

YR10 ENGINEERING

Component 3

BIG



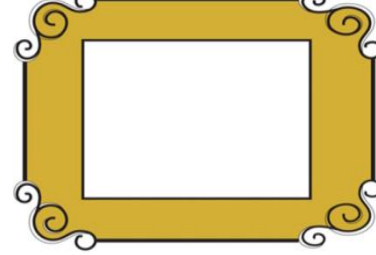
□ https://www.youtube.com/watch?v=4x0f2b_0kn0

How are chefs kitchen knives made?

Learning Focus: Forging and its applications in Engineering

- I can name most of the different materials we can use for forging, and I can make a list of the products made
- I can name all of the materials that we can use for casting and I am able to describe the processes
- I can name all the different materials we use for forging, I can describe all of the products in detail, and I can describe different situations in which the various processes can be used

Forging



- <https://www.youtube.com/watch?v=mRA6RY2o9L>
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- Forging is a manufacturing process involving the shaping of metal using localized compressive forces.

Forging

- ❑ Forging is one of the oldest known metalworking processes. Traditionally, forging was performed by a smith using hammer and anvil



Forging

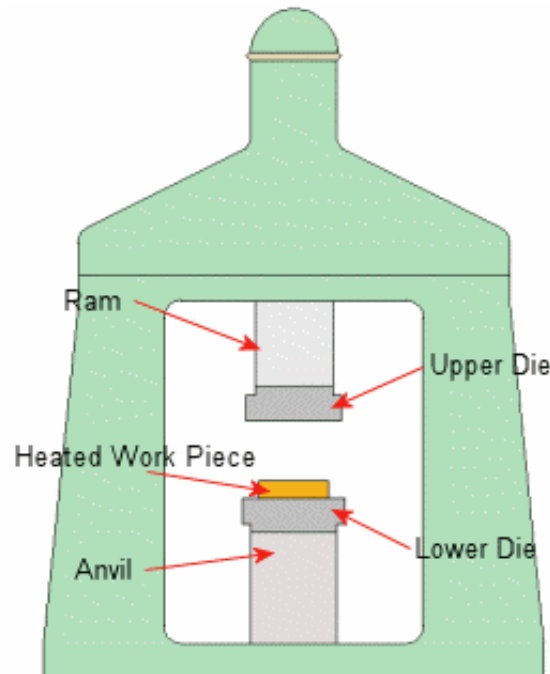
- There are a few different types of forging, such as;
 - Drop forging
 - Press forging
 - Roll forging

- Minecraft



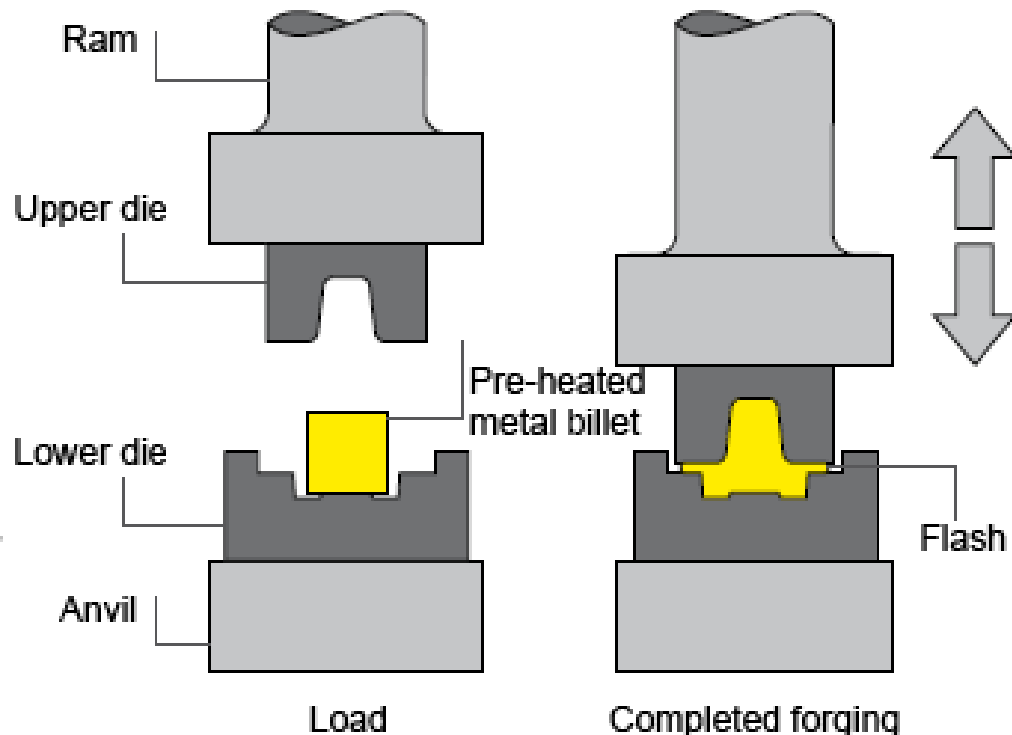
Drop Forging

- <https://www.youtube.com/watch?v=leXpTLV3HMQ>
- Drop forging is a forging process where a hammer is raised and then "dropped" onto the workpiece to deform it according to the shape of the die.



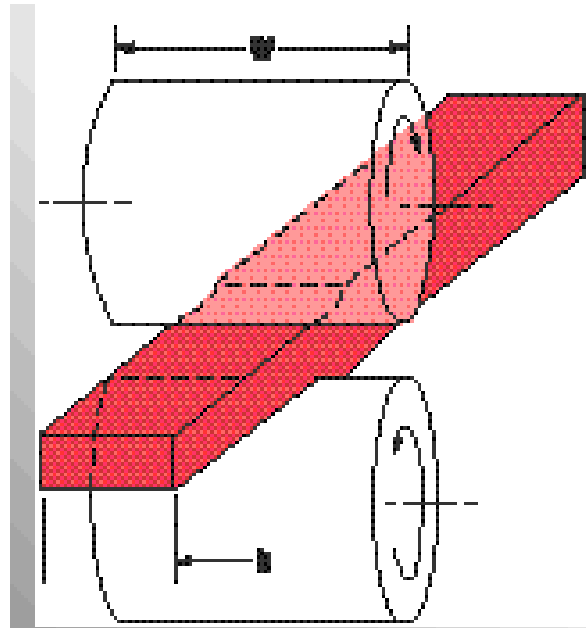
Press Forging

- Press forging works by slowly applying a continuous pressure or force, which differs from the near-instantaneous impact of drop-hammer forging.



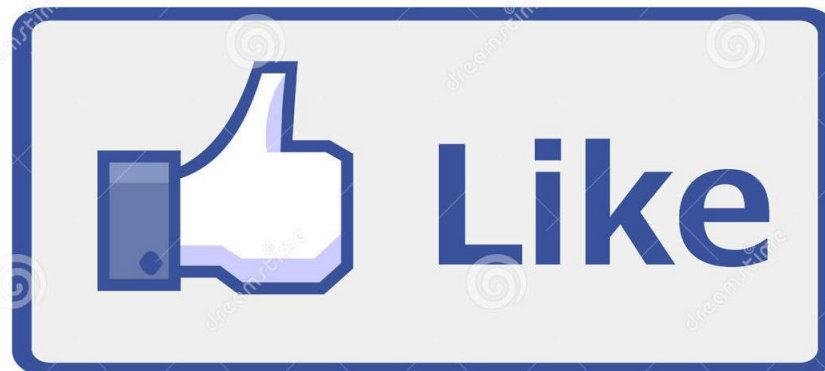
Roll Forging

- Roll forging is a process where round or flat bar stock is reduced in thickness and increased in length.
- <https://www.youtube.com/watch?v=k6iODHla6qY>



Advantages of Forging

- The main advantages are;
 - ▣ Parts produced by forging are stronger than casted or machined parts.
 - ▣ During the forging process the internal grain of the part changes its form and continuous forging for a few minutes strengthens the part's characteristics.

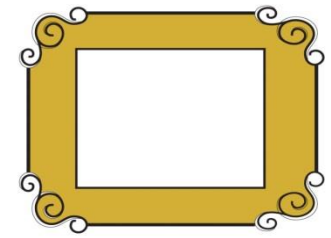


Disadvantages of Forging

- **More difficult** to perform machining on forged parts.
- **It is very expensive** for the machinery, dies, tools and personnel.



Typical Products



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Fast finishers: Try to come up with a number of reasons why you would Forge some of these products

Plenary

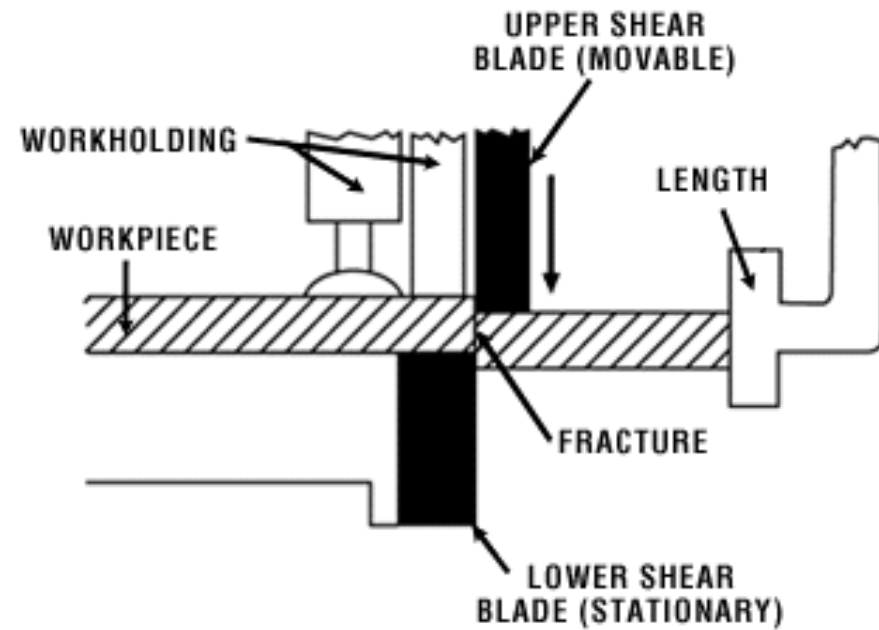
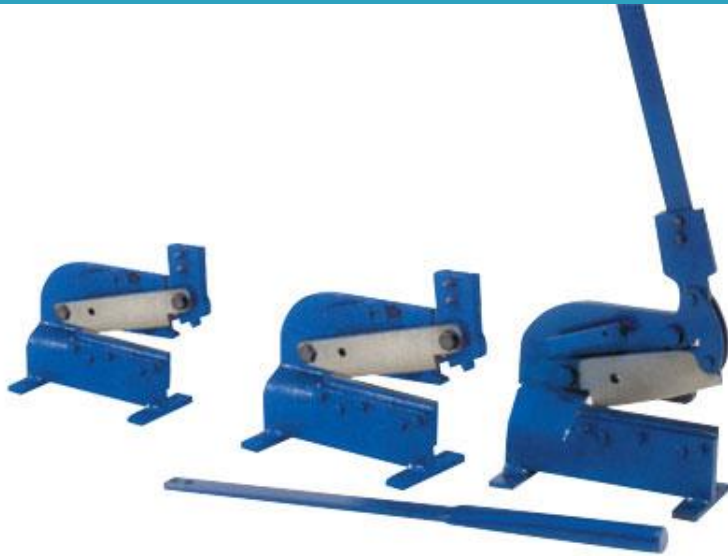
- What are the three types of forging we mentioned today?
- What are the typical products made from forging?
Briefly describe one of the forging processes
- What are the main advantages/disadvantages of forging? Describe two of the forging process in detail

Shearing

- A good example of shear force is seen with a simple scissors. The two handles put force in different directions on the pin that holds the two parts together. The force applied to the pin is called shear force.



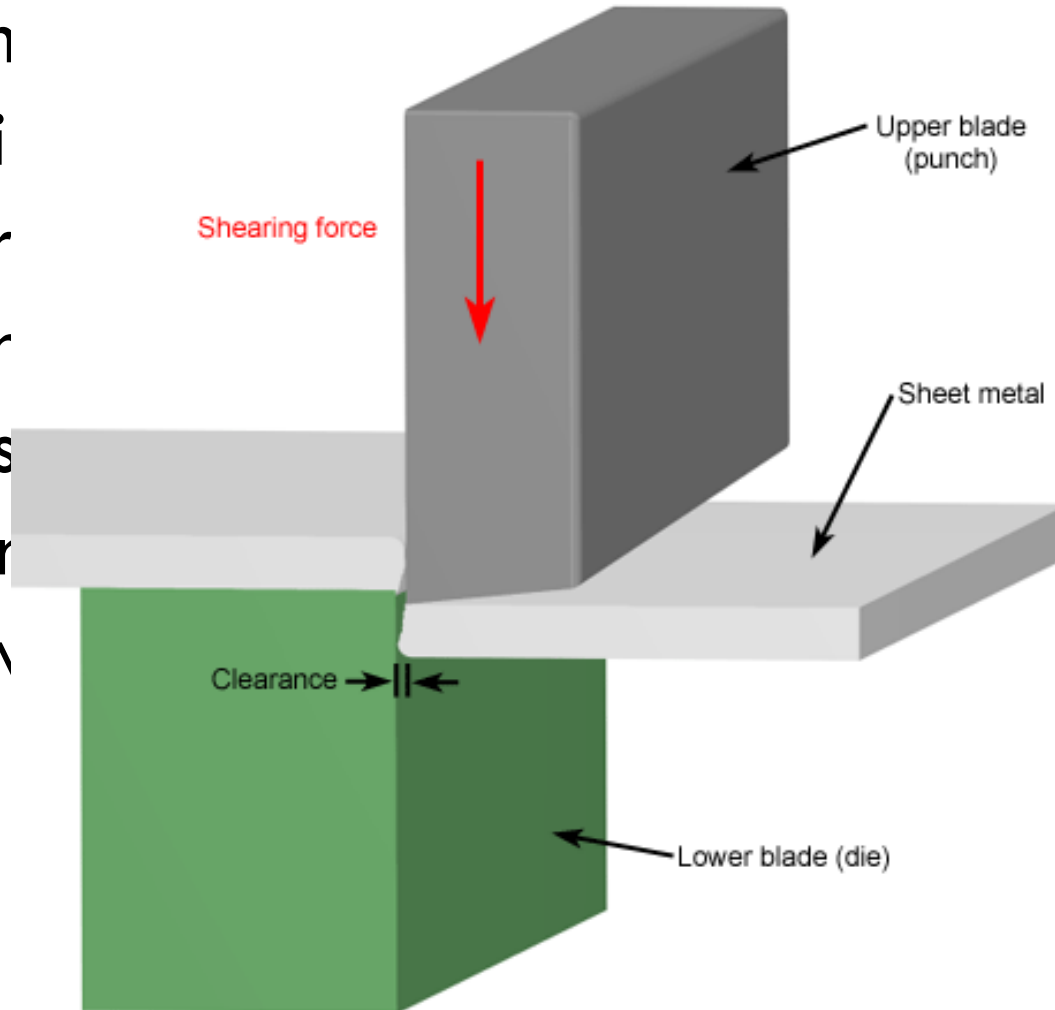
Shearing



SHEARING PROCESS

Shearing

- The shearing machine consists of an upper blade and a lower blade. The upper blade is forced down together with the sheet metal. In most cases, the lower blade is stationary and the upper blade is forced down.



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Shearing

- Used to cut
 - ▣ Sheet steel
 - ▣ Sheet aluminium
 - ▣ Sheet copper
 - ▣ Small sized bar

