

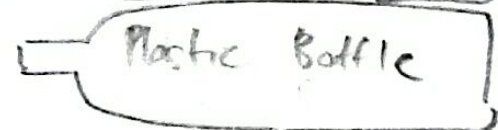
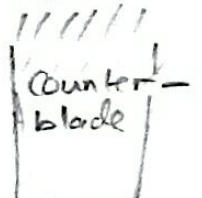
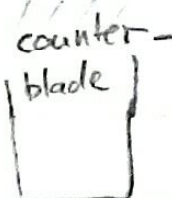
$t$  = thickness of plastic bottle

$l$  = length of the plastic scrap to be cut  
(Which depends on the knife thickness)

$$A = t \times l \quad ???$$

## Cutting mechanism

Top view



Blade

Shaft

FBD

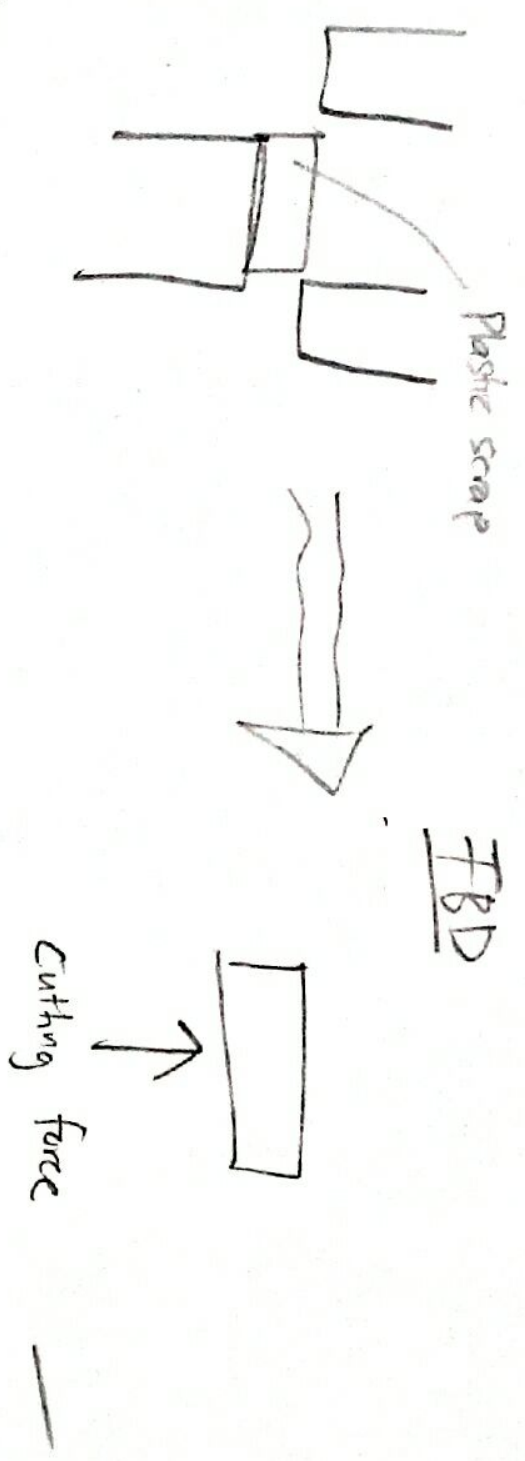
Resistance force

Resistance force



cutting force

Now lets see if the scrap dimension is less than the blade thickness



This condition will make the scrap get "pushed away" rather than getting cut. So, the maximum cutting capability (minimum size of scrap that can be cut) relies on the blade thickness (and its distance from the counter blade should gap is given between blades and counter blades)