

Converting Between Number Forms

Standard Notation → Number Expanded Notation

- Begin by identifying the place value of each digit in the number.

Number: 402,810

Place Value Chart														
trillions			billions			millions			thousands			ones		
									4	0	2	8	1	0
hundreds	tens	ones	hundreds	tens	ones	hundreds	tens	ones	hundreds	tens	ones	hundreds	tens	ones

- Starting from the leftmost **digit**, write the digit followed by an **appropriate number of zeros** behind the digit. The number of zeros should match the number of digits behind the **digit of interest**. A plus sign "+" separates each place value.

Number: 402,810

start **end**

$$\underline{400,000} + 00,000 + 2,000 + 800 + 10 + 0$$

start **end**

$$\underline{400,000} + 00,000 + 2,000 + 800 + 10 + 0$$

start **end**

- It is common practice to remove all numbers composed of only zeros to produce a reduced number expanded notation.

number expanded notation

$$400,000 + 00,000 + 2,000 + 800 + 10 + 0$$

↓

$$400,000 + \cancel{00,000} + 2,000 + 800 + 10 + \cancel{0}$$

↓

$$400,000 + 2,000 + 800 + 10$$

reduced number expanded notation

Converting Between Number Forms

Number Expanded Notation Standard Notation

1. Convert the number from **reduced number expanded notation** to **number expanded notation**.

reduced number expanded notation

$$70,000,000 + 2,000,000 + 500,000 + 20$$

↓

$$70,000,000 + 2,000,000 + 500,000 + 00,000 + 0,000 + 000 + 20 + 0$$

number expanded notation

2. Combine the first **digit** of each number in number expanded notation starting from the left to switch to standard notation. Commas separate each period.

$$70,000,000 + 2,000,000 + 500,000 + 00,000 + 0,000 + 000 + 20 + 0$$

↓

$$72,500,020$$

↓

$$72,500,020$$

Converting Between Number Forms

Number Expanded Notation → Word Name

1. Convert the number from **number expanded notation** to **reduced number expanded notation**.

number expanded notation

$$400,000,000 + 00,000,000 + 2,000,000 + 000,000 + 00,000 + 0,000 + 200 + 00 + 0$$

↓

$$400,000,000 + \cancel{00,000,000} + 2,000,000 + \cancel{000,000} + \cancel{00,000} + \cancel{0,000} + 200 + \cancel{00} + \cancel{0}$$

↓

$$400,000,000 + 2,000,000 + 200$$

reduced number expanded notation

2. Identify each of the **periods** in the **reduced expanded notation**.

$$400,000,000 + 2,000,000 + 200$$

millions

ones

3. Recombine from reduced number expanded notation to word form starting from the leftmost period.
Commas separate each period.

$$400,000,000 + 2,000,000 + 200$$

millions

ones

start

end

four hundred two million,

two hundred

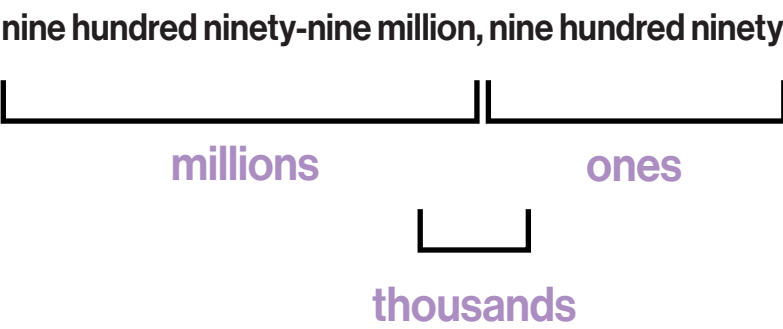
four hundred two million, two hundred

Converting Between Number Forms

Word Name → Number Expanded Notation

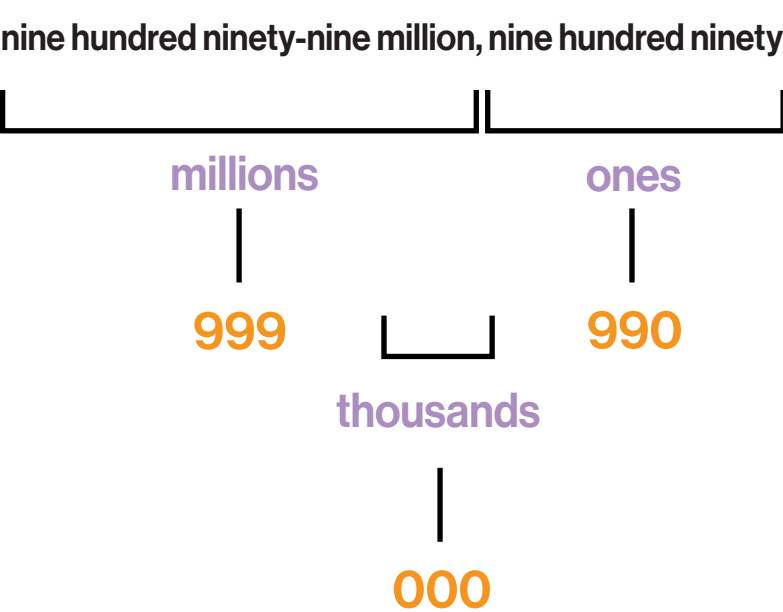
1.

Identify each of the **periods** in the word form.



2.

Identify each of the **digits** in the word form.



Converting Between Number Forms

Word Name \longrightarrow Number Expanded Notation

3. Recombine from word form to expanded notation starting from the leftmost digit.
Plus signs “+” separate each place value.

Diagram illustrating the conversion of the word form "nine hundred ninety-nine million, nine hundred ninety" to expanded notation.

The word form is divided into two main sections: **millions** and **ones**.

Under **millions**, the digits **999** are shown, with a red line under the first 9 labeled **start**.

Under **ones**, the digits **990** are shown, with a blue line under the last 0 labeled **end**.

Between the millions and ones sections, a bracket labeled **thousands** is shown, with the digits **000** written below it.

The final expanded notation is:

$$900,000,000 + 90,000,000 + 9,000,000 + 000,000 + 00,000 + 0,000 + 900 + 90 + 0$$

4. Change from **expanded notation** to **reduced expanded notation**.

Diagram illustrating the conversion of expanded notation to reduced expanded notation.

The initial expanded notation is:

$$900,000,000 + 90,000,000 + 9,000,000 + 000,000 + 00,000 + 0,000 + 900 + 90 + 0$$

Arrows indicate the reduction process, where the trailing zeros are removed:

$$900,000,000 + 90,000,000 + 9,000,000 + \cancel{000,000} + \cancel{00,000} + \cancel{0,000} + 900 + 90 + \cancel{0}$$

The final reduced expanded notation is:

$$900,000,000 + 90,000,000 + 9,000,000 + 900 + 90$$