

# ASTROLYMPICS

# ROTATION

**DEFINITION:** when an object turns around a central axis. Rotational speed is defined as the number of turns around an axis over a given time.

The idea of rotation can be found in many places from children's toys (spinning tops and merry go rounds) to household appliances (washing machines). In modern language, the description of rotation is often used interchangeably with 'spin' and 'revolution'. By measuring how many rotations (or cycles) an object makes over a certain amount of time, we can compare how quickly each is turning.

**Units:** revolutions per minute (RPM), one cycle per second (Hertz)



## OLYMPIC EXAMPLE

Gymnast performing a back flip in mid-air:  
90 RPM (1.5 Hertz)

## COSMIC EXAMPLE

Crab Nebula Pulsar:  
1,800 RPM (30 Hertz)

The Crab Nebula spews a blizzard of high-energy particles, as detected by NASA's Chandra X-ray Observatory, from a dense core that spins at 1,800 RPM (30 Hertz).



## EVERYDAY EXPERIENCE

Washing machine:  
1,200 RPM (20 Hertz)