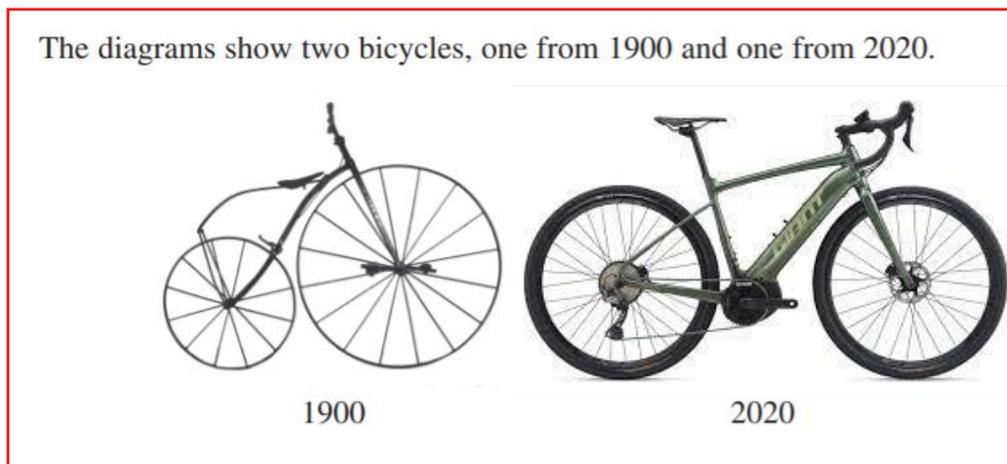


Year 12 Engineering Studies HSC Tips and Strategies

Responding to Short Answer questions

2020HSC Question 23a

Breaking down and analysing the question:



Stimulus: look at the stimulus material for information that may guide your answer. In this example consider each design illustrated and the differences between them. Look for features that may be relevant eg. rubber tyres vs solid metal wheels, solid metal frame vs tubular frame, gears vs non-gears, simple shapes vs complex shapes. Stimulus material may give ideas on the things you could write about in your response

The basic components of the bicycle frame have not changed for 120 years. However, **manufacturing and materials technologies** have evolved significantly during this period.

Compare TWO technologies used in the production of modern bicycle frames to those used in earlier times.

Identify the requirements of the question. What is the question asking you to do?

Compare - Show how things are similar or different

TWO technologies – your response must look at two different materials or manufacturing technologies

Identify the focus of the question. What is the question about, what is the knowledge that is being examined.

Note in this example the question is not about bicycle design but about manufacturing and materials technologies

Marking Guidelines

Criteria	Marks
• Compares TWO technologies used in modern bicycle frames to those used in earlier times	3
• Compares a technology used in modern bicycle frames to one used in earlier times	2
• Provides some relevant information about bicycle frames	1

Note how the marking guidelines are really just an interpretation of the question and do not differ from the analysis just done. If you develop skills in analysing questions, you are able to identify what the examiners are looking for in your response and how to achieve marks. Also note that you can achieve at least one mark by providing some information relevant to the question.

Writing your response.

1. Identify the TWO new technologies you will focus on. These could include:
Materials; carbon fibre reinforced polymers, lightweight aluminium alloys, polymers such as rubber
Manufacturing; pressure die casting, extrusion/rolling of tube, metal joining techniques (welding)
2. Describe the key differences between the old and the new making reference to the bicycle
3. Note the space provided for your response, (6 lines), as this is a guide to the expected length and depth of your response

Sample Response

The 1900 bicycle illustrated would have been manufactured from steel which was heavy and had limitations in terms of strength and formability. Modern bicycles utilise fibre reinforced polymers such as carbon fibre which are extremely light weight, very strong and able to be formed into a multitude of shapes.

Early bicycle frames would have been manufactured by forging and bending components before joining. Aluminium alloy components on modern bicycles are formed by pressure die casting techniques which allow rapid production and forming of single components.