

Place Value to 1,000,000

Unit 1 Overview: 7 lessons

Students read, write, compare and order whole numbers to 1,000,000. They learn the periods and the commas between them, find the value of a digit from its place, and see that each place is worth ten times the place to its right, so a digit one place to the left is worth 10 times as much. They write numbers in standard, word and expanded form, rename a number in other units (3,400 is 34 hundreds or 340 tens), place numbers on number lines, and compare and order them with $>$, $=$ and $<$. Place value opens the year because rounding, the column algorithms and multi-digit multiplying and dividing all lean on it. Lesson 1.7 (numbers to 999,999,999) is for the states that teach the millions period in 4th grade.

THE UNIT, DAY BY DAY

Day 1	Pre-Check	What students already know, before the first lesson.
Day 2	1.1 Place value to a million	I can find the value of a digit to a million.
Day 3	1.2 Ten times the place to its right	I can tell that a place is worth 10 times the place to its right.
Day 4	1.3 Standard, word and expanded form	I can write numbers in word and expanded form.
Day 5	1.4 One number, many ways	I can rename a number in hundreds or tens.
Day 6	1.5 Numbers on a number line	I can read and place numbers on a number line.
Day 7	1.6 Compare and order numbers	I can compare and order numbers to a million.
Day 8	1.7 Numbers to 999,999,999 ★	I can read and write numbers in the millions.
Day 9	Unit Review	The review, to go over together.
Day 10	Unit Test	Form A; Form B (other numbers) is for a retest.

★ Taught in 4th grade in some states. Skip these lessons if yours teaches them in another grade; animalmath.com/standards shows your state's list.

GET READY FOR THE UNIT

- Base-ten blocks: a thousand cube, flats, rods and units
- A place value chart to the hundred thousands for each student, in a sheet protector (one to the hundred millions for lesson 1.7)
- Digit cards 0 to 9, and sticky notes to cover places
- Number line strips with ten equal jumps and no numbers
- Whiteboards and dry erase markers

HOW EACH LESSON GOES

- 1. Warm up** (5 min)
 - 2. Teach** (10 min)
 - 3. Try it together** (10 min)
 - 4. Practice** (15 min)
 - 5. Exit ticket** (5 min): a quick check on the lesson.
- Each lesson page ends with the Animal Math sheets, makers, tools and quizzes for it. "Sheet 3" is the third worksheet of a pack; a color pack prints each sheet again in black and white.

CHECKING AS YOU GO

PRINTABLE	Pre-Check: Day 1, with a key	EXIT TICKET	Exit Tickets: one a lesson, four to a page
PRINTABLE	Unit Review: the day before the test	PRINTABLE	Unit Test: Forms A and B, with keys



Place Value to 1,000,000

Lesson 1.1: Place value to a million

GOAL Students read numbers to 1,000,000 by periods, put the commas in, and find the value of a digit from its place: in 457,382 the 5 is worth 50,000.

About 45 minutes

I can find the value of a digit to a million.

THE LESSON

- 1 Warm up** (5 min) Write 4,186 on the board. Students say what each digit is worth. Ask: what place comes after the thousands?
- 2 Teach** (10 min) Draw the chart with two periods, thousands and ones, each with hundreds, tens and ones. Write 457,382 in it. Read the thousands period as a number, then say “thousand” at the comma: four hundred fifty-seven thousand, three hundred eighty-two. The 5 is in the ten thousands place, so it is worth 50,000. Then write 1,000,000: ten hundred thousands make a million.
Say: “I read each period like a number to 999, then say its name at the comma. A digit is worth its place.”
- 3 Try it together** (10 min) Pairs pull six digit cards, build a number in their chart and read it aloud. The partner underlines one digit and writes its value. Do one with a zero in the ten thousands, such as 805,136, and ask what the 0 tells.
- 4 Practice** (15 min) Students fill the chart and find the values of underlined digits on sheet 1 of Place Value to Millions; sheets 1, 2 and 5 of Place Value to 100,000 are a step back. Early finishers write the greatest six-digit number with no digit used twice.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 1.1** and circle a face beside the “I can” line. On question 1, look for 10,000, 9,000 and 800,000; a lone 1, 9 or 8 means the place was not used. On question 2, look for 602,090; 629 means the zeros in the empty places were left out.

Need help? Build the number in the chart with digit cards, and say each digit’s place before its value.

Ready for more? Write three six-digit numbers whose 7 is worth 70,000, then order them.

GET READY

- A place value chart to the hundred thousands for each student
- Digit cards 0 to 9 for each pair
- Base-ten blocks: a thousand cube, flat, rod and unit

WORDS TO USE

period: three places read together, like the thousands period

digit: one of the signs 0 to 9

value: what a digit is worth in its place

ASK

- What is the 5 worth? How do you know?
- Where does the comma go, and why?
- What does a 0 in a place tell you?

WATCH FOR

Writes the digit for its value: 5 for 50,000. Say the place too: 5 ten thousands. Write the 5 and a 0 for each place to its right.

Reads the thousands period as hundreds. Point to the comma and say “thousand” every time you reach it.

Writes 3 hundred thousands and 7 tens as 370. Fill the chart first, a digit in every place: 300,070.

ON ANIMAL MATH

PRINTABLE

Place Value to Millions: sheet 1

PRINTABLE

Place Value to 100,000: sheets 1, 2 and 5 as review

MAKER

Expanded Form: Mode Write in Expanded Form, Number Range 6-digit (100,000–999,999)

QUIZ

Place Value to 1,000,000 Quiz: the Value of a Digit level

EXIT TICKET

4th Grade Place Value Exit Tickets: Exit Ticket 1.1

Place Value to 1,000,000

Lesson 1.2: Ten times the place to its right

GOAL Students see that each place is worth ten times the place to its right: a digit one place to the left is worth 10 times as much, and one place to the right its value divided by 10.

About 45 minutes

I can tell that a place is worth 10 times the place to its right.

THE LESSON

- 1 Warm up** (5 min) Show a unit, a rod and a flat. How many units make a rod? Rods make a flat? Flats make a thousand cube?
- 2 Teach** (10 min) Lay out a unit, a rod, a flat and a thousand cube, biggest on the left: each block is 10 of the block to its right. Write 40, 400, 4,000 and 40,000 in the chart, one under another. Each time the 4 moves one place left, it is worth 10 times as much: $10 \times 400 = 4,000$ and $4,000 \div 10 = 400$. In 233,105 the first 3 is worth 30,000, 10 times the second 3.
- 3 Say:** "Each place is worth ten times the place to its right. When a digit moves one place left, it is worth 10 times as much."
- 3 Try it together** (10 min) Pairs build a number with blocks, then 10 times it (each block becomes the next bigger block), and write both in the chart: 23 and 230, 140 and 1,400. They write the times and divided by sentences.
- 4 Practice** (15 min) Students do the "10 times" parts of sheet 1 of Place Value to Millions, then sheet 2 of Renaming Whole Numbers. Early finishers find a number where one digit is worth 100 times another.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 1.2** and circle a face beside the "I can" line. On question 1, look for 43,000 and 6,100; 430,000 or 610 means a zero too many was added or taken off. On question 2, look for 80,000 and 10.

Need help? Use the blocks: trade 10 of one block for the next bigger block, and write the number before and after.

Ready for more? How many times as much is the 4 in 40,000 as the 4 in 400?

GET READY

- Base-ten blocks: units, rods, flats and a thousand cube
- Place value charts and digit cards
- Whiteboards and markers

WORDS TO USE

ten times as much: 10 groups of it:
 $10 \times 400 = 4,000$

place to its right: the next place to the right

divided by 10: split into 10 equal parts:
 $4,000 \div 10 = 400$

ASK

- How many hundreds make a thousand?
- What happens to the digits when we multiply by 10?

WATCH FOR

Adds a zero in the wrong place:

$10 \times 4,050 = 4,0500$. Write both in the chart and slide every digit one place left.

Says 400 is 10 times 4,000. Build both with blocks: the bigger one is 10 times the smaller.

Thinks the two 3s in 233,105 are worth the same. Write each 3 in the chart and read its place.

ON ANIMAL MATH

PRINTABLE

Place Value to Millions: sheet 1

PRINTABLE

Renaming Whole Numbers: sheet 2

TOOL

Base Ten Blocks: ten of a block make the next block

QUIZ

Place Value to 1,000,000 Quiz: the Ten Times as Much level

EXIT TICKET

4th Grade Place Value Exit Tickets: Exit Ticket 1.2

Place Value to 1,000,000

Lesson 1.3: Standard, word and expanded form

GOAL Students write numbers to 1,000,000 in standard form, in words and in expanded form, and go from any form to the others, keeping a zero in every empty place.

About 45 minutes

I can write numbers in word and expanded form.

THE LESSON

- 1 Warm up** (5 min) Say eight hundred four thousand, ninety. Students write it on whiteboards. Who wrote 804,090?
- 2 Teach** (10 min) Write 371,460 in the chart. Read it by periods and write the words: three hundred seventy-one thousand, four hundred sixty. The comma in the words goes where the comma in the number is. Then write the value of each digit and add: $300,000 + 70,000 + 1,000 + 400 + 60$. The 0 has no part. Back the other way: $500,000 + 4,000 + 30 + 1$ is 504,031, with zeros in the empty places.
Say: "Word form says each period and its name. Expanded form adds the value of every digit that is not zero."
- 3 Try it together** (10 min) One partner writes a number in one form; the other writes it in the other two. Include a number with zeros inside, such as 410,007, and an expanded form out of order: $80 + 900,000 + 4,000$.
- 4 Practice** (15 min) Students write numbers in all three forms on sheet 2 of Place Value to Millions, then sheet 3 of Place Value to 100,000. Early finishers write the seconds in a day (86,400) in all three forms.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 1.3** and circle a face beside the "I can" line. On question 1, look for 208,016; 208,16 means the zero in the hundreds place was left out. On question 2, look for $600,000 + 3,000 + 80$.

Need help? Fill a place value chart first, then read it aloud period by period before writing the words.

Ready for more? Write a six-digit number whose expanded form has exactly two parts, in all three forms.

GET READY

- Place value charts
- Number word cards (one to twenty, the tens, hundred, thousand)
- Whiteboards and markers

WORDS TO USE

standard form: the number in digits: 371,460

word form: the number in words

expanded form: the values of the digits added up: $300,000 + 70,000 + 1,000 + 400 + 60$

ASK

- Where does the word "thousand" go when you read it?
- Which places get no part in expanded form?
- How can you check your expanded form?

WATCH FOR

Writes seventy thousand, nine as 7,009. Fill the chart: 70 thousand, then 009. Every period after the first has three digits.

Says "and" in a whole number. "And" is for decimals and money; whole numbers leave it out.

Leaves a part out of expanded form. Add the parts back up: they must make the number.

ON ANIMAL MATH

PRINTABLE

Place Value to Millions: sheet 2

PRINTABLE

Place Value to 100,000: sheet 3

MAKER

Expanded Form: Mode Mixed Form Practice, Number Range 6-digit (100,000-999,999)

QUIZ

Place Value to 1,000,000 Quiz: the Standard, Word and Expanded Form level

EXIT TICKET

4th Grade Place Value Exit Tickets: Exit Ticket 1.3

Place Value to 1,000,000

Lesson 1.4: One number, many ways

GOAL Students rename a number in other units: 3,400 is 34 hundreds or 340 tens, and 63 thousands is 63,000. They cover places to see how many of a unit a number holds.

About 45 minutes

I can rename a number in hundreds or tens.

THE LESSON

- 1 Warm up** (5 min) Show 3 flats and 4 rods. How many tens are there in all? (34.) Then: 34 tens is what number? (340.)
- 2 Teach** (10 min) Write 3,400 in the chart. Put a sticky note over the tens and ones: what is left, 34, is how many hundreds are in 3,400. Cover only the ones: 340 tens. Check: $34 \times 100 = 3,400$. The other way, 63 thousands is 63 with three zeros: 63,000. Then mix units: 1 thousand 14 hundreds is $1,000 + 1,400 = 2,400$.
Say: "To find how many hundreds, I cover the tens and ones and read what is left."
- 3 Try it together** (10 min) Pairs rename numbers called out: 8,600 in hundreds and in tens, 45 thousands, 920 tens. Then they build 2 thousands 13 hundreds with blocks and trade 10 flats for a thousand cube.
- 4 Practice** (15 min) Students rename numbers on sheet 1 of Renaming Whole Numbers, then do the mixed units and comparisons of sheet 3. Early finishers find how many hundreds make 1,000,000.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 1.4** and circle a face beside the "I can" line. On question 1, look for 57, 294 and 46,000; 7 or 4 means only the digit in that place was read. On question 2, look for hundreds circled: 36 tens is only 360.

Need help? Build the number with blocks and count the flats, trading each thousand cube for 10 flats.

Ready for more? Write 240,000 four ways: in ten thousands, thousands, hundreds and tens.

GET READY

- Place value charts and sticky notes
- Base-ten blocks: thousand cubes, flats and rods
- Whiteboards and markers

WORDS TO USE

unit: what we count by: ones, tens, hundreds, thousands

rename: write the same number in other units

regroup: trade 10 of a unit for 1 of the next

ASK

- How many hundreds are in 8,600? How do you know?
- Which is more: 52 hundreds or 6 thousands?

WATCH FOR

Reads only the digit in the place: 3,400 has 4 hundreds. Cover the tens and ones and read everything left: 34 hundreds.

Writes 26 hundreds as 26,000. Hundreds means two zeros: $26 \times 100 = 2,600$.

Writes 2 thousands 13 hundreds as 213,00. Trade 10 hundreds for 1 thousand first: 3 thousands 3 hundreds.

ON ANIMAL MATH

PRINTABLE

Renaming Whole Numbers: sheets 1 and 3

TOOL

Base Ten Blocks: Break Apart the flats to count the tens

QUIZ

Place Value to 1,000,000 Quiz: the Ten Times as Much level

EXIT TICKET

4th Grade Place Value Exit Tickets: Exit Ticket 1.4

Place Value to 1,000,000

Lesson 1.5: Numbers on a number line

GOAL Students find the size of each jump on number lines to 1,000,000, read and place numbers on them, and find the number halfway between two numbers.

About 45 minutes

I can read and place numbers on a number line.

THE LESSON

- 1 Warm up** (5 min) Label the board line 0 to 100 with ten jumps. What is each jump? Where is 70? Relabel it 0 to 1,000, then 0 to 10,000: the ticks stay, the jumps change.
- 2 Teach** (10 min) Label the ends 400,000 and 500,000. Find the jump: the line goes up 100,000 in 10 jumps, so each jump is 10,000. Count by 10,000s to read a point seven jumps along: 470,000. The middle tick is halfway: 450,000. Then label a line 0 to 1,000,000: each jump is 100,000. Place 540,000: between 500,000 and 600,000, a little before halfway.
Say: "First I find the jump: how far it is from end to end, divided by the number of jumps. Then I count by that jump."
- 3 Try it together** (10 min) Pairs label strips 30,000 to 40,000 and 0 to 500,000. They mark every tick, place numbers called out (32,000 and 350,000) and find the number halfway between the ends of each strip.
- 4 Practice** (15 min) Students read and place numbers on the number lines of sheet 3 of Place Value to Millions. Early finishers draw a line from 0 to 1,000,000 with 4 jumps and place 600,000 on it.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 1.5** and circle a face beside the "I can" line. On question 1, look for 630,000 and 690,000; 603,000 or 609,000 means each jump was read as 1,000. On question 2, look for 65,000 and 850,000; a number that is not the same distance from both ends means the middle was guessed, so have them count the jumps from each end.

Need help? Write the number under every tick before reading or placing a point.

Ready for more? Draw a line from 0 to 1,000,000 with 8 jumps. What is each jump? Where is 375,000?

GET READY

- A long number line on the board with 10 equal jumps and no numbers
- Number line strips for each pair
- Sticky notes

WORDS TO USE

jump: the distance from one tick mark to the next

halfway: the middle: the same distance from both ends

endpoint: the number at either end of the line

ASK

- How far is it from one end to the other? How many jumps?
- What is each jump worth?
- How do you know your number is halfway?

WATCH FOR

Counts every jump as 1. Find the jump first: the distance between the ends divided by the number of jumps.

Counts the ticks instead of the jumps: 11 ticks make 10 jumps. Put a finger on each jump as you count it.

Places a number by its first digit only: 540,000 near 50,000. Find the two ticks it is between first.

ON ANIMAL MATH

PRINTABLE

Place Value to Millions: sheet 3

TOOL

Number Line: Start 0, End 1000000, Interval 100000 (its labels print without commas)

EXIT TICKET

4th Grade Place Value Exit Tickets: Exit Ticket 1.5

Place Value to 1,000,000

Lesson 1.6: Compare and order numbers

GOAL Students compare numbers to 1,000,000 with $>$, $=$ and $<$, first by the number of digits, then place by place from the left, and order numbers from least to greatest.

About 45 minutes

I can compare and order numbers to a million.

THE LESSON

- 1 Warm up** (5 min) Which is greater, 9,999 or 10,001? Students vote, then explain: more digits means greater.
- 2 Teach** (10 min) Write 526,183 and 562,183 in the chart, one above the other. Both have six digits, so start at the left: the hundred thousands are both 5, the ten thousands are 2 and 6. 6 is greater, so $562,183 > 526,183$; the other digits do not matter. Then 98,400 and 104,250: five digits against six, so $98,400 < 104,250$. To order, line them all up and look at one place at a time.
Say: "I line up the places and start at the left. The first place that is different tells me which number is greater."
- 3 Try it together** (10 min) Pairs order three number cards from least to greatest and write the order with $<$ signs. Then each pair writes two numbers that differ only in the thousands place for another pair to compare.
- 4 Practice** (15 min) Students compare and order on sheet 3 of Place Value to Millions, then sheet 4 of Place Value to 100,000. Early finishers order five numbers between 450,000 and 460,000.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 1.6** and circle a face beside the "I can" line. On question 1, look for $>$ and then $<$; $68,950 > 107,342$ means the first digits were compared before the digits were counted. On question 2, look for $74,268 < 724,860 < 742,068$.

Need help? Write the numbers in a place value chart, lined up at the right, and shade the first place where they differ.

Ready for more? Use the digits 3, 5, 0, 7, 1 and 9 once each to make the greatest and least six-digit numbers you can.

GET READY

- Place value charts
- Cards with five- and six-digit numbers for ordering
- Whiteboards and markers

WORDS TO USE

greater than: $>$: the open side faces the greater number

less than: $<$: the point faces the smaller number

line up: the same places in the same column

ASK

- How many digits does each number have?
- Which place decides? Why not the ones?
- How do you know your order is right?

WATCH FOR

Compares the first digits when the lengths differ. Count the digits first, or line the numbers up at the right.

Mixes up $>$ and $<$. Read it aloud from the left: 526,183 is less than 562,183.

Orders from greatest to least. Circle "least" in the directions and start with the smallest.

ON ANIMAL MATH

PRINTABLE

Place Value to Millions: sheet 3

PRINTABLE

Place Value to 100,000: sheet 4

MAKER

Greater Than / Less Than: Number Range 0 to 1,000,000

QUIZ

Place Value to 1,000,000 Quiz: the Compare and Order level

EXIT TICKET

4th Grade Place Value Exit Tickets: Exit Ticket 1.6

Place Value to 1,000,000

Lesson 1.7: Numbers to 999,999,999

GOAL Students add a third period, the millions, to the chart, and read, write and find the value of digits in numbers to 999,999,999 in standard, word and expanded form.

I can read and write numbers in the millions.

About 45 minutes

★ Taught in 4th grade in some states

THE LESSON

- 1 Warm up** (5 min) Count by hundred thousands from 600,000 to 1,000,000 together. Write 1,000,000 and read it: one million. How many thousands is that?
- 2 Teach** (10 min) Add a millions period to the chart and write 406,513,870 in it. Read each period as a number and say its name at the comma: four hundred six million, five hundred thirteen thousand, eight hundred seventy. The 6 is in the millions place, so it is worth 6,000,000; the 4 is worth 400,000,000. Write the expanded form: $400,000,000 + 6,000,000 + 500,000 + 10,000 + 3,000 + 800 + 70$.
Say: "I read each period like a number to 999, then say its name: million, thousand. The ones period has no name."
- 3 Try it together** (10 min) Pairs write a big number from a map or the news in the chart and read it aloud. Then they write numbers the teacher reads, such as twenty million, five hundred thousand, sixty, with zeros in the empty places.
- 4 Practice** (15 min) Students do sheets 4 and 5 of Renaming Whole Numbers: nine-digit charts, words, expanded form, comparing and renaming millions, then the nine-digit number in the chart on sheet 1 of Place Value to Millions. Early finishers write the greatest nine-digit number with no digit used twice.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 1.7** and circle a face beside the "I can" line. On question 1, look for 70,000,000 and 4,000,000; 7,000,000 or 40,000,000 means a place was read one off. On question 2, look for 58,030,600; 58,30,600 or 5,830,600 means a period was not written with three digits.

Need help? Write each period in its own box of three places, then read the boxes from left to right.

Ready for more? Find two nine-digit numbers that differ only in the ten millions place, and say how much greater one is.

GET READY

- A place value chart with three periods: millions, thousands and ones
- Digit cards 0 to 9
- Big numbers from a map, an atlas or a news story (populations, distances)

WORDS TO USE

millions period: the three places left of the thousands: millions, ten millions, hundred millions

million: a thousand thousands: 1,000,000

period: three places read as one number, then its name

ASK

- What are the three places in the millions period?
- Where do the commas go?
- How many thousands make a million?

WATCH FOR

Writes 3 million as 3,000,000,000. A million has six zeros: three for the thousands period and three for the ones.

Leaves out a period of zeros: twelve million, five as 12,005. Every period after the first has three digits: 12,000,005.

Reads the millions period without its name. Point to each comma and say its name before going on.

ON ANIMAL MATH

PRINTABLE

Renaming Whole Numbers: sheets 4 and 5

PRINTABLE

Place Value to Millions: sheet 1, the nine-digit row of its chart

EXIT TICKET

4th Grade Place Value Exit Tickets: Exit Ticket 1.7