

Ages 14–15 · Science

Name _____ Class _____ Date _____

A Key terms: match each term to its meaning

Write the letter of the correct meaning in the box next to each term.

- | | | |
|-----------------------------------|--------------------------|--|
| 1 Reference point (origin) | ☐ | A Displacement divided by the time interval in which it happens. |
| 2 Distance | ☐ | B Motion along a circular path at constant speed, in which the direction of velocity keeps changing. |
| 3 Displacement | ☐ | C The rate of change of velocity, measured in m/s^2 . |
| 4 Average velocity | ☐ | D The change in position of an object, with both size and direction. |
| 5 Acceleration | ☐ | E A fixed point from which the position of an object is measured. |
| 6 Kinematic equations | ☐ | F The total length of the path travelled by an object; it has size but no direction. |
| 7 Uniform circular motion | ☐ | G Equations linking u , v , a , s and t for motion in a straight line with constant acceleration. |

B Quick quiz

Circle the best answer, write its letter, then explain your choice in a few words.

- 1 A girl walks 4 m east and then 3 m west. What is her displacement?**

- a) 7 m east
b) 1 m east
c) 1 m west
d) 7 m west

Answer: _____ Why? _____

- 2** What is 54 km/h in metres per second?

- a) 54 m/s
b) 5.4 m/s
c) 19.4 m/s
d) 15 m/s

Answer: _____ Why? _____

- 3** A scooter speeds up from 5 m/s to 15 m/s in 5 s. What is its average acceleration?

- a) 2 m/s^2 b) 3 m/s^2
c) 10 m/s^2 d) 50 m/s^2

Answer: _____ Why? _____

- 4** A flat horizontal line on a position-time graph shows that the object is:

- a) Moving at constant velocity
b) Speeding up
c) At rest
d) Moving in a circle

Answer: Why?

- ### 5 Why is uniform circular motion called accelerated motion?

- a) Its speed keeps increasing
b) Its direction, and so its velocity, keeps changing
c) Its distance is always zero
d) It always moves in a straight line

Answer: _____ Why? _____

Motion: Speed, Velocity, Acceleration & Graphs

Answer key for teachers · Ages 14–15 · Science

A Key terms

1	Reference point (origin)	E	A fixed point from which the position of an object is measured.
2	Distance	F	The total length of the path travelled by an object; it has size but no direction.
3	Displacement	D	The change in position of an object, with both size and direction.
4	Average velocity	A	Displacement divided by the time interval in which it happens.
5	Acceleration	C	The rate of change of velocity, measured in m/s^2 .
6	Kinematic equations	G	Equations linking u , v , a , s and t for motion in a straight line with constant acceleration.
7	Uniform circular motion	B	Motion along a circular path at constant speed, in which the direction of velocity keeps changing.

B Quick quiz

1 b) 1 m east

Displacement is the net change in position: 4 m east minus 3 m west leaves her 1 m east of the start. The distance travelled is 7 m.

2 d) 15 m/s

Multiply by 5/18: $54 \times 5 \div 18 = 15 \text{ m/s}$.

3 a) 2 m/s^2

$a = (v - u) \div t = (15 - 5) \div 5 = 2 \text{ m/s}^2$.

4 c) At rest

If the position does not change with time, the object is at rest. A sloping straight line would show constant velocity.

5 b) Its direction, and so its velocity, keeps changing

The speed is constant, but the direction of motion changes at every point. A change in direction is a change in velocity, so the object is accelerating.