

UNIT
1

Kinematics



UNIT CONTENTS

CHAPTER 2 Describing Motion

CHAPTER 3 Analyzing Motion

A blink of an eye is a lifetime compared to the time that has elapsed between the first and last image in the inset photos of a bullet impacting on body armour. This sequence of motion was captured by a device composed of eight digital cameras, ingeniously wired together, that produces the fastest frame-by-frame images to date. Such technology is allowing scientists to examine an object's motion in the kind of minute detail that previously could only be hypothesized by using computer modelling.

Not all motion is quite this fast. Scientists have discovered, for example, that the continents of the world are adrift. What are now rugged mountain ranges were once buried deep beneath the sea. These very mountains might one day become rolling hills or farmland. The movements of the continents escaped the notice of scientists until recently, because the rate of the motion of continents is extremely slow.

This unit examines how physicists describe motion. The unit ends by giving you an opportunity to consider motion from the director's chair. Based on your expanded knowledge, you will be challenged to create your own realities by either speeding up imperceptibly slow motion through animation, or slowing down events that normally escape vision because they happen in the blink of an eye.

UNIT PROJECT PREP

At the end of this unit, you will have a chance to create a cartoon, video, or special effects show. To find out more, go to the unit project in your e-book.

- How can you manipulate frames of reference to create the illusion of motion?
- What ideas can you get from amusement parks to simulate natural forces?

Photo insets courtesy of Professor Arun Shukla, University of Rhode Island