

Place Value of Whole Numbers Through One Million

Brief Overview:

This learning unit develops and reviews place value concepts through millions. It involves the utilization of manipulatives. The lessons focus on a students' basic understanding of place value and the reinforcement of the concept. It is ideal for a classroom setting where differentiation is implemented and can be used in a large or small group setting.

NCTM Content Standard/National Math Education Standard:

Grade/Level:

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

Understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals.

Grade/Level:

Grade 3

Duration/Length:

Three 60-minute periods

Student Outcomes:

Students will:

- Identify whole numbers through millions**
- Identify place value and value of digits through millions**
- Write whole numbers through millions**
- Write the expanded form of numbers through millions**
- Write the standard form of the number, given the expanded or word form of the number**

- Order whole numbers through millions

Materials and Resources:

Lesson 1

- Student Resource 1, "Set of Ten Number Cards
- Student Resource 2, "Millions Place Value Chart"
- Student Resource 3, "Number Cards 0 - 9"
- Student Resource 4, "Place Value Worksheet to Millions"
- Teacher Resource 1, "Student Response Data Sheet"
- Teacher Resource 2, "Directions for Constructing the Millions Place Value Chart".
- Teacher Resource 3, "Place Value Through The Millions".
- Place Value Draw, p.23 (S. Staylor, Mega-Fun Math Fairs, Carson-Dellosa Publishing Company, Inc., 2003.)
- Sets of base ten blocks for pairs of students including ones, tens, hundreds and thousands
- Staplers
- Scissors

Lesson 2

- Student Resource 2, "Millions Place Value Chart"
- Student Resource 3, "Number Cards 0 - 9"
- Student Resource 5, "Number Cards 0"
- Student Resource 6, "Writing Expanded Form"
- Teacher Resource 4, "Writing Expanded Form"
- <http://www.quia.com/mc/279741.html>
- Rubber band

Lesson 3

- Student Resource 7, " Number Bingo"
- Student Resource 8, "Number Words"
- Student Resource 9 a, "Writing Checks"
- Student Resource 9 b, "Writing Checks"
- Student Resource 10, "Fun With Numbers"
- Student Resource 11, "Writing Numbers in Word Form"

- Teacher Resource 5, "Number Bingo Cards"
- Teacher Resource 6, "Fun With Numbers Answer Sheet"
- Teacher Resource 7, "Writing Numbers in Word Form, Answer Sheet"
- Dry erase boards and markers
- Large index cards

Development/Procedures:

Lesson 1

Pre-Assessment/Launch -

- Provide each student (or pair of students) with a set of ten number cards (Student Resource 1, "Set of Ten Number Cards"). Instruct the students to place the cards on their desktop.
- Explain that a clue will be given and they must identify the number that matches the clue.
- Instruct the student to hold up the number for each clue.
- Give the students one clue at a time. Once the students identify the number by holding it up. Call on one student to read the number.
- Use Teacher Resource 1, "Student Response Data Sheet" to record students' responses.

Clues:

1. Show me the two-digit number.
 2. Show me a number with the two in the tens place.
 3. Show me a number with nine in the ones place.
 4. Show me a three-digit number.
 5. Show me a number with eight in the hundreds place.
 6. Show me a four-digit number.
 7. Show me a number with four in the thousands' place.
 8. Show me the largest number.
 9. Show me the smallest number.
- Instruct the students to put their cards in order from least to greatest.

Teacher Facilitation -

- Explain to the student that they are going to learn about place value through millions.
- Distribute sets of base ten blocks to each pair of students.
- Review the values of each type of place value (ones, tens, hundreds, and thousands blocks). Example: While holding up a unit, "This is called a unit it represents ones". While holding up a long, say, "This is called a long. It represents tens."
- Instruct the students to construct the four four-digit numbers that are written on the board using the base ten blocks. Example: "Look at the number 5,432 on the board. Show me how you would represent this number using the place value blocks."
- Ask students how many unit blocks it takes to make a ten-rod.
- Ask students how many ten rods it takes to make a hundred flat.
- Ask how many hundred flats it takes to make a thousand cubes.
- Call students up to the front of the class to demonstrate making one thousand with the cubes.
- Discuss with the students how many cubes it would take to make ten thousand (ten), hundred thousand (100), and a million (1,000). Emphasize the pattern of how it takes ten of each place value representation to make the value of the next placeholder.
- Write the number 3,425,689 on the board. Ask a volunteer to read the number. Discuss the place value of each number. Example: "What is the value of 6?" (600) "What is the value of 5?" (5,000)
- Introduce to the ten thousands, hundred thousands, and millions place. Label each on the board.
- Explain to the students that they are going to make a millions place value chart.

- Provide each student with Student Resource 2, "Millions Place Value Chart" and Student Resource 3, "Number Cards 0 - 9"
- Demonstrate how to label the place values and make the charts (Teacher Resource 2, "Directions for Constructing the Millions Place Value Chart").
- Instruct students to cut out their number cards.
- Ask students to place the cards in the correct placeholder as the teacher reads a number aloud. Example: "I am going to tell you a number. The number is 9,324. Use your number cards to represent the number on your place value chart".
- Walk around the classroom to observe what the students are doing.
- Model the number using the chart on the board.
- Ask one of the students to read the number.
- Repeat with different numbers.

Student Application -

- Distribute Student Resource 4, "Place Value Through the Millions" to each student.
- Explain the directions to the class.
- Tell the students that this is an independent exercise and they will have 10 minutes to complete the worksheet.

Embedded Assessment -

- Make observations during the pre-assessment/launch and the lesson. Observations will be recorded on Teacher Resource 1, "Teacher Observation Form." Student Resource 4, "Place Value to the Millions" will be used as a written assessment. Use Teacher Resource 3 to check student worksheet.

Reteaching/Extension -

- Use teacher observation and the completed worksheet to determine if any student is having difficulty learning the concept.
- Students will play the game "Place Value Draw" from the book, Mega Fun Math Fairs.

Lesson 2

Pre-Assessment/Launch -

- Write various numbers on the board. Have the students read and identify various place values to the millions. Example: Write 2,365,476 on the board. Ask the students what is the value of the 5. What is the value of the 2
- Distribute Student Resource 3, "Million's Place Value Chart", Student Resource 5, "Number Cards 0", and Student Resource 3, "Number Cards 0 - 9" to each student.
- Tell the students to create a number that has a seven in the ten thousands place. The students can use any number they choose to complete the chart.
- Ask each student to share his/her numbers with a partner by first showing and then reading the number.

Teacher Facilitation -

- Explain to the students that they are going to learn how to write large numbers in expanded form.
- Demonstrate the meaning of expand by taking a rubber band and stretching it.
- Ask the students what is happening to the rubber band (It is expanding, or becoming longer).
- Write 3,452 on the board.
- Discuss with the students how expanded form means that you break down a number indicating the place value of each digit.
- Model the expanded form $3000 + 400 + 50 + 2$

- Have the students put their Millions Chart, Number Cards 0-9, and Number Cards 0 on their desks.
- Ask them to place the number 3,452 on their chart
- Instruct the students to place 0's in the hundreds, tens, and ones place.
- Ask the students what number is now on the chart.
- Explain to the students that 3,000 is the first number that would be written in expanded form.
- Write 3,000 on the board.
- Tell the students to turn the 3 over since they are finished with the thousands place and pull off the 0 in the hundreds place over the 4.
- Question the students about what number they now see. All students should have 400.
- Explain to the students that in expanded form they would add a plus next to the 3000 + and add the 400. Example: $3000 + 400$
- Work through the tens and ones in the same manner with the students.
- Model one additional six or seven digit number.

Student Application -

- Distribute Student Resource 6, "Writing Expanded Form"
- Explain to the students that they will work in pairs
- Instruct the students to complete the Student Resource 6, "Writing Expanded Form" worksheet with their partners.

Embedded Assessment -

- Student's Resource 6, "Writing Expanded" Form will be used to assess students progress.
- Use Teacher Resource 4, "Writing Expanded Form, Answer Sheet."

Reteaching/Extension -

- Instruct students to go onto the Website <http://www.quia.com/mc/279741.html> to match the different forms of numbers.

Lesson 3

Pre-Assessment/Launch -

- Distribute Student Resource 7, "Number Bingo"
- Explain to the students that they are going to play bingo
- Review the game rules with the students
- Use Teacher Resource 5, "Number Bingo Cards" to call out the numbers.

Teacher Facilitation -

- Explain to the students that they will learn to write numbers in word form. Discuss reasons why they need to write the word form of numbers.
- Distribute Student Resource 8, "Number Words" to each student.
- Ask the students to point to the number word that the teacher says. Example: "Point to the number word sixty." Repeat this several times.
- Discuss with the students how they would write the word form of the number 6,782.
- Explain to the students the rules for writing number word forms
- Start with the highest digit and do not place the word "and" in between two numbers.
- Write numbers on the board in word form and instruct the students to write the standard form on their dry-erase boards. Repeat as needed with different numbers.

Student Application -

- Tell the students that they are going to write numbers in word form on checks.
- Draw a sample of a check on the board. Describe a real life scenario and demonstrate how to fill in the amount on the check. Demonstrate how to add the amount on the check.
- Instruct the students to complete the checks, Student Resource 9a and 9b, "Writing Checks".
- Collect the checks and ask the students, "What are the 3 ways that we have learned how to write numbers?"
- Discuss what each term means and some examples of each.
- Draw the chart on the board. (Prior to this activity, the teacher needs to make up at least four or more samples of each number form written on large index cards.)

STANDARD FORM	EXPANDED FORM	WORD FORM
2,678	$2000 + 600 + 70 + 8$	two thousand, six hundred seventy eight
56,071	$50,000 + 6000 + 70 + 1$	fifty six thousand, seventy one
87	$80 + 7$	eighty seven
399	$300 + 90 + 9$	three hundred ninety nine

- Instruct the students to come to the board and match the cards underneath the appropriate column.
- Ask the students to look at the cards for the same number in different rows.
- Instruct the students to match the same number in standard form, expanded form, and word form.
- Review the student's responses.

Embedded Assessment -

- Instruct students to complete Student Resource 11, "Writing Numbers in Word Form." Answer key can be found on Teacher Resource 7.

Reteaching/Extension -

- Students can complete Resource 11, "Writing Numbers in Word Form."

Summative Assessment:

All students will be given Student Resource 10, "Fun with Numbers". Use Teacher Resource 6, "Fun With Numbers, Answer Sheet," to check students' work.

Authors:

Mary Kay Thierer
Clarksville Elementary
Howard County, Maryland

Juliana Cordell
Ft. Washington Forest Elementary
Prince George's County, Maryland

966**74****657****235****4,715****113****882****5,026****2,957****3,819**

1	2	3	4	5
6	7	8	9	0

Name _____ Date _____

Place Value Through the Millions

Use the place value words below to identify the value of the underlined digit.

ones

tens

hundreds

thousands

ten thousands

hundred thousands

millions

1. 67,709 _____2. 4,068,327 _____3. 815,645 _____4. 9,138 _____5. 2,491,45 _____6. 5, 063 _____7. 8,970,341 _____8. 557,124 _____9. 1,587,322 _____10. 782,456 _____

0	0	0	0	0
0	0	0	0	0

Name _____ Date _____

☺Writing Expanded Form☺

➔ Use your number 'Millions Place Value Chart' to write the expanded form for each number below.

$$1. 56,781 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$2. 3,905,644 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$3. 861,052 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$4. 23,995 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

➔ Make a 4-digit number in your number chart. Record the number below and write the expanded form.

$$5. \underline{\hspace{2cm}} = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

your number

➔ Make a 5-digit number and write the expanded form below.

$$6. \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

your number

Number BINGO

eighty-eight	$400 + 9$	five hundred sixty-one
$9,000 + 80 + 5$	one thousand, sixteen	$40,000 + 600 + 3$
six thousand, nine hundred seventy	$800 + 50 + 5$	two hundred thirty-three

Number Words

1	one	20	twenty
2	two	30	thirty
3	three	40	forty
4	four	50	fifty
5	five	60	sixty
6	six	70	seventy
7	seven	80	eighty
8	eight	90	ninety
9	nine	100	one hundred
10	ten		
11	eleven	100	one hundred
12	twelve		
13	thirteen	1,000	one thousand
14	fourteen		
15	fifteen	10,000	ten thousand
16	sixteen		
17	seventeen	100,000	one hundred thousand
18	eighteen		
19	nineteen	1,000,000	one million
20	twenty		

hundred

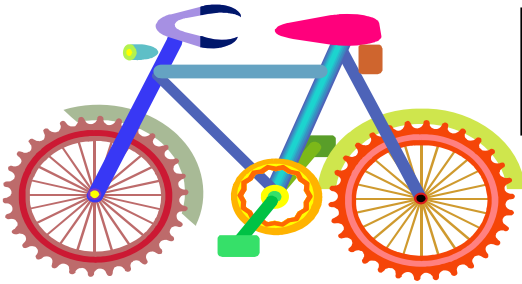
thousand

million

Name _____ Date _____

Writing Checks

Write a check for each amount.



\$

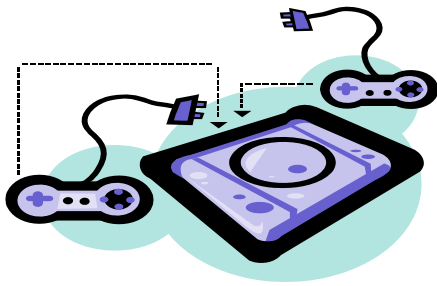
1.

Bicycles R Us Pay to the order of dollars _____ Signature	\$
---	---



2.

Computers R Us Pay to the order of dollars _____ Signature	\$
--	---



\$

3.

Video Games R Us

\$

Pay to the order of

dollars

Signature

\$



4.

Cameras R Us

\$

Pay to the order of

dollars

Signature

Name _____ Date _____

Fun With Numbers

Each number below needs to be represented in standard form, expanded form and in word form. Fill in the chart below with the missing information.

STANDARD FORM	EXPANDED FORM	WORD FORM
7,345	_____ + _____ + _____ + _____	seven thousand, three hundred forty-five
_____	50,000 + 7,000 + 900 + 10 + 8	_____
3,807,422	_____ + _____ + _____ + _____ + _____ + _____ + _____	_____
_____	_____ + _____ + _____ + _____ + _____ + _____	five hundred sixty-six thousand, forty-three
_____	7,000 + 600 + 9	_____
99,112	_____ + _____ + _____ + _____ + _____	ninety-nine thousand, one hundred twelve

Name _____ Date _____

😊Writing Numbers in Word Form😊

⇒ Using your number words, write each number in word form below.

1. 86,412 =

2. 5,308,276 =

3. 745,032 =

4. 2,156,804 =

⇒ Write a 4-digit number. Write your number below and then write your number in word form.

5. _____ =

your number

⇒ Write a 5-digit number and write the number in word form below.

6. _____ =

your number

Student Response Data Sheet

Targeted Concept _____ Date _____

Key: ✓ correct response ✕ incorrect response ? partial understanding

Score each student response.

Student: _____
Responses:

Student: _____
Responses:

Student: _____
Responses:

Student: _____
Responses:

Student: _____
Responses:

Student: _____
Responses:

Student: _____
Responses:

Student: _____
Responses:

Student: _____
Responses:

Student: _____
Responses:

Directions for Constructing the Millions Place Value Chart

- Make copies of Student Resource 2 for each student.
- Have students FOLD along the single long dotted line that runs the length of the paper. This creates the pocket at the base of the chart. Staple the left and right side of the pocket just created.
- Complete the chart by folding along the other 6 fold lines. The chart is then unfolded and the folds simply create the division between each place holder.
- Carefully guide the students as they label each place holder with ones, tens, hundreds, thousands, ten thousands, hundred thousands and millions on the solid lines at the top of the chart.
- The chart is now completed and ready for number cards to be placed in the placeholder pockets.

Name _____ Date _____

Place Value Through the MillionsUse the place value words below to identify the value of the underlined digit.

ones tens hundreds thousands
ten thousands hundred thousands millions

1. 67,709 7 hundreds
2. 4,068,327 6 ten thousands
3. 815,645 5 thousands
4. 9,138 8 ones
5. 2,491,45 2 millions
6. 5, 063 6 tens
7. 8,970,341 9 hundred thousands
8. 557,124 1 hundred
9. 1,587,322 8 ten thousands
10. 782,456 2 thousands

Name _____ Date _____

☺Writing Expanded Form☺

➔Use your number 'Millions Place Value Chart to write the expanded form for each number below.

$$1. 56,781 = \begin{array}{cccccc} 50,000 & 6,000 & 700 & 80 & 1 & \\ \hline \end{array} + \begin{array}{cccccc} 3,000,000 & 900,000 & 0 & 5,000 & 600 & \\ \hline \end{array}$$

$$2. 3,905,644 = \begin{array}{cccccc} 40 & 4 & & & & \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array}$$

$$3. 861,052 = \begin{array}{cccccc} 800,000 & 60,000 & 1,000 & 0 & 50 & 2 \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array}$$

$$4. 23,995 = \begin{array}{cccccc} 20,000 & 3,000 & 900 & 90 & 5 & \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array} + \begin{array}{cccccc} & & & & & \\ \hline \end{array}$$

➔Make a 4-digit number in your number chart. Record the number below and write the expanded form.

Answers will vary. Must be a 4-digit number.

$$5. \begin{array}{c} \text{your number} \\ \hline \end{array} = \begin{array}{c} \hline \end{array} + \begin{array}{c} \hline \end{array} + \begin{array}{c} \hline \end{array} + \begin{array}{c} \hline \end{array}$$

➔Make a 5-digit number and write the expanded form below.

Answers will vary. Must be a 5-digit number.

$$6. \begin{array}{c} \text{your number} \\ \hline \end{array} = \begin{array}{c} \hline \end{array} + \begin{array}{c} \hline \end{array} + \begin{array}{c} \hline \end{array} + \begin{array}{c} \hline \end{array} + \begin{array}{c} \hline \end{array}$$

Number Cards to use with the 'Number BINGO' game. Number cards could be made on larger cards if the game is being used with a large class.

88**409****561****9,085****1,016****40,603****6,970****233****855**

Blank card

Name _____ Date _____

Fun With Numbers

Each number below needs to be represented in standard form, expanded form and in word form. Fill in the chart below with the missing information.

STANDARD FORM	EXPANDED FORM	WORD FORM
7,345	7,000 + 300 + 40 + 5 _____ + _____ + _____ + _____	seven thousand, three hundred forty-five
57,918 _____	50,000 + 7,000 + 900 + 10 + 8	(fifty-seven thousand, nine hundred eighteen)
3,807,422	3,000,000 + 800,000 + 0 + 7,000 + 400 + 20 + 2 _____ + _____ + _____ + _____ + _____ + _____ + _____	(three million, eight hundred seven thousand, four hundred twenty-two)
566,043 _____	500,000 + 60,000 + 6,000 + 40 + 3 _____ + _____ + _____ + _____ + _____ + _____	(five hundred sixty-six thousand, forty-three)
7,609 _____	7,000 + 600 + 9	seven thousand, six hundred nine
99,112	90,000 + 9,000 + 100 + 10 + 2 _____ + _____ + _____ + _____ + _____	ninety-nine thousand, one hundred twelve

Name _____ Date _____

☺Writing Numbers in Word Form☺

⇒ Using your number words, write each number in word form below.

eighty-six thousand, four hundred twelve

1. 86,412 = _____

_____ **five million, three hundred eight thousand, two hundred**

seventy-six

2. 5,308,276 = _____

_____ **seven hundred forty five thousand, thirty-two**

3. 745,032 = _____

_____ **two million, one hundred fifty-six thousand, eight**

hundred four

4. 2,156,804 = _____

⇒ Now you write a 4-digit number. Write your number below and then write your number in word form.

Answers will vary. Must be a 4-digit number.

5. _____ =

_____ **your number**

⇒ Write a 5-digit number and write the number in word form below.

Answers will vary. Must be a 5-digit number.

6. _____ =

_____ **your number**

