List/State the ‘tool’

Low Carbon steel, DC Motor, injection moulding, gears, plastic, metal, copper, Sand Casting, Machining, grinding, battery, sustainability, land fill, robots, pick and place unit, ergonomics.

Materials and Components

Hand Held ‘Power tools’

Manufacturing Methods

Use of Technology

Sprue, gearbox, chuck, two speed, variable speed, ABS, Nylon, bar codes, Just In Time, Hardening, Carbon rich, Electrical circuit, vents, grip, gear train, bearings, seals, power, torque.
Look at the pictures, and answer the following questions:
What is it?, Why is it there? What is it made from?, How is it made?, Could it be made an alternative way? Why is it made from this material? CLUE! What properties does the material have that make it suitable.

Give an alternative material they could be made from giving advantages as to why

What is it? ______________
Why is it there? __________
What is it made from? __________
How is it made? __________
Alternative Material? ______
Why is this material suitable? ______________
Material properties? ______
Alternative method of manufacture? __________
Ergonomics: Looking at food mixers 1, 2 & 3. Which one would you say has the most comfortable handle and is therefore more ergonomically designed?
Do any of them have any rubber around the grip, if not how would this help if it was there?
The most comfortable design is number ____
I think this is the most comfortable design because:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
2 Marks
Rubber would/would not help the grip because
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
1 Mark
Ergonomics means:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
2 Marks
Manufacturing Methods- Plastic: Injection moulding

1) Expand on the three areas below with regard to injection moulding, do not forget to include PPE where appropriate:
   - Preparation
     ___________________________________________
     ___________________________________________
     ___________________________________________
   - Heating
     ___________________________________________
     ___________________________________________
     ___________________________________________
   - Finishing
     ___________________________________________
     ___________________________________________
     ___________________________________________

2) Explain the following terms:
   - Flashing
     ___________________________________________
     ___________________________________________
   - Runner
     ___________________________________________
     ___________________________________________
   - Sprue
     ___________________________________________
     ___________________________________________

3) Explain why using a rib or gusset is important in injection moulded outer casing?
   ___________________________________________
   ___________________________________________
   ___________________________________________
Manufacturing Methods – Metal gear cutting: Watch the video and fill in the blanks.

1) __________________________
   __________________________
   __________________________

2) __________________________
   __________________________
   __________________________

3) __________________________
   __________________________
   __________________________

4) __________________________
   __________________________
   __________________________

5) __________________________
   __________________________
   __________________________

6) __________________________
   __________________________
   __________________________

7) __________________________
   __________________________
   __________________________

8) __________________________
   __________________________
   __________________________

9) __________________________
   __________________________
   __________________________

10) __________________________
    __________________________
    __________________________

11) __________________________
    __________________________
    __________________________

12) __________________________
    __________________________
    __________________________

13) __________________________
    __________________________
    __________________________

14) __________________________
    __________________________
    __________________________
Use of New Technology – Manufacture and assembly.
Give three examples of how robots can be used in the production of products shown on the left.
Example 1 ____________________________
Example 2 ____________________________
Example 3 ____________________________
What new, high tech alternative method of manufacture is there to injection moulding cases? _______________________________
Why is this new, high tech method not used more? _______________________________
_____________________________________
_____________________________________
Explain the term ‘Just In Time’?
_____________________________________
_____________________________________
Explain how barcodes are used in modern manufacturing today? _______________________
_____________________________________
_____________________________________
What does CNC stand for? _______________
_____________________________________

Robotic tending of an injection molding machine, courtesy ABB Inc.