

Scientific Notation for Huge and Tiny Numbers

Grade 8 math · Worksheet · Standards: 8.EE.A.3, 8.EE.A.4

Name: _____ Date: _____ Class: _____

These 20 problems follow Standards 8.EE.A.3 and 8.EE.A.4. They cover writing large and small numbers as $a \times 10^n$, comparing sizes, calculating with powers of ten and reading calculator notation.

Move from simple conversions to science and money contexts. Always check that the coefficient is at least 1 and below 10 in a final answer.

Standards: 8.EE.A.3, 8.EE.A.4 · **Level:** Grade 8

Problem 1 Large numbers (easy)

Write each number in scientific notation: (a) 6,300,000 (b) 480 (c) 52,000,000,000



Count the places the decimal point travels.

Problem 2 Small numbers (easy)

Write each number in scientific notation: (a) 0.0004 (b) 0.0000715 (c) 0.062

Problem 3 Back to standard form (easy)

Write in standard form: (a) 3.9×10^5 (b) 8.04×10^{-3} (c) 1.2×10^7

Problem 4 Is it scientific notation? (easy)

Decide whether each is in scientific notation. If not, rewrite it correctly: (a) 45×10^3 (b) 0.7×10^5 (c) 3.1×10^{-2} (d) 10×10^2

Problem 5 Calculator notation (easy)

(a) A calculator shows 3.2E5. Write it in standard form. (b) It shows 7.5E−3. Write it in standard form. (c) Write 9.1×10^{-6} as a calculator would show it.

Problem 6 Follow the decimal point (easy)

Use the diagram to write 0.00058 in scientific notation.



Slide the point until one nonzero digit is in front.

Problem 7 Order small numbers (medium)

Order from least to greatest: 4.2×10^{-3} , 3.9×10^{-2} , 5×10^{-3} , 1.1×10^{-2} .

Problem 8 Multiply (medium)

Multiply and write the answer in scientific notation: (a) $(3 \times 10^4)(2.5 \times 10^3)$ (b) $(4 \times 10^{-3})(6 \times 10^5)$

Problem 9 Divide (medium)

Divide and write the answer in scientific notation: (a) $(8.4 \times 10^9) \div (2.1 \times 10^4)$ (b) $(9 \times 10^{-2}) \div (3 \times 10^{-6})$

Problem 10 Add and subtract (medium)

Compute and write in scientific notation: (a) $3.4 \times 10^5 + 2.6 \times 10^4$ (b) $7.1 \times 10^{-3} - 4 \times 10^{-4}$

Problem 11 How many times as much (medium)

A stadium sells 6×10^7 fan-photo downloads in a year, and a school site sells 2×10^4 . How many times as many downloads does the stadium sell?

Problem 12 Town and city (medium)

A town has 6×10^4 residents and a city has 3×10^5 . Use the bars to find how many times as large the city is.



Population bars.

Problem 13 Which is larger? (medium)

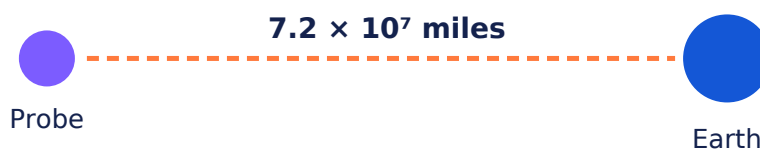
Which is larger, 7.2×10^6 or 9.5×10^5 ? Explain using the exponents, then confirm with standard form.

Problem 14 Choosing a unit (medium)

A red blood cell is about 0.000007 meter wide. Write this in scientific notation. Then state the width in micrometers, where 1 micrometer = 10^{-6} meter.

Problem 15 Radio signal delay (hard)

A space probe is 7.2×10^7 miles from Earth. A radio signal travels 1.8×10^5 miles per second. How many seconds does a message take to arrive? Convert the result to minutes and seconds.



A radio signal covers 1.8×10^5 miles each second.

Problem 16 Data center storage (hard)

One drive stores 2.4×10^{12} bytes. A data center has 5×10^3 drives. How many bytes can it store in all? Write it in scientific notation.

Problem 17 Hair and paper (hard)

A human hair is about 8×10^{-5} meter wide. A sheet of paper is about 1×10^{-4} meter thick. How many times as thick as the hair is the paper?

Problem 18 Country and state (hard)

A country has about 3.3×10^8 people, and one of its states has about 5.5×10^6 . How many times as large is the country?

Problem 19 Concert revenue (hard)

A concert tour sells 4×10^5 tickets at \$65 each. Find the total revenue in scientific notation, then in dollars.

Problem 20 Bacteria colony (hard)

One bacterium has a mass of 1×10^{-12} gram. A colony holds 2.5×10^9 bacteria. Find the colony's mass, then find how many times as heavy a rice grain of 2.5×10^{-2} gram is.