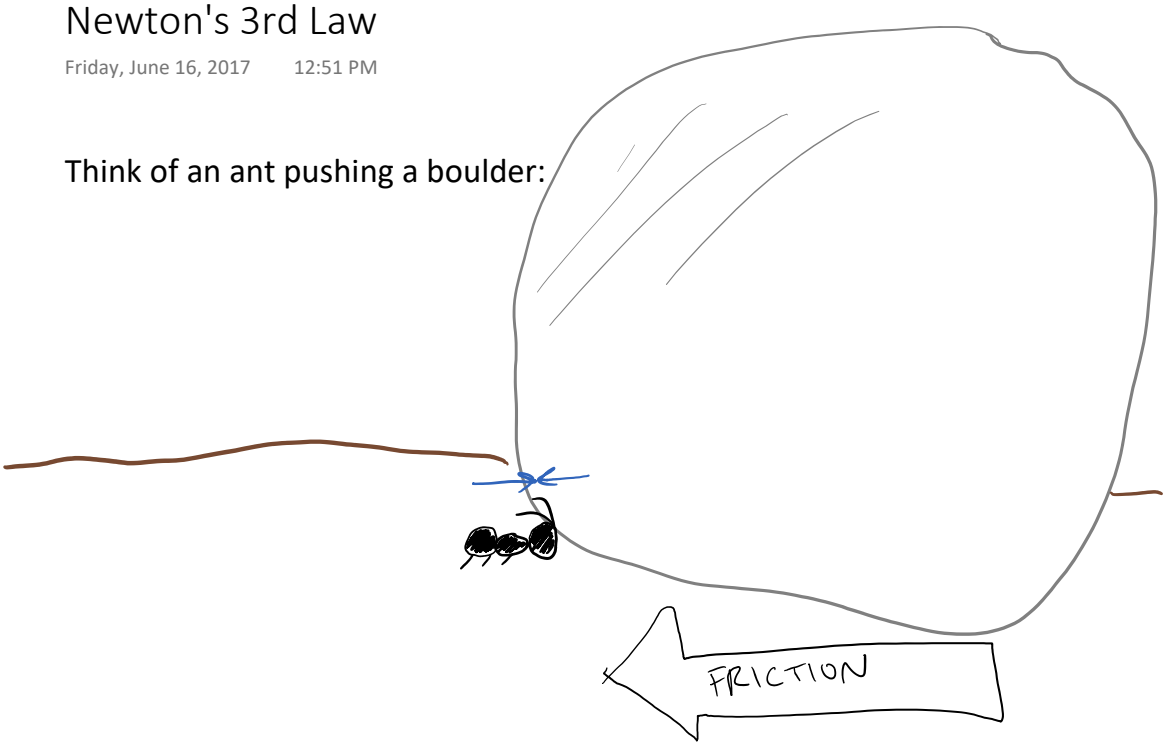
Newton's 3rd Law

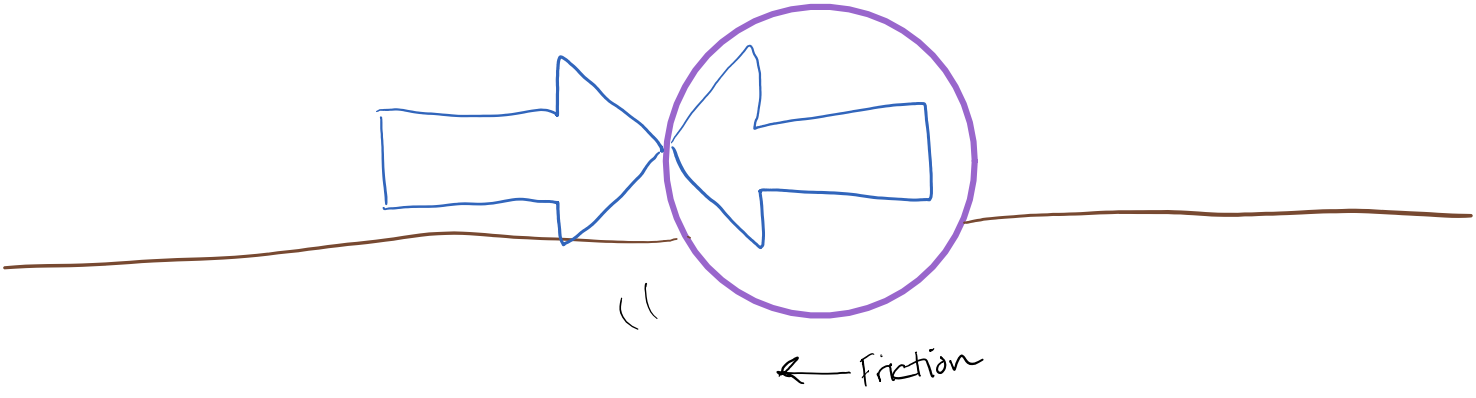
Friday, June 16, 2017 12:51 PM

Think of an ant pushing a boulder:



Because of the ants size, he can only generate a small amount of force on the boulder. Newton's law tells us there must be an equal force acting in the opposite direction (from the boulder to the ant). In this case, the boulder doesn't move because the force acting on it is too small.

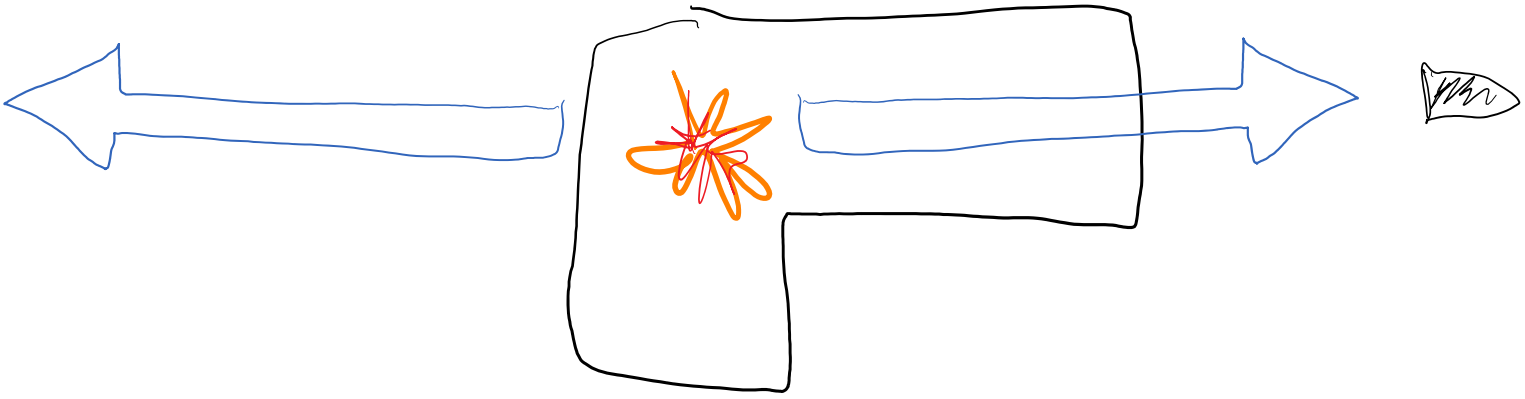
Now imagine that you are pushing a ball on a table:



In this case, the amount of force you can exert on the ball is very large compared to the size of the ball. This amount of force can easily overcome the coefficient of friction which is also working in the

opposite direction.

In the gun example, the bullet does have an equal and opposite effect on the gun. The gun kicks back as the shot is fired. However, because of the guns large size and the fact that it is held in place by an even larger person, it does not travel nearly as fast or as far:



As an additional note, in each of the examples above, friction ALSO acts in both directions (ie. The boulder exerts a frictional force on the ground as the ground exerts a frictional force on the boulder). This pair of forces is distinct from the main pair of forces (ie. The ant pushing on the boulder versus the boulder pushing back on the ant).