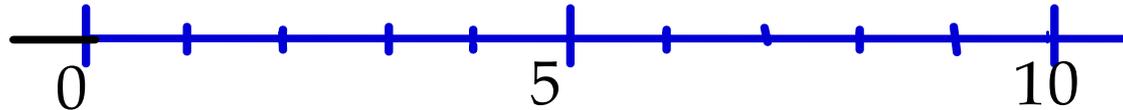## Number Lines

A number line is a very important image for students of all ages to refer to.

The 10s and the 5s are often marked.

Where larger numbers are involved, 0 may be absent.

The calculation $1003 - 998$ is straightforward if this image can be brought to mind. The written method is quite inappropriate here and those with a good mental image of the number line are at an advantage.

It is also important to be able to control the scale.

The following properties of the number line are listed in Peter Lacey's article entitled 'Using geometric images of number to teach mental addition and subtraction' in *Mathematics Teaching*, no 163.
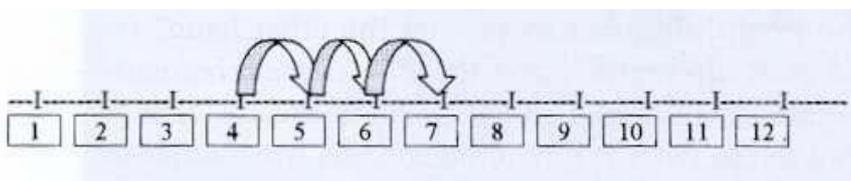

This is a particularly rich image.

- It supports the development of the concept of inverse: the diagram shows how $4 + 3 = 7$ and $7 - 3 = 4$ are illustrated in the same image.

- It poses the notion of infinity, in that the line can extend indefinitely.

- It offers the prospect of generalisation, in that the arrow system on top can be shifted to the right or to the left to show all number pairs whose difference is 3. The focus has shifted from adding 3 to or subtracting 3 from a particular number, to adding 3 to or subtracting 3 from any number.

- It indicates the relationship between numbers in terms of their location on the number line.

- It illustrates a structure in the number system.

A number line on a computer screen can benefit from its dynamic qualities.

Consider, for example, the software available from the DfES Standards site at http://www.standards.dfes.gov.uk. Use the search facility on the homepage to locate the relevant software on number lines.

Display the difference between the 2 numbers and move one of the numbers along the length of the line.
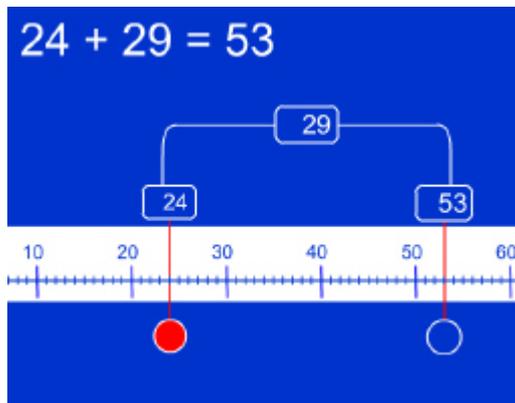
Talk to colleagues about the value of this image. What are its restrictions?

Reference

Lacey, P. (1998) 'Using geometric images of number to teach mental addition and subtraction', *Mathematics Teaching*, no. 163.