

When we count using decimal or base 10, our normal counting system, we count up to nine using a different symbol each time: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. Then for ten, we use two digits: 10. Beyond that, we combine the same ten symbols in various ways to give all possible numbers.

This is called a positional system. So 3528 means three thousand, five hundred and twenty eight, or  $3000 + 500 + 20 + 8$ . But you can count using less digits than this. You must have a zero. But you're not going to get anywhere with just zero ! So you need a digit for one as well. This is called binary or base 2.

As you can see, binary numbers are usually longer than decimal numbers, and get even longer the bigger they get. You need twenty binary digits for a million. Also, the numbers are quite difficult to understand or remember, as they are strings of ones and zeros.

This means that binary is not very useful for people. However, computers are good at remembering long numbers, and understand numbers whatever format they are in. Computers want numbers that they can hold easily in an electronic form, and where arithmetic is easy.

In a computer, one means that an electrical current is flowing, and zero means that it is switched off. If you look at your TV, you may see that the on/off switch is marked 1 and 0.

Number	Decimal	Binary
<b>zero</b>	0	<b>0</b>
<b>one</b>	1	<b>1</b>
<b>two</b>	2	<b>10</b>
<b>three</b>	3	<b>11</b>
<b>four</b>	4	<b>100</b>
<b>five</b>	5	<b>101</b>
<b>six</b>	6	<b>110</b>
<b>seven</b>	7	<b>111</b>
<b>eight</b>	8	<b>1000</b>

Write down the following numbers in the binary system :

1. **Your age**
2. **Sixteen**
3. **Twenty**
4. **Thirty**
5. **Thirty two...**

