

Place Value and Decimals

Our number system is based on units of ten. Numbers like 1.35, 0.8, and 25.09 are called decimals.

You can use a place-value chart like the one at the right to help you read decimals and write them in words. Use the word *and* to represent the decimal point.

10,000	1,000	100	10	1		0.1	0.01	0.001	0.0001	0.00001
ten thousands	thousands	hundreds	tens	ones	decimal point	tenths	hundredths	thousandths	ten-thousandths	hundred-thousandths
			2	5	•	0	9			

EXAMPLES Write Decimal in Words

Write each decimal in words

1 20.09

tens	ones	decimal point	tenths	hundredths
2	0	•	0	9

twenty and nine hundredths

2 6.738

ones	decimal point	tenths	hundredths	thousandths
6	•	7	3	8

six and seven hundred thirty-eight thousandths

You can also write decimals in **expanded notation** using place value and decimals or their fraction equivalents as shown at the right.

Decimal	0.1	0.01	0.001	0.0001
Fraction	$\frac{1}{10}$	$\frac{1}{10^2}$	$\frac{1}{10^3}$	$\frac{1}{10^4}$

EXAMPLE Write a Decimal in Expanded Notation

3 Write 2.814 in expanded notation using decimals and using fractions.

Write the product of each digit and its place value.

$$2.814 = (2 \times 1) + (8 \times 0.1) + (1 \times 0.01) + (4 \times 0.001)$$

$$2.814 = (2 \times 1) + \left(8 \times \frac{1}{10}\right) + \left(1 \times \frac{1}{10^2}\right) + \left(4 \times \frac{1}{10^3}\right)$$

Replace the decimals with their fraction equivalents.