

Using Symbols to help Teach Scientific Concepts

Using symbols can enable pupils with literacy difficulties access to information that they might otherwise be unable to access independently.

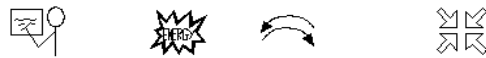
Teachers can use symbols to made a wide variety of resources including

- Work sheets
- Word cards to help pupils to write with greater independence
- Revision and reference materials

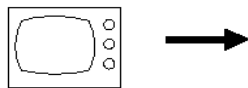
All of these resources have been made using the program Writing With Symbols 2000 (WWS 2000) by Widgit Software. It is a very powerful program that has a range of functions including a word processor so that when a word is typed a symbol “pops” up above the word.

Extract from a work sheet on energy transfers

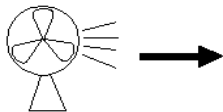
Energy transfers



Write the energy changes that happen in these things.



television



fan

Extract from a word card on electricity



circuit



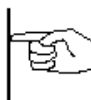
crocodile clips



current



dim



hard



light



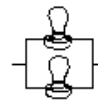
measure



more



motor



parallel

Extract from a Key Stage 3 revision sheet on electricity



MEASURING VOLTAGE The voltage will be different in different parts of the



circuit. As the electricity bits go round the circuit the voltage goes down because



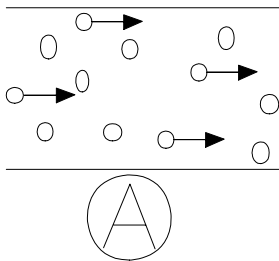
the electricity's push gets used up. All the voltage gets used up in a circuit.

Current, voltage and resistance

Not only do the symbols help to support literacy, but they can also help to develop and reinforce pupils understanding and recall of some concepts. Many of the science symbols have been specifically designed to reinforce the link between the word and the concept related to it.

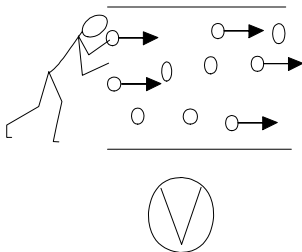
Current – Is the rate at which the charge (or bits of electricity) go around the circuit. This is to do with 2 things;

- How fast the charge (bits) of electricity are going
- How many charges of electricity there are going round the circuit



The symbol shows the charges (or bits) of electricity moving through the wire. The A is there to help pupils that current is measured in Amps.

Voltage – Is how much push the charges (bits) of electricity have to get them round the circuit.



The symbol shows the voltage as the push needed to move the charges (bits) of electricity round the current. The V is there to help pupils that voltage is measured in Volts.

Teaching scientific vocabulary

When teaching a particular unit of science work, large pictures of the symbols can be printed out and put onto cards. Having the symbol appears to help pupils link or chunk together information, so that when they recall the word with the aid of the symbol, they not only usually remember a lot more information than when given the word alone, but often the information they recalled was more than was embedded in the symbol.

Below are some examples for what pupils could tell me about different words when shown some symbols connected to a topic that they had been working on over a year ago. Previously when these pupils had been asked the same question, but without the aid of the symbol, all of them had been able to recall nothing.

series circuit - “The bulbs would get dim because the electricity can’t get through that much and the bulbs are in one line.”

“The bulbs are in one circuit and they will get very dim because the electricity can’t go through very fast.”

voltage – “It’s how mush push the electricity has got so if its hard for the electricity to get through because the wire’s very thin then it needs a big voltage.”

(Taken from a MA study of the effectiveness of symbols – Sue Norton)