he could actually understand and do algebra problems now!

Learning vocabulary words.

It is important to learn each vocabulary word thoroughly. In this workbook there are various exercises to attempt to force the student to do this, e.g. writing definitions, writing sentences, matching, examples, drawing, and problem solving. You can always do more examples or solve more problems until you feel you really understand.

I sometimes include definitions of words that relate to the math word. For example the math term "place value" consists of two English words; place (a

particular area or location) and value (what something is worth). By learning the regular English words it helps you to learn and remember the math definition of "place value" (the worth of a position of a digit in a number.)

I also sometimes include more than one definition of a word. This helps the student to get a wider understanding of the concept. Here is an example for the word "measure".

- <u>measure-</u> 1. to find the size, weight, etc. of something. (Please measure the height of this table.)
 - 2. to have as a measurement. (The table measures three feet high.)
 - 3. a unit of measure or a fixed amount used for measuring. (An inch is a measure of length.)

Symbols are also presented like a vocabulary word. For example the entry for percent would be as follows:

% (the symbol for percent.)

How to study the vocabulary section.

This section gives words, definitions, or other information. You should carefully read and study what is written. You will need to know this information in order to answer questions or solve problems. The sentences in parentheses after the definitions show an example sentence using the vocabulary word.

Example:

Study the following.

<u>learn</u> (**lurn**) - to find out about something, or find out how to do something. (I want to learn about dogs.)

<u>study</u> (**stuhd**-ee) - to spend time and have attention on something so you can learn it. (To study dogs, I spent two hours reading a book, and 20 minutes talking with my friend about how he trains his dog.) <u>understand</u> (uhn-dur-**stand**) - to know the concept of something very well. (I really understand dogs now, since I carefully studied them.)

How to study the pronunciation section.

Learning how to pronounce a word, and saying it out loud helps you to learn the word. It will be easier to remember. Also, when your teacher says it, you will understand what they are saying.

This section helps you learn the pronunciation of a word if you don't already know it. In the vocabulary section, the word is written first and the pronunciation follows it in parentheses. Say the word out loud first. If you can't pronounce it, use the pronunciation to help you. (The bold part of the pronunciation is the part you accent). Then write the word in the blank. If you need help understanding the pronunciation, use the pronunciation key in the back of the book, or ask someone to help you.

Example:

<u>understand</u> (uhn-dur-**stand**) - to know the concept of something very well. (I really understand dogs now, since I carefully studied them.)

Say each word out loud and write it in the blank.

understand <u>understand</u>

For the word understand:

<u>understand</u> (uhn-dur-stand). The part in bold means to accent that part, or say that part more forcefully.

accent this syllable

Remember, you can also ask someone if you are having trouble pronouncing a word.

How to do the writing definitions sections.

Reading and studying a definition thoroughly enough to write the definition in your own words, helps you to learn the definitions.

When doing this section carefully read the definition. Study the example sentence. Then write the definition in your own words.

Example:

<u>learn</u> (**lurn**) - to find out about something, or find out how to do something. (I want to learn about dogs.)

<u>study</u> (**stuhd**-ee) - to spend time and have attention on something so you can learn it. (To study dogs, I spent two hours reading a book, and 20 minutes talking with my friend about how he takes care of his dog.)

Write each definition in your own words.

learn - discovering something about a topic or figuring out how to do a task.

study - putting my efforts towards a topic to learn it

How to do the writing sentences sections.

Writing sentences using words that are new to you, helps you to learn the words. You can write as many sentences as you need to so you can really learn the word.

When a word is shown with its definition, there is usually an example sentence in parentheses after the definition.

Example:

 $\underline{\text{learn}}$ (**lurn**) - to find out about something, or find out how to do something. (I want to learn about dogs.)

The example sentence is, "(I want to learn about dogs.)"

Write three sentences using the word.

learn

- 1. *I will learn about the sun in science class.*
- 2. *My friend learned how to bake cookies.*
- 3. *Jim learns different things in each class at school.*

How to do the "writing examples" sections.

Writing down examples using numbers or pictures also helps you to learn words and math concepts. Example sections will vary depending on the topic. Read the instructions carefully for each section.

Example:

Write three examples of addition using numbers.

- 1. 2 + 3 = 5
- 2. 4 + 1 = 5
- 3. 10 + 10 = 20

Write three examples of addition using pictures.

- 1. $\bullet \bullet \bullet + \bullet \bullet = \bullet \bullet \bullet \bullet \bullet$
- 2. ___ = ____
- 3. $\blacktriangle \blacktriangle + \blacktriangle = \blacktriangle \blacktriangle \blacktriangle$

How to study the matching sections.

Draw lines to connect the word to its definition.



Matching.

learn	to find out about something, or find out how to do something
study	-to know about something very well
understand	to spend time and have attention on something so you can learn it.

Additional information.

The back of the book contains several sections that will help you study. They are as follows:



A dictionary is often useful to have with you when you are studying.

If you have any questions or problems that you can't figure out by yourself, be sure to ask someone for help before you continue.

 $\underline{\text{digit}}$ (**dij**-it) – the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. (There are two digits in the number 53.)

<u>numeral</u> (**noo**-mur-uhl) – the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. Same as a digit. (There are two numerals in the number 61.)

<u>number</u> (**nuhm**-bur) – a symbol or word that is used in counting or measuring. Examples: 3, 76, 1.42, 6.5, six, twenty. (Ten is a number.)

<u>figure</u> (**fig**-yur) – a symbol used in counting or measuring. Examples: 4, 32, 74.1, 9, 0 (312 is a figure.)

Say each word out loud and write it in the blank.

digit
numeral
number
figure
Write each definition in your own words.
digit
numeral
number
figure
Write two sentences using each word.

digit

1.

2.

numeral 1.	
2.	
number 1.	
2.	
figure 1.	
2.	
Write 5 examples of each.	
digit-	
numeral-	
number-	
figure-	
Matching	
digit	6 or six
1	7 but not seven
numeral	the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9.
number figure	the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9.

Fill in the blanks.

1.	3 is a	or a	
01	r a	or a	
2.	10 is a	or a	
3.	223.4 is a	 or a	
4.	ten is a		
	С		

Study the following words.

counting numbers (kount-ing) – the set of numbers used in counting. 1,2,3,4...

<u>natural numbers</u> (**nach**-ur-uhl) – counting numbers

whole numbers (hole) – the set of counting numbers and zero. 0, 1, 2, 3, 4, 5, 6...

<u>integers</u> (in-tuh-jur) – numbers made from the counting numbers (including 0) by putting a positive or a negative sign in front (the positive sign is often left out) ...-4,

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

<u>numbers</u> (**nuhm**-bur) – symbols used to measure or name quantities. Examples: 2 people, 4 inches, 7, 8.3, 100 feet, 55.66, 3, 12, -23, -17, -34.56

Say each word out loud and write it in the blank.

natural
counting
integer
whole
number
Write each definition in your own words.
counting numbers
natural numbers
whole numbers
integers
numbers
Write 10 examples of each.

counting numbers-

natural numbers-

whole numbers-

integers-

numbers-

Put a check in each column that correctly describes the item.

T.			1	T	NT 1
Item	Counting	Natural number	Whole	Integer	Number
	Number		number		
-10					
-5					
-1					
0					
2					
4					
10					
200					
456					
4.4					
62.7					
-45.67					
-1.8					

Matching



Study the following words.

<u>consecutive</u> (kuhn-**sek**-yuh-tiv) – following one after another without a break. (When you recite the alphabet, you say it in consecutive order.) (I read three consecutive chapters yesterday.)

<u>consecutive numbers</u> – numbers that follow each other in order (3,4,5 are consecutive) (21, 22, 23, 24 are consecutive)

even numbers (ee-vuhn) – whole numbers that can be divided evenly by 2 with no remainder. 0,2,4,6,8,10,12,14,16,18,20,22,24,26...

<u>odd numbers</u> (od) – whole numbers which, when divided by two, have a remainder of one. 1,3,5,7,9,11,13,15,17,19,21,23,25,27...

Say each word out loud and write it in the blank.

consecutive	
even	
odd	

Write each definition in your own words.

consecutive

consecutive numbers

even

odd

Write three sentences using the word consecutive.

1.

2.

3.

Write 4 examples of groups of consecutive numbers. Example: 4,5,6,7,8

- 1. 2.
- 3.
- 4.

Fill in the blanks.

1. Look at the even numbers in the definition. What do all even numbers end with?

_____ or _____ or _____ or _____ or _____

2. Look at the odd numbers in the definition. What do all odd numbers end with?

_____ or ____ or ____ or

Write 10 examples of each. Use numbers that are <u>not</u> given in the definition.

or

even number-

odd number-

Matching.

consecutive3,5,7,9consecutive numbers100, 101, 102, 103even numbers6,8,10,12odd numbersfollowing one after another without a
break

Circle all the even numbers.

1	2	3	7	18	19	25		310	744	16
77	7	888	8	240)2		510)7	49,470	



Study the following words.

<u>arithmetic</u> (uh-**rith**-muh-tik) - using numbers in adding, subtracting, multiplying, and dividing. (I learned my multiplication tables in arithmetic class.)

<u>addition</u> (uh-**dish**-uhn) - the act of adding or putting things together and finding out how much you have when you put it together. (I used addition to find out how many CDs my friend and I had together.)

sum (suhm) - the answer to an addition problem. (The sum of 3 and 4 is 7.)

<u>subtraction</u> (suhb-**trakt**-shun) - the act of taking something away from something else. (I used subtraction to find out how many mice I had after 2 ran away.)

<u>difference</u> (dif-ruhnss) – the answer to a subtraction problem. (The difference of 10 and 2 is 8.)

Say each word out loud and write it in the blank.

arithmetic
addition
sum
subtraction
difference
Write each definition in your own words.
arithmetic
addition
sum
subtraction
difference

Write two sentences using each word.

arithmetic 1.	
2. addition 1.	
2.	
sum 1.	
2.	
subtraction 1.	
2.	
difference 1.	
2.	
Matching.	
arithmetic	the answer to an addition problem.
addition	the act of taking something away from something else
sum	using numbers in adding, subtracting, multiplying, and dividing.
subtraction	the answer to a subtraction problem
difference	the act of adding (putting things together) and finding out how much you have when you put it together.



4. 6 + 3 = 9

You can show subtraction by using pictures.



4. 6 - 2 = 4

In addition and subtraction You sometimes see the following words.

addend (ad-end) – the numbers you are adding

minuend (min-yoo-end) – the number you are subtracting from

<u>subtrahend</u> (**suhb**-truh-hend) – the number you are subtracting

$2 \leftarrow addend$ + 4 \leftarrow addend 6 \leftarrow sum
$ \begin{array}{r} 10 \leftarrow \text{minuend} \\ \underline{- 6} \leftarrow \text{subtrahend} \\ 4 \leftarrow \text{difference} \end{array} $
Say each word out loud and write it in the blank.
addend minuend subtrahend
Write each definition in your own words.
addend
minuend
subtrahend

Subtraction is the opposite of addition.

Example: take 7 and <u>add 2</u> to get 9, then <u>subtract 2</u>, and you are back where you started at 7.

Write an example of subtraction being the opposite of addition.



Label each number.



$$\begin{array}{r} 12 \leftarrow \\ - 2 \leftarrow \\ 10 \leftarrow \end{array}$$

Study the following words.

<u>multiply</u> (**muhl**-tuh-plye) - to take a number and add it a certain amount of times. Example: $2 \times 3 = 2 + 2 + 2$

<u>multiplication</u> (muhl-tuh-pli-**kay**-shun) - the act of multiplying, a quicker way to add.

product (prod-uhkt) – the answer to a multiplication problem

<u>divide</u> (duh-**vide**) - to split up a number into groups of whatever you are dividing by

<u>division</u> (di-**vizh**-uhn) - the act of dividing. Example: 35 divided by 7 equals 5 (Take the number 35 and split it into groups of 7. There are 5 groups of 7 in the number 35.)

quotient (kwoh-shuhnt) - the answer to a division problem

Say each word out loud and write it in the blank.

multiply	
multiplication_	
product	
divide	
division	
quotient	

Write each definition in your own words.

multiply

multiplication

product

divide

division

quotient

Write two sentences using each word.

multiply 1.

2.

multiplication

1.
 2.
 product
 1.
 2.
 divide
 1.

Ι.

2.

division

1.

2.

quotient

1.

2.

S		

Matching.

multiply	to take a number and add it a certain amount of times
multiplication	Example: $2 \times 3 = 2 + 2 + 2$
munipileation	the answer to a division problem
product	the act of multiplying, a quicker way to add.
divide	the answer to a multiplication problem
division	the act of dividing. Example: 35 divided by 7 equals 5 (Take the number 35 and split it into groups of 7. There are 5 groups of 7 in the number 35.)
quotient	to split up a number into groups of whatever you are dividing by
S	

You can show multiplication using pictures. Each problem can be shown two different ways.

Examples: $2 \times 4 = 8$ Two rows of 4 in each row

Two rows of 4 in each row **or** 4 rows of 2 in each row



- 3. $3 \times 3 = 9$
- 4. $10 \times 2 = 20$

You can show division two different ways using pictures.

Here is method 1.



Use method 1 to divide the following using pictures.

1. $9 \div 3 = 3$

- 2. $18 \div 6 = 3$
- 3. $20 \div 4 = 5$ 4. $30 \div 10 = 3$

You can show division two different ways using pictures.

Here is method 2.



The answer is 4.

Use method 2 to divide the following using pictures.

1. $9 \div 3 = 3$

2. $18 \div 6 = 3$



Use both methods to show the following in pictures.



In multiplication and division the word **factor** is used quite often.

Occasionally you see the words **divisor** and **dividend**.

factor (fak-tur) - the numbers you are multiplying

divisor (di-vye-zur) – the number you are dividing by

dividend (div-i-dend) - the number you are dividing

 $9 \leftarrow factor$ \times 5 \leftarrow factor $45 \leftarrow \text{product}$ 16 8 ÷ 2 dividend divisor quotient Say each word out loud and write it in the blank. factor divisor dividend Write each definition in your own words. factor divisor

dividend
Study the following.

Multiplication is the opposite of division.

Example: Take 3 and <u>multiply it by 5</u> to get 15. Then <u>divide it by 5</u> and you get 3, your original number.

Write an example of multiplication being the opposite of division.



Label the number that each arrow is pointing to.

Study the following words.

<u>equal</u> (ee-kwuhl) - the same as. (She has an equal number of left shoes as right shoes.)

<u>greater than</u> (**grayt**-ur **TH**an) - bigger or larger than. (8 is greater than 7.) (My left foot is greater than my right foot.)

<u>less than</u> (**less TH**an) - smaller than. (7 is less than 8.) (This paycheck is less than the one I got last week.)

Say each word out loud and write it in the blank.

Matching.

equal	larger than
greater than	smaller than
less than	the same as

Circle the pairs of numbers that are <u>equal</u>.



CHAPTER 3 - ARITHMETIC

Arithmetic Review

Show the following in pictures.

1. 9 + 2 = 11

- 2. 7 3 = 4
- 3. $7 \times 2 = 14$
- 3. $7 \times 2 = 14$ 4. $15 \div 5 = 3$

Fill in the blanks.

- 5. ______ is the opposite of ______.
- 6. ______ is the opposite of ______.

CHAPTER 3 - ARITHMETIC

Label the number that each arrow is pointing to.



Study the following words.

<u>place</u> (**playss**) - a particular area or location (We lived in several places when we were children.)

value (val-yoo) - 1. What something is worth. (What is the value of this radio?)

2. In math, a given or calculated number or quantity. (The value of y is given as 3.)(Find the value of x if x = 2 + 3)

place value (playss val-yoo) - The value of a position of a digit in a number. (The place value of the 5 in 52, is 10)

<u>ones place</u> (wuhnz) - The farthest place to the right, in a whole number. It means a digit in this place is worth one times the digit. (In the number 254, the 4 is in the ones place and it has a value of 1×4 or 4.)

<u>tens place</u> (tenz) - One place over towards the left, in a whole number. It means a digit in this place is worth ten times the digit. (In the number 254, the 5 is in the tens place and it has a value of 10×5 or 50.)

<u>hundreds place</u> (huhn-druhdz)- Two places over towards the left, in a whole number. It means a digit in this place is worth one hundred times the digit. (In the number 254, the 2 is in the hundreds place and it has a value of 100×2 or 200.)

<u>unit</u> (**yoo**-nit) – the number one. (The smallest counting number is a unit.)(I added two units together to get 2.)) I wrote two units next to each other to make the number eleven.)

<u>units place</u> (yoo-nitz) – the ones place

Say each word out loud and write it in the blank.

place		
value	-	
ones		_
tens		
hundreds		
unit		

Write each definition in your own words.

place

value

place value

ones place

tens place

hundreds place

unit

units place

Study the following.

Take the number 254.

Hundreds place	Tens place	Units or ones place
2	5	4
The 2 is worth	The 5 is worth	The 4 is worth
2 times 100	5 times 10	4 times 1
or 200	or 50	or 4

So for the number 254 we have 200 and 50 and 4 or **200** + **50** + **4**

Write two sentences using each word.

place

1.

2.

value 1.	
2.	
place value 1.	
2.	
unit 1.	
2.	$\langle \cdot \rangle$
Write 5 numbers bigger than 100 for each, and circ	cle the number that is in
that place. ones place-	
tens place-	
hundreds place-	
Fill in the blank.	
The units place is the same as the	place.

Matching.

place	the value of a position of a digit in a number
value	the farthest digit to the right
place velue	a location
place value	one place over to the left in a whole
ones place	number
unit	what something is worth
units place	two places over to the left in a whole number
tens place	another name for the ones place
hundreds place	the number one
6	

Circle the digits in the units place.

42 571 8247 52 3 81 95556 4712

Circle the digits in the tens place.

34 571 8217 52 17 81 23556 4757



What is the value, or what is the circled digit worth based on the digit, and the place value?



Write the following numbers as separate hundreds, tens, and ones.

Example: 468 = 400 + 60 + 8

- 1. 621
- 2. 25
- 3. 122
- 4. 604
- 5. 592
- 6. 41
- 7. 8
- 8. 59
- 9. 863
- 10. 274

Study the following definitions.

<u>period</u> (**pihr**-ee-uhd) - 1. A mark at the end of a sentence, showing the sentence has ended.

- 2. a length of time (He walked around outside for a short period.)
- 3. in math, a group of three places of digits. Periods are usually seperated by commas. Some periods are shown as follows. The name of the period comes from the right most place value in that period. (The number contained three periods.)



Write two sentences for each definition of period.

period (definition 1.) 1.

2.

period (definition 2.) 1.

2.

period (definition 3.) 1.

2.



Study the place values of the following.



CHAPTER 4 - PLACE VALUE

Write a nine digit number, and label each of the periods.

Write another 9 digit number, and label the place values.



Study how to write out or say a large number.

123,456,789

You say the above number as follows.

One hundred twenty-three million, four hundred fifty-six thousand, seven hundred eighty-nine.

Notice how you group the periods together when you write out the number.

One hundred twenty-three million, — millions period four hundred fifty-six thousand, — thousands period seven hundred eighty-nine. — ones period

Write this number out in words, the way you would say it.

623,419,775

Write a 9 digit number and <u>label the periods</u>, <u>label the place values</u>, and <u>write</u> <u>it out in words</u>.



Study the periods of the following.

ten quadrillions

hundred quadrillions

<u>548</u>, <u>659</u>, <u>213</u>, 245, 874, 112 quadrillions trillions billions period period period Say the words out loud and write them in the blank. billion (**bil**-yuhn) trillion (**tril**-yuhn) quadrillion (kwahd-**dril**-yuhn) Study the place values of the following. 43,784,123 billions ten billions hundred billions trillions ten trillions hundred trillions quadrillions

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Label all the place values for this number.



CHAPTER 4 - PLACE VALUE

Write another 18 digit number, and label the place values.



Write these numbers out in words, the way you would say them.

124,540,678,227,203,114

889,561,217,580,540,112

Study the following words.

<u>symbol</u> (**sim**-buhl) - something that stands for or represents something else. Symbols can be letters, words, marks, or pictures.

letter (let-ur) - a symbol that stands for a sound of speech; part of an alphabet

word (wurd) - a letter or group of letters that stand for spoken sounds or a group of sounds and has meaning and is used as a single piece of speech

<u>mark</u> (**mark**) - a written symbol, like a question mark or other punctuation marks like a comma or period.

sign (sine) - a symbol that stands for something, like a dollar sign, or a plus sign.

Say each word	d out loud a	and write i	t in the bl	ank.
symbol			\sim	
letter				
word				
mark				
sign				
Examples: Symbols: + ÷	\$ B Q	bird tree 3	7 ♥ ▲	♣,?!
Marks:				,?!
Letters:	BQ			
Words:	ł	oird tree		
Signs: +	÷ \$			

Write each definition in your own words.

symbol	
letter	
word	
mark	
sign	
Matching.	
symbol	a symbol that stands for a sound of
word	a symbol, like a comma
letter	something that stands for or represents something else
sign	a written symbol, like a question mark
mark	a letter or group of letters that stand for a spoken sound



Put a check mark in each column that correctly describes these items.

Review

Fill in the blanks with vocabulary words.



Study the following symbols.

- + This is a plus sign. It means plus, or add. Example: 2 + 3 means 2 plus 3.
- This is a minus sign. It means minus or subtract. Example: 7 2 means 7 minus 2.
- \times This is a times sign. It means times, or multiplied by. Example: 3×4 means 3 times 4.
- This also means times. Example: 2 3 means 2 times 3.
- * This also means times. It is often used in computer programming. Example: 3 * 4 means 3 times 4
- This means divided by.
 Example: 10 ÷ 5 means 10 divided by 5
-) This means divided by or divided into.

Example: $4\overline{)12}$ means 12 divided by 4, or 4 into 12

Notice how when you say divided by, you read the problem backwards, 12 divided by 4.

Write 5 examples using each symbol.



)

Matching.



Write the following in words two different ways.

1.	3) 15	15 divided by 3. 3 into 15.
2.	4) 20	
3.	6) 36	5

- 4. 2)14
- 5. 5) 35

Write the following in words.

1. a. 4 <u>÷ 20</u>	3. a. $3 \div 21$
b. 4) 20	b. 3) 21
2. a. 2) 14	4. a. $4\overline{)16}$
b. $2 \div 14$	b. $4 \div 16$

CHAPTER 5 - SYMBOLS **Study the following symbols.**

- = This is an equal sign. It means "is equal to", or "equals". Example: 2 + 2 = 4 means 2 plus 2 <u>equals</u> 4 or 2 plus 2 <u>is equal to</u> 4.
- > This is a greater than sign. It means "is greater than". Example: 3 > 2 means 3 is greater than 2.
- This is a less than sign. It means "is less than".
 Example: 1 < 4 means 1 is less than 4.

For less than and greater than, the "mouth" would eat the bigger number.



Draw two examples of each, showing the less than and greater than symbols as mouths of an animal.

less than

greater than

CHAPTER 5 - SYMBOLS Write three examples using the = sign.

Matching.



Study the following.

<u>exponent</u> (ek-spoh-nuhnt) - a number written to the upper right side of another number, showing how many times that number should be multiplied. (Example: In 3^4 , the 4 is the exponent. 3^4 means $3 \times 3 \times 3 \times 3$.)

<u>power</u> (**pou-ur**) - another word for an exponent. The power is how many times you multiply the number. (Example: 3^4 means 3 to the forth power. 3^4 means $3 \times 3 \times 3 \times 3$.)

<u>base</u> (**bayss**) - the bottom number when you have a number to a power. (Example: In 3^4 , the 3 is the base.)

<u>squared</u> (skwaird) - instead of saying "to the second power" you can say "squared". (6^2 means 6 to the second power, or 6 squared.)

<u>cubed</u> (**kyoobd**) - instead of saying "to the third power" you can say "cubed". $(5^3 \text{ means five to the third power, or five cubed.)$

Squared and cubed are the only two special words to name powers.

Say each word out loud and write it in the blank.

exponent	
power	
base	
squared	
cubed	

Write each definition in your own words.

exponent

power

base

squared

cubed

\$7

Write 5 examples of each. Write a number to a power, and circle the part that is named by the word.

exponent-

power-

base-

squared-

cubed-

Write the word or words that apply to the circled numbers.

1.	20	or	
2.			
3.	42	or	or
4.	7 3	or	or

Matching.

exponent	another word for an exponent
power	a number written to the upper right side of another number, showing how many times that number should be multiplied
base	instead of saying "to the second power" you can say this
squared	instead of saying "to the third power" you can say this
cubed	the bottom number when you have a number to a power

Study the following again.

<u>exponent</u> (ek-spoh-nuhnt) - a number written to the upper right side of another number, showing how many times that number should be multiplied. (Example: In 3^4 , the 4 is the exponent. 3^4 means $3 \times 3 \times 3 \times 3$.)

More examples: Write as a multiplication problem.

$$4^{3} = 4 \times 4 \times 4$$

 $6^{2} = 6 \times 6$
 $10^{4} = 10 \times 10 \times 10 \times 10$

Write the following as multiplication problems.

- 1. $2^3 =$
- 2. $4^8 =$
- 3. $7^2 =$
- 4. $8^4 =$
- 5. $9^3 =$

Make up 5 examples of bases with exponents, and then write as a multiplication problem.

Study the following.

Writing bases with exponents is a short-cut way of writing multiplication of the same number over and over.

Examples: $3 \times 3 \times 3 \times 3 \times 3 = 4 \times 4 \times 4 = 4^3$

Write these multiplication problems as a base and an exponent.

- 1. $6 \times 6 \times 6 \times 6 =$
- 2. $3 \times 3 =$
- 3. $9 \times 9 \times 9 \times 9 \times 9 \times 9 =$
- 4. $10 \times 10 \times 10 =$
- 5. $18 \times 18 \times 18 \times 18 \times 18 \times 18 =$

Write 5 examples of multiplication problems that multiply the same number. Then write as a base with an exponent.

Study the following.

The next step is to solve exponent problems. First you write an exponent as a multiplication problem, then you multiply all the numbers together.

Examples: $2^4 = 2 \times 2 \times 2 \times 2 = 16$

$$3^2 = 3 \times 3 = 9$$

$$10^4 = 10 \times 10 \times 10 \times 10 = 10,000$$

Solve showing the multiplication problem, and then the answer.

1.
$$2^{3} =$$
_____ = ____
2. $4^{2} =$ _____ = ____
3. $10^{3} =$ _____ = ____

Make up 5 examples like the problems above, and solve.

1. 2. 3. 4. 5.
Solve.

- 1. $2^2 = 2 \times 2 = 4$
- 2. $3^2 =$
- 3. $2^3 =$
- 4. $1^2 =$
- 5. $7^5 =$
- 6. $6^4 =$
- 7. $3^3 =$
- 8. $8^3 =$
- 9. $2^6 =$
- 10. $9^2 =$
- 11. $5^3 =$