



Figure 6.1 This Australian Grand Prix Formula 1 race car moves in a circular path as it makes the turn. Its wheels also spin rapidly. The same physical principles are involved in both of these motions. (Richard Munckton).

## Chapter Outline

6.1 Angle of Rotation and Angular Velocity

6.2 Uniform Circular Motion

6.3 Rotational Motion

## Introduction

### Teacher Support

**Teacher Support** Before students begin this chapter, they may wish to review the concepts of distance, displacement, speed, velocity, acceleration, force, and Newton's laws of motion. Address any misconceptions about centrifugal force.

Point out that we come across circular motion in our everyday lives; for instance, a car tire spinning, a fan rotating, and so forth. This chapter is about the quantities that describe rotational motion and the relationships between them.

You may recall learning about various aspects of motion along a straight line: kinematics (where we learned about displacement, velocity, and acceleration),

projectile motion (a special case of two-dimensional kinematics), force, and Newton's laws of motion. In some ways, this chapter is a continuation of Newton's laws of motion. Recall that Newton's first law tells us that objects move along a straight line at constant speed unless a net external force acts on them. Therefore, if an object moves along a circular path, such as the car in the photo, it must be experiencing an external force. In this chapter, we explore both circular motion and rotational motion.