




### Check Your Understanding –Scientific Notation

The table below identifies the key concepts from this unit.

1. Check your understanding by completing these questions.
2. Check your answers in the key provided.
3. In the table below, highlight the questions you got correct.
4. Ask peers/Dr. James about concepts where you can improve.

<b>Key Concepts</b>	 Mild	 Medium	 Spicy
Converting Between Large Numbers and Scientific Notation	1	3	None
Converting Between Small Numbers and Scientific Notation	2	3	None
Multiplying Numbers Written in Scientific Notation	4	6	7
Dividing Numbers Written in Scientific Notation	5	6	7

1) The table below shows the diameter of several planets and stars (in km). Convert each to scientific notation.

Planet or Star	Decimal Notation Diameter in kilometers	Scientific Notation Diameter in kilometers
Earth	12 756	
Saturn	116 464	
Jupiter	142 984	
Sun	1 392 000	
Aldebaran	59 770 000	
Betelgeuse	903 500 000	
VV Cephei	2 644 800 000	

2) The table below shows the diameter of various objects (in m). Convert each to scientific notation.

<b>Object</b>	<b>Decimal Notation Diameter in meters</b>	<b>Scientific Notation Diameter in meters</b>
Salt Grain	0.005	
Skin Cell	0.000 03	
Chromosome	0.000 007	
HIV Virus	0.000 000 130	
Hepatitis B	0.000 000 045	
Water Molecule	0.000 000 000 275	

3) Write the following in decimal notation.

a)  $5.76 \times 10^4 =$

b)  $0.315 \times 10^6 =$

c)  $-34.79 \times 10^3 =$

d)  $5.66 \times 10^{-2} =$

e)  $-8.95 \times 10^{-6} =$

4) Calculate the following and write your answer in scientific notation.

a)  $(3.5 \times 10^4) * (1.7 \times 10^8) =$

b)  $(-2.78 \times 10^{-8}) * (2.39 \times 10^{-5}) =$

5) Calculate the following and write your answers in scientific notation.

a)  $(4.25 \times 10^{25}) \div (3.6 \times 10^{18}) =$

b)  $(9.86 \times 10^{-13}) \div (-3.45 \times 10^{-11}) =$

6) Calculate the following and write your answers in scientific notation

a)  $(5.5 \times 10^{-4}) * (7.9 \times 10^8) =$

b)  $\frac{7.4 \times 10^{-9}}{9.067 \times 10^3} =$

c)  $(0.058 \times 10^{-9}) \cdot (0.0036 \times 10^{-16}) =$

d)  $(0.00987 \times 10^{-12}) \div (18.276 \times 10^{-17}) =$

7) Calculate the following and write your answers in scientific notation

a)  $\frac{(8.9 \times 10^9)(6.2 \times 10^{-3})}{(3.1 \times 10^2)} =$

b)  $\frac{(1.4 \times 10^4)(7.3 \times 10^{-4})}{(5.6 \times 10^{-4})} =$

c)  $\frac{(1.4 \times 10^4)}{(5.6 \times 10^8)(7.4 \times 10^{12})} =$

## Answers

1) The table below shows the diameter of several planets and stars (in km). Convert each to scientific notation.

Planet or Star	Decimal Notation Diameter in kilometers	Scientific Notation Diameter in kilometers
Earth	12 756	$1.2756 \times 10^4$
Saturn	116 464	$1.16464 \times 10^5$
Jupiter	142 984	$1.42984 \times 10^5$
Sun	1 392 000	$1.392 \times 10^6$
Aldebaran	59 770 000	$5.977 \times 10^7$
Betelgeuse	903 500 000	$9.035 \times 10^8$
VV Cephei	2 644 800 000	$2.6448 \times 10^9$

2) The table below shows the diameter of various objects (in m). Convert each to scientific notation.

Object	Decimal Notation Diameter in meters	Scientific Notation Diameter in meters
Salt Grain	0.005	$5.0 \times 10^{-3}$
Skin Cell	0.000 03	$3.0 \times 10^{-5}$
Chromosome	0.000 007	$7.0 \times 10^{-6}$
HIV Virus	0.000 000 130	$1.3 \times 10^{-7}$
Hepatitis B	0.000 000 045	$4.5 \times 10^{-8}$
Water Molecule	0.000 000 000 275	$2.75 \times 10^{-10}$

3a) 57,6000   b) 315,000   c) -34790   d) 0.0566   e) -0.00000895

4a)  $5.95 \times 10^{12}$    b)  $-6.6442 \times 10^{-13}$

5a)  $1.18 \times 10^7$    b)  $-2.86 \times 10^{-2}$

6a)  $4.35 \times 10^5$    b)  $8.16 \times 10^{-13}$    c)  $2.09 \times 10^{-29}$    d)  $5.4 \times 10^1$

7a)  $1.78 \times 10^5$    b)  $1.83 \times 10^4$    c)  $3.38 \times 10^{-18}$