<u>Chapter 21 - 'Controlling things'</u>

Robotics are used in industry to reduce the cost of labour and to improve quality in products. Essentially a robot used in this situation is a **'reprogrammable multi- functional manipulator'.**

<u>A manipulator:</u>

This is the moving part which is like an arm on a stand and has a hand to grab objects and tools.   Robots also need a power supply to operate them and a controlling computer to basically tell them what to do.

<u>Why have robots?</u>

Often robots and humans work together in factories. They can perform the boring and dangerous jobs.

<u>Movement:</u>

Robots can navigate or move around via tracks fitted to the floor. The robots keep a record of how far they have moved and distances travelled so they know exactly what they are doing. Robots can orientate themselves around humans via an infrared beam, if anything gets in it's way it just stops and once the person has moved it starts again.

<u>Computers in control:</u>

Sensors - these can detect various physical quantities e.g temperature, pressure and so on.

Types of sensors include:

- Mercury tilt switch - mercury hits contacts and completes a circuit

- Light sensor - e.g. bar code reader, alarm system

- Push switch - i.e. fridge door

- Temperature sensor - central heating system

- Sound sensor - used by environmental health

- Proximity sensor - this is in two halves and if sensor are moved apart then they can activate an alarm.

- Position sensor - i.e position of a robots arm.

- pH sensor - measures how basic or acidic a solution is.

- Humidity sensor - measures moisture.

- **<u>Interfaces:</u>**

Name given to the hardware and software needed to compensate for the differences in operating characteristics of peripheral units and the computer.

Buffers:

Holds data temporarily to compensate for the differences in speeds of different devices used in data transfer.

Actuators:

Hardware which reacts to signals given to them. E.g greenhouse windows.

Stepper motor:

A motor which turns through various stages depending on instructions/signals from the computer. They are connected to a computer via a buffer. These can be used in robots.