

Gaps & Intervals

CKSTEM Math Problem Solving · Grades 4–7

Try each problem on your own first — then watch the solution videos.

- ★ **If N objects sit in a line with one at each end, then there are $N - 1$ spaces between them — always one less.**

Hold up one hand with your fingers spread out. There are 5 fingers in a row, with one finger at each end. How many gaps sit between neighbouring fingers?

WORK IT OUT HERE

- LO **If N objects are equally spaced from end to end, then gap = total $\div (N - 1)$ — divide by spaces, not by objects.**

Student volunteers set up 8 rest mats in a row inside a school gym. There is a mat at each end. The spaces between mats are all equal. From the first mat to the last mat there are 28 floor tiles. How many tiles sit between two neighbouring mats?

WORK IT OUT HERE

L1 If equally-spaced objects are numbered 1..N, then the distance from object i to object j is $|j - i| \times \text{gap}$ — count the gaps you cross, not the stops.

After a storm, a school becomes a community relief hub. Volunteers set up 10 water stations equally spaced along a 54 m walking route. One station sits at the entrance and one sits at the gym. What is the distance from the 3rd station to the 6th station?

WORK IT OUT HERE

L2 If departures (or strikes / events) are at equal time intervals with both endpoints known, then $(\text{last} - \text{first}) \div (N - 1) = \text{interval}$.
Times are points on a line.

A shuttle bus takes families to a clinic at equal time intervals. The first shuttle departs at 8:12 and the last shuttle departs at 9:48. There are 9 total trips. How many minutes apart are neighbouring shuttles?

WORK IT OUT HERE

L3 If a regular pattern would place N_0 objects but some positions are blocked (end clearances, excluded zones), then count = $N_0 -$ (blocked); subtract, never recount.

Volunteers light a 120 m outdoor path with lanterns every 6 m, with a lantern position at each end. There are 2 restrictions: keep 12 m clear at each end for wheelchairs (no lanterns within 12 m of either end), and no lanterns in the medical zone from 54 m to 72 m. How many lanterns can be placed?

WORK IT OUT HERE

L4 If two plans (different spacing, different count) both fit the same fixed corridor, then $(N_1 - 1) \times g_1 = (N_2 - 1) \times g_2$ — equate spaces \times gap.

Volunteers place chairs along a school corridor for tired families. Two plans cover the SAME corridor. In both plans, the first chair sits 2 m from one end and the last chair sits 2 m from the other end. Plan A uses 10 chairs spaced x m apart. Plan B uses 7 chairs spaced $(x + 3)$ m apart. Find the length of the corridor.

WORK IT OUT HERE