

UNIT 1



NUMBERS AND PLACE VALUE

SEEING OUR CREATOR IN MATHEMATICS

Welcome to a new year of math! There are many exciting and interesting topics in this book and you are going to have a great year learning about all of them.

But before we jump in let's think about our motivation. Why are we learning math this year? Many people thinking of learning math as a bridge. It is something that allows them to get where they want to go.



But math is so much more than that. It isn't just a requirement that allows you to get onto the fun stuff. It is an opportunity to learn about God.

You see when God made the world he included math. He didn't have to, he chose for it to be a part of his design. And everything God made was good.

We find math in the world around us in the symmetry and patterns of creation. You will learn more about that throughout this book. When we look closely at these examples in creation, we catch a glimpse of the character of the Creator. In the beauty, order, and truth of creation we see the fingerprints of His beauty, order, and truth. That is why we learn math.

Let's get started!



Skills Practice for Unit 1:

Adding and Subtracting Three-Digit Numbers



PLACE VALUE

In this chapter, you will learn to:

- ⦿ Use place value to write numbers up to one million
- ⦿ Write numbers in expanded and written form
- ⦿ Round numbers





LESSON 1: NUMBERS TO 100,000

Math Scavenger Hunt

You Will Need:

- Number Scavenger Hunt: Activity Sheet (in the back of the answer key)
- Magazines/flyers or a location with numbers displayed such as a library, grocery store, or bank
- Scissors
- Glue stick
- A timer
- Clipboard (optional)



You Will Do:

1. Carefully tear out the Number Scavenger Hunt Activity Sheet from the back of the answer key. Set a timer for 10 minutes.
2. If you are using a magazine or flyer, flip through it looking for examples of the different kinds of numbers or math ideas. Cut out the examples and glue them in the correct section.
3. If you are looking for examples at a location instead, write them down or sketch a picture in the correct places.
4. Were you able to find everything before the timer went off? If not, you can write or draw in examples for what you could not find.

Math is all around us. We use math to count items and group shapes according to their properties. We also use math to measure lengths, capacity, and even time.

Numbers are how we record these amounts. Sometimes you can record amounts with a simple mark like the ones below.



But our universe is a huge place with big distances, lots of creatures, and enormous things to measure. So, we need a simple way to record really large numbers without taking up lots of space. **Place value** is what we use to do that.

**PLACE VALUE:**

A system of writing numbers where the location of a digit affects its value.

5,423

1,104

The digit 4 in the number on the left represents 4 hundreds. The digit 4 in the number on the right represents 4 ones. That's because the place where the digit 4 is in the number represents its value.

PLACE VALUE CHART

Millions			Thousands			Ones		
Hundred Million	Ten Million	One Million	Hundred Thousand	Ten Thousand	One Thousand	Hundreds	Tens	Ones
1	2	3,	4	5	6,	7	8	9

STANDARD FORM:

123,456,789

EXPANDED FORM:

$100,000,000 + 20,000,000 + 3,000,000 + 400,000 + 50,000 + 6,000 + 700 + 80 + 9$

WORD FORM:

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

This chart shows the place value of numbers all the way up to a hundred million. You can see that there is a pattern on the chart. Each group of 3 digits has ones, tens, and hundreds. These groups of 3 are called **periods**. When we write out numbers, we separate each period with a comma so that it is easier to read.

**PERIODS:**

Groups of 3 designating ones, tens, and hundreds in place value.

EXAMPLE 1: What does the 7 in the number 670,334 represent?

The 7 is in the ten thousands place. So the 7 represents 70,000.



1. Write the value of the underlined digit.

a. $17\underline{1},213$ _____

b. $\underline{4},056$ _____

c. $\underline{9}13,456$ _____

d. $661,\underline{5}83$ _____

2. Write an example of a number that has a 5 in the ten thousands place.

3. Write an example of a number that has a 6 in the millions place.

1 8 2 5 6 9

4. What is the smallest number you can make with the digits above?

5. What is the largest number you can make with the digits above?



LESSON 2: UP TO ONE MILLION

How much is a million? Have you ever heard someone talking about a million dollars or a million grains of sand? Let's take a moment to try to picture how much one million is.



10 rolls = 1 case = 1,000 sheets



10 cases = 10,000 sheets



1 pallet = 100 cases = 100,000 sheets



**A million paper towel sheets is
10 pallets of paper towels!**



Talk with your parents about examples of a million.

It is important for you to understand the relationship between different places on the place value chart. The first thing to notice is that there can only be a single digit in each spot. You will never find more than one number for each value. Numbers from 0-9 are acceptable.

Each new value is 10 times as much as the space to the right. For example, one thousand is the same as 10 hundreds. But you can't put a 10 in the space. That would be 2 digits when only 1 is allowed.

One million is the same as 10 hundred thousands. From here you could count up to 9 million. What would come next? 10 million, of course.



In 2011, a powerful earthquake in Japan triggered a tsunami that traveled across the Pacific Ocean. The wave was so powerful that an estimated **one million** sea creatures were pushed all the way to the West Coast of the United States. The sea slugs here are just one example of some of the creatures.

EXAMPLE: How many ten thousands do you need to make one hundred thousand? Picture the place value chart.

Millions			Thousands			Ones		
Hundred Million	Ten Million	One Million	Hundred Thousand	Ten Thousand	One Thousand	Hundreds	Tens	Ones

You need 10 ten thousands to make one hundred thousand. The one hundred thousands place is one space to the left of the ten thousands. It is ten times as big.



1. Write the value of the underlined digit.

a. $2\underline{2}9,111$ _____

b. $4,0\underline{4}9$ _____

c. $\underline{1},223,780$ _____

d. $1,3\underline{4}5,107$ _____

2. 10 groups of ten is the same as

3. 10 groups of a hundred is the same as

4. 10 groups of a thousand is the same as

5. 10 groups of ten thousand is the same as

6. 10 groups of one hundred thousand is the same as

7. What number is one less than one million?

VOLUMES OF OCEANS (km²)

OCEAN	Approximate Area in Square Kilometers
Arctic	15,558,000
Atlantic	85,133,000
Indian	70,560,000
Pacific	161,760,000
Southern Ocean	21,960,000



Note: There is some debate over the boundary lines between the different oceans. This table is based on information provided on the NOAA website.

8. Look at the oceans chart to answer these questions.

- a. Which ocean has a 3 in the ten thousands place?

- b. Which 3 oceans have the same value in the ten thousands place?

- c. Which ocean has a 1 in the hundreds thousands place?

- d. According to this chart, which ocean has the greatest area?



LESSON 3: EXPANDED FORM

Expanded Form Flip Book

You Will Need:

- Expanded Form Flip Book: Activity Sheet
- Scissors
- Stapler

You Will Do:

1. Carefully tear out the Expanded Form Flip Book: Activity Sheet from the back of the answer key.
2. Cut apart each of the rectangles on the activity sheet. Stack them with the largest number on the bottom and the smallest on the top.
3. Staple them together on the right side.
4. Flip through your number so you can see it in standard form and in expanded form.



Normally, we write numbers in standard form. All of the numbers in lessons 1 and 2 were written in standard form. It is a nice way of writing numbers because it doesn't take up very much space. But sometimes it is also helpful to write a number in expanded form or written form. In this lesson, we will practice and review **expanded form**. In lesson 4, you will learn how to write numbers in written form.



EXPANDED FORM:
a way of writing numbers
that shows the value of
each digit.

EXAMPLE 1: Write the number 345,654 in expanded form.

$$300,000 + 40,000 + 5,000 + 600 + 50 + 4$$

EXAMPLE 2: Write the number 4,056 in expanded form.

$$4,000 + 50 + 6$$

The number has no hundreds so you do not need to expand that part of the number.



1. Match each number in standard form on the left with its expanded form on the right.

a. 106,789 $90,000 + 800 + 10 + 7$

b. 65,112 $100,000 + 6,000 + 700 + 80 + 9$

c. 160,229 $3,000 + 2$

d. 56,702 $100,000 + 60,000 + 200 + 20 + 9$

e. 3,002 $60,000 + 5,000 + 100 + 10 + 2$

f. 90,817 $50,000 + 6,000 + 700 + 2$

2. Correct the numbers below by adding commas in the correct places to show the different periods.

a. **88123**

b. **2300699**

3. Write each number in standard form.

a. $3,000 + 40 + 2$ _____

b. $800,000 + 70,000 + 600 + 10 + 5$ _____

4. Write each number in expanded form.

a. 234,515 _____

b. 1,203,305 _____



LESSON 4: NUMBERS IN WRITTEN FORM

State Exploration

You Will Need:

- An atlas or internet search tool

You Will Do:

1. How big is your state in square miles? Look up the size or have your parent can look up the size in the teaching guide notes for this lesson. List it in the top space below.
2. Choose one other state and find its area in square miles. Write it down on the table below. You will complete this table after reading the lesson.



MY STATE:	AREA OF MY STATE:
Expanded Form _____	
Written Form _____	

A SECOND STATE:	AREA OF SECOND STATE:
Expanded Form _____	
Written Form _____	

A third form for numbers is written form. This is exactly what it sounds like; it just means writing out the number with words instead of using numerals. We use the written form of numbers in certain types of writing or to avoid confusion. When your parent writes a check, they write the amount using numerals and also in the **written form**. Why do you think that is? Tell your parent.

When we write a number in written form, we put a comma after each period or group of three digits just like we did with numerals. When you get to the comma, you say the name of the period.



WRITTEN FORM:

a way of writing numbers using words instead of numerals.

EXAMPLE 1: Say the number 980,122 out loud. You try first and then have your parent read it to you.

“nine hundred eighty thousand, one hundred and twenty-two.”

When we write out the number in written form, we write a comma after each period of numbers to prevent confusion. Also, remember that numbers between 21 and 99 have a hyphen in them.

EXAMPLE 2: Write 1,450,111 in written form.

One million, four hundred fifty thousand, one hundred eleven.

EXAMPLE 3: Write the number 644,123 in expanded form and written form. How many periods does it have?

Expanded form:

$$600,000 + 40,000 + 4,000 + 100 + 20 + 3$$

Written form:

six hundred forty-four thousand, one hundred twenty-three

This number has two periods: thousands and ones.



1. Read each number below aloud to your parent.

a. 340,999

b. 1,299,123

2. Write each number in written form.

a. 65,072

b. 1,456,000


c. 2,303

d. 765,555


e. $4000 + 500 + 5$

f. $1,000,000 + 20,000 + 3,000 + 300 + 20 + 1$

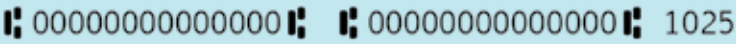
3. Redemption Church is building a new Sunday School wing for 1,000,801. They need some help completing the check below. Write out the written form of the cost where you see the red X.


REDEMPTION CHURCH
Date 3/3/2021 1025

PAY TO THE ORDER OF Cool Construction \$ 1,234,801

X _____ DOLLARS 

MEMO Sunday School Wing *Pastor Smith*

 1025



LESSON 5: COMPARING AND ORDERING

Place Value Math Search

You Will Need:

- Lesson 5: Activity Sheets
- Masking tape
- A notebook

You Will Do:

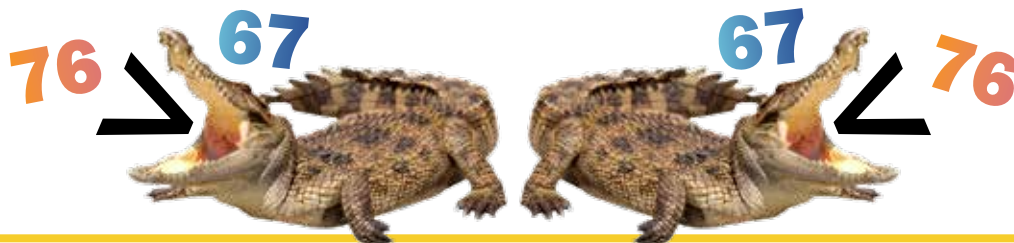
1. Tear out the activity sheets from the back of the answer key.
2. Have your parent cut out the different math clues and tape them up according to the instructions in the answer key.
3. Start at any math clue. Ignore what is on the top of the flap. That is the answer to a different math question. Instead, lift the flap and read the question that is written underneath. Answer the question in your math notebook.
4. Look at the other math clues and see if you can find the matching answer on the top flap. When you find it, move to that clue.
5. Lift the flap and begin answering the question posted below. If you answer all the questions correctly, you will travel to all 8 clues and end where you started.



In this lesson, you will learn how to compare and order 6 or 7-digit numbers. When we compare or order larger numbers, we use the same process we used with two or three digit numbers. Begin by comparing the largest place value and keep going from there.



For many kids, remembering which sign is which is harder than finding the greater number. You can think of the symbol as an alligator's mouth eating the greater number (because alligators are hungry so they want to choose the biggest lunch). Or you can remember that the symbol points to the smaller number.



EXAMPLE 1: Fill in the correct symbol $<$, $>$, or $=$.

$$77,623 \bigcirc 77,413$$

Begin by comparing the ten thousands place.

$$70,000 = 70,000$$

The thousands are equal too.

$$7,000 = 7,000$$

But the number on the left has more hundreds.

$$600 > 400$$

600 is greater than 400. So, we use a $>$ symbol. $77,623 \textcircled{>} 77,413$

EXAMPLE 2: Put these three numbers in order from least to greatest:

143,005 75,991 78,551

It can be easier to compare the place values by lining up the numbers vertically. 143,005 is the only number with a digit in the hundred thousands place so it is the largest. 5,000 is less than 8,000, so 75,991 is the smallest number in the group. The numbers in order from least to greatest are

75,991; 78,551; 143,005.

143,005
75,991
78,551

EXAMPLE 3: What digit could be placed in the blank to make the statement true? $45,702 < 4_,233 < 47,111$

The number in the middle needs to be greater than 45,702 and less than 47,111. Comparing just the thousands place that means that it needs to have 6 thousands. So a 6 should go in the blank.

$$45,702 < 4\mathbf{6},233 < 47,111$$



1. Below are several comparison problems to help you review how to use the symbols correctly. Fill in $<$, $>$, or $=$ in each example. Have your parent check your answers to this section before you move on to section 2.

a. $23 \bigcirc 27$

b. $51 \bigcirc 43$

c. $123 \bigcirc 304$

d. $650 \bigcirc 450$

e. $761 \bigcirc 770$

f. $230 \bigcirc 230$

2. Fill in the correct symbol $<$, $>$, or $=$ to complete the comparison.

a. $32,999 \bigcirc 102,033$

b. $254,789 \bigcirc 254,789$

c. $778,003 \bigcirc 778,030$

d. $6,798 \bigcirc 6,777$

e. $34,559 \bigcirc 304,559$

f. $344,280 \bigcirc 340,289$

3. Put the numbers in order from greatest to least.

a. $686,923 \quad 17,999 \quad 786,239$

b. $85,717 \quad 87,900 \quad 86,999$

4. What digit could be placed in the blank to make the statement true?

a. $\boxed{3072} < \boxed{30 \text{ ____ } 1} < \boxed{3090}$

b. $\boxed{440} < \boxed{4 \text{ ____ } 4} < \boxed{451}$



● Mount Everest

Mariana Trench



Look at these amazing creatures found in the Mariana Trench!

5. Mount Everest is 29,029 feet tall at its summit. The Mariana Trench is 36,011 feet deep. Which is greater, the height of Mount Everest or the depth of the Mariana Trench?

6. Which do you think would be more exciting to explore?
