

Quantum Theory for Kids

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In [1] we present an entirely diagrammatic presentation of quantum theory with applications in quantum foundations and quantum information. This was the result of many years of work by many, and started off as a category-theoretic axiomatisation motivated by computer science as well as axiomatic physics. However, I have always felt that the diagrammatic presentation is of great use in its own right, be it to bridge disciplines, make quantum theory more easy to grasp, or, for educational purposes, in [2] we made the bold claim that using diagrams high-school kids could even outperform their teachers, or university students. Now, we will put this claim to the test. To do so, we have written two tutorials [3,4], covering exactly the same material, but one only using diagrams, while the other contains the standard Hilbert space presentation. There are corresponding sets of examples too. We will present the pictorial tutorial, as well as provide the logical underpinning of this material.

References

1. B. Coecke & A. Kissinger, *Picturing Quantum Processes: A First Course in Quantum Theory and Diagrammatic Reasoning*, Cambridge University Press, 2017.
2. B. Coecke, “Quantum pictorialism”, *Contemporary Physics*, vol. **51(1)**, 2010, pp. 59–83.
3. B. Coecke & S. Gogioso, “Quantum theory in Pictures”, Top Secret.
4. B. Coecke & S. Gogioso, “Quantum theory in Hilbert space”, a bit less top Secret.