

Velocity vs. Time

For each short story, draw a **velocity vs. time graph** that matches the description.

- On your graph, time is on the x-axis and velocity on the y-axis.
 - Positive velocity means moving forward; negative velocity means moving back toward the start.
 - Show accelerations (sloped lines), constant velocities (horizontal lines above or below the axis), and rest (a flat line on the time axis). Label axes clearly.
1. A skateboarder rolls forward at a constant speed.
 2. A runner stands still for a few seconds, then jogs forward at a steady pace.
 3. A bicyclist rides at a steady speed, slows evenly to a stop, then stays at rest.
 4. A dog starts walking slowly, speeds up evenly, then walks steadily at that faster speed.
 5. A car moves at a constant speed, brakes evenly to a stop, waits, then accelerates smoothly forward again.
 6. A student runs quickly, stops suddenly, stands still, then jogs back toward the start at a slower constant speed.
 7. A sprinter accelerates rapidly out of the blocks, maintains top speed for several seconds, then decelerates evenly to a stop.
 8. A bus moves at a slow constant speed, accelerates steadily to a higher speed, cruises, then decelerates smoothly to a stop.
 9. A train departs a station, accelerates steadily, maintains high speed, brakes smoothly, and stops at the next station.
 10. A car backs slowly out of a driveway (negative velocity), stops, then accelerates forward onto the road and drives at a steady speed.
 11. A toy car is pushed: it speeds up steadily, slows down to a stop on its own, then is pushed again to a faster constant speed.
 12. A jogger runs at steady speed, pauses, then runs back toward the start at the same speed.
 13. A roller coaster accelerates downhill, levels out at a high constant speed, brakes evenly to zero, then waits.
 14. A cyclist pedals forward at a constant speed, coasts while slowing evenly to rest, pauses, then accelerates backward down a hill (negative velocity).

15. A driver accelerates quickly forward, cruises, slams the brakes to zero, waits, then accelerates backward in reverse.
16. A rowboat moves forward slowly at constant speed, accelerates strongly, slows gradually to rest, then drifts backward at a gentle constant speed.
17. A drone rises upward at constant velocity, accelerates faster, hovers (zero velocity), then descends steadily to land (negative velocity).
18. A runner sprints forward, slows evenly to rest, reverses immediately into a steady jog back toward the start, then slows to rest again.
19. A courier accelerates forward to a sprint, maintains it, brakes evenly to zero, accelerates backward (negative velocity), cruises, then brakes to rest.
20. A spacecraft accelerates gently forward, coasts at constant velocity, decelerates smoothly to zero, reverses with steady acceleration, cruises backward, and finally decelerates to rest at the origin.
21. Consider the following combinations of signs and values for the velocity and acceleration of a car. Describe what the car is doing in each case.
 - a. Velocity: Is the car moving forward, backwards, or not moving.
 - b. Acceleration: Is the car speeding up, slowing down, or maintaining its speed.

	Velocity	Acceleration
a	Positive	Positive
b	Positive	Negative
c	Positive	Zero
d	Negative	Positive
e	Negative	Negative
f	Negative	Zero
g	Zero	Positive
h	Zero	Negative