

- The factories are owned as follows:
- the radio factory - the seven disabled organisations in South Africa (50%)
  - the torch factory - NICRO - an organisation committed to rehabilitation of offenders and protection of abused women (50%)
  - the workers trust (25%)
  - the Liberty Life Foundation (25%)
- The Freeplay Group has created 500 jobs across three continents.

- Choose an electrical product you have at home and find out:
- the manufacturer,
  - where it is made,
  - how it is made.

research



The workers operate injection moulding machines to produce the outer shell and assemble the electrical and mechanical parts inside the shell to give the finished torch.

The Freeplay Lantern is made by the Freeplay Group which also produces the Freeplay Radio. The Group works in partnership with the Liberty Life Foundation, the charity arm of the Liberty Life Group, a large financial services group.

The Freeplay Group believes that business has an obligation to contribute to the communities in which it operates. The two factories in Cape Town, South Africa are mainly staffed by disabled people, rehabilitated offenders, abused women and family members of offenders. The workers earn negotiated union wages.

2 how it's made

CS 1

# freeplay self-powered lantern



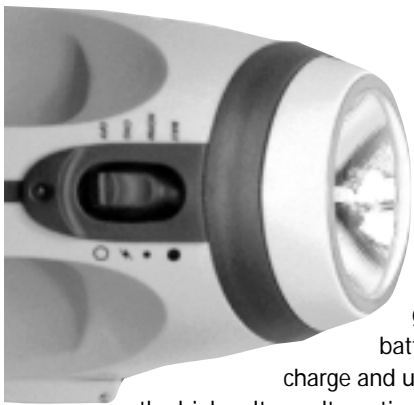
CASE STUDY



This is a hand-held torch with a rechargeable battery and a wind-up, spring-driven generator.



You can use the wind-up generator to recharge the battery. If the battery fails you can use the wind-up generator to light the bulb. 55 turns stores enough energy in the spring to give light for up to 4 minutes.

The torch is manufactured in Cape Town, South Africa - mainly by disabled or disadvantaged workers.



# 1 how it works

The 2.4 volt rechargeable battery lights the bulb when you push the switch from off, past charge to normal. If you push the switch to maximum the bulb shines more brightly. A fully charged battery gives a 'shine time' of up to two hours. When the battery runs out you can recharge it by switching to charge and using mains electricity and an adaptor that converts

the high voltage alternating current from the mains to low voltage, direct current. Or you can use the handle to wind up the spring with the switch in the off position  and then switch to charge  and let the spring unwind. This will increase the level of charge in the battery.

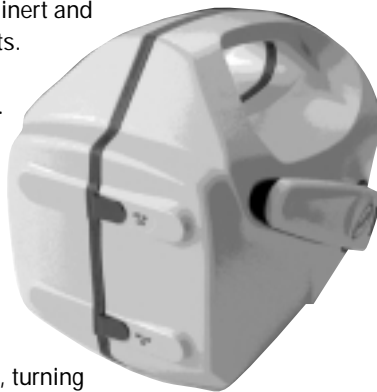
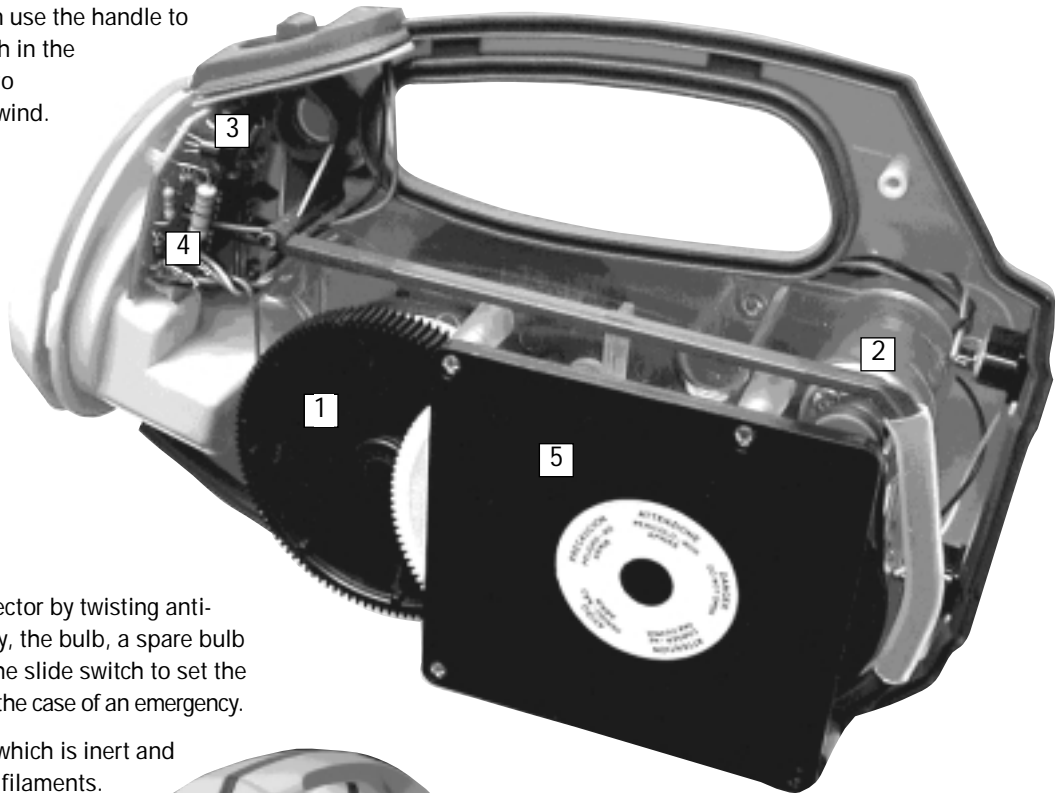
The battery is supplied with the RBRC (Rechargeable Battery Recycling Corporation) seal, to indicate that when the useful life of the battery is over you should dispose of it in an environmentally friendly way.

You can remove the lens and reflector by twisting anti-clockwise. This reveals the battery, the bulb, a spare bulb and a slide switch. You can use the slide switch to set the torch to flash to attract attention in the case of an emergency.

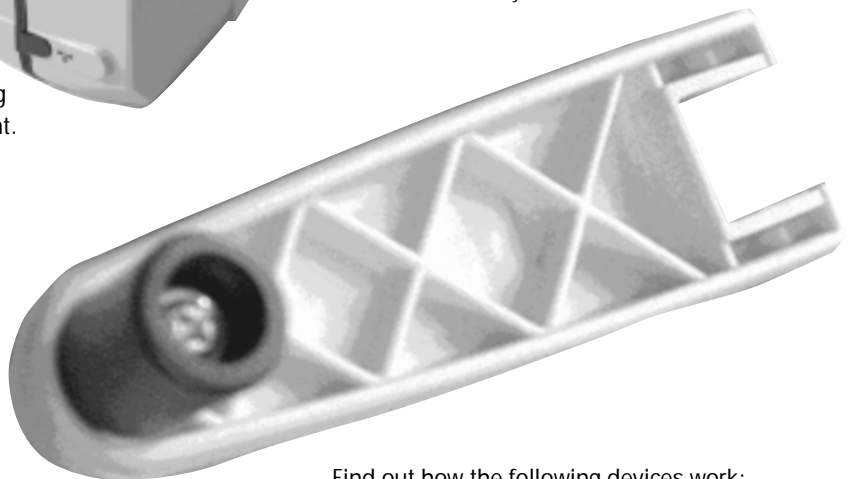
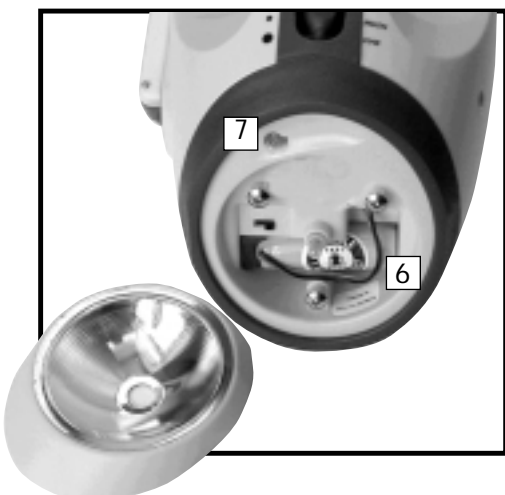
The bulb is filled with xenon gas which is inert and does not react with the white hot filaments. There are two filaments; one is used on 'normal' and both on 'maximum' brightness.

You can use the energy stored in the spring to drive other electrical devices providing they do not require more than 3V and 350mA (the equivalent of using 2 AA batteries). You just wind up the torch, connect the device to the 3V output socket at the back of the torch and switch to charge. The spring unwinds, turning the generator which supplies the electrical current.

- wind-up spring 1
- generator 2
- flashing circuit 3
- circuitry giving 3 volt output 4
- brake, which traps spring in energy stored position 5



- Left: Input and output sockets enable connection to external devices
- Below: The injection moulded handle is ribbed for stiffness and lightness
- Below left: Both battery 6 and spare bulb 7 are very accessible



Find out how the following devices work:

- generator - as used to light cycle lamps,
- solar-powered garden lamps.

Present your findings as labelled diagrams.