

# Outcome 3 - Scientific Notation & the Calculator

## Bronze examples...

**Examples...** (a number)  $\times 10^{\text{something}}$

Write the following in scientific notation.

$3\ 8\ 2\ 0\ 0 = 3.82 \times 10^4$

$0\ 0\ 0\ 0\ 1\ 3\ 9 = 1.39 \times 10^{-4}$

Write the following in number form.

$7.25 \times 10^3 = 7\ 2\ 5\ 0$

$9.03 \times 10^{-2} = 0\ 0\ 9\ 0\ 3$

## Silver examples

**Examples...**

Use your calculator to answer the following giving your answer in scientific notation...

SCI NOT button (usually!) close to '=' button.

$3 \cdot 5 \times 10^{14} \times 4 \times 10^7 = 1 \cdot 4 \times 10^{22}$

$7 \cdot 45 \times 10^9 \times 3 \cdot 9 \times 10^4 = 2 \cdot 9055 \times 10^{14}$

$4 \cdot 34 \times 10^{13} \div 3 \cdot 1 \times 10^5 = 1 \cdot 4 \times 10^8$

$3 \cdot 21 \times 10^{11} \div 6 \cdot 42 \times 10^3 = 5 \times 10^7$

## Gold example

**Examples...**

Give your answer to the following question in scientific notation...

A DVD sold  $5 \cdot 28 \times 10^6$  copies on the day it was released. If each DVD cost £17, how much money was made?

$5 \cdot 28 \times 10^6 \times 17 = 89\ 760\ 000$   
 $= £8 \cdot 976 \times 10^7$

## Bronze Questions

Write the following in scientific notation...

- 1 8350      2 7 209 000
- 3 38 200      4 543 200
- 5 0.6382      6 0.000 000 0405

Write the following in number form...

- 7  $6.37 \times 10^5$       8  $8.09 \times 10^7$
- 9  $3.05 \times 10^{-2}$       10  $4.027 \times 10^{-6}$

## Silver Questions

Use your calculator to answer the following giving your answer in scientific notation...

- 1  $6 \cdot 8 \times 10^{11} \times 6 \times 10^5$
- 2  $8 \cdot 24 \times 10^8 \times 9 \cdot 3 \times 10^7$
- 3  $8 \times 10^3 \times 5 \cdot 46 \times 10^7$
- 4  $7 \cdot 77 \times 10^9 \div 3 \cdot 7 \times 10^4$
- 5  $2 \cdot 382 \times 10^{21} \div 6 \times 10^8$
- 6  $2 \cdot 624 \times 10^{17} \div 3 \cdot 28 \times 10^9$

## Gold Questions

Use your calculator to answer the following giving your answer in scientific notation...

- 1 The population of England is  $5 \cdot 35 \times 10^7$ . It is recommended that they should each drink 2.6 litres of water per day. How many litres is this altogether?
- 2 The speed of light is approximately  $3 \cdot 8 \times 10^8$  metres per second. How far will light travel in 123 seconds?
- 3 The exchange rate in Italy is 1 GBP = 2470.62 ITL. Paul is going to Italy for a gap year and changes £9000 into Italian Lira. How much will he receive in Lira?

## Bronze Answers

- |                                 |                                |
|---------------------------------|--------------------------------|
| 1. $8 \cdot 35 \times 10^3$     | 2. $7 \cdot 209 \times 10^6$   |
| 3. $3 \cdot 82 \times 10^4$     | 4. $5 \cdot 432 \times 10^5$   |
| 5. $6 \cdot 382 \times 10^{-1}$ | 6. $4 \cdot 05 \times 10^{-8}$ |
| 7. 637 000                      | 8. 80 900 000                  |
| 9. 0.0305                       | 10. 0.000 004027               |

## Silver Answers

- |                                 |                                  |
|---------------------------------|----------------------------------|
| 1. $4 \cdot 08 \times 10^{17}$  | 2. $7 \cdot 6632 \times 10^{16}$ |
| 3. $4 \cdot 368 \times 10^{11}$ | 4. $2 \cdot 1 \times 10^5$       |
| 5. $3 \cdot 97 \times 10^{12}$  | 6. $8 \times 10^7$               |

## Gold Answers

1.  $1 \cdot 391 \times 10^8$
2.  $4 \cdot 674 \times 10^{10}$
3.  $2 \cdot 223558 \times 10^7$