Flipping Physics Lecture Notes:

Centripetal Force Introduction and Demonstration

Newton's Second Law states: $\sum \vec{F} = m\vec{a}$

Previously we showed that an object moving along a curved path must have a centripetal acceleration that is inward. Which means: $\sum \vec{F}_{in} = m\vec{a}_c$

The net force in the in-direction or $\sum \vec{F}_{in}$ is called the Centripetal Force.

There are three things I need you to remember about the Centripetal Force:
1) Centripetal Force is not a new force.
2) Centripetal Force is never in a free body diagram.
3) When summing the forces in the in-direction, the in-direction is positive and the out-direction is negative.

Full Free Body Diagrams with mint to the left and right of the center of the record player:
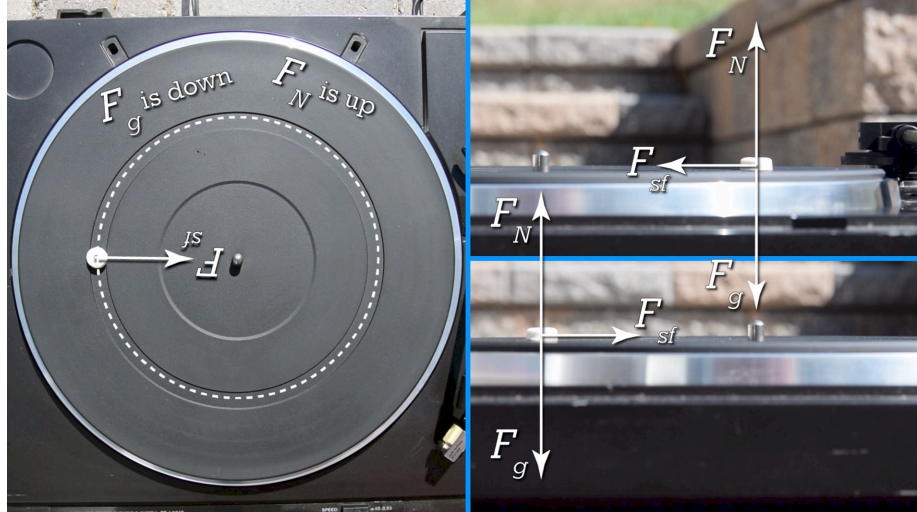


Free Body Diagrams with just the Force of Static Friction to show it is always inward: