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The Science

Why the Growth Mindset?

When students and educators have a growth mindset, they understand that intelligence can be developed. Students focus on improvement instead of worrying about how smart they are. They work hard to learn more and get smarter. Based on years of research by Stanford University's Dr. Dweck, Lisa Blackwell Ph.D., and their colleagues, we know that students who learn this mindset show greater [motivation in school, better grades, and higher test scores](#).

What does a Growth Mindset School look like?

Administrators support teachers' learning. They are responsive to honest feedback, rather than defensive. They seek to build their skills, and are willing to learn from their teachers.

Teachers collaborate with their colleagues and instructional leaders, rather than shut their classroom doors and fly solo. They strive to strengthen their own practice, rather than blame others. They truly believe that all students can learn and succeed—and show it.

Parents support their children's learning both inside and outside the classroom. They partner with teachers, and respond to outreach. They worry less about advocating for their children to get good grades and focus on making sure kids are being challenged and put in the effort needed to grow.

Students are enthusiastic, hard-working, persistent learners. They take charge over their own success.

What is the impact of Mindset?

Mindsets Predict Motivation and Achievement

In one study, Blackwell and her colleagues followed hundreds of students making the transition to 7th grade. They found that students with a growth mindset were more motivated to learn and exert effort, and outperformed those with a fixed mindset in math—a gap that continued to increase over the two-year period. Those with the two mindsets had entered 7th grade with similar past achievement, but because of their mindsets their math grades pulled apart during this challenging time. (Blackwell, L.S.,

Trzesniewski, K.H., & Dweck, C.S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, 78. 246-263, Study 1.)

Growth Mindset Training Boosts Motivation and Achievement

In another study, also with adolescents, Blackwell and her colleagues divided students into two groups for a workshop on the brain and study skills. Half of them, the control group, were taught about the stages of memory; the other half received training in the growth mindset (how the brain grows with learning to make you smarter) and how to apply this idea to their schoolwork. Three times as many students in the growth mindset group showed an increase in effort and engagement compared with the control group. After the training, the control group continued to show declining grades, but the growth-mindset group showed a clear rebound in their grades. (Blackwell, L., Trzesniewski, K., & Dweck, C.S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, 78. 246-263, Study 2).

Growth Mindset Training Narrows the Gender Gap in Math

In a third study with adolescents, students who received growth mindset training (compared to matched controls who received other instruction) showed significant increases in both their math and verbal achievement test scores. It was interesting to note that girls who received the growth mindset training narrowed the gender gap in math. (Good, C., Aronson, J., & Inzlicht, M. (2003). Improving adolescents' standardized test performance: An intervention to reduce the effects of stereotype threat. *Applied Developmental Psychology*, 24, 645-662.)

Growth Mindset Training Narrows the Racial Achievement Gap

Aronson and colleagues taught college students a growth mindset and taught the control group about multiple intelligence (don't feel bad if you don't do well in one area, you may still be smart in other areas). There was also a no-training control group. The growth mindset group showed significantly higher grades than the control groups. This was particularly true for African American students, who also showed a sharp increase in their valuing of school and their enjoyment of their academic work. (Aronson, J., Fried, C. B., & Good, C. (2002). Reducing the effects of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology*, 38, 113-125.) You can read more about mindset and narrowing the achievement gap by downloading this [free report from UNC Greensboro](#).

Brainology® Improves Resilience, Behavior, and Achievement

Direct studies of the Brainology program demonstrate the efficacy of this program. In a large study in Scotland, classrooms were randomly assigned to receive Brainology. These classrooms, compared to matched controls, showed significant increases in their reading achievement test scores, as well as greater resilience in the face of setbacks and increased life satisfaction.

In a recent study of California middle schoolers, Brainology led to an increased grade point average among Latino students (compared to a matched control group), as well as improved conduct scores for students who had prior conduct problems.

See [handout summarizing results from recent studies on Brainology® and the Mindset Works® EducatorKit](#).

Research shows that Intelligence is Malleable

It's also important to know that the growth mindset has been receiving scientific confirmation from cognitive psychology and from neuroscience. For example, neuroscientists tracked students during their teenage years. For many students, they found substantial changes in performance on verbal and non-verbal IQ tests. Using neuroimaging, they found corresponding changes in the density of neurons in the relevant brain areas for these students. In other words, an increase in neuronal connections in the brain accompanied an increase in IQ-test performance, while a decrease in neuronal connections in the brain accompanied a decrease in IQ-test performance. This is just what Brainology teaches. (Ramsden, S., Richardson, F.M., Josse, G., Thomas, M., Ellis, C., Shakeshart, C., Segquier, M., & Price, C. (2011). Verbal and non-verbal intelligence changes in the teenage brain. *Nature* **479**, 113–116.

See other articles about the growth mindset in [In The News](#), or read our co-founder Carol Dweck's book [Mindset: The New Psychology of Success](#).

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