



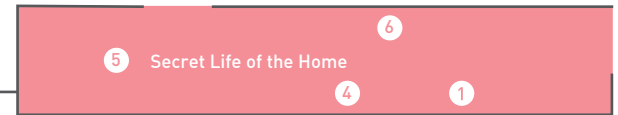
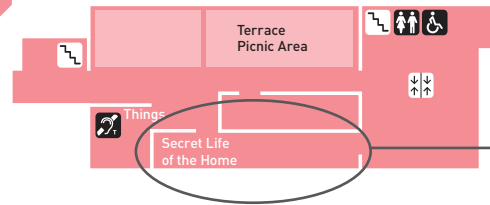
Science Trail

Electrifying Electricity

This pack has been designed for teachers and adult group leaders to use while guiding groups around the Museum. Explore the topic of Electricity and uncover the science and stories behind some of our amazing objects.

Tips for using this pack

1. Use each page as your guide to help your students engage with an object – challenge them to find the object in its particular gallery and then take the lead on facilitating the activities.
2. You can use the pack as a trail, or dip in and out to fit around your schedule for the day. We recommend allowing at least 15mins for each object.
3. The activities work best with smaller groups, each lead by an adult. Give a pack to each adult in your group, the activities are easy to facilitate and don't require any pre-planning or prior knowledge.
4. The activities can be done in any order, so explore at your own pace.



- 1 Automatic Door
- 4 Burgot Burglar Annunciator

- 5 Wooden Electrical Driven Washing Machine
- 6 Coin-Slot Electricity Generator

Automatic Door

The Secret Life of the Home, Basement

When this automatic door was first installed in the Museum in 1933, many people had never seen one before. Now we see them everywhere! There is a motion sensor on the other side of the door that detects when a person is there, sending a signal to open the door.



Where else might it be useful to have something operated by motion sensors?

Examples include burglar alarms, hand-dryers and lift doors.



Look for the sensor that makes the door open and close. Do you need to stand by the sensor or can you find another way to make the door open?



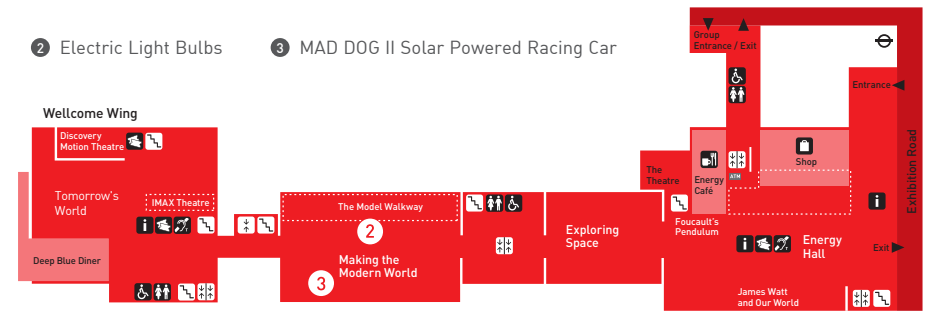
Can you estimate how long the door stays open after it has been triggered by the sensor? Do you think it stays open for too long, or not long enough? How might this influence the effectiveness of the automatic door?

Estimate by counting and repeating with different students enough times for a fair test.



2 Electric Light Bulbs

3 MAD DOG II Solar Powered Racing Car



Electric Light Bulbs

Making of the Modern World, Ground Floor

These two light bulbs were invented almost at the same time, by two scientists who had never met each other! One was invented in England by Joseph Swan, the other was invented in America by Thomas Edison. Electric light bulbs like these were much safer than older methods of lighting because their light comes from a glowing filament instead of a flame.



Today many of our light bulbs contain a fluorescent gas which glows instead of a glowing filament, this modern type of light bulb gives off the same amount of light but uses less electricity. Do you think it is important to save electricity? Why? What other things could we do to save electricity as well as using energy saving light bulbs?



Observe the different shapes of the light bulbs, which shape did Edison design and which shape did Swan design? Can you spot the filament in each light bulb?

The filament is the thin strip of metal that glows when a current passes through it.

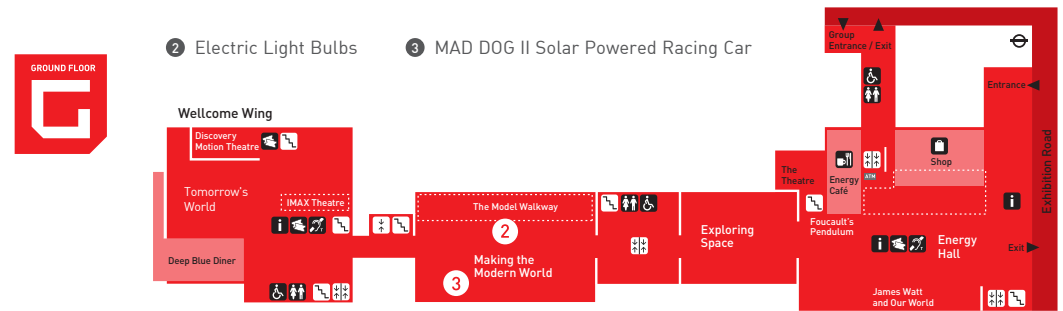


Explore the Making of the Modern World gallery, can you find 5 other objects that use electric light bulbs? Would these objects work without a light bulb? Can you think of any alternatives for their electric lights?

Objects to explore: cars, planes, x-ray machines



SCIENCE
MUSEUM



MAD DOG II Solar Powered Racing Car

Making of the Modern World, Ground Floor

This racing car is solar powered. The solar cells which cover the car collect the sun's energy and convert it into electricity to power the car's engine. The solar panels can also charge a battery within the car so that it will still work at night or on cloudy days.



Could this be the future of powering our cars? Would your family use a solar powered car? Can you think of any different ways of using solar power?

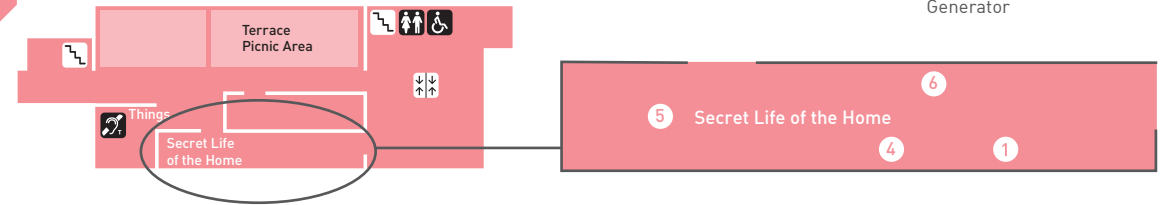


Can you see the 'bubble' at the front? That's where the driver sits. It's a very small space, what position do you think the driver had to sit in to fit inside?

The driver sat in a position where he was almost laid down flat, with his head up slightly and with his knees up and feet flat on the floor in front.



The main body of this car is made of a very strong material called carbon fibre, this material also conducts electricity. What other conductive materials can you see around you? Can you find any insulators?



Burgot Burglar Annunciator

The Secret Life of the Home, Basement

When this alarm is tripped by an intruder it dials a telephone number and plays a message from the gramophone record. Alarms are intricate devices that create a sound when a switch is tripped.



What if the burglar gets into your home? Light-beam sensors can be used to protect your home on the inside – if the burglar steps across a beam the alarm will sound. Where would you put burglar-alarm light beams in your home to make it safe? Why?



This exhibit allows you to listen to the recording the alarm would play if triggered. Can you find out how to do this? Whose phone number does the alarm dial? How effective do you think it would be for stopping burglars?

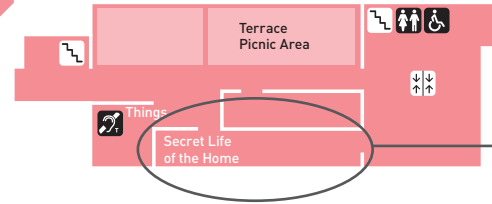
Press the red button beneath the display to hear the recording. The alarm would dial the phone number of the police (specifically, Scotland Yard) and they would hear the recording.



To understand how a burglar alarm works choose two students to be burglars and two students to be a buzzer. Ask all the others to hold hands in a circle – they are the alarm circuit. While they are holding hands electricity can flow and the alarm will not sound. Get the burglars to enter the circle. As soon as any two students in the circle stop holding hands to let the burglars through the circuit is broken – and the buzzers will need to make their best alarm sound!

Most burglar alarms work like this. When the alarm is set, current flows through a circuit. If an intruder opens a door or window the circuit is broken, which triggers a separately powered buzzer to sound.





- 1 Automatic Door
- 4 Burgot Burglar Annunciator

- 5 Wooden Electrical Driven Washing Machine
- 6 Coin-Slot Electricity Generator

Wooden Electrical Driven Washing Machine

The Secret Life of the Home, Basement

This washing machine has been fitted with a motor so that it can run on electricity. Originally this machine would have been operated by hand, by pulling a handle back and forth to spin the clothes until they were clean. Sometimes these machines would have been attached to a treadmill for a dog or a goat to walk on to provide power! You will see the electric motor attached underneath the wooden tub.



Adding the electric motor to this machine made laundry a much easier job in the 1920s. Is there anything you use at home or in school that you could improve using electricity?



Look carefully at the wooden washing machine. Can you identify what the different parts of the washing machine were used for? How does it compare with washing machines we use today?

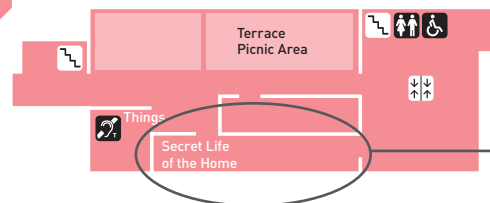


Explore the objects in the gallery. Pick three objects you have in your home that work with electricity and compare them with the ones in the gallery. How do they look different? What has changed? What has stayed the same?



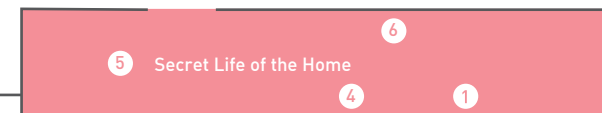


THE
MUSEUM



- 1 Automatic Door
- 4 Burgot Burglar Annunciator

- 5 Wooden Electrical Driven Washing Machine
- 6 Coin-Slot Electricity Generator



Coin-Slot Electricity Meter

The Secret Life of the Home, Basement

Before there were utility bills every house or building would have a coin-slot electricity meter to provide power. Every month a person from the electricity board would visit to collect the money and check this against the amount of energy consumed.



Today most people use electricity as they need it and then pay a bill later. How do you think life would be different if everyone had to put coins in a meter before using electricity? Do you think these old-style meters could have any benefits?

For example, would it help people to save money? Help the environment? Would it mean you had to watch less TV? Or spend less time on games consoles?



Looking carefully at objects can often give us more information than we first expect. Examine the coin-slot meter. Can you find out where it was made? Where do you think the owner of the meter lived?

The meter was made in Brighton. The metal plaque at the top of the meter says 'Leyton District Council', which suggests it was fitted at a home or business in Leyton, East London.



Could you live without electricity? Get your students to stand up. Call out objects, starting with the least important, asking students to drop out if they feel they cannot live without the object called. Explore the impact of life without each object as you call it out. The last ones standing would be the best wild campers!

Begin with items such as electric can-openers or hair-straighteners and work up to TVs, mobile phones, PlayStations, cookers, light bulbs and so on.