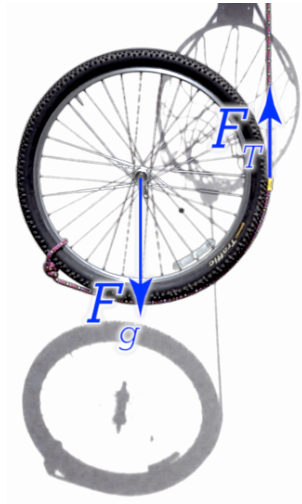




## Flipping Physics Lecture Notes:

### Which Direction will the Wheel Accelerate?

Example: A rope is wrapped around a bicycle wheel. The wheel is released from rest and allowed to descend without slipping as the rope unwinds from the wheel. While descending, does the center of the wheel move straight down, toward the left, or toward the right?



$$\sum F_x = 0 = ma_x \Rightarrow a_x = 0 \quad \text{No acceleration in the x direction.}$$

$$\sum F_y = ma_y \neq 0 \Rightarrow a_y \neq 0 \quad \text{There is an acceleration in the y direction.}$$

Center of the wheel will accelerate downward and not to the left or to the right.