

Describing engineering developments

How have engineering developments impacted the following three areas:

Structural design – Development of bicycles

Developments in new lightweight materials have improved the efficiency of bicycles by reducing weight and increasing structural strength. The use of composite materials has allowed for improved streamlining. Further developments in tyre and gear technology have all impacted on the cycling world in both professional sports and daily use.

Mechanical design – Focus on theme parks

The engineering developments in theme parks have allowed the creations of far more immersive and challenging experiences for users. The integration of sophisticated mechanical animatronics combined with more mechanically advanced motions on rides and digital content have revolutionised theme parks.

Electronic design – Mobile phone technology

The developments in mobile phone technology are fast paced and evolve on a regular basis. The introduction of more connectivity to smart home devices, the inclusion of more control of our surrounding home environment, from geo tagging to camera and screen development, have revolutionised mobile phones and their use.

The effects of engineering developments

How has the impact on engineering products been impacted by:

Materials – New materials have impacted directly on engineered products in a variety of ways. Improved strength and reduced weight has had a dramatic impact, as has the development of new alloys and smart materials. Developments in plastics and textiles have also allowed for more diverse products and garments to be developed.

Smart technology – The growth in smart home integration has driven smart technology developers to focus on more integrated products and services. As more products incorporate Bluetooth and WiFi connectivity, the overall outcome is improved quality of living for people both at home and at work.

Electronic and microelectronic components – Continued miniaturisation of components has allowed electronic products to become smaller and faster with increased storage capacity, making devices more efficient and reliable. Improved screen technology and the way in which we interact with technology has changed considerably in recent years. Considerations should be given to identify both the positive and negative aspects of the above developments when discussing the individual topics.

How environmental issues affect engineering

How engineering applications and products have an environmental impact.

Materials development – The improved use of sustainable materials and the way that recycling has improved has had a positive impact on the environment. The development of new plastic polymers is reducing the dependency on petroleum-based plastics.

Costs – The improvement of more efficient manufacturing techniques has helped to reduce the overall cost of producing some materials. Some raw material prices are volatile due to changing prices of oil and ores.

Transportation – The impact of the need to move products globally and the effect that emissions have on our environment.

Usage – The impact that end users have on products by the way that they are disposed of at the end of life. The different ways in which countries approach sustainability and recycling.

Disposal – How do different countries dispose of products when they fail or reach their obsolescence?

Recycling – What strategies are available for recycling products? Are these successful and are there any obvious failures?

Sustainability – What strategies exist for managing sustainable development of products and resources?