



PUZZLER

In a moment the arresting cable will be pulled taut, and the 140-mi/h landing of this F/A-18 Hornet on the aircraft carrier USS *Nimitz* will be brought to a sudden conclusion. The pilot cuts power to the engine, and the plane is stopped in less than 2 s. If the cable had not been successfully engaged, the pilot would have had to take off quickly before reaching the end of the flight deck. Can the motion of the plane be described quantitatively in a way that is useful to ship and aircraft designers and to pilots learning to land on a “postage stamp?” (Courtesy of the USS *Nimitz*/U.S. Navy)

chapter

2

Motion in One Dimension

Chapter Outline

- 2.1 Displacement, Velocity, and Speed
 - 2.2 Instantaneous Velocity and Speed
 - 2.3 Acceleration
 - 2.4 Motion Diagrams
 - 2.5 One-Dimensional Motion with Constant Acceleration
 - 2.6 Freely Falling Objects
 - 2.7 (Optional) Kinematic Equations Derived from Calculus
- GOAL Problem-Solving Steps**