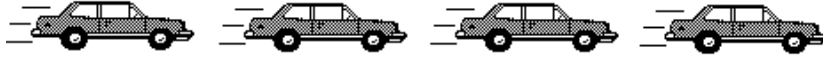


Motion Diagrams

A motion diagram represents the position and speed of an object at various times.

Suppose that you took a stroboscopic picture of a car moving to the right at constant speed where each image revealed the position of the car at one-second intervals.



This is the motion diagram that represents the car. We model the position of the object with a small point. At each position an arrow represents the object's speed: the longer the arrow, the greater the speed.

Let's say the car above is moving at a constant speed of 20 mph. Fill in the instantaneous speed of the car for every second of the trip. The instantaneous speed is what the speedometer would read in the car at each second.



Your turn: Draw a motion diagram for each scenario. For each diagram label the times and speeds below each arrow.

- 1) A car is traveling at a constant speed of 50 mph for 3 seconds.
- 2) 2 toy cars are racing each other for 4 seconds. The first car is moving at a constant speed of 2 m/s. The second car is moving at a constant 4 m/s.

- 3) A truck starting from rest increases his speed by 5 m/s every second. He moves for 4 seconds.

- 4) A soccer ball moving at 7 m/s on grass slows down by 1 m/s every second. It moves for 5 seconds.

- 5) A car starting from rest increases in speed by 10 m/s every second. How much time will go by before it reaches a speed of 50 m/s ? Use the diagram to answer the question.

- 6) A truck driver moving at 10 m/s lightly hits the brakes. He slows down at a rate of 2 m/s every second. How much time does it take for the truck to stop?

- 7) A train traveling at 14 m/s increases its speed by 0.5 m/s every second. How fast will the train be going after 5 seconds?