

Boost Free Lessons - Year 9 Maths

Lesson 10: Scientific Notation

Name: _____ Grade: _____ Date: _____

Worked Example 1

Write 4 580 000 in scientific notation.

1. Scientific notation is written as $a \times 10^n$, where a is between 1 and 10.
2. Put the decimal point straight after the first digit: 4.58.
3. Count how many places the point moved: 6 places to the left.
4. Moving left gives a positive index, so $n = 6$.

$$= 4.58 \times 10^6$$

Worked Example 2

Write 0.00072 in scientific notation.

1. Put the decimal point after the first non-zero digit: 7.2.
2. Count the places the point moved: 4 places to the right.
3. Moving right gives a negative index, so $n = -4$.
4. Numbers smaller than 1 always have a negative index.

$$= 7.2 \times 10^{-4}$$

Remember: The first part must be between 1 and 10. Large numbers take a positive index, and numbers smaller than 1 take a negative index.



Question 1: Write each of these in scientific notation.

1. 5 000
2. 62 000
3. 340
4. 1 250 000
5. 0.004
6. 0.00056
7. 87 000 000
8. 0.0219
9. 900
10. 0.000008



Question 2: Write each of these as a basic numeral.

1. 3×10^4

2. 7.5×10^2

3. 2.6×10^{-3}

4. 9×10^{-1}

5. 1.08×10^5

6. 4.2×10^{-5}

7. 6×10^6

8. 3.75×10^{-2}



Question 3: Answer the following questions.

1. The distance from the Earth to the Sun is about 150 000 000 km. Write this in scientific notation.
2. A virus is about 0.000 000 12 m across. Write this in scientific notation.
3. Which is larger, 3.2×10^5 or 4.1×10^4 ? Explain your answer.
4. Write 8.4×10^3 as a basic numeral.
5. The mass of an electron is 9.11×10^{-31} kg. How many zeros come after the decimal point before the 9?





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Answers: Scientific Notation**Question 1**

- | | |
|-----------------------|--------------------------|
| 1. 5×10^3 | 6. 5.6×10^{-4} |
| 2. 6.2×10^4 | 7. 8.7×10^7 |
| 3. 3.4×10^2 | 8. 2.19×10^{-2} |
| 4. 1.25×10^6 | 9. 9×10^2 |
| 5. 4×10^{-3} | 10. 8×10^{-6} |

Question 2

- | | |
|-----------|--------------|
| 1. 30 000 | 5. 108 000 |
| 2. 750 | 6. 0.000042 |
| 3. 0.0026 | 7. 6 000 000 |
| 4. 0.9 | 8. 0.0375 |

Question 3

1. 1.5×10^8 km
2. 1.2×10^{-7} m
3. $3.2 \times 10^5 = 320\,000$ and $4.1 \times 10^4 = 41\,000$, so 3.2×10^5 is larger
4. 8 400
5. 30 zeros

