Definition

Tensile forces and Compressive forces

- Tensile force is the resistance to the extended of the original length
- Compressive force is the resistance to the compression of the original length

Hooke's Law

- $F = kx$
- Distinguish between IV and DV of the graph (Both are correct) of F-x and x-F graph
- X axis is independent(the variable you **change**) and Y axis is dependent(the variable you **measure**) variable, and you should be aware of the axis with the correct neuances
- k is spring constant, or *stiffness*

Spring Combination

- Use Analogy with resister(parallel/Series)
- Parallel:$k_{total} = k_1 + k_2$ (series resister)
- Series:$k_{total} = \frac{k_1 * k_2}{k_1 + k_2}$ (parallel resister)
- Combination: using the similar techniques in resister (resistors in parallel use the same formula as springs in series)

Stress and Strain + Young's Module

- Stress: $\sigma = \frac{F}{A}$ (Closness to breaking), unit Pa
- Strain: $\epsilon = \frac{\Delta L}{L}$, no unit or in $\%$
- Young's Module: $\frac{\sigma}{\epsilon}$ is constant for the same material(ration remain the same)
- It can be also expressed in $\frac{FL}{A\Delta L}$
- Young's Moduls is **not the property of the object**, but the **property of the material making the object**

Limit of elasticity

- Limit of propotionality is the maximum possiple point where the line is still straight(allow to apply Hooke's law) - Last point of the straight line
- Limit of elasticity in 99% conicide with limit of propotionality, but for some material it can shrink back to the original size even after this point, then it is **always beyond** the limit of propotionality - Last point where the spring shurnk back to original size

- If the Spring does not shrink back to the original size and exceeds the original size, the area between the curve is the energy use to extend the spring/energy left in the spring