

Units

Choose the correct unit

tick one box for each

1 The **activity** of a radioactive source is measured in:

☐ Bq ☐ cm ☐ s ☐ min

3 The **range of alpha radiation in air** is measured in:

☐ Bq ☐ cm ☐ s ☐ min

5 A GM tube records **counts per minute**. To convert this to Bq you must:

☐ $\times 60$ ☐ $\div 60$ ☐ $\times 3600$ ☐ $\div 3600$

2 An activity of **1 Bq** means:

☐ 1 decay per hour ☐ 1 decay per minute

☐ 1 decay per second

4 Which unit of time must be used when you **substitute into an equation**?

☐ hours ☐ minutes ☐ seconds ☐ days

6 The **thickness of lead** needed to reduce gamma radiation is measured in:

☐ Bq ☐ cm ☐ min ☐ s

Add the correct unit

write Bq, cm, s, min or h on each line

(a) A source gives 120 decays each second. Activity = 120

.....

(c) The count rate halves every 25 minutes. Half-life = 25

.....

(e) Gamma is only reduced by several of lead.

(b) Alpha travels about 5 in air before it is absorbed.

(d) The half-life of technetium-99m is 6

(f) The background count rate is 0.4

Unit conversions

fill in the missing number

2 hours = ... s

30 min = ... s

5 min = ... s

1.5 hours = ... min = ... s

250 cm = ... m

0.5 m = ... cm

The golden rule — always convert before you calculate. Every physics equation needs **time in seconds (s)** and **distance in metres (m)**. Minutes $\rightarrow$ seconds: $\times 60$. Hours $\rightarrow$ seconds: $\times 3600$. Centimetres $\rightarrow$ metres: $\div 100$.

Exam-style question

A sealed radioactive source is kept in a school laboratory.

- (a) State the unit that is used to measure the activity of the source. [1]
- (b) The activity of the source is 4800 Bq. State what this tells you about the source. [1]
- (c) The half-life of the source is 2 hours. Calculate the half-life in seconds. [2]
- (d) A student measures the range of the radiation in air to be 4.5 cm. Give this distance in metres. [1]
- (e) A detector next to the source records 1200 counts in 1 minute. Calculate the count rate in counts per second. [2]

(Total for question = 7 marks)

ANSWER
