STANDARD FORM FOR LARGE NUMBERS

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

$7000 = 7 \times 1000 = 7 \times 10^3$

Multiplying by 10, 100 or 1000 moves each digit 1, 2 or 3 places to the left.

$2.5 \times 100 = 250$

1 Work out each calculation.

a) 6×100 ☐

b) 4×1000 ☐

c) 2.5×100 ☐

d) 7.1×1000 ☐

2 Fill in the missing numbers.

a) $900 = 9 \times$ ☐

b) $50\,000 = 5 \times$ ☐

c) $3\,000\,000 = 3 \times$ ☐

3 Write the missing index in each box.

a) $100 = 10^{\square}$

b) $1000 = 10^{\square}$

c) $1\,000\,000 = 10^{\square}$

4 Circle the numbers that are greater than or equal to 1 and less than 10

0.8 1 3.5 9.99 10 12

STANDARD FORM FOR LARGE NUMBERS

SUPPORT

NAME _____ CLASS _____ DATE _____

KEY IDEA

Standard form is $A \times 10^n$ where A is at least 1 and less than 10

$6000 = 6 \times 1000 = 6 \times 10^3$ $6500 = 6.5 \times 1000 = 6.5 \times 10^3$

1 Write each number in standard form.

a) 7000 b) 50 000

c) 900 d) 3 000 000

2 Write each number as an ordinary number.

a) 4×10^3 b) 2.5×10^2

c) 8.1×10^4 d) 6×10^5

3 Circle the numbers that are written in standard form.

3.2×10^4 32×10^3 0.5×10^2 9.9×10^7 1×10^5 10×10^3

4 Fill in the missing numbers.

a) $4500 = 4.5 \times$ ____ $= 4.5 \times 10$ ____

b) $72\,000 = 7.2 \times$ ____ $= 7.2 \times 10$ ____

STANDARD FORM FOR LARGE NUMBERS

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

Standard form: $A \times 10^n$ where $1 \leq A < 10$ and n is an integer.

$2700 = 2.7 \times 1000 = 2.7 \times 10^3$. Think about the place value, do not just count the zeros.

FLUENCY

1 Write each number in standard form.

a) **85 000** _____ b) **602 000** _____

c) **40** _____ d) **1 230 000 000** _____

2 Write each number as an ordinary number.

a) **3.07×10^4** _____ b) **9×10^8** _____

c) **1.5×10^6** _____ d) **6.25×10^2** _____

REASONING

3 These numbers are not in standard form. Write each one correctly in standard form.

a) **32×10^2** _____ b) **0.8×10^5** _____ c) **10×10^3** _____

4 Read what Jen says.

Jen says, "$56\,000 = 5.6 \times 10^3$ because 56 000 ends in three zeros."

Explain Jen's mistake and write 56 000 correctly in standard form.

STANDARD FORM FOR LARGE NUMBERS

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) A × 10^5 in standard form has 6 digits before the point. ALWAYS SOMETIMES NEVER

b) In standard form, a bigger index means a bigger number. ALWAYS SOMETIMES NEVER

c) Doubling A gives another number in standard form. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 Write these numbers in ascending order.

4.2×10^5 9.8×10^4 4.02×10^5 1.1×10^6

_____ , _____ , _____ , _____

smallest greatest

3 Here are two distances.

Earth to the Sun ≈ 1.5×10^8 km **Earth to the Moon ≈ 3.84×10^5 km**

a) Write both distances as ordinary numbers.

Sun: _____ km **Moon:** _____ km

b) Roughly how many times further from Earth is the Sun than the Moon? _____

★ CHALLENGE FOR ALL

4 Write each answer in standard form. Find the number that is...

a) halfway between 6×10^4 and 7×10^4 _____

b) halfway between 3×10^5 and 3×10^6 _____

c) the total of 4×10^3 and 8×10^3 _____

STANDARD FORM FOR LARGE NUMBERS

ANSWERS

BUILDING BLOCKS

1 a) 600 · b) 4000 · c) 250 · d) 7100

2 a) 100 · b) 10 000 · c) 1 000 000

3 a) 2 · b) 3 · c) 6

4 1, 3.5 and 9.99

SUPPORT

1 a) 7×10^3 · b) 5×10^4 · c) 9×10^2 · d) 3×10^6

2 a) 4000 · b) 250 · c) 81 000 · d) 600 000

3 3.2×10^4, 9.9×10^7 and 1×10^5

4 a) 1000, index 3 · b) 10 000, index 4

CORE

1 a) 8.5×10^4 · b) 6.02×10^5 · c) 4×10^1 · d) 1.23×10^9

2 a) 30 700 · b) 900 000 000 · c) 1 500 000 · d) 625

3 a) 3.2×10^3 · b) 8×10^4 · c) 1×10^4

4 $5.6 \times 10^3 = 5600$. $56\,000 = 5.6 \times 10\,000$, so $56\,000 = 5.6 \times 10^4$. Counting zeros does not work because the 6 is also a digit after the 5

GREATER DEPTH

1 a) Always (the number is from 100 000 up to, but not including, 1 000 000) · b) Always (for positive numbers, e.g. $9.9 \times 10^4 < 1 \times 10^5$) · c) Sometimes, e.g. $2 \times 3 = 6$ works but $2 \times 6 = 12$ does not

2 9.8×10^4, 4.02×10^5, 4.2×10^5, 1.1×10^6

3 a) 150 000 000 km and 384 000 km · b) about 400 times ($150\,000\,000 \div 384\,000 \approx 391$)

★ a) 6.5×10^4 · b) 1.65×10^6 (1 650 000) · c) 1.2×10^4 (12 000)