

Work with numbers between 0 and 1 in standard form

1 Complete the statements.

a) $0.007 = 7 \times \boxed{0.001} = 7 \times 10^{-3}$

b) $0.06 = 6 \times \boxed{0.01} = 6 \times 10^{-2}$

c) $0.0008 = 8 \times \boxed{0.0001} = \boxed{8} \times 10^{-4}$

d) $0.0000004 = \boxed{4} \times \boxed{0.0000001} = \boxed{4} \times 10^{-7}$

e) $\frac{7}{10000} = \boxed{7} \times \boxed{0.0001} = \boxed{7} \times 10^{-4}$

f) three thousandths = $\boxed{3} \times \boxed{0.001} = \boxed{3} \times 10^{-3}$

g) 2 millionths = $\boxed{2} \times \boxed{0.000001} = \boxed{2} \times 10^{-6}$

2 Tick the numbers that are **not** in standard index form.

4×10^{-27}	$6 \times 10^{-\frac{3}{4}}$	0.05×10^{-2}	5.4×10^{-6}
7×10^5	$1.6 \times 10^{-0.4}$	$10 \times 10^{-1.5}$	10×10^{-1}

3 Write >, < or = to complete the statements.

a) $0.0001 \bigcirc 10^{-4}$

d) $\frac{1}{2} \bigcirc 5 \times 10^{-1}$

b) $0.004 \bigcirc 3 \times 10^{-2}$

e) $3 \times 10^{-5} \bigcirc \frac{3}{100000}$

c) $8 \times 10^{-2} \bigcirc 0.9$

4 Write the standard form numbers as ordinary numbers.

a) $6 \times 10^{-3} = \boxed{0.006}$

d) $5 \times 10^{-2} = \boxed{0.05}$

b) $7 \times 10^{-4} = \boxed{0.0007}$

e) $8 \times 10^{-6} = \boxed{0.000008}$

c) $8 \times 10^{-5} = \boxed{0.00008}$

f) $10^{-1} = \boxed{0.1}$

5 Fill in the missing information.

a) $0.008 = 8 \times 0.001 = 8 \times 10^{-3}$

b) $0.009 = 9 \times 0.001 = \boxed{9} \times 10^{-3}$

c) $0.0085 = 8.5 \times 0.001 = \boxed{8.5} \times 10^{-3}$

d) $0.0083 = \boxed{8.3} \times 0.001 = \boxed{8.3} \times 10^{-3}$

e) $0.027 = \boxed{2.7} \times 0.01 = \boxed{2.7} \times 10^{-2}$

f) $0.000062 = \boxed{6.2} \times \boxed{0.00001} = \boxed{6.2} \times 10^{-5}$

g) $0.67 = \boxed{6.7} \times \boxed{0.1} = \boxed{6.7} \times 10^{-1}$

h) $0.00000056 = \boxed{5.6} \times \boxed{0.0000001} = \boxed{5.6} \times 10^{-7}$

6 Write the ordinary numbers in standard index form.

a) $0.0004 = \underline{4 \times 10^{-4}}$

d) $0.002 = \underline{2 \times 10^{-3}}$

b) $0.00043 = \underline{4.3 \times 10^{-4}}$

e) $0.0021 = \underline{2.1 \times 10^{-3}}$

c) $0.000437 = \underline{4.37 \times 10^{-4}}$

f) $0.00201 = \underline{2.01 \times 10^{-3}}$

7 Write the standard form numbers as ordinary numbers.

- a) $3 \times 10^{-3} =$ 0.003 d) $8.27 \times 10^{-4} =$ 0.000827
 b) $3.1 \times 10^{-3} =$ 0.0031 e) $8.27 \times 10^{-5} =$ 0.0000827
 c) $3.81 \times 10^{-3} =$ 0.00381 f) $8.207 \times 10^{-5} =$ 0.00008207

8 a) The length of a plant cell is about 0.00005 m.
Write this length in standard form.

5×10^{-5} m

b) A blood cell is about 8×10^{-6} m long.
Write this length as an ordinary number.

0.000008 m

c) The diameter of a proton is about 0.00000000000000087 m.
Write this length in standard form.

8.7×10^{-16} m

9 a)



−4 is smaller than −3,
so 6×10^{-4} is smaller than
 8×10^{-3}

Do you agree with Jack? Yes

Explain your answer.

$6 \times 10^{-4} = 0.0006$ $8 \times 10^{-3} = 0.008$
 $0.0006 < 0.008$

b) Write the numbers in ascending order.

7 hundredths	7×10^{-7}	0.007	7.5×10^{-2}	0.017
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7×10^{-7} , 0.007, 0.017, 7 hundredths, 7.5×10^{-2}

6×10^{-7}	$\frac{6}{100000}$	0.000000667	6.6×10^{-6}	6 millionths
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6×10^{-7} , 0.000000667, 6 millionths, 6.6×10^{-6} , $\frac{6}{100000}$

10



0.3×10^{-4} is not in standard form.
 $0.3 \times 10^{-4} = 3 \times 10^{-1} \times 10^{-4} = 3 \times 10^{-5}$
Now the number is in standard form.

Use Mo's reasoning to write these numbers in standard form.

- a) $0.7 \times 10^{-4} =$ 7×10^{-5} c) $53.8 \times 10^{-4} =$ 5.38×10^{-3}
 $70 \times 10^{-4} =$ 7×10^{-3} $538 \times 10^{-4} =$ 5.38×10^{-2}
 $0.07 \times 10^{-4} =$ 7×10^{-6} $0.0538 \times 10^{-4} =$ 5.38×10^{-6}

- b) $0.6 \times 10^{-3} =$ 6×10^{-4}
 $0.06 \times 10^{-3} =$ 6×10^{-5}
 $600 \times 10^{-3} =$ 6×10^{-1}