mindset works®

Brainology®

FOR HOME

Brainology for
Home Parents Guide
Sample

Other Mindset Works Programs

Mindset Works' programs help students and educators become more motivated and effective learners.

Brainology® for Schools

Brainology® for Schools is a blended learning curriculum that teaches students how to develop a growth mindset. The program includes online animated instructional units, as well as offline cla sroom activities. Brainology for Schools also comes with a Spanish language option, Brainology en Español!

LeaderKit™

The LeaderKit is a valuable resource for school leaders to use to help foster a growth mindset across a school. When leaders model a growth mindset, it sets the stage for all stakeholders to follow. Note: The LeaderKit will be available for purchase in 2016.

SchoolKit™

Mindset Works SchoolKit is a suite of resources (including **Brainology® for Schools**, **MindsetMaker** and **LeaderKit**) developed to cultivate a growth mindset school culture. It contains tools for administrators, teachers, and students to learn, teach and live the growth mindset.

Mindset Infusion™
Tools for Math and Literacy

The Mindset Infusion Tools for Math and Literacy contain lessons, tools and resources for educators to use all year to cultivate growth mindsets in their students in Math and English classrooms, grades 6-8. Note: Mindset Infusion Tools will be available for purchase in 2016.

Brainology® for Home

Brainology® for Home is a blended learning curriculum that teaches students how to develop a growth mindset. The program includes online animated instructional units, as well as offline cla sroom activities. Brainology for Schools also comes with a Spanish language option, Brainology en Español!

GEM™
Growing Early Mindsets

Growing Early Mindsets (GEM) is an early learning curriculum designed to integrate growth mindset into the PreK-3 classroom. Note: The GEM curriculum will be available for purchase in 2016.

Guide to Implementation

Building Parents' Critical Knowledge and Skills to Support Students' Confidence, Fulfillment and Achievement

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What is the Purpose of the Brainology® Guide for Parents?

This Brainology Guide for Parents includes:

- An introduction to the Brainology curriculum;
- An overview of the research behind Brainology;
- Detailed instructions on how to enroll and navigate through the online Brainology program; and
- An outline of each unit's goals, lessons, common challenges and at-home reinforcement strategies, including lesson plans and handouts for home use.

It is important to use these materials with your children to reinforce and incorporate the lessons taught in Brainology into their everyday thinking and behavior. We believe that parents and children can gain knowledge and forge positive relationships over the course of this program. It is our hope that supporting your child's growth mindset development will yield benefits for years to come.

Customer Support & Feedback

If you have any questions or run into any issue please contact us anytime at support@mindsetworks.com. We also always welcome your questions, comments and ideas on what we can do to better serve you at feedback@mindsetworks.com.

We look forward to serving you and hope that Brainology is very helpful to you and your children.

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Brainology® Curriculum Overview

The goal of the Brainology curriculum is to help children develop a growth mindset. Children with a growth mindset think of their intelligence as something that they can develop through learning and study rather than as something fixed. Cultivating a growth mindset can help increase a child's sense of self-efficacy and motivation to learn.

We help children develop a growth mindset by teaching them how the brain functions, learns and remembers, and how it changes physically when we exercise it through study and learning. In addition, we provide a practical set of skills for tackling academic challenges by showing them how to apply this knowledge to their schoolwork.

Brainology is designed as a challenge-based, interactive multimedia instructional program. In an introduction plus four ~30 minute units, children follow animated teenaged characters Chris and Dahlia as they tackle various problems in their most difficult subjects. They visit the lab of eccentric brain scientist Dr. Cerebrus and learn about the basic structure and function of the brain: how thinking occurs, how learning and memory work, how to develop and change the brain, and how to improve their study habits and skills in light of this knowledge. They gain experience in visualizing and applying these ideas through interactive activities and exercises. Throughout the program they reflect on their challenges and their learning through an E-Journal. The goal is for them to understand that they have great, untapped potential and that the development of their mental ability is largely within their own control, and to provide them with study habits and skills that will help them take action.

Through this Parents Guide, we hope to help you support your children by providing information and strategies that you can use to reinforce their growth mindset development.

Research Background Overview

During adolescence, students are at risk for underachievement, particularly in the area of mathematics and sciences. Over the past two decades, the main goal of two of our co-founders, Carol S. Dweck, Ph.D., and Lisa Sorich Blackwell, Ph.D., has been to research what helps students to achieve highly, and to apply the lessons learned to improving their motivation and achievement.

Achievement and Motivation

In Drs. Dweck and Blackwell's research, we have found that the beliefs and attitudes held by students when they begin junior high school have a strong influence on their achievement in mathematics over these critical years.

In particular, the research found that students who believed that their intelligence was something that they could develop and increase—what we term a **growth mindset**—also held many other positive attitudes. First, believing that their ability could be increased, they **valued learning** as a goal, even when it involved hard work or initial errors. They also believed in the **efficacy of effort**—that is, they viewed effort in a positive way and felt that they had the ability, through their own efforts, to learn and master new material up to standard. When they had difficulty in a subject, they made more constructive, **mastery-oriented explanations**—rather than just saying, "I'm not smart enough," or "I just can't do math," they explained their difficulty as due to lack of effort or inadequate strategy. Then they responded with more **positive, effort-based strategies** to work harder and spend more time on the subject instead of giving up.

Even more striking, students with a growth mindset had an **upward trajectory in mathematics grades** over seventh and eighth grade, while those who viewed their intelligence as a fixed quality did not. This was true even though students had equal levels of prior achievement: students who believed that their intelligence was malleable did better than did equally able students who viewed their intelligence as an unchangeable, fixed quality. This was true for students at all levels of ability (see Figure 1 on the following page).

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Our research, as well as that of others, has shown that students who hold a growth mindset use more sophisticated strategies in their coursework. For example, they use more complex **cognitive and meta-cognitive strategies**–those that involve active and deeper-level processing of material, and self-monitoring of the learning process.

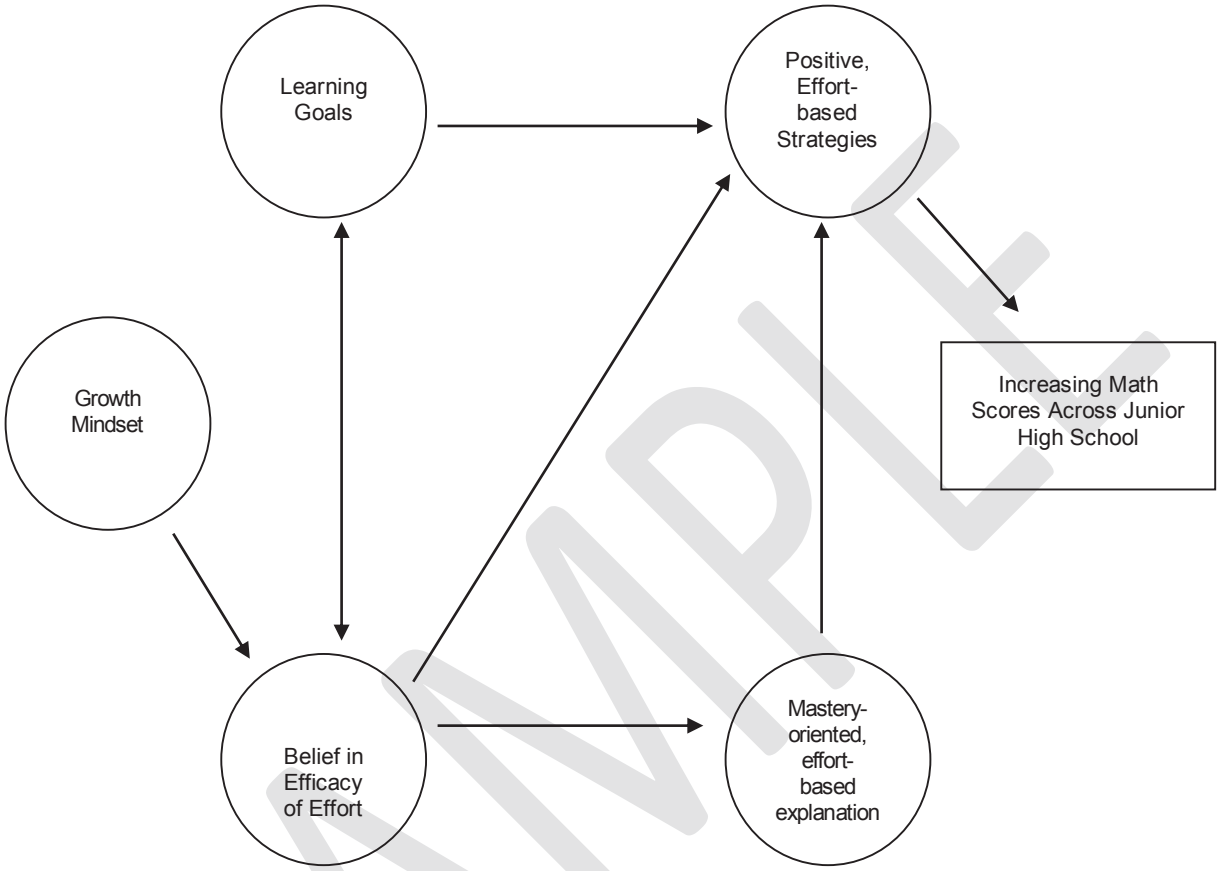

Figure 1. How beliefs and goals promote higher mathematics achievement as shown in prior research.

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Research on Learning and the Brain

In the same period of time, research has shown that the brain is in fact much more malleable than previously thought. It was once believed that the brain did not grow new cells, and that there were severe limitations on the malleability, or **neuroplasticity,** of the brain after early childhood. But in the past few decades, research has shown that learning causes substantial changes in the brains of both animals and human beings throughout life.

Thinking occurs in the brain through the chemical communication of nerve cells connected in a complex network. With learning, the cells of the brain develop new connections between them, and existing connections become stronger. Studies in neurophysiology, neuroanatomy, and brain imaging have shown that when people practice and learn new skills, the areas of the brain responsible for those skills actually become larger and denser with neural tissue, and that new areas of the brain become active when performing related tasks. Furthermore, it has been found that the brain continues to grow new nerve cells, or neurons, daily, and that this process speeds up when a lot of active learning is occurring.

Thus, the brain has the capacity to develop throughout life. However, this development depends on the stimulation of challenge and learning. This fact makes it all the more critical that students be given challenging material and motivated to apply effort and take an active role in learning.

Intervention Approach: Teaching a Growth Mindset

Would it be possible to improve students' motivation and achievement by teaching them a growth mindset? In a pilot study, we did just that by teaching middle school students about what has been learned about the flexibility of the brain to develop and grow new networks with challenge and learning. We then examined changes in their motivation and mathematics achievement over the year of the intervention, comparing them with a similar group of students in the same school who did not receive this intervention.

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Pilot Study Results

Gains in motivation: We asked teachers to assess changes in their students' classroom motivation over the period of the intervention. Note that in the pilot study we taught the growth mindset intervention to students outside of their class periods, and teachers did not participate in the intervention. Thus, teachers were unfamiliar with the content of the intervention, and they did not know which of their students had received instruction in the malleable brain. Yet teachers cited significantly more of the students who had received the growth mindset training as showing positive change in their effort and interest in (see Figure 2).

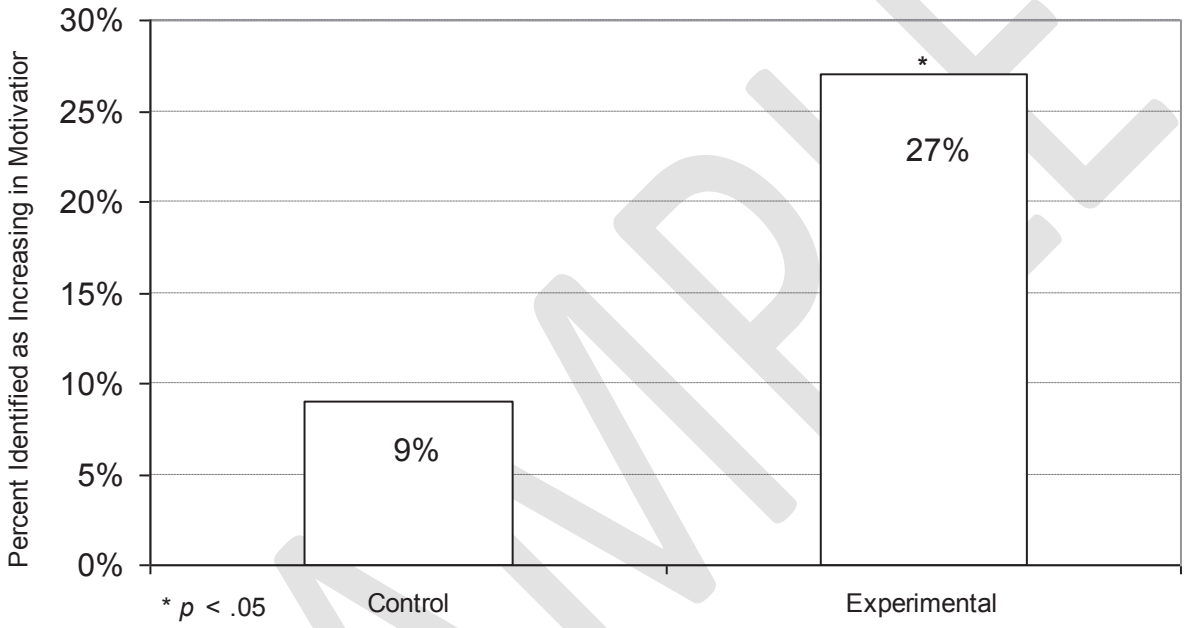

Figure 2. Teacher-rated change in students' classroom motivation (effort, interest in learning) following intervention. (Note: Experimental group was taught lesson on malleable intelligence.)

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Following are some comments from teachers about these students:

"M. was performing far below grade level. During the past few weeks, she has voluntarily asked for extra help from me during her lunch period in order to improve her test-taking performance. Her grades drastically improved from failing to an 84 on the most-recent exam."

"Lately I have noticed that students have a greater appreciation for improvement in academic performance. R. was performing below standards, but now he has learned to appreciate the improvement from his grades of 52, 46, and 49 to his grades of 67 and 71. He valued his growth in learning Mathematics."

"Your workshop has already had an effect. L., who never puts in any extra effort and often doesn't turn in homework on time, actually stayed up late working for hours to finish an assignment early so I could review it and give him a chance to revise it. He earned a B+ on the assignment (he had been getting C's and lower)."

"Several students have voluntarily participated in peer tutoring sessions during their lunch periods or after school. These students were passing when they requested the extra help and motivated by the prospect of sheer improvement."

Gains in Math Achievement: The mathematics grades of all students in the study had been declining prior to the intervention. However, after the intervention, the grades of those students who learned about the growth mindset (experimental group) took an upward turn, while those of their fellow students who did not receive this curriculum continued to decline (see Figure 3.)

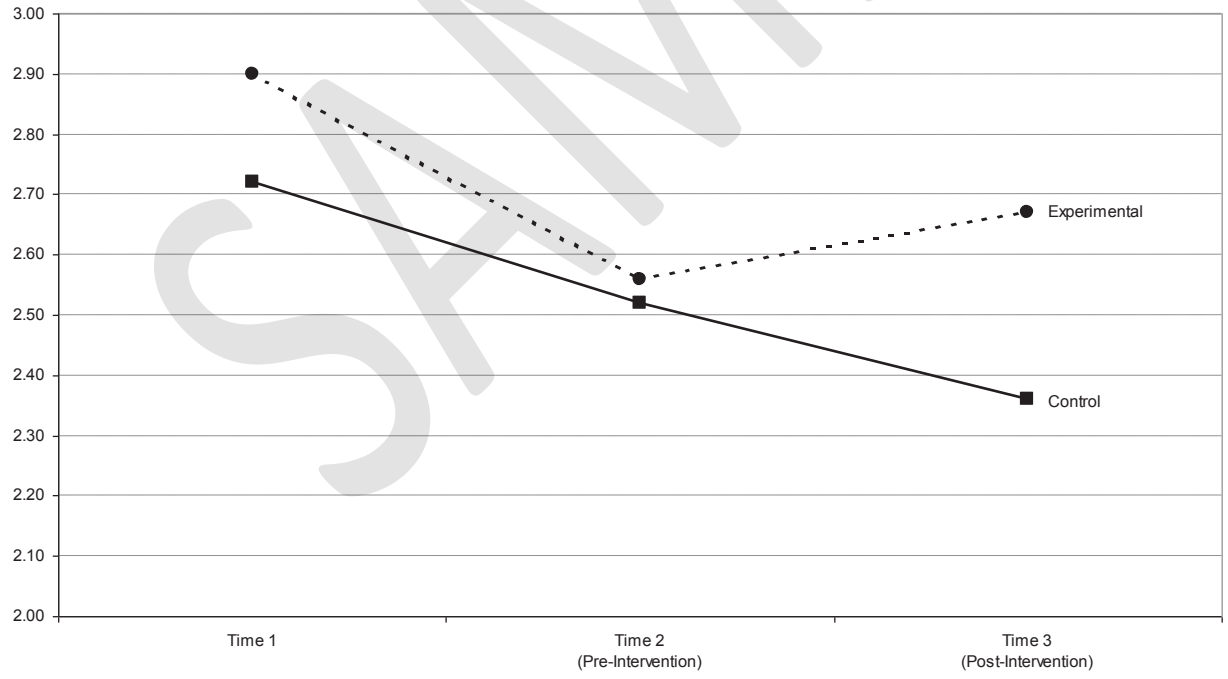

Figure 3. Math grade curves over period of the intervention (T1=spring 6th, T2=fall 7th, T3=spring 7th)

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References

Blackwell, L., Trzesniewski, K., & Dweck, C. (2007). Implicit Theories of Intelligence Predict Achievement Across an Adolescent Transition: A Longitudinal Study and an Intervention. *Child Development, Vol. 78, No. 1*, pp. 246-263.

Dweck, C. (2006). *Mindset: The New Psychology of Success*. Random House: New York.

Acknowledgements

The quoted research was funded by grants from the William T. Grant Foundation and the Spencer Foundation.

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Guiding Your Child to the Growth Mindset

It is important that the adults around the child are well versed on and embrace the growth mindset. They need to be able to guide their children in their everyday life, and model the behavior that the growth mindset advocates.

Of particular relevance to parents is the topic of praise, which we briefly discuss below. If you would like a more in-depth discussion of this and other growth mindset topics, we highly recommend our co-founder Carol Dweck's book *Mindset: The New Psychology of Success*. Additional resources are listed at the end of this section.

The Mindsets

Dr. Carol Dweck's research shows that a person's mindset profoundly affects the way this person leads his or her life. It determines behavior, which has significant consequences.

- **Fixed Mindset:** The belief that one or more of your basic qualities are set in stone. This mindset creates an urgency to prove yourself over and over by undertaking efforts with low risk and high probability of success. Students with a fixed mindset will frequently lose interest in a subject when it becomes difficult.
- **Growth Mindset:** The belief that your basic qualities can be cultivated through your own effort and that we don't know the upper bounds of what anyone can accomplish with years of passion, toil and training.

The Danger of Praise

No parent thinks "I wonder what I can do today to undermine my children, subvert their effort, turn them off learning, and limit their achievement." Of course not! They think "I would do anything, and give anything, to make my children successful." Yet many of the things they do boomerang. Their helpful judgments, their lessons, their motivating techniques often send the wrong message. In fact, every word and action sends a message. It tells children – or students or athletes – how to think about themselves. It can be a fixed mindset message that says: "You have permanent traits and I'm judging them." Or it can be a growth mindset message that says: "You are a developing person and I am interested in your development."

Messages About Success

Listen for the messages in the following examples:

- "You learned that so quickly! You're so smart!"
- "Look at that drawing. Martha, is he the next Picasso or what?"
- "You're so brilliant, you got an A without even studying!"

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If you're like most parents, you hear these as supportive, esteem-boosting messages. But listen more closely. See if you can hear other messages, the ones that children hear:

- "If I don't learn something quickly, I'm not smart."
- "I shouldn't try drawing anything hard or they'll see I'm no Picasso."
- "I'd better quit studying or they won't think I'm brilliant."

Messages About Failure

Nine-year-old Elizabeth was on her way to her first gymnastics meet. Lanky, flexible, and energetic, she was just right for gymnastics, and she loved it. Of course, she was a little nervous about competing, but she was good at gymnastics and felt confident of doing well. She had even thought about the perfect place in her room to hang the ribbon she would win.

In the first event, the floor exercises, Elizabeth went first. Although she did a nice job, the scoring changed after the first few girls and she lost. Elizabeth also did well in the other events, but not well enough to win. By the end of the evening, she had received no ribbons and was devastated. What would you do if you were Elizabeth's parents?

1. Tell Elizabeth you thought she was the best.
2. Tell her she was robbed of a ribbon that was rightfully hers.
3. Reassure her that gymnastics is not that important
4. Tell her she has the ability and will surely win next time.
5. Tell her she didn't deserve to win.

There is a strong message in our society about how to boost children's self-esteem, and a main part of that message is: protect them from failure! While this may help with the immediate problem of a child's disappointment, it can be harmful in the long run. Why? Let's look at the five possible reactions from a mindset point of view and listen to the messages:

- The first (you thought she was the best) is basically insincere. She was not the best – you know it, and she does too. This offers her no recipe for how to recover or how to improve.
- The second (she was robbed) places blame on others, when in fact the problem was mostly with her performance, not the judges. Do you want her to grow up blaming others for her deficiencies?
- The third (reassure her that gymnastics doesn't really matter) teaches her to devalue something if she doesn't do well in it right away. Is this really the message you want to send?
- The fourth (she has the ability) may be the most dangerous message of all. Does ability automatically take you where you want to go? If Elizabeth didn't win this meet, why should she win the next one?
- The last option (tell her she didn't deserve to win) seems hardhearted under the circumstances. And of course you wouldn't say it quite that way. But that's pretty much what her growth-minded father told her.

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Healthy Praise

After seven experiments with hundreds of children, we have clear findings that praising children's intelligence lessens their motivation and harms their performance. Instead of praising talent and intelligence, focus on your child's effort and behavior. For example: rather than saying, "You are very smart for getting an A in math", you can say "You must have tried very hard to get an A in math." This puts the praise on the effort and the behavior rather than on the outcome, the A in math. Upon failure, you could say "I know how you feel. It's disappointing to have your hopes up and to perform your best but not make the squad, but it happens to everybody and we must take it as a learning experience. If this is something that you really want, then it's something you'll really have to work for, as with everything else in life. We can try different approaches and learn from them to find the way to success." This approach allows you to console and empathize with your child. It also gives your child the opportunity to grow from her failure and teaches her that through hard work and effort she can undertake lifelong learning and self-improvement.

Additional Resources

For additional resources on these topics you may want to read:

- Dr. Carol Dweck's book Mindset: The New Psychology of Success, which includes a chapter on Parents, Teachers and Coaches. The book's website is http://www.mindsetonline.com/
- A summary of the research that led to Brainology: http://www.brainology.us/websitemedia/info/brainology_intro_pres.pdf
- How Not to Talk to Your Kids: The inverse power of praise, New York Magazine cover article, Feb. 17 2007: http://nymag.com/news/features/27840/
- The Secret to Raising Smart Kids, Scientific American, Dec. 2007: http://www.sciam.com/article.cfm?id=the-secret-to-raising-smart-kids

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Technical Support

Technology Requirements: The Brainology® curriculum requires a computer with an Internet connection and a means for the children to listen to the computer audio (i.e. headphones or speakers). A broadband Internet connection is preferred but the program will also work with a slow Internet connection after a few minutes of preloading. The program is accessed with any browser with the Adobe Flash Player version 8 or higher (which is freely available from http://get.adobe.com/flashplayer/ and already installed in 98%+ of computers).

Enrolling in the Program

Step 1: Create your Parent user account

The first step is for you, as the adult parent or educator, to create your own account. To do this, go to www.mindsetworks.com, go to **Sign Up** in the top right corner of the page, select parent, and follow the prompts to create your account. If you already have a username and password to log into our website, please move to Step 2 below.

Step 2: Gain access to your program

After purchasing Brainology for Home, you will automatically be enrolled in the program and redirected to **My Account**. In **My Programs** you can view curriculum guides and resources, as well as launch the Brainology program for your own viewing. It is *very important* to continue on to the next step so your child has access to Brainology in a student account. This will allow them to access Student Resources and allow you to view their progress in the program.

Step 3: Give your child access to Brainology

There are two options to register your child. Option 1 is easiest for home implementations.

Option 1: Your child will choose his or her own username and password to access the program, but first you'll need to set up a class in **My Students** to generate a **Class Code**.

How to generate the **Class Code**:

1. After logging in, click on **My Account** in the top right corner of the page, then go to **My Students**.
2. Select **"+Add New Class"**. Enter a descriptive name (e.g. "The Smith family") and save.
3. The creation of the class generates a **Class Code**. You can give this code to your child so that he or she can set up his or her own account. Children can create their own accounts by going to our homepage and clicking **Sign Up**, on the top right of the page. (You may need to log out first.) If you'd like, you can print out the following page for them to follow the instructions, and **be sure to write down your child's username and password just in case they are forgotten.**

Option 2: For families with multiple children, you can complete the batch upload method in the **My Students** section. You will find instructions on the webpage, accessed from **+Add New Class** or **Add Students** links.

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For Students: How to enroll in Brainology with a Class Code

Once your parent or teacher gives you a **Class Code** to enroll in Brainology®, follow these steps to create your own username and password and launch Brainology!

1. Go to the Brainology home page, http://www.mindsetworks.com.
2. On the top right corner of the page, click on **Sign Up**. If you don't see an option to **Sign Up**, click **Log Out** on the top right corner of the page, and then click **Sign Up**.
3. Select the **Student** button.
4. Enter the **Class Code** that your parent or teacher provided to you.
5. Fill out your information on the next page, choosing a username and password that you will easily remember, and then click **Continue**.
6. Please write down your username and password so you don't forget them! Write them in the space below or on a different piece of paper and keep it in a safe place.
7. To launch the program, click on "**Go to Brainology**!"
8. There are also additional resources and tools for you to check out in the **My Programs**, **My Resources**, and **Help** sections of **My Account**.
9. We hope you enjoy it and learn a lot!!!

Log-in Reminder for Student to keep:

Name:_____

Username:_____

Password:_____

To log in, go to www.mindsetworks.com

Log-in Reminder for Parent to keep:

Name:_____

Username:_____

Password:_____

To log in, go to www.mindsetworks.com

Log-in Reminder to Give to Teacher:

Name:_____

Username:_____

Password:_____

To log in, go to www.mindsetworks.com

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Launching the Program & Introduction to the Tools

To launch the program, go to www.mindsetworks.com, log in, click on **My Account** in the top right corner of the page, then click the orange button to **Launch Brainology Now**. Chris & Dahlia will explain how to use the program and guide you throughout the program, but if you get stuck on anything, here is a quick picture-based guide to the tools in the program:

Figure 1: Use the E-Journal to record your reflections and challenges

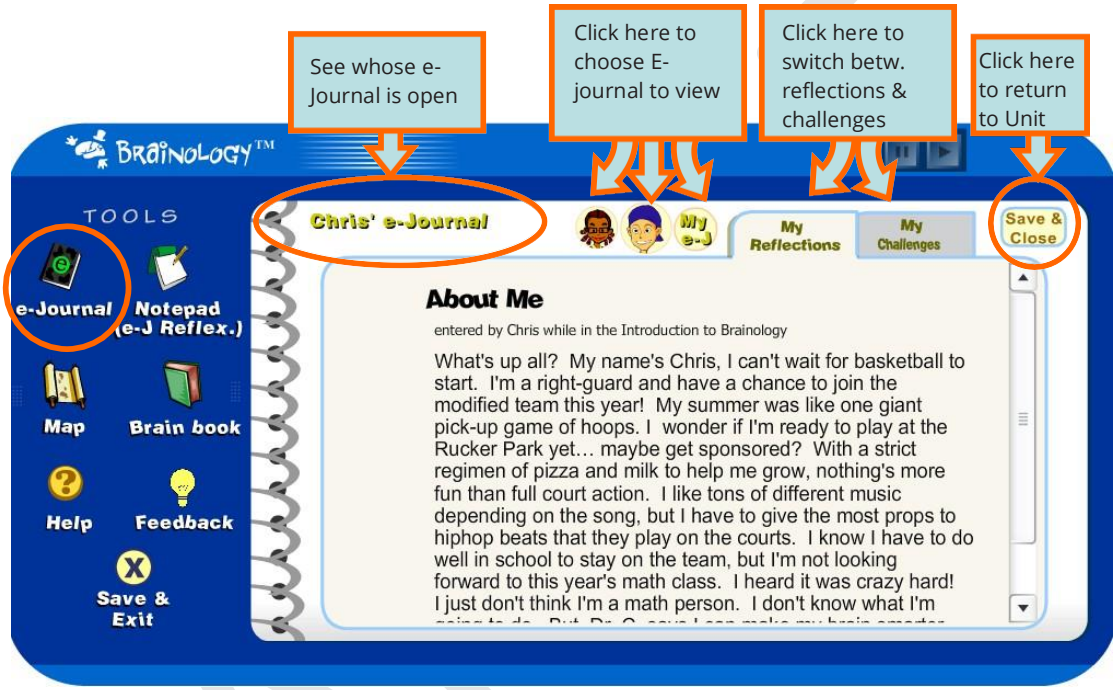

Figure 2: The E-Journal with your reflections selected

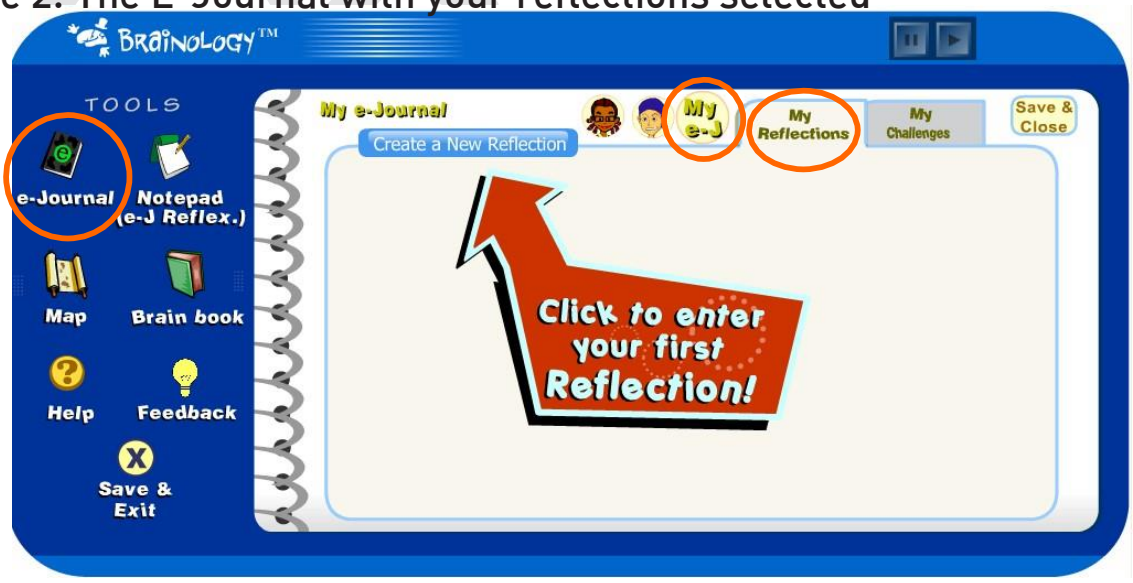

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Figure 3: The Notepad is another (very quick) way to enter E-Journal reflections without leaving the main units.

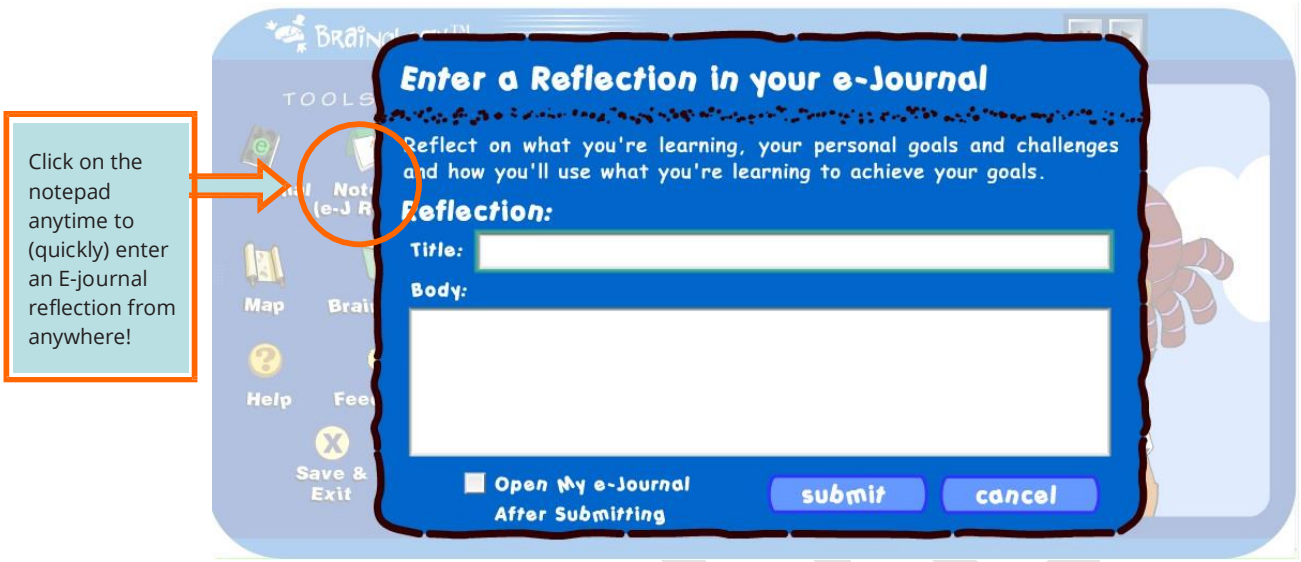

Figure 4: Use the Map to navigate and revisit prior sections

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Figure 5: Use the Brain Book to further research what you are learning

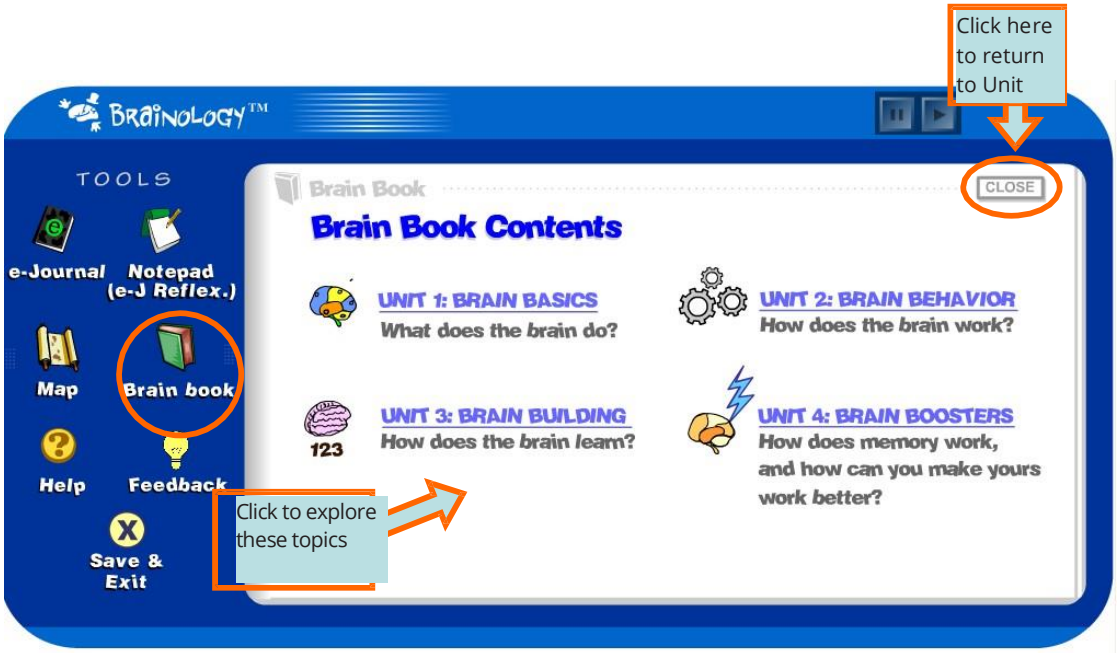

Figure 6: If you need help, click Help!

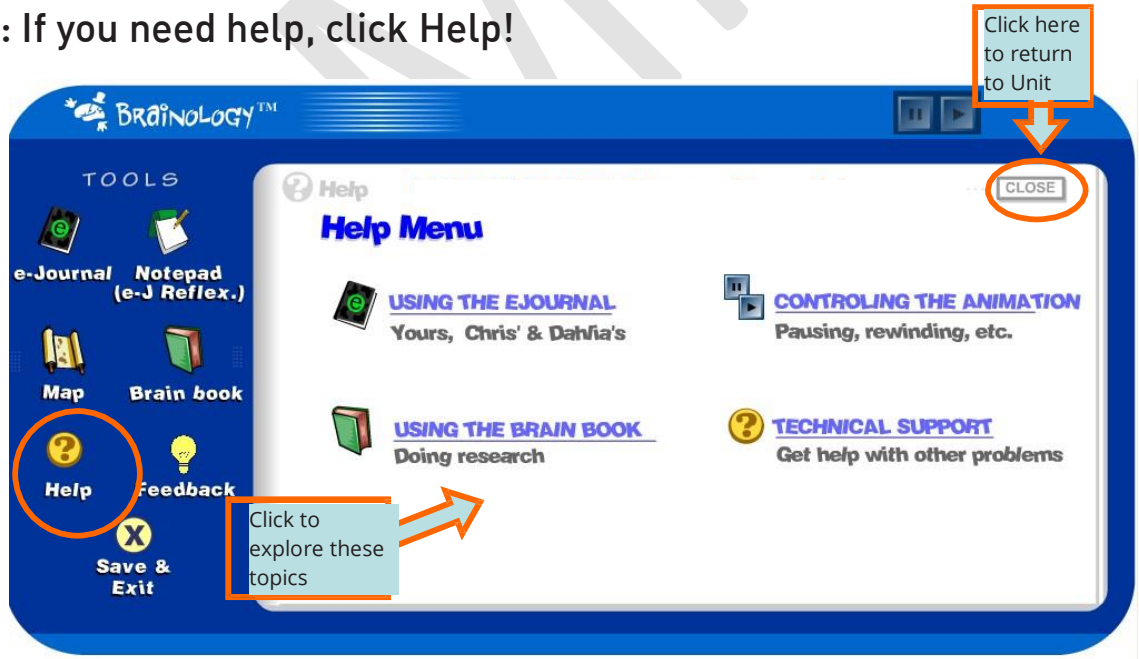

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Figure 7: Click on Feedback to send us any feedback

Figure 8: When you're done, click Save & Exit

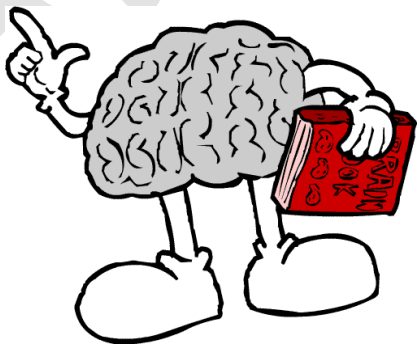
Customer Support & Feedback

If you have any questions or run into any issue, please contact us anytime at support@mindsetworks.com. We also always appreciate your feedback at feedback@mindsetworks.com.

Thank you for your support! We look forward to serving you and hope that Brainology® is very helpful!

BRAINOLOGY®

Introductory Unit



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Introductory Unit

Unit Goal

In this unit, children are introduced to the Brainology® online program and resources. Children and parents learn about malleable intelligence through reading and discussion activities.

Key Challenge

Children don't understand or believe that intelligence can grow and change through effort and practice.

Main Information from Introductory Level of the Online Program

- Brainology® helps students develop a growth mindset by teaching them how the brain functions, learns, and remembers, and how it changes physically when we exercise it through study and learning.
- Brainology® is designed as a blended learning curriculum combining a challenge-based, interactive multimedia online program and in-home activities.
- In the online program, consisting of an introduction plus four 30-minute units, students follow animated teenaged characters Chris and Dahlia to learn about the basic structure and function of the brain and how to improve their study habits and skills in light of this knowledge.
- The Introductory Level introduces students to the main characters and shows them how to get around in the online environment. They also practice using tools, such as the e-journal and Brain Book.
- The in-home activities provide opportunities to reinforce, apply, and practice what students learn in the online component. The goal is for them to understand that the development of their mental ability is largely within their own control and to provide them with study habits and skills that will help them take action.

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Discussion Activities

These discussion activities are ideas to get you started, and ways to reinforce the concepts that your child is learning. Discussions should take place after each interactive lesson, or during other time throughout the week. Or, you may ask your child to write about these questions and then share their responses.

On Intelligence:

- What is intelligence?
- Do all humans have equal intelligence? How do we know?
- What are the most "intelligent" animals on Earth?
- What are the best ways to measure intelligence? How do we know?

On Mindset:

- Are there some subjects where you don't feel confident that you can learn and do well?
- How do you think it feels to get a bad grade if you believe that you can't do any better?
- Can you think of a time when you learned to do something really hard? How did you learn it? Was it worth it?
- What would you be willing to work hard to achieve if you knew it was possible?
- If you knew that you could develop your intelligence through effort, what goals would you set for yourself?

Reinforcement Strategies

Child Feedback:

Use opportunities at home to praise your child for exhibiting a growth mindset whenever possible. Responses to encourage a growth mindset include the following:

- I really like the effort you are putting into studying/reading/practicing a skill (piano, basketball, skateboarding, gymnastics, etc.).
- Great job using different strategies (reading, watching an online video, asking a friend for help) to learn a new skill or new information.
- When you choose to do challenging things, your brain will grow!
- Thanks for asking for help when you got stuck! I am glad you didn't give up.
- I can tell that you learned from your mistake.
- What can this mistake teach you so that you can do better next time?

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Concrete Strategies:

- Talk to your child about why they will be completing the Brainology Program. Include some of the following points in your discussion:
    - Everyone knows that when you lift weights regularly, your muscles get bigger and you get stronger. Learning new things is like lifting weights. Brainology will help you understand that your brain is like a muscle, and the more you work it out, the stronger it gets.
    - How is lifting weights like learning new things? In order to get smarter, should you keep practicing things you already know how to do, or should you challenge your brain to learn new things? Brainology will help you learn new strategies for tackling challenges.
    - Do you remember a time when you worked extremely hard on something that was difficult, but after practice and effort you were able to succeed? Tell me about it. What specific strategies did you use to succeed? How did you feel when you were successful? Was it worth the effort? Brainology will teach you specific strategies to grow your brain, get better at learning new things, and have fun mastering challenging material.

- Reflecting on challenges is a great way to gauge your child's current mindset and look for opportunities to shift into growth-minded thinking. Ask your child to talk with you or write in response to one of the following prompts:
    - What is the biggest challenge you are facing today? Explain why and how this is challenging for you. What do you plan to do to overcome your challenge?
    - What is a problem you are dealing with right now? If someone were giving you advice about how to solve your problem, what do you think they would say?
    - What is a problem or issue you are dealing with right now? If a friend had the same problem, what advice would you give your friend? Why?

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Introductory Unit Activity 3, "Practice It": You Can Grow Your Intelligence

Description: An introductory article about brain science with a follow up activity

Objective: Children will learn about the concept of expandable intelligence.

Timeline: Approximately 30 min.

Instructions: There are 2 versions of the article: Option A (*Plain Text Version*) and Option B (*Interactive Text Version*). Choose the one most appropriate for your learners.

Instructions for Option A *(Plain Text Version):*

1. To activate children's prior knowledge, ask them to generate research questions about intelligence. Record the research questions on chart paper. (Some examples are below.)
   - What is intelligence?
   - Do all humans have equal intelligence? How do we know?
   - What are the most "intelligent" animals on Earth?
   - What are the best ways to measure intelligence? How do we know?
2. Ask your children if they would like to learn how to grow their intelligence, and explain that they will be reading research today about how to grow their intelligence.
3. Children will draw 6 pictures to help their brains add this new information to their long-term memories.
4. Pass out copies of the worksheet and discuss non-linguistic representations of concepts (drawings) as a way to process and remember a new idea. You can connect the idea to the saying, "a picture is worth a thousand words" and remind children that the brain has an amazing ability to remember pictures.
5. Read the first section together and model the drawing and the response to the first one.
6. Ask your child to read silently the next section and complete the second drawing.
7. Have your child check for understanding using these frames:
   - I made a connection to the article when I read… because…
   - The article explores my research question… when it talks about…
   - The article raises a new question for me, which is… because…

Differentiating Instruction:
Option A – *Content & Process*

This lesson contains content intended for On-Level and Advanced Learners. The text is chunked by use of the graphic organizer. Much of the lesson requires the student to read the text independently, but discuss ideas as a class. There are scaffolding suggestions as well as extension opportunities.

BACK TO CONTENTS

Instructions for Option B *(Interactive Text Version):*

1. To activate your child's prior knowledge, ask them to generate research questions about intelligence. Record the research questions on chart paper. (Some examples are below.)

    - What is intelligence?
    - Do all humans have equal intelligence? How do we know?
    - What is animal intelligence measured as compared to human intelligence?
    - What are the most "intelligent" animals on Earth?
    - What are the best ways to measure intelligence? How do we know?
    - What are some people more intelligent than others?

2. Ask children if they would like to learn how to grow their intelligence, and explain that they will be learning today how to grow their intelligence.

3. Pass out the copies of the Interactive Text and read together as your child completes the prompts and thought bubbles.

Differentiating Instruction:
Option B – Content & Process

This lesson contains content intended for Below-Level Learners. The text is chunked throughout the article with built-in processing boxes and language response frames. The process is best delivered with some read-alouds by the parent and child taking turns.

Brainology® Intro Unit Activity 3 "Practice It" Handout

You Can Grow Your Intelligence

New Research Shows the Brain Can Be Developed Like a Muscle

Many people think of the brain as a mystery. They don't know much about intelligence and how it works. When they do think about what intelligence is, many people believe that a person is born either smart, average, or dumb—and stays that way for life.

But new research shows that the brain is more like a muscle—it changes and gets stronger when you use it. And scientists have been able to show just how the brain grows and gets stronger when you learn

Everyone knows that when you lift weights, your muscles get bigger and you get stronger. A person who can't lift 20 pounds when they start exercising can get strong enough to lift 100 pounds after working out for a long time. That's because the muscles become larger and stronger with exercise. And when you stop exercising, the muscles shrink and you get weaker. That's why people say "Use it or lose it!"

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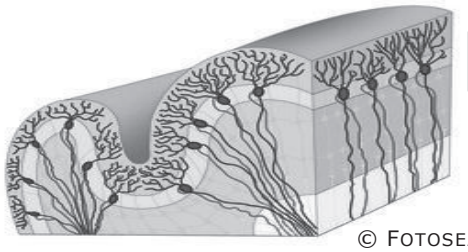
But most people don't know that when they practice and learn new things, parts of their brain change and get larger a lot like muscles do when they exercise.



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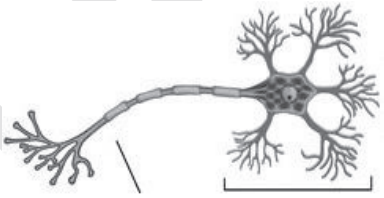
A section of the cerebral cortex

Inside the cortex of the brain are billions of tiny nerve cells, called neurons. The nerve cells have branches connecting them to other cells in a complicated network. Communication between these brain cells is what allows us to think and solve problems.



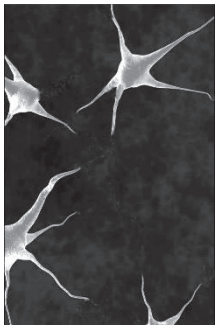
A typical nerve cell

When you learn new things, these tiny connections in the brain actually multiply and get stronger. The more that you challenge your mind to learn, the more your brain cells grow. Then, things that you once found very hard or even impossible to do—like speaking a foreign language or doing algebra—seem to become easy. The result is a stronger, smarter brain.

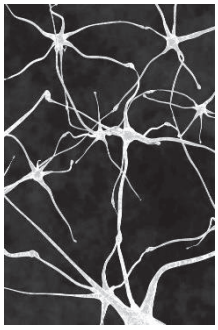
How Do We Know the Brain Can Grow Stronger?

Scientists started thinking that the human brain could develop and change when they studied animals' brains. They found out that animals who lived in a challenging environment, with other animals and toys to play with, were different from animals who lived alone in bare cages.

While the animals who lived alone just ate and slept all the time, the ones who lived with different toys and other animals were always active. They spent a lot of time figuring out how to use the toys and how to get along with the other animals.



Nerves in brain of animal living in bare cage



Brain of animal living with other animals and toys

Effect of an Enriched Environment

These animals had more connections between the nerve cells in their brains. The connections were bigger and stronger, too. In fact, their whole brains were about 10% heavier than the brains of the animals who lived alone without toys.

The animals who were exercising their brains by playing with toys and each other were also "smarter"—they were better at solving problems and learning new things.

Even old animals got smarter and developed more connections in their brains when they got the chance to play with new toys and other animals. When scientists put very old animals in the cage with younger animals and new toys to explore, their brains also grew by about 10%!

Children's Brain Growth

Another thing that got scientists thinking about the brain growing and changing was babies. Everyone knows that babies are born without being able to talk or understand language. But somehow, almost all babies learn to speak their parents' language in the first few years of life. How do they do this?

The Key to Growing the Brain: Practice!

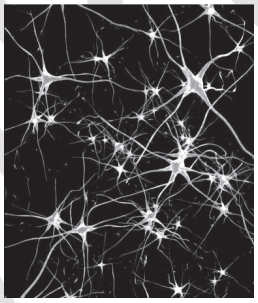
From the first day they are born, babies are hearing people around them talk—all day, every day, to the baby and to each other. They have to try to make sense of these strange sounds and figure out what they mean. In a way, babies are exercising their brains by listening hard.

Later, when they need to tell their parents what they want, they start practicing talking themselves. At first, they just make goo-goo sounds. Then, words start coming. And by the time they are three years old, most can say whole sentences almost perfectly.

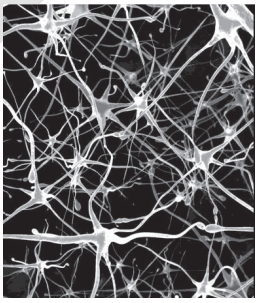
Once children learn a language, they don't forget it. The child's brain has changed—it has actually gotten smarter.

This can happen because learning causes permanent changes in the brain. The babies' brain cells get larger and grow new connections between them. These new, stronger connections make the child's brain stronger and smarter, just like a weightlifter's big muscles make them strong.

Growth of neuron connections in a child from birth to 6 years old



At birth



At age 6

The Real Truth About "Smart" and "Dumb"

No one thinks babies are stupid because they can't talk. They just haven't learned how to yet. But some people will call a person dumb if they can't solve math problems, or spell a word right, or read fast—even though all these things are learned with practice.

At first, no one can read or solve equations. But with practice, they can learn to do it. And the more a person learns, the easier it gets to learn new things—because their brain "muscles" have gotten stronger!

The students everyone thinks as the "smartest" may not have been born any different from anyone else. But before they started school, they may have started to practice reading. They had already started to build up their "reading muscles." Then, in the classroom, everyone said, "That's the smartest student in the class."

They don't realize that any of the other students could learn to do as well if they exercised and practiced reading as much. Remember, all of those other students learned to speak at least one whole language already—something that grownups find very hard to do. They just need to build up their "reading muscles" too.

What Can You Do to Get Smarter?

Just like a weightlifter or a basketball player, to be a brain athlete, you have to exercise and practice. By practicing, you make your brain stronger. You also learn skills that let you use your brain in a smarter way—just like a basketball player learns new moves.

But many people miss out on the chance to grow a stronger brain because they think they can't do it, or that it's too hard. It does take work, just like becoming stronger physically or becoming a better ball player does. Sometimes it even hurts! But when you feel yourself get better and stronger, all the work is worth it!

E-mail questions or comments to:
support@mindsetworks.com

Brainology® Intro Unit Activity 3, "Practice It": Plain Text Version - Option A Handout

"You Can Grow Your Intelligence"

Directions: 1) Read each numbered section. **2)** Draw a picture that represents the main ideas in that part of the article. **3)** Fill in the sentence frames to explain how your picture represents the idea.

1

This picture of a _____ represents the main idea because

_____

_____

_____

_____

_____.

2

My picture represents the branches (dendrites) growing between brain cells because

_____

_____

_____

_____

_____.

3

My picture represents the difference between animals who had toys and stimulation and those animals that did not because

_____

_____

_____

_____

_____.

4

The way babies learn to speak is represented in my picture because

_____

_____

_____

_____

_____

_____.

5

Everyone has a brain that can be exercised, and what I drew shows

_____

_____

_____

_____

_____

_____.

6

Summary: Things that I learned from this article are

_____

_____

and are represented by my picture because_____

_____

_____

_____

_____.

Brainology® Intro Unit Activity 3, "Practice It": Interactive Text Version - Option B

You Can Grow Your Intelligence

New Research Shows the Brain Can Be Developed Like a Muscle

Many people think of the brain as a mystery. They don't know much about intelligence and how it works. When they do think about what intelligence is, many people believe that a person is born smart, average, or dumb—and stays that way for life.

What do YOU think??

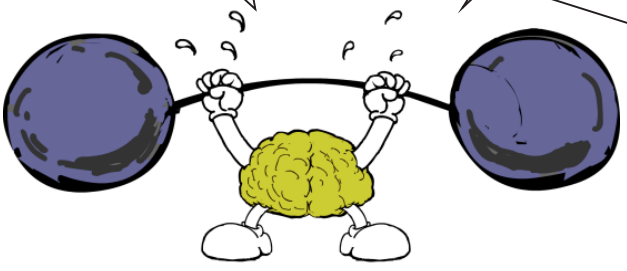
GUESS WHAT?

New research shows that the brain is more like a muscle—it ***changes*** and ***gets stronger*** when you use it!

Everyone knows that when you lift weights regularly, your muscles get bigger and you get stronger.

But what happens to your muscles when you STOP lifting weights?

I think that when you stop lifting weights….



That's why people say, *"Use it or lose it!"*

Most people **don't know** that when they practice and learn new things, part of their brain changes, grows, and gets stronger and larger, a lot like muscles do when they exercise.

Scientists have actually been able to **show** just how the brain grows and gets stronger when you learn.

So here is an analogy: Muscle is to exercise as the brain is to _____.

In other words… Muscles will grow with exercise and the brain will grow with_____.

Here's the secret:

Inside the cortex of the brain are billions of tiny nerve cells called neurons. The nerve cells have branches connecting them to each other in a complicated network. Communication between these brain cells is what allows us to think and solve problems.

When you learn new things, these tiny connections in the brain actually **multiply** and get **stronger**.

The more that you challenge your mind to learn, the more neuron connections you make in your brain.

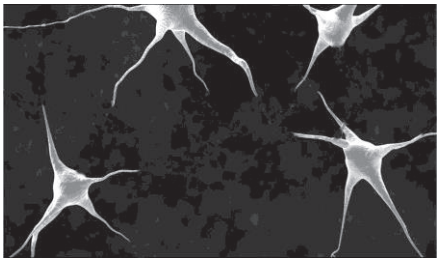
If you continue to strengthen these connections, things that you once found very hard to do—like remembering information for a test or doing algebra—seem to become easy. The result is a stronger, smarter brain.

Use the information you have just read to complete the organizer below

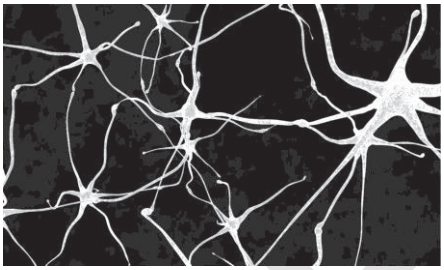
IF…	→	THEN…

The Secret…. continued

Scientists started thinking that the human brain could develop and change when they studied animals' brains. They found out that animals who lived in a challenging environment, with other animals and toys to play with, were different from animals who lived alone in bare cages.



Brain of animal living in bare cage
(non-stimulating environment)

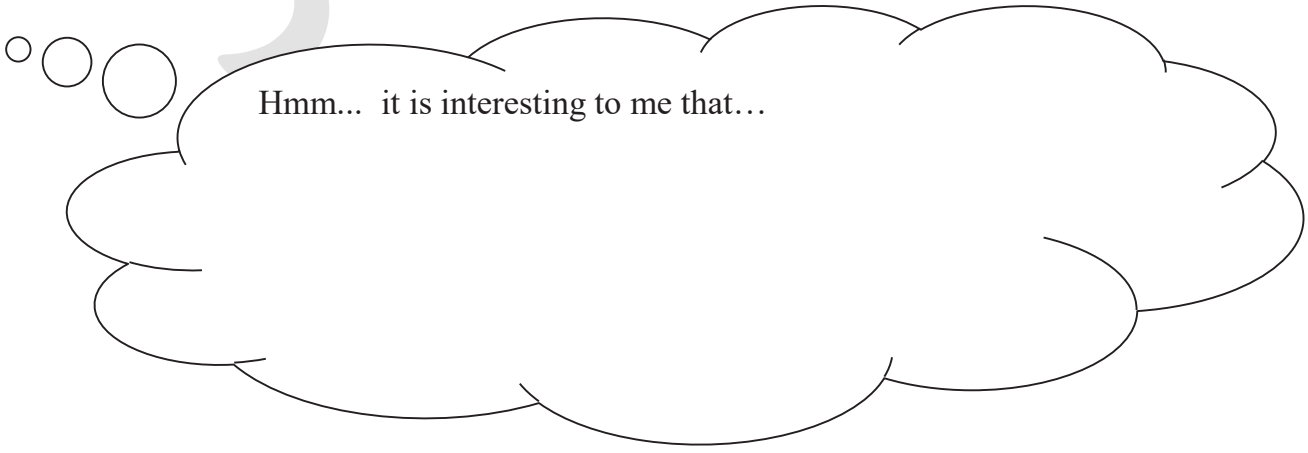


Brain of animal living with other animals and toys
(stimulating environment)

While the animals that lived alone just ate and slept all the time, the ones that lived with different toys and other animals spent a lot more time figuring out how to use the toys and how to get along with other animals.

The animals who lived in the stimulating environment had more connections between nerve cells in their brains. The connections were bigger and stronger, too. In fact, their whole brains were about 10% heavier than the brains of the animals who lived alone without toys. The animals who were exercising their brains by playing with toys and each other were also "smarter"—they were better at solving problems and learning new things.

Even old animals got smarter and developed more connections in their brains when they got a chance to play with new toys and other animals. When scientists put very old animals in cages with younger animals and new toys to explore, their brains grew by about 10%.



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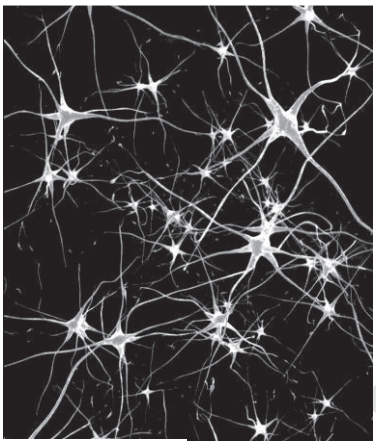
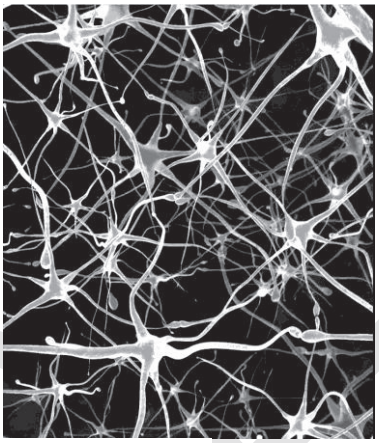
Neuron connections in a child from birth to 6 years old



At birth

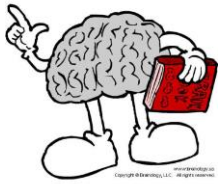


At age 6

Do you think this child developed strong language skills by the age of six? Why or why not?	How do you think this child grew all of those neuron connections and pathways?

The Real Truth about "Smart" and "Dumb"

No one thinks babies are stupid because they can't talk. They just haven't learned how to yet. But some people will call a person dumb if they can't solve math problems, or spell a word right, or read fast—even though all these things are learned with practice. At first, no one can read or solve equations. But with practice, they can learn to do it. And the more a person learns, the easier it gets to learn new things—because their brain "muscles" have gotten stronger!



What Can YOU Do to Get Smarter?

Just like a weightlifter or a basketball player, you have to exercise and practice to make your brain grow stronger. By practicing, you also learn skills that let you use your brain in a smarter way—just like a basketball player learns new moves.

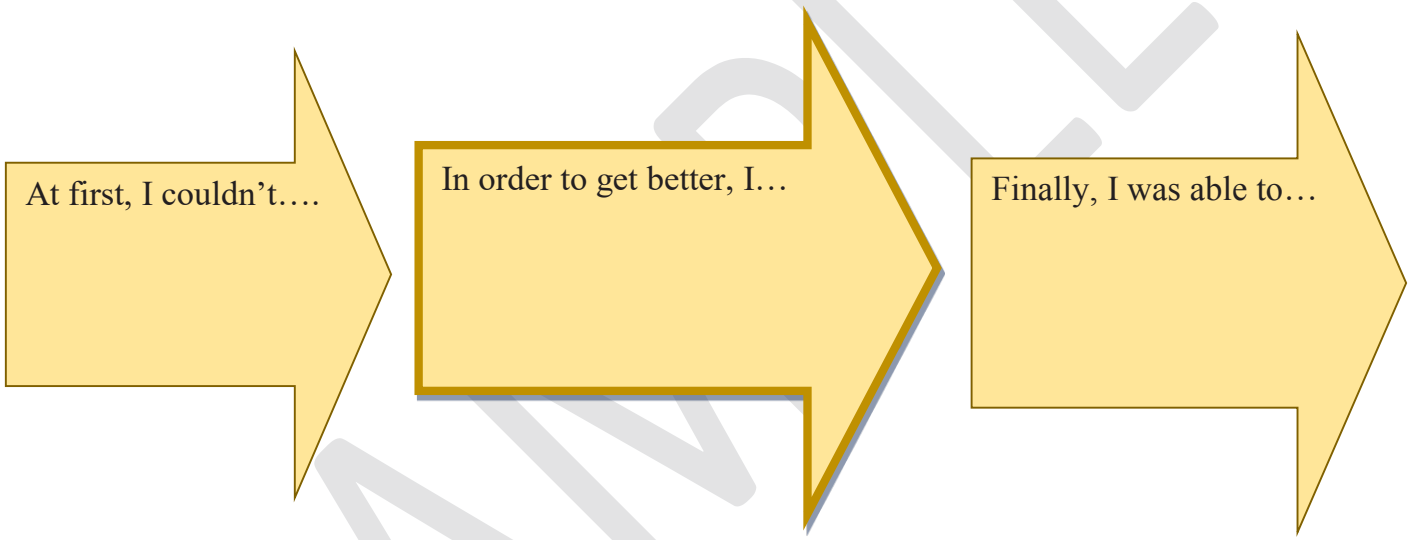
Why doesn't EVERYBODY do this?

Many people miss out on the chance to grow a stronger brain because

- they think they can't do it
- they think it's too hard
- they think it's too much work

Can you relate?

Reflection: Remember a time when you worked extremely hard on something that was at first difficult, but after practice and effort you were able to succeed.



How did you feel when you were successful?	Was it worth the effort? Explain.

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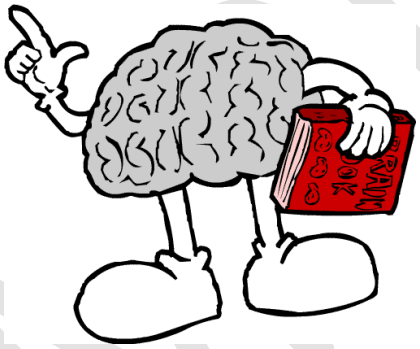
Customer Support & Feedback

If you have any questions or run into any issue please contact us anytime at support@mindsetworks.com or 888-344-6463. We also always welcome your questions, comments and ideas on what we can do to better serve you. Please send them to us at feedback@mindsetworks.com.

We look forward to serving you and hope that Brainology® is very helpful to you and your child(ren).



About Mindset Works

Mindset Works was co-founded by one of the world's leading researchers in the fie d of motivation, Stanford University professor Carol S. Dweck, Ph.D. and K-12 mindset expert Lisa S. Blackwell, Ph.D. The company translates psychological research into practical products and services to help students and educators increase their motivation and achievement.

Our award-winning interactive program provides students, parents and educators with a better approach to learning.

Brainology® is a fun, interactive, award-winning, online program that helps middle school students learn about how the brain works, how to strengthen their own brains and how to better approach their own learning. In the process, the Brainology® program helps them cultivate a growth mindset whereby they think of their intelligence as something they can develop through study and learning rather than as something fi ed. The core belief in the malleability of the mind triggers motivation and learning-oriented behavior in various aspects of life.

mindset works®

Visit www.mindsetworks.com for more growth mindset resources, tools, articles, and videos. Contact us at info@mindsetworks.com.

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