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Fast and painless way to better mental arithmetic? Yes, there might actually be a way

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In the future, if you want to improve your ability to manipulate numbers in your head, you might just plug yourself in. So say researchers who report in the Cell Press journal *Current Biology* on May 16 on studies of a harmless form of brain stimulation applied to an area known to be important for math ability.

"With just five days of cognitive training and noninvasive, painless brain stimulation, we were able to bring about long-lasting improvements in cognitive and brain functions," says Roi Cohen Kadosh of the University of Oxford.

Incredibly, the improvements held for a period of six months after training. No one knows exactly how this relatively new method of stimulation, called transcranial random noise stimulation (TRNS), works. But the researchers say the evidence suggests that it allows the brain to work more efficiently by making neurons fire more synchronously.

Cohen Kadosh and his colleagues had shown previously that another form of brain stimulation could make people better at learning and processing new numbers. But, he says, TRNS is even less perceptible to those receiving it. TRNS also has the potential to help even more people. That's because it has been shown to improve mental arithmetic—the ability to add, subtract, or multiply a string of numbers in your head, for example—not just new number learning. Mental arithmetic is a more

complex and challenging task, which more than 20 percent of people struggle with.

Ultimately, Cohen Kadosh says, with better integration of neuroscience and education, this line of study could really help humans reach our cognitive potential in math and beyond. It might also be of particular help to those suffering with neurodegenerative illness, stroke, or learning difficulties.

"Maths is a highly complex cognitive faculty that is based on a myriad of different abilities," Cohen Kadosh says. "If we can enhance mathematics, therefore, there is a good chance that we will be able to enhance simpler cognitive functions."

More information: *Current Biology*, Snowball et al.: "Long-Term Enhancement of Brain Function and Cognition Using Cognitive Training and Brain Stimulation." dx.doi.org/10.1016/j.cub.2013.04.045

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