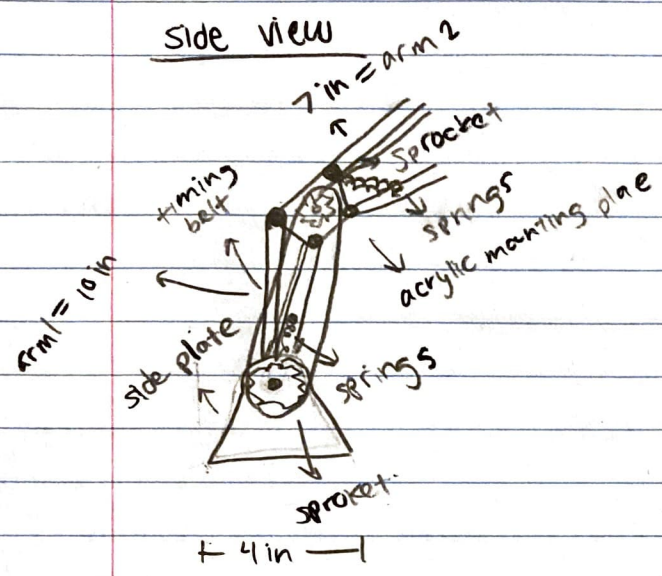
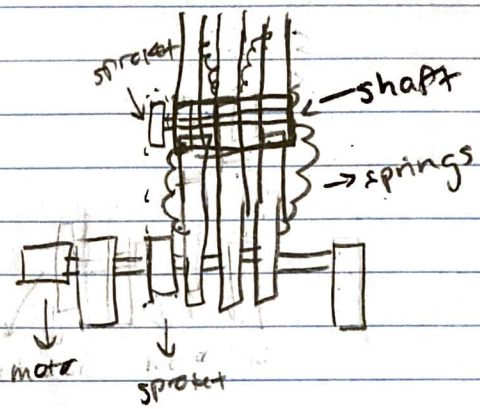
Question 1 : Robotic Arm Joint Motor for belt drive

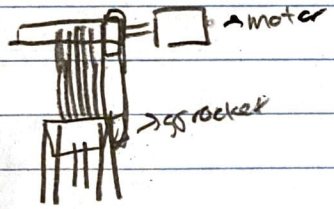
Side view



Front view



Top view



NON-BEARED MOTOR

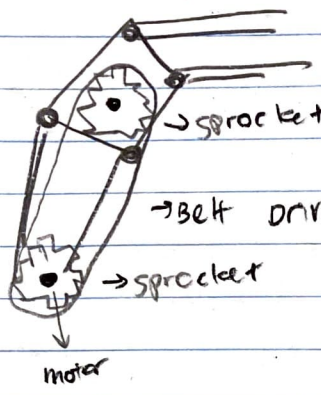
The motor at base spins sprocket which uses belt drive to rotate sprocket at joint connect.

Springs = used for control / suspension

3 parallel bars = easy movement while having same front facing direction

FT-E Analysis Proposal

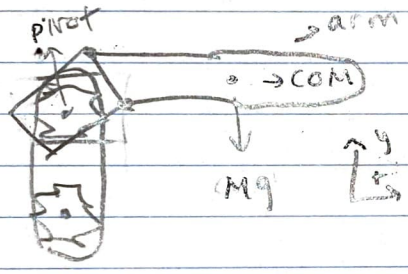
1)



Belt drive to rotate Arm

2) No friction, No slack, 100% power efficiency

3)



Need to rotate arm around pivot point

4) $\tau = I\alpha$

$\omega = \theta/t$

$P = E/t$

$E = \frac{1}{2} I\omega^2$

$I = mr^2$

5) motor + springs → suspension

↓

gear ratio to increase τ

6) Ideally FOS > 3