Making maths physical – Paddy McCabe

The Izak9 from Qubizm helps pupils in key stages 2 and 3 develop mental maths strategies.

It comprises one big cube 40cm high made up of 27 smaller ones. The faces of the smaller cubes each display a number, fraction, percentage or shape, all colour coded by concept.

The product comes with a range of e-learning materials presented by Helix and Abacus, two robots who set the children maths tasks. The resource can be used with or without the software, which includes banks of questions associated with each task, tiered according to curriculum levels. Together with the comprehensive 20-page manual, this makes lesson planning easy.

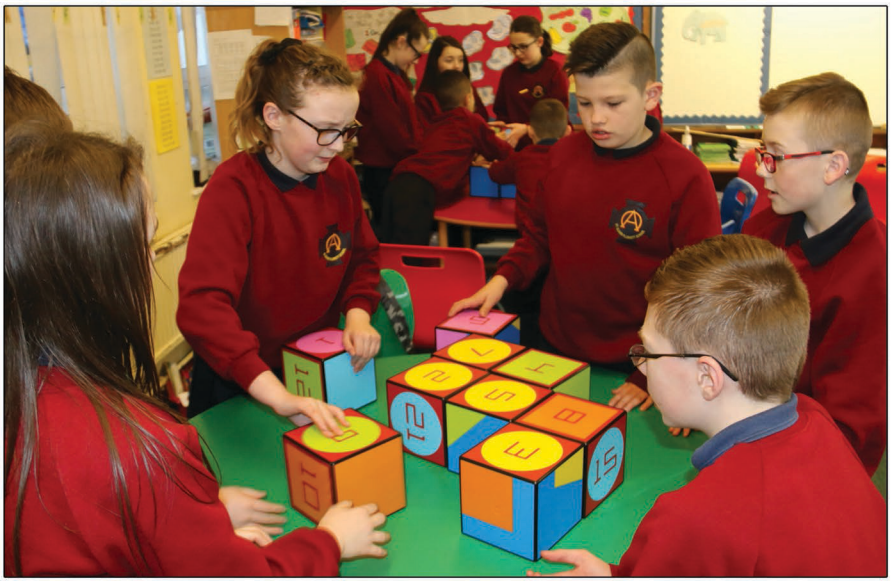
The cube appeals to every single child, irrespective of ability or opportunity in life. They pick the cubes up, turn them around, stack them up and rearrange them, learning through play and taking an active part in team activities to solve maths problems. Indeed, pupils love it so much that our Izak9 after school club is oversubscribed.

In class, children are split into three mixed-ability groups, with each team working with one of the walls – nine cubes. In the case of the prime number wall, Helix and Abacus might ask the pupils to arrange the cubes in a given order, calculate the total and then see how many ways they can find to make 25 from just three cubes. The more obvious answers include 5+7+13 and 3+5+17, but pupils soon learn to think laterally and discover that equally valid answers include 23+5-3, 19+(2x3) and (23x2)-21.

Another task gets pupils familiar with compass bearings – each group follows the instructions to build a three-by-three wall of cubes. For example: 2 is south of 8 and south-east of 9.

When I first came across Izak9, I bought one on the proviso that the company trained the school to use the cubes. It was the best CPD I have undertaken in 25 years. The training centred around teaching my staff to be children again, to think as children and discover as children. As I watched them, I knew their bubbling enthusiasm and engagement would transfer spontaneously to pupils. My reaction following this training was to order another two cubes, giving us a set for each of the Key Stage 2 year groups.

The following day, I went to see the teachers using them in action... and ordered another two sets. You may well ask, what is so marvellous about these cubes?



Maths is just one of the things pupils learn with the Izak9. Other skills include learning to be part of a team, leadership, articulating ideas and problem-solving

Very simply, Izak9 puts every child on an equal footing, so no one worries they might not be clever enough to contribute an answer, or thinks they might get it wrong and be ridiculed. In the course of the training, the trainers demonstrated how to tease out responses from pupils and show that there are many different ways to approach a task, which the pupils find very empowering.

The philosophy behind the cubes embraces all that is best in the Northern Ireland curriculum – plan, do, review – and gives children the opportunity to be creative, take risks, have a go and fail, which are crucial life lessons.

Above all, working with the cubes means that pupils are no longer struggling with abstract concepts because they can manipulate numbers in a physical way that creates concrete memories. Izak9 has helped turn pupils into problem-solvers, decision-makers and team players who collaborate on the strategies they will use to solve the task at hand.

In a surprisingly short space of time, it has made them more confident in their use of mathematical language. Coincidentally, the cubes have also highlighted gaps in pupils' knowledge in a very non-threatening way, things that we would have presumed that pupils knew in the past.

Best of all, the cubes have enabled children to come up with their own mathematical approaches. For example, one group was discussing how they would add or subtract 11 to or from a given number. They came up with adding or subtracting 10, and then one. At the end of the lesson, I asked them what they would do about subtracting 13 to see if their new concept had become ingrained, and they talked about subtracting 10 and then three. Then I asked how they would handle 73-14. Quick as a flash one child said: 'I would take away 10, take away three and then take away one.' Amazed that he knew he had to break down the four to make it easier for himself, I asked him how he had come up with this, and he said: 'Izak9 – I saw other kids using this strategy and once they showed me how to do it, I could take away bigger numbers.'

There is virtually nothing in key stages 2 or 3 maths that can't be addressed using the Izak9 – fractions, decimals, percentages, prime numbers, squared numbers, cubed numbers, symmetry, factors, multiples, algebra and even shapes and spaces. For example, pupils recently explored which angles make up a regular pentagon using the cube.

The only downside is that Izak9 is designed mainly for Key Stage 2 pupils. I'm now waiting for the developers to come up with a cube for our pupils in Key Stage 1!

www.izak9.com

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