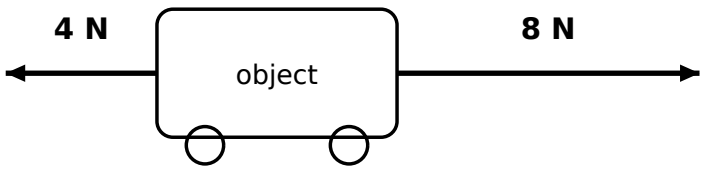
Read a force arrow

In a force diagram an arrow shows direction. Its length can represent force size when the diagram uses a stated scale.

Scale: 1 cm of arrow represents 2 N. The values refer to the same trolley.



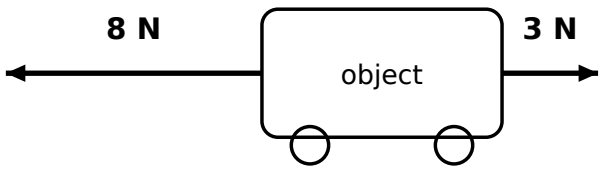
1. Which horizontal force is larger? Find the arrow lengths needed for 4 N and 8 N at the stated scale.

2. Draw a labelled 6 N arrow acting to the right in your response space. Use the same scale and a ruler.

A force against the motion

A resultant force opposite to the direction of motion makes an object slow down. Force direction and movement direction can differ.

The trolley is moving RIGHT at the instant shown.



1. Calculate the horizontal resultant. State whether the trolley initially speeds up or slows down.

2. Does the trolley instantly move left? Explain what the diagram does and does not tell you.

Include the waiting time

A journey average includes the entire stated interval, including a stop. Identify the interval before calculating.

Stage	Distance / m	Time / s
Move to loading point	6	3
Wait at loading point	0	4
Move to finish	6	3

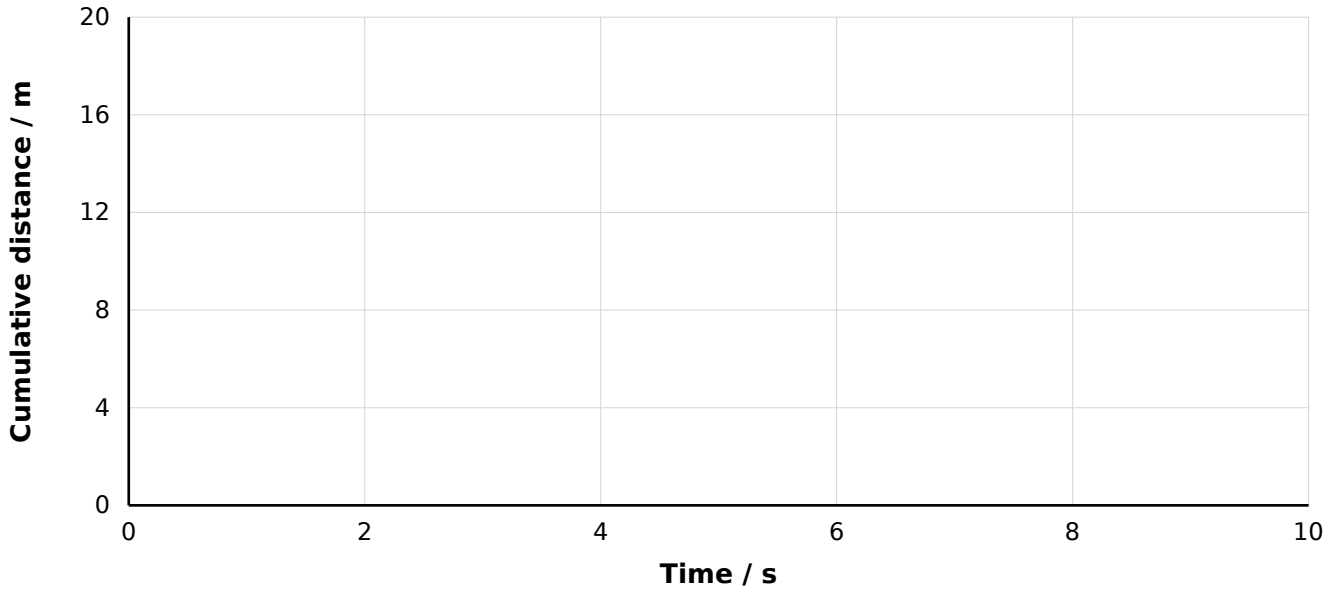
1. Find the total distance, total elapsed time and average speed for the whole journey.

2. Calculate the average speed during the moving time only. Explain why this differs from the whole-journey average.

From table to graph

Plot the supplied data accurately. A longer time gap does not mean you should invent an extra measured point.

Data pairs (time / s, cumulative distance / m): (0,0), (2,2), (4,4), (6,4), (8,10), (10,16).



1. Plot and join the six points with straight segments. Identify the stopped interval.

2. Compare the speeds during 0-4 s and 6-10 s. Find the whole-journey average.