

The Electricity Gallery

A guide for teachers and group leaders

The Electricity Gallery

The Electricity Gallery is about the generation, supply and domestic use of electricity.

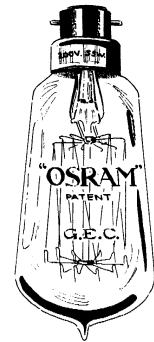
National Curriculum

The contents of the gallery are relevant to work on the science of electricity and energy, and to the following area of the history curriculum:

- KS1 Changes in the way of life of people in the past,
- KS2 Britain since 1930,
- KS3 Britain 1750-1900.

Using the gallery

The gallery is on four floors of the 1830 Warehouse (Building 2). Access for people in wheelchairs is restricted to the ground floor.



These notes describe the main sections and a selection of key exhibits in the Electricity Gallery in a broadly chronological sequence that starts in the basement and moves up through each floor.

The Basement

The condenser

Access to the basement is down stairs cut through the condenser of a power station. A power station uses steam to turn the blades of turbines. The turbine blades rotate generators to produce electricity. The large number of tubes inside the condenser cool the used steam back into water. The water then returns to the boiler to be made into steam again. The size of the condenser provides a sense of the scale of electricity generation for power.

Audio-visual display

At the bottom of the stairs, a short audio-visual display introduces the gallery with a brief history of the exploration of electricity as a phenomenon.

Interactives Area

Key exhibits

- Racing circuits Move a ring along a zigzag rod without touching the rod. Touch the rod and a bulb lights and buzzer sounds.
- Static electricity Rub a plastic case containing polystyrene to generate static electricity.
- Be a battery Put both hands on metal discs to complete an electric circuit.
- Make electricity Move a magnet in and out of a coil of wire to generate a current.
- Lightning ball A glass filled sphere of lightning!
- Jumping ring Press a button that generates a current. This creates an electric field causing a ring to jump up a column.

Early scientific investigations of electricity

Key exhibits

- Nineteenth century Leyden jars,
- Wimshurst machine,
- Leclanché and Bichromate cells,
- Early light bulbs including carbon arc lamps, Edison and Swan bulbs,
- Nineteenth century hand driven generators for medical use.

Electricity: An Industry Develops

The development of the early electricity industry in the late nineteenth century.

Key exhibits

- Parsons Turbine
Charles Parsons invented the steam turbine in 1884. This production model dates from 1885 and provided electric lighting on a steam ship. The development of steam turbines was a key development in the history of technology as it enabled the economically viable generation of electricity to take place.
- Alley and McLellan Steam Engine
Press a button to see the pistons working on this two-cylinder steam engine that was used for electricity generation.
- Brush Mordey Hydro-electric generator
The alternator was driven by a water turbine to provide electricity for a house in Hawkshead, Cumbria in the late nineteenth century.
- Models - Hero's Aeolipile (100BC) and Branca's turbine (1612)
Two air powered models of early investigations into the use of steam.

This section of the gallery also contains displays of late nineteenth century generators, switches, meters and lighting.

Ground Floor

The National Grid

Key Exhibits

- A panel showing the spread of power stations and electricity supply in Greater Manchester.
- A small Ferranti transformer that was used in homes to transform electricity from 2000V down to 400V at which level it was used to light electric arc lamps.
- An insulator column from an electricity transmission tower. This carries four heavy electric cables. There is a model of a complete transmission tower on display.

Electricity in the Home

Key Exhibits

- Videos (each lasting 2 – 5 minutes) of mid-twentieth century advertising film.
 - News by Wire, 1938
 - Well I Never, 1934
 - Willing does it, date unknown
 - Plenty of Time for Play, 1934
 - 'Twas on a Monday Morning, 1945
 - Their Invisible Inheritance, 1945
 - Into the Light, date unknown



**USE ELECTRIC
POWER and say—
not
WASHING DAY
but
WASHING HOUR**

- Room sets of 'ideal homes' from the 1930s and 1950s with a range of domestic objects in context.
1930s All Electric Show Sitting Room with fire, kettle, toaster, hairdryer, radio, television, radio console.
1930s All Electric Show Kitchen with electric cooker, fire, refrigerator, vacuum cleaner, washing machine, tumble dryer, iron.
1950s All Electric Show Kitchen with cooker, washing machine, spin dryer, refrigerator, food mixer, kettle, coffee percolator, toaster, transistor radio, tumble dryer, wall clock.
1950s All Electric Show Sitting Room with two bar electric fire, television, radiogram, vacuum cleaner, hairdryer, sewing machine.

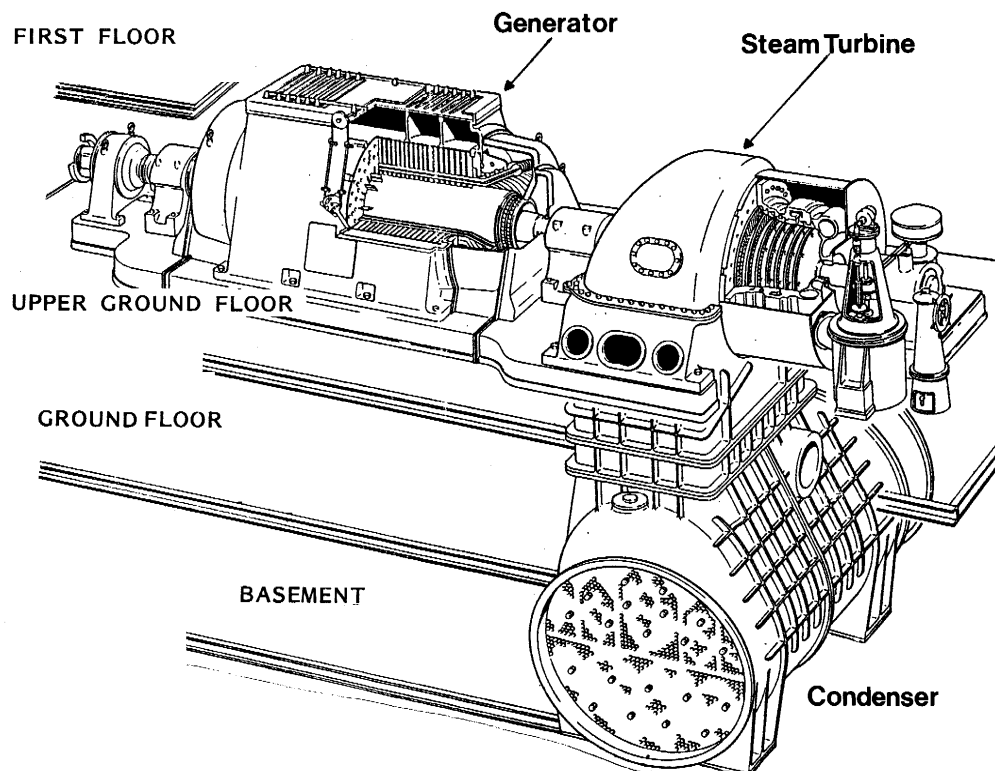
Electricity in the Home also contains the following:

- Display cases containing a range of old and modern, familiar and unfamiliar electrical appliances,
- Handling table of old and new electrical appliances,
- An interactive exhibit – pedal an exercise bike to compare the suction produced by a vacuum cleaners driven by muscle power and electric power.

Upper Ground Floor

The Turbine Hall

The large hall is filled with a generating set. One of six dating from 1923 used at Back o' th' Bank Power Station, Bolton. The generating set consists of a steam turbine, which drove a generator and could produce 15,625kW of electricity. The steam was created by burning coal. Sections have been cut open and covered with Perspex to show the rotors of the turbine and the coils of wire in the generator. The Power Station Control Room at the end of the hall display control panels from the Power Station. Press a button to hear a commentary about life working in the Power Station.



First Floor

The Computer Gallery

An exhibition about Manchester's vital role in computer development.

Second Floor

Energy for the Future

(Displays here are unlikely to be suitable for children in Key Stages 1 and 2.)

The exhibition explores the following topics:

1. Introduction
Text panel about the problems with fossil fuels – acid rain and global warming.
2. History of Nuclear Power in Britain
A brief history beginning with the first controlled splitting of the atom in 1938 to the opening of the first British nuclear power station in 1956.
3. Nuclear Reactors
How different reactors use the energy released when the atom is split to produce steam that drives a turbine, which generates electricity.
4. Radiation
The risk of cancer increases with the amount of exposure to radiation. Most radiation is natural background radiation however civilian and military use of radioactivity has increased radiation levels. Displays include:
 - protective clothing from the nuclear industry,
 - radiation monitoring equipment,
 - an interactive to test samples of materials for radioactivity.
5. Nuclear Fuel
Fuel for reactors comes from uranium ore. This occurs in two forms, uranium-235 and uranium-238. A process called enrichment is used to increase the amount of uranium-235 in the fuel.
6. Waste Disposal
Issues involving the disposal of high level, intermediate and low level nuclear waste.
7. Renewable Energy
Exhibits and displays on alternative sources of power.

