Circular motion

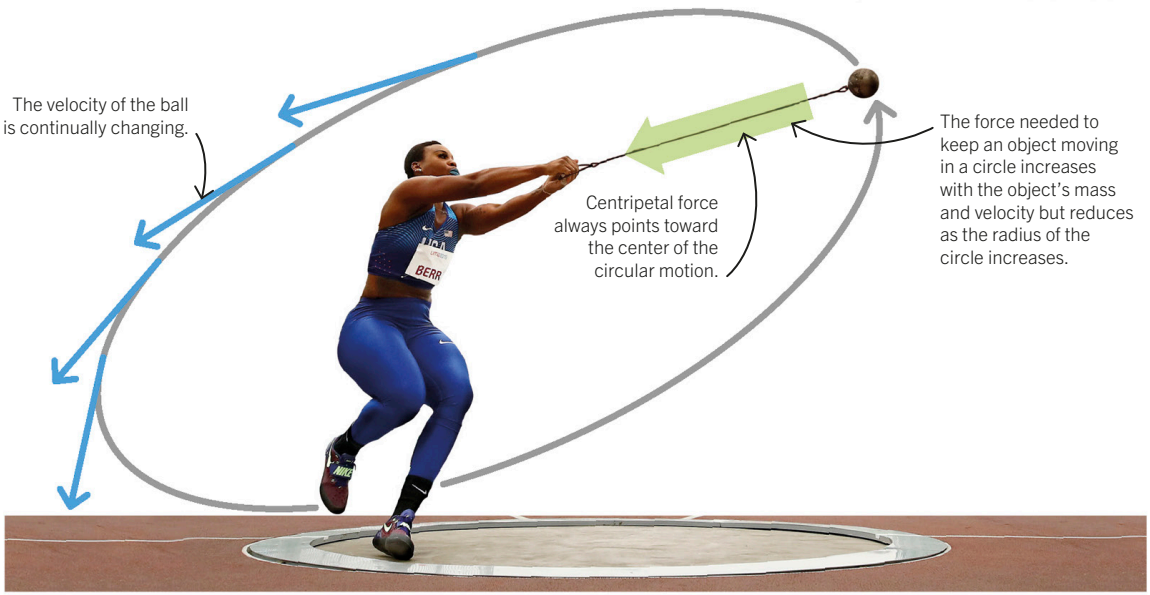
Many objects move along curved or circular paths, from the Moon orbiting planet Earth to the passengers on a fairground ride. The force that makes an object travel in a circle is called centripetal force.

Centripetal force

In the hammer throw, a weighted ball is swung around in circles before being released. Its velocity is changing continually as it swings, which means the ball is accelerating. All accelerations are caused by a force, and in this case the force is tension in the cable. This is an example of centripetal force. If the centripetal force suddenly stops, the object flies off in a straight line.

Key facts

- ✓ **Circular motion occurs due to a centripetal force, which acts inward.**
- ✓ **Without centripetal force, a moving object would travel in a straight line.**
- ✓ **Centrifugal force is a fictitious force experienced by objects traveling along a curved path.**
- ✓ **The force needed to keep an object moving in a circle increases with an object's mass and velocity but falls as the radius of the circle increases.**



Centrifugal force

On a swing ride, the riders experience what feels like a real force pulling them outward and making their seat rise. This is called centrifugal force, but it is not a real force. It only feels like a force from the point of view of the riders, so we call it a fictitious force. It is caused by centripetal force pulling them toward the center while their mass tries to move away in a straight line due to its inertia.