COMPARE AND ORDER NUMBERS IN STANDARD FORM

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

To compare numbers, line them up in a place value chart.
Look at the biggest place value first.

45 000 has 4 ten thousands. 7000 has none.

So 45 000 > 7000

	TTh	Th	H	T	O
45 000	4	5	0	0	0
7000		7	0	0	0

look here first

1 Write 0.4 and 0.06 in the chart. Then write the bigger number in each pair.

	TTh	Th	H	T	O	t	h
a) 23 000	2	3	0	0	0		
3200		3	2	0	0		
b) 0.4							
0.06							

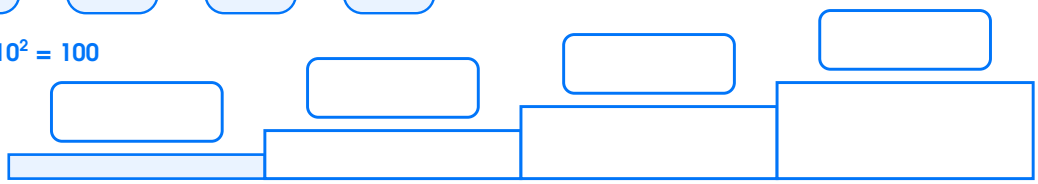
The bigger number is a) _____

The bigger number is b) _____

2 Write these powers of 10 on the steps, from smallest to largest.

10^4 10^1 10^3 10^2

Hint: $10^2 = 100$



smallest largest

3 Write < or > in each box.

a) 10^3 ☐ 10^5

b) 1000 ☐ 10^2

c) 0.1 ☐ 0.01

d) 4 × 100 ☐ 3 × 1000

< LESS > MORE
3 < 5
5 > 3

4 Mark 0.3, 0.07 and 0.25 on the number line. Then write them in order.



Order: _____ < _____ < _____ smallest first

COMPARE AND ORDER NUMBERS IN STANDARD FORM

SUPPORT

NAME _____ CLASS _____ DATE _____

KEY IDEA

Different powers: compare the powers.

3×10^5 or 8×10^4

5 is greater than 4, so 3×10^5 is bigger.

Same powers: compare the first numbers.

6.2×10^3 or 5.9×10^3

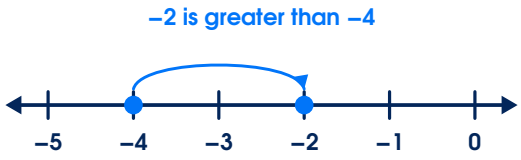
6.2 is greater than 5.9, so 6.2×10^3 is bigger.

1 The powers are different. Circle the bigger number in each pair.

a) 2×10^6 or 9×10^5

b) 4.1×10^3 or 3.8×10^4

c) 6×10^{-2} or 5×10^{-4}



2 The powers are the same. Circle the bigger number in each pair.

a) 3.2×10^5 or 2.9×10^5

b) 7.04×10^{-3} or 7.4×10^{-3}

c) 1.5×10^8 or 1.05×10^8

3 The table shows the number of visitors to three attractions in one year.

Attraction	Visitors
Castle	2.3×10^6
Museum	9.5×10^5
Zoo	1.2×10^6

a) Which had the most visitors?

b) Which had the fewest visitors?

c) Write the attractions in order, fewest visitors first.

_____ , _____ , _____

4 Write <, > or = in each box.

a) 5×10^3 ☐ 4900

b) 0.007 ☐ 7×10^{-2}

c) 2.5×10^4 ☐ 25 000

Change to ordinary numbers first.

COMPARE AND ORDER NUMBERS IN STANDARD FORM

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

1. **Check that each number is written correctly in standard form.**
2. **Compare the powers of 10. The greater power gives the greater number.**
3. **If the powers are the same, compare the values of A.**

For a mix of forms, write every number in the same form first.

FLUENCY

1 Write <, > or = in each box.

a) 8.1×10^{-5} ☐ 1.8×10^{-4}

b) 6.02×10^{7} ☐ 6.2×10^{7}

c) 3.4×10^{-2} ☐ 0.034

d) 9×10^{8} ☐ 1.1×10^{9}

2 Write each list of numbers in order.

a) 4.3×10^{5} 3.9×10^{6} 5×10^{4} 4.03×10^{5} smallest first

☐ ☐ ☐ ☐

b) 2.1×10^{-3} 1.9×10^{-2} 8×10^{-4} 0.0035 largest first

☐ ☐ ☐ ☐

REASONING

3 Zara is comparing two numbers.

"3×10^{-7} is greater than 3×10^{-4}, because 7 is greater than 4."

Explain why Zara is wrong.

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.....

4 Here are two numbers.

45×10^{3} or 4.4×10^{4}

a) Which is greater? ☐

b) Why must you check that both numbers are in standard form first?

.....

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COMPARE AND ORDER NUMBERS IN STANDARD FORM

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

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

All numbers are positive. Give examples for one 'sometimes' statement.

a) In standard form, greater power = greater number. ALWAYS SOMETIMES NEVER

b) Changing the sign of the power makes it smaller. ALWAYS SOMETIMES NEVER

c) Not in standard form, greater power = greater number. ALWAYS SOMETIMES NEVER

d) Squaring a negative-power number makes it smaller. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 Write three different numbers in standard form between these two values. One must have a power of –2.

6.5×10^{-3} < ☐ < ☐ < ☐ < 2×10^{-1}

3 The table shows the masses of four objects.

Object	Mass
Blue whale	1.5×10^5 kg
Elephant	6000 kg
Car	1.4×10^6 g
Person	7×10^4 g

1 kg = 1000 g

Write the four objects in order of mass, lightest first.

☐ ☐

☐ ☐

★ CHALLENGE FOR ALL

4 Use 3, 6 and 8 once each. The minus card is optional (power only).

3 6 8 – ☐.☐ × 10^☐

a) Largest number: ☐ **b)** Smallest number: ☐

c) The number closest to 1: ☐

COMPARE AND ORDER NUMBERS IN STANDARD FORM – ANSWERS

ANSWERS

BUILDING BLOCKS

1) a) 23 000 b) 0.4 (0.4: 0 . 4 in O, t · 0.06: 0 . 0 6 in O, t, h)
2) 10^1, 10^2, 10^3, 10^4
3) a) < b) > c) > d) < (400 < 3000)
4) 0.07 < 0.25 < 0.3

SUPPORT

1) a) 2×10^6 b) 3.8×10^4 c) 6×10^{-2}
2) a) 3.2×10^5 b) 7.4×10^{-3} c) 1.5×10^8
3) a) Castle b) Museum c) Museum, Zoo, Castle
4) a) > (5000 > 4900) b) < (0.007 < 0.07) c) =

CORE

1) a) < b) < c) = d) <
2) a) 5×10^4, 4.03×10^5, 4.3×10^5, 3.9×10^6 b) 1.9×10^{-2}, 0.0035, 2.1×10^{-3}, 8×10^{-4}
3) −7 is less than −4, so $3 \times 10^{-7} = 0.000\,000\,3$ is smaller than $3 \times 10^{-4} = 0.0003$
4) a) 45×10^3 ($= 4.5 \times 10^4 > 4.4 \times 10^4$) b) 45×10^3 is not in standard form, so its power looks smaller than it really is

GREATER DEPTH

1) a) always b) sometimes ($3 \times 10^2 \rightarrow 3 \times 10^{-2}$ smaller; $3 \times 10^{-2} \rightarrow 3 \times 10^2$ bigger) c) sometimes ($50 \times 10^1 > 2 \times 10^2$) d) always
2) Any three between 0.0065 and 0.2, one with power −2, e.g. 9×10^{-3}, 4.2×10^{-2}, 1.5×10^{-1}
3) Person (70 kg), car (1400 kg), elephant (6000 kg), blue whale (150 000 kg)
4) a) 6.3×10^8 b) 3.6×10^{-8} c) 8.6×10^{-3}