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**History and Impacts of Product Development**

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**Acknowledgement**

Mr John Gibson is a highly regarded educator and engineer. John taught Industrial Arts at a number of high schools before taking a position at Sydney Teachers’ College, then University of Sydney. He had an engineering education consultancy and has extensive experiencing working with NESA on Engineering Studies syllabus development and the HSC examination committee. The STEM Industry School Partnerships (SISP) Program asked John for his responses to the iTeachSTEM topic discussion questions. SISP is grateful to John for submitting these example discussion responses.

# History

# Discuss how the use of materials has changed on products over the past 30 years.

* early 20th century: development of aluminium by Hall-Heroult Process reduces cost of aluminium to industry
* late 19th century: development of polymeric-based, non-ferrous materials
1. **Explain how the change in materials has affected the way things are manufactured.**

* the properties of useful engineering material will, to a large degree, determine the manufacturing processes for specific items
* with strength, low density, and corrosion resistance, aluminium is used to manufacture high voltage power cables in place of copper
1. **Describe technology innovations in manufacturing techniques.**
* power sintering: gears and bushes for automotive gearboxes
1. **Describe an example of a product that has undergone significant change as new technology has been introduced.**
* cast aluminium alloy wheels to replace steel wheels for cars

# Impacts

1. **List significant impacts on people’s lives achieved in Australia by product engineering projects in areas such as:**
* transport
* electricity supply
* water supply
* packaging
* health
1. **Discuss the affect that product engineering has had on:**
* communication
* cultural awareness
* safety
* the environment
1. **Discuss examples of recycling and sustainability in product engineering.**
2. **Describe an innovation in material application in product engineering.**
3. **Describe an innovation in manufacturing techniques used to produce products.**
4. **Discuss the impacts that product development has had on people’s lives.**
5. **Discuss examples of product recycling and sustainability.**
6. **Discuss an innovation in material application in a product.**