Hydraulics and Pneumatics
pg 39-40



Right Side – Teacher Input

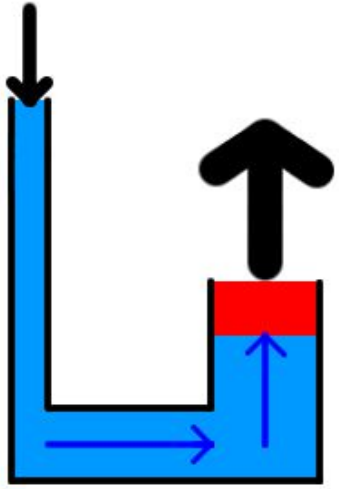
*Remember that all notes must be on the right side and this ENTIRE lesson must be on this page only

Hydraulics

- **Hydraulic systems** use a liquid in an enclosed space, under pressure to move loads
- The advances in technology have made construction much safer by allowing machines to do hard and dangerous work instead of humans







Pressure

- Pressure is a measurement of the amount of force applied to a given area and we saw that it can be calculated by:

$$P = F/A$$

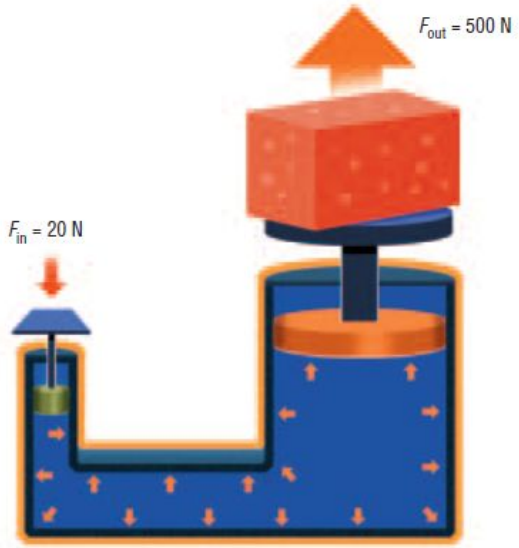
- The 2 important facts we learned about pressure:
  - When a liquid is enclosed in a space and a pressure is applied, the pressure is transmitted equally to the whole liquid (Pascal's Law)
  - Liquids are hard to compress



Ratios, Pressure and Pistons

- We can calculate MA from a piston if we know the input and output force…but what if we don't?
- We can create a ratio of two F/A equations to calculate how much force a piston will produce

$$\frac{F_{small}}{A_{small}} = \frac{F_{large}}{A_{large}}$$



Pneumatics

- **Pneumatic systems** use gases instead of liquid under pressure – these systems do not usually seal the gas the same way a hydraulic systems encloses a liquid

- Usually air passes through the device under high pressure and the escapes out of the device – it is common for these machines to use compressed air (this explains why they are so loud!!)



Left Side – Student Input

Left Side Page – Requirements

https://www.youtube.com/watch?v=P2r9U4wkjcc

Left Side Requirements:

- Design an original device that uses hydraulics or pneumatics - can be used for anything!
- Create a diagram of your device that includes:
  - -Labels
  - -Colour
  - -Brief explanation of how your device uses hydraulics

