

CHAPTER OVERVIEW

2: Kinematics

Objects are in motion everywhere we look. Everything from a tennis game to a space-probe flyby of the planet Neptune involves motion. When you are resting, your heart moves blood through your veins. And even in inanimate objects, there is continuous motion in the vibrations of atoms and molecules. Questions about motion are interesting in and of themselves: *How long will it take for a space probe to get to Mars? Where will a football land if it is thrown at a certain angle?* But an understanding of motion is also key to understanding other concepts in physics. An understanding of acceleration, for example, is crucial to the study of force. Kinematics is the branch of classical mechanics which describes the motion of points, bodies, and systems of bodies without consideration of the masses of those objects, nor the forces that may have caused the motion.

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Thumbnail: Kinematics of a classical particle of mass m , position r , velocity v , acceleration a . (Public domain; [Maschen](#)).

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