

## The Wonder of the Abacus

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Hello everyone! Are you any good at mental arithmetic? Let's try a problem. Add these five numbers in your head as they appear. Are you ready? The answer is [ANSWER]. Easy, wasn't it? Now, let's try something a little more difficult. Could you do it? Yes, it's [ANSWER].

I can solve mental arithmetic problems like this because I attended an abacus class for eight years. After a while, I could perform calculations with a mental abacus in my head. I came to love math, and I decided to pursue a career in science and enrolled in National Institute of Technology, Wakayama College.

The abacus, known as the *soroban* in Japanese, is an excellent calculator with an ancient history. Sumerians had abacuses in around 2500 BCE, and they were also used by the Ancient Egyptians and Aztecs. The abacus was introduced to Japan from China and spread throughout the country in the 15th century. It was taught at *terakoya*, or temple schools, where children studied in the Edo period. The *soroban* was an important part of learning, in keeping with the *terakoya* motto of "reading, writing, and arithmetic".

In addition to the basic operations of addition, subtraction, multiplication, and division, the abacus can also be used to find square roots. Nevertheless, now that we have calculators, many people think that we no longer need abacuses. They are becoming less popular, and are only studied for a few hours at elementary school.

It is true that calculators can perform more complex calculations and are much faster than abacuses. However, I believe that there is something special that can be gained by learning the abacus: the ability of spatial recognition.

In fact, evidence from research has shown that children who have learned the abacus perform better in tasks involving the mental manipulation of shapes and have greater attentional ability. I also decided to do my own research into this. First, I conducted a survey of my classmates about their experience of learning the abacus, and found that only three out of 42 had studied the *soroban*. All three of them said that they could use an abacus in their head to complete calculations instantly when shopping.

I then conducted an experiment with the three who had learned the abacus and another three who had not. Please look at this picture of a stack of cubes. In the experiment, my classmates were asked to look at the image and count exactly how many cubes there were. Can you guess? That's right! The answer is 84.

The results of the experiment showed that the three who had studied the soroban could find the correct answer in 43 seconds on average. On the other hand, the other group took 82 seconds. That's almost twice as long! Based on this result, I believe that the students who had learned the abacus have improved spatial recognition skills, as they better understand shapes mathematically and numerically. Let me show you

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how I would solve this problem. First, I count the number of blocks each of the visible cubes is sitting on and then add them all together to give the total. Because of the time pressure, the tasks performed in this experiment also required concentration and information processing skills. It seems that learning the abacus improves not only arithmetic skills, but also the ability to visualize and quickly solve problems in our heads, which is important in all areas of life, especially as engineers.

For this reason, I believe the *soroban* should once again be a part of basic elementary school education in order to foster the creativity and problem-solving skills needed to develop cutting edge technology. I want everyone to know the wonder of the abacus!