

**DEFINITION**

A sphere in which the top and bottom have been flattened is called an *oblate spheroid*. Mathematically, this means that a radius to a point on the equator of the sphere is longer than the radius to the pole.

MATH IS ALL AROUND US

The earth is often referred to as an oblate spheroid. Many other heavenly bodies, including the planet Saturn and the star Altair are also oblate spheroids. The degree of flattening depends on the speed of rotation of the celestial object: the faster the speed of rotation, the flatter the object. Closer to home, candies like M&M's are oblate spheroids.

ACTIVITY

Rotating an ellipse about its minor axis produces an oblate spheroid. For the ellipse whose equation is

$$\frac{x^2}{9} + \frac{y^2}{4} = 1,$$

the volume formed by rotating the area bounded by the curve about the y-axis can be determined using calculus by evaluating the integral

$$\pi \int_{-2}^2 9 \left(1 - \frac{y^2}{4} \right) dy = 24\pi.$$

