

Axle Design

Task:

To design a rear axle for your Formula Schools car.

Introduction

The rear axle takes the power of the engine and transfers it through the wheels to the road. It not only drives the car along it also is an integral part of the rear suspension.

Research Section

What key factors influence the design of the axle?

What materials can be used to make an axle? What characteristics are needed for the car to be fast? What stops the axle from just spinning in the car and not pushing it along?

What size are the wheels?

Where is it to be mounted?

Produce a table showing what materials can be used and which cannot and the reasons behind your choices.

Will the drive system to the wheels have to have a differential unit? Can one be made the right size and can it be fitted in to the system?

How long does it have to be?

How would you make the axle? How exact does it have to be? How would you check the sizes? What do different materials cost?

Design Section

Collect the information you need to design the axle. Draw the axle to size or scale the design to fit the paper and dimension it. Decide on the wheel fixing method.

Decide on the drive fixing method.

Show the processes involved.

Material availability.

Processing availability.

Produce full working drawing using the most appropriate system with either manual or a CAD package.

Manufacturing Section

Accurately measure some sample components using a Vernier calliper or Micrometer and check your findings against others.

Using the correct machine, produce one sample end to the axle and see if a wheel will fit, measuring the end at each stage.

Cut the total axle length.

Complete the machining on both ends of the axle.

Health and safety

Carry out a risk assessment on the main process you plan to use to produce the axle. Consider the following; materials, machine, tools, environment, training, protective equipment, and any action you have to take if a problem occurs.

Target Areas

KS 3 or 4

Resistant Materials

Material properties and processing

GCSE Engineering

Unit 1

Specifications and Engineering drawings

Unit 2

Production planning, Choosing materials, Using processes

Health and Safety

Unit 3

Investigating Products

Key Skills

Communication, Number, IT

