

**Production methods:**

**Batch production:** Batch production enables items to be created stage by stage in bulk ('a batch'). Generalist equipment is used to produce quantities of a product to meet a specific demand. The production process is stopped on the completion of each batch. A new batch, usually of a different product, is then produced using the same generalist equipment and workforce. The workforce is usually divided into a group designated to work on a particular stage of the process. Batch production is commonly used in food production.

Advantages	Disadvantages
Allows flexible production	Making many small batches can be expensive
Inventories of part-finished goods can be stored and completed later	If production runs are different there may be additional costs and delays in preparing equipment

**One off production:** concentrates on producing one product from start to finish. Once one product is complete, another can begin. It is highly specialised and very labour intensive. Some examples:

- making a wedding dress
- painting a house
- building an oil rig

Advantages	Disadvantages
High quality product	Production costs likely to be high
Can customise orders	Production time may be longer
Workers involved in entire production process from start to finish	Investment in machinery may be higher as specialist equipment may be needed

**Flow production:** Flow production is also known as continuous production. It enables a product to be created in a series of stages on an **assembly line**. It is defined by the continuous movement of items through the production process. Large numbers of the same goods are produced continuously in this production process. There is often an opportunity for a high level of automation on a flow production assembly line. Some examples:

- car assembly plant
- bottling plant
- bicycle production line

Advantages	Disadvantages
Economies of scale can be achieved as cost per unit will be low	Standardised product produced
Automated assembly lines save time and money	High initial set-up costs of automated assembly lines
Quality systems can be built into the production at each stage	Workers find work repetitive and boring

**Technology push and pull:**

Manufacturers constantly try to improve products in order to make more money. One way to do this is to look at how they make their products, by improving the design or making it cheaper and easier to manufacture. They also re-design products in response to market pull or technology advances.

**Market pull** is about what consumers want. Changing fashions and social attitudes affect the kind of products people want (consumer demand) This is ever changing and the consumer demand will be different for different types of products. A car was invented as a quicker way of transporting people from A to B, however now it has become a status symbol and a luxury item. **Technology push** is about advances in production/materials/new technologies that mean a product can be enhanced and made better. Research is ongoing to find new, smarter materials, different ways of manufacturing items this can drive the design of new products to improve existing ones. The iPhone is a good example of technology push, advances in technology have seen a mobile get thinner, lighter, flexible and foldable as well as have many more features than simply making a call.



**Designing and presentation skills:**

There are several different design strategies for presenting your work.



**Iterative design:** [Iterative design - Designing - AQA - GCSE Design and Technology Revision - AQA - BBC Bitesize](#) is a circular design process that models, evaluates and improves designs based on the results of testing. Starting with a **design brief** a designer may come up with a good idea that solves a problem. Using an iterative design process, a model can be made from a design sketch and then tested. The test results may suggest failures and **modifications** to the design. These changes are evaluated, and then the cycle begins again - until the best solution to the problem is found.

**Sketching design ideas:** This involves creating a series of **freehand sketches** of design ideas that may help solve the problem in the design brief. These could be different from each other or developments of an original idea.

**Collaboration:** Working with others is an excellent way of gaining feedback for designs. Many companies use groups of designers with different tastes, ideas and specialities to allow a diverse range of opinions to be acted on.

**User-centred design:** is a different style of designing from **iterative design**, as it bases the design of a product around the needs of the **target market** rather than the continual development of **iterations**. The user is questioned and consulted throughout development, and evidence is gathered through questionnaires, interviews, testing and observations, and the results are used to improve the product.

