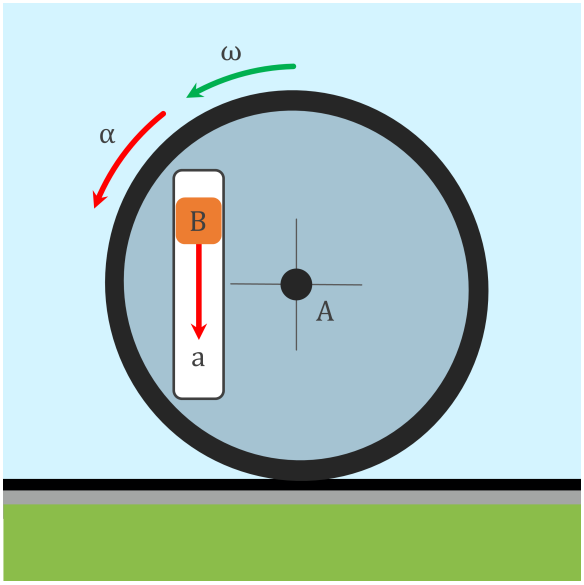
# Rotating Wheel with Slider




**The disk rotates about a fixed axis through A with angular velocity $\omega = 4$ rad/s and angular acceleration $\alpha = 6$ rad/s$^2$. Find the Coriolis acceleration if the velocity of the block is 5 m/s in the direction indicated.**

*Using known expressions*:
Coriolis acceleration:

$$2\boldsymbol{\omega} \times \mathbf{v}_{\text{rel}} \tag{1}$$

*Given*:
Velocity of block inside slot: $v_{rel} = 5$ m/s
Angular velocity: $\omega = 4$ rad/s
Angular acceleration: $\alpha = 6$ rad/s$^2$

Inserting these values in Equation 1 gives.

$$2\boldsymbol{\omega} \times \mathbf{v}_{\text{rel}} \quad \Rightarrow \quad \text{Coriolis acceleration} = 2 \begin{pmatrix} 0 \\ 0 \\ \omega \end{pmatrix} \times \begin{pmatrix} 0 \\ -v \\ 0 \end{pmatrix} = \begin{pmatrix} 2v \cdot \omega \\ 0 \\ 0 \end{pmatrix} \tag{2}$$

$$\begin{pmatrix} 2v \cdot \omega \\ 0 \\ 0 \end{pmatrix} = \begin{pmatrix} 2 \cdot 5 \cdot 4 \\ 0 \\ 0 \end{pmatrix} = \begin{pmatrix} 40 \\ 0 \\ 0 \end{pmatrix} \text{ m/s}^2$$