

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:

1001 become **10010**

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

2. Each of the cards we have used so far represents a 'bit' on the computer ('bit' is short for '**b**inary **d**igit'). 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 recognize 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 (**A**merican **S**tandard **C**ode for **I**nformation **I**nterchange), which is based on using this number of bits per character, but some non-English speaking countries have to use longer codes.