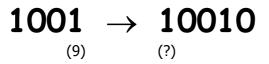
Worksheet Activity: More on Binary Numbers

1. Another interesting property of binary numbers is what happens when a zero is put on the right hand side of the number. If we are working in base 10 (decimal), when you put a zero on the right hand side of the number, it is multiplied by 10. For example, 9 becomes 90, 30 becomes 300.

But what happens when you put a 0 on the right of a binary number? Try this:



Make up some others to test your hypothesis. What is the rule? Why do you think this happens?

Each of the cards we have used so far represents a 'bit' on the computer ('bit' is short for 'binary digit'). So our alphabet code we have used so far can be represented using just five cards, or 'bits'. However a computer has to know whether letters are capitals or not, and also recognise digits, punctuation and special symbols such as \$ or ~.

Go and look at a keyboard and work out how many characters a computer has to represent. So how many bits does a computer need to store all the characters?

Most computers today use a representation called ASCII (American Standard Code for Information Interchange), which is based on using this number of bits per character, but some non-English speaking countries have to use longer codes.



Photocopiable for classroom use only. © 2002 Computer Science Unplugged (www.unplugged.canterbury.ac.nz)