

Spatial Reasoning and Intelligence

Spatial reasoning is the capacity to understand, recall, and analyze the dimensional (3D) relationships among objects. Spatial ability is important for success in solving everyday life tasks, as well as in many fields of study (natural sciences, economic forecasting, meteorology, and architecture just to name a few).

Research shows that spatial reasoning, one of the most important predictors of achievement in STEM (Science, Technology, Engineering, and Mathematics), is actually one of the most neglected subjects in our school systems. While schools are falling short, spatial ability is becoming increasingly more important in the development and proliferation of new technologies for our modern world. So, what is spatial reasoning's role in mathematics? Spatial reasoning is the mode of thought we use to image different visual perspectives. Are these two shapes different [Image 3]? Or are they identical and merely oriented differently?

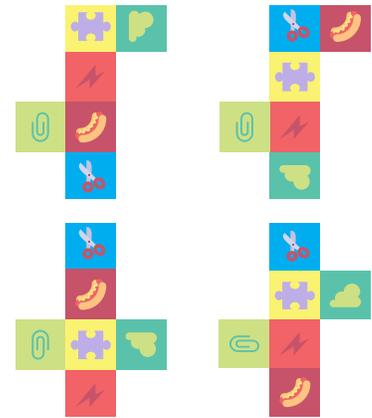
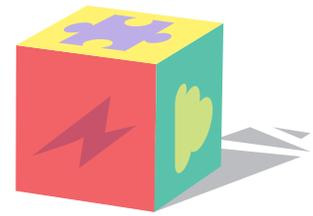
In fact, spatial reasoning generates our ability to investigate and solve problems, especially with non-routine or novel problems in mathematics. We know that by focusing on spatial thinking, we can tap into the child's ability to become a more visual learner and connect into the ability to recognize patterns and make discoveries. Even Albert Einstein conceived his theory of relativity by visualizing himself riding a beam of light.

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The focus on spatial thinking allows mathematics to become more accessible, more engaging, and more importantly, more relevant. Young children who are better at visualizing spatial relationships, develop stronger arithmetic abilities, especially in the primary and early elementary school levels.

While easy to point out the importance, how many of you have seen our schools and teachers develop and equip our children with these skills? In today's world, parents and school rely heavily on repetition and memorization -- as well as technologies such as tablets and smartphones, for kids to learn math. We are taught to believe that, if your child can remember the times table, they are actually gaining intelligence. Yet, by the time they enter middle school or high school many of our children are struggling with classes in Algebra, Trigonometry, and Calculus.

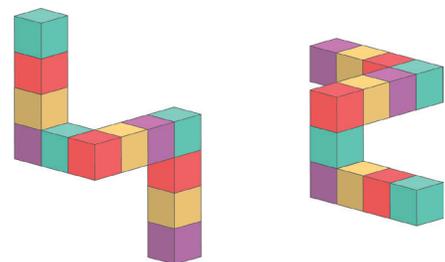
At Growing IQ, our goals are long term and we teach math in ways that kids understand it best. Children who have been attending Growing IQ for 3 to 4 years have shown amazing growth and cognitive understanding of higher-level mathematical concepts. Spatial reasoning is only part of our unique curriculum, that focuses on developing critical thinking, problem-solving, and logical reasoning. A large part of learning incorporates 3D manipulatives and focuses on teaching children, over a long period of time, ways to break down problems and process information in a different way that they experience in their classrooms.



[Image 1] Which net builds the cube?



[Image 2] Building 3D shapes.



[Image 3] Are these different?

