

## GOING GREEN

### Make your own electricity

### National Curriculum

This activity supports work in:

#### SCIENCE

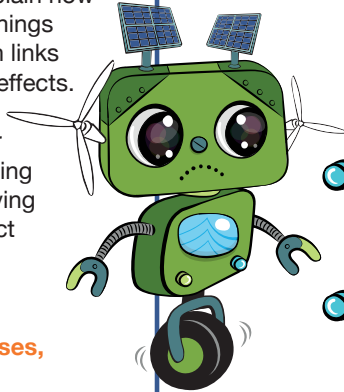
##### Sc1 Scientific enquiry, Knowledge, skills & understanding:

1a) That science is about thinking creatively to try to explain how living and non-living things work, and to establish links between causes and effects.

1d) Make a fair test or comparison by changing one factor and observing or measuring the effect while keeping other factors the same.

##### Sc4 Physical processes, Electricity:

1b) How changing the number or types of components (for example, batteries, bulbs, wires) in a series of circuits can make bulbs brighter or dimmer.



### How to use the worksheet

- Ask the children what makes the following work: ordinary torch, overhead light, computer, mobile phone charger and radio. They should easily identify electricity (mains or battery).
- Tell the children that they are going to find out about electrical items that work without mains or battery electricity. Ask them to read the information and then look at the pictures. Explain the term 'generator' (a machine for producing electricity through energy from movement) and that something has to provide this energy. After they have completed the sentences on the worksheet, invite volunteers to explain where the energy comes from to produce electricity for each item. For the wind-up items, point out that the person turning the handle or the pedals provides the energy.
- As a homework activity the children could find out about other electrical items that provide their own electricity, such as solar-powered calculators and road signs.
- The extension activity on the worksheet provides an opportunity for fair testing. Ask the children to plan their investigation before they begin, making sure that the test is fair for comparing a hand generator with a bulb. The brightness of a bulb can be measured by using a photo-sensor and data logging software, or by holding a number of sheets of paper in front of it as described on worksheet 2.06: Voltage value.



### Key electricity facts

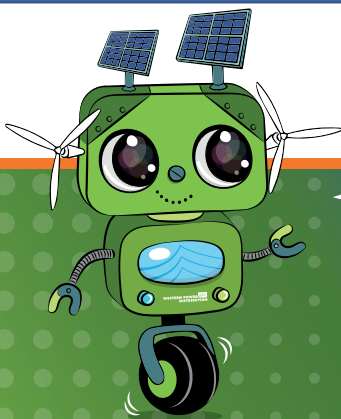
- Generators make electricity from movement. A dynamo is a type of generator. On the bike, movement comes from turning the wheel by pedalling. It powers the lights.
- Power stations use steam from water heated by fuels such as coal or gas to turn their turbines. A wind turbine is turned by wind.
- In a wind-up torch, movement comes from turning the handle. It powers the torchlight.
- In a wind-up phone charger, the movement comes from turning the handle. It provides power to charge the phone. In a wind-up radio, movement comes from turning the handle. It powers the radio's components to produce sound.

Also supports work in:

#### PSHE/CITIZENSHIP

##### Learning to play an active role as citizens:

2j) That resources can be allocated in different ways and that these economic choices affect individuals, communities and sustainability of the environment.



**Ecobot says:** For more information see [www.generatorguide.net/howgeneratorworks.html](http://www.generatorguide.net/howgeneratorworks.html)



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Some electrical devices (like the ones in the pictures below) don't need a battery or mains electricity. This is because they each have their own 'generator'. Generators make electricity from movement.

Complete the sentences below to explain how electricity is produced and what the electricity powers:



In this mobile phone charger, the movement to make electricity comes from

.....

.....

This electricity is used to

.....

.....



In this wind-up torch, the movement to make electricity comes from

.....

.....

This electricity is used to

.....

.....



In this radio, the movement to make electricity comes from

.....

.....

This electricity is used to

.....

.....



In the dynamo light on this bike, the movement to make electricity comes from

.....

.....

The electricity is used to

.....

.....

#### Ecobot says:

If your school has a small hand generator, try using it to power a small light bulb.

Measure the bulb's brightness. Compare it with a battery of the correct voltage for the bulb.

