Comparing Decay Counts and Heat

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A nuclear simulation records every decay in two containers during an equal observation interval. It also calculates the energy deposited in each container. In the model each decay in a given container deposits the stated amount of energy, and the container records all of it.

Container	Decays counted	Energy deposited per decay (model units)
P	24	2
Q	12	4

1 Which container has more decay events during the interval?

(1) P only

(2) Q only

(3) They have the same count.

(4) Only energy can be compared.

2 Calculate and compare the deposited energies for P and Q. [1]

Answer and work

3 A student uses the equal energy readings to report equal decay rates. Evaluate the claim with both records. [1]

Answer and work

A third container deposits 48 energy units. It contains only one of the two decay types, but its event counter is turned off.

4 Give the two decay counts that fit the third container’s energy reading. Explain what additional evidence would distinguish them. [1]

Answer and work