



? How to use this worksheet

- The children should first have made circuits with switches. They could draw a picture of the new circuit or, if appropriate, a circuit diagram.
- Ask them to note the different ways in which outdoor lights are switched on and off and ask them if they notice any special types of switch, for example sensors.
- They should have opportunities to explore the use of light sensors to compare light conditions in different places; also to use movement detectors along with a control box system.
- The children should first use a light sensor that will switch on a circuit with a lamp when it detects a low level of light. They will need to experiment to find at what level to set the response to the sensor.
- Ask them if this is suitable for the house in the picture. Do they want the light to stay on all the time if it is dark outside? Ask about lights they have seen that switch on when someone passes, and introduce motion sensors.



⚡ Key Electricity Facts

- Sensors act as switches in a circuit by responding to changes in the immediate environment such as light and movement. In the final circuit there are two sensors: i.e. two switches that have to switch 'on' in order to allow the current to pass through the lamp. These are inputs for the control software. There is one output – the lamp.
- The light sensor has to detect a low level of light and the movement sensor has to detect movement within its sensing range. If this is true for both inputs, the output is switched on (the lamp lights).
- Once children have a circuit with a light sensor that works (at the right level of light) and they add the movement sensor, if the circuit doesn't work they will then know that it is only the movement sensor that they need to adjust, e.g. repositioning it.



Exercise Extension: The students could bring in photos of their own homes or homes they have seen as 'unsafe' and illustrate where their circuit would be useful and the house feel safer.

National Curriculum supporting information

ICT

Developing ideas & making things happen:

2b) how to create, test, improve and refine sequences of instructions to make things happen and to monitor events and respond to them (for example, detecting light levels and turning on a light)

SCIENCE

SC4 Physical processes, Electricity:

1a) constructing circuits incorporating a battery or power supply and a range of switches, to make electrical devices work



Related Material

resources.woodlands-junior.kent.sch.uk/revision/science/electricity.htm



An outdoor light can make people feel safer going into their homes at night.

1. Draw an outdoor light on this house where you think one would be useful.
2. Make a circuit for the light.
3. What could you add to your circuit so that the light will switch itself on when it is dark outside?



4. Make a new circuit to test your idea

Make a note here about how it worked and about anything else you had to do to make it work.

5. It will waste electricity if the light stays on all the time when it is dark. What else could you add to the circuit so it only works in the dark and only when someone goes near the light?

6. Draw the new circuit below



Now try this!

Write instructions for the control box you will use to control the light.