

Scales of Production

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- **One off production** – single products made as prototypes or concepts, or bespoke custom-made items are manufactured.
Advantage – the user or owner will have an original product unlike any other.
Disadvantage – lots of manual labour will be used because no production line would be set up for one product.
- **Batch production** – products made in limited numbers at any one time, although this may be repeated.
Advantage – small numbers of similar items are made at one time to satisfy demand.
Disadvantage – there may be a delay until the next batch is produced.
- **Mass production** – identical products made in large volume, normally thousands, with some use of automated machinery to achieve accuracy, efficiency and identical outcomes.
Advantage – more profit for the manufacturer as materials are bought in bulk, and automated machinery is set up so less workers required.
Disadvantage – initial set up costs are high, and not much flexibility once production line is set up.
- **Continuous flow production** – identical products constantly being produced 24 hours per day, 7 days per week without stopping. There will be heavily automated production lines in use for speed, accuracy and quality control purposes.
Advantage – huge numbers produced identically, efficiently and quickly, saving time, energy and need for manual workers.
Disadvantage – one single fault can stop the whole production process and be very costly.

Jigs and repeating activities

Sometimes a process needs to be repeated several times in order to make one or more products. Manufacturers will often use devices to help complete this task and ensure accuracy and consistency.

Jigs – a jig is a device used to hold or secure material and guide cutting or drilling tools to ensure accuracy and repeatability.

Pattern – a pattern is a shape attached to the surface of the material to help to shape it.

Template – a template is a tool for marking out a shape repeatedly, so it is exactly the same each time.

Computer aided manufacture (CAM)

Machines that are controlled by a computer offer many benefits when manufacturing. They are:

- faster than working by hand
- far more accurate and precise than what manual workers could achieve.

They can:

- repeat tasks consistently and identically
- support production by making difficult components or parts while others are produced simultaneously
- produce multiple items in one go
- save material and reduce waste
- work without supervision or lunch breaks!