



BRAINOLGY[®]

FOR SCHOOLS



Sample
Implementation Guide

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 classroom activities. Brainology® for Schools also comes with a Spanish language option: Brainology® en Español!



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 activities.



MindsetMaker™ Online Professional Development

This online Professional Development course for teachers provides tools and resources needed to shift teachers' practice and cultivate a growth mindset culture of teaching and learning within their classroom.



GEM™ Growing Early Mindsets™

Growing Early Mindsets™ (GEM™) is an early learning curriculum designed to integrate growth mindset into the PreK-3 classroom.



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.



Live Training

Our professional learning specialists deliver engaging, high-quality talks and workshops to help your school or district learn how to cultivate a growth mindset culture. Using reflection, discussion, activities, games, videos, and practical tools and resources, we can promise an interactive session that has lasting impact for both immediate and future change.



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.



Learn more about Mindset Works® programs at:

www.mindsetworks.com

Brainology® Curriculum: Teaching a Growth Mindset

What are mindsets?

Mindsets are the beliefs that people hold about their attributes. When people believe that their attributes—such as intelligence—are unchangeable, they hold a **fixed mindset**. When they believe that these attributes can be developed through learning, they hold a **growth mindset**.

Decades of research by Dr. Carol Dweck and colleagues show that when people understand that they can develop their intelligence through learning, they are motivated to seek challenge, value learning, invest effort, and persist through difficulty—and they achieve more highly. Furthermore, the growth mindset can be taught.

What is Brainology®?

Brainology® is a research-based method for teaching students a growth mindset, along with the tools to put it into practice. The Brainology® curriculum combines online, interactive animation with classroom-based activities to teach students how the brain changes with learning, and how they can use brain-based study strategies to accelerate their progress.

How do I get started?

The Brainology® Implementation Guide will walk you through the process. It is organized in 3 sections, as follows:

- **Get Ready!** provides an overview of the purpose and structure of the Brainology® Curriculum.
- **Get Set!** provides recommendations and tools for planning, and technical instructions on how to implement the program.
- **Go!** provides step-by-step guidance on teaching Brainology® in the classroom. The Go! section provides a general overview of the units, then chunks each unit, providing its overview and goals, lesson plans, and reproducibles to use with students.

On the next page, you will find a summary of materials in each section.

Summary of Materials

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BRAINOLGY®

FOR SCHOOLS

Building Students' Confidence, Fulfillment, and Achievement Through the Understanding of Expandable Intelligence



Get Ready!

Part I. Curriculum Overview:
Research Foundations &
Curriculum Introduction

GET READY! Curriculum Overview

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SAMPLE

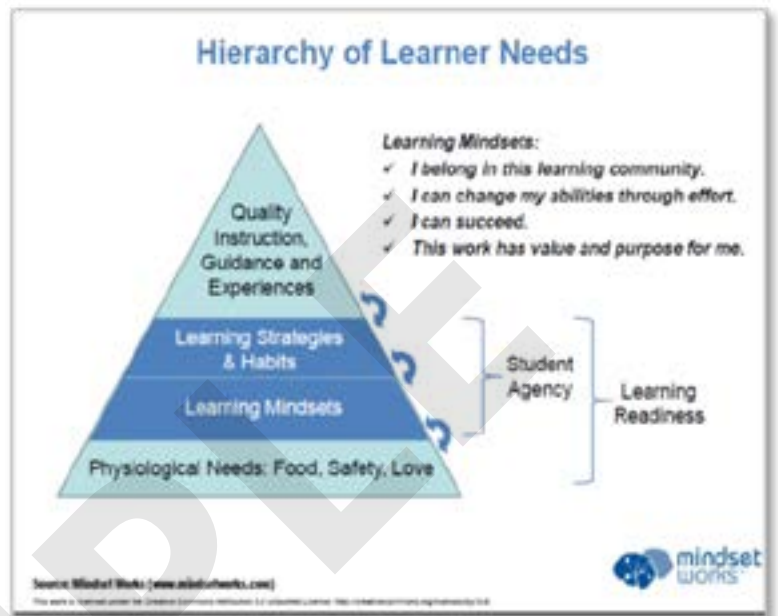
Why Teach Brainology®?

What do students need to be successful?

Mindsets and Student Agency

What do students need to succeed? We know that they need good curriculum and instruction, including appropriate levels of challenge and support. But even before that, they need to be *ready* to learn—to have the attitudes, skills, and habits of effective learners.

The Raikes and Lumina Foundations commissioned the UChicago Consortium on Chicago Student Research (CCSR) to conduct a research literature review to determine what adolescents need to become learners. CCSR determined that there are several critical factors that together contribute to building **student agency**—the belief that they can achieve and that they have the knowledge and strategies needed to do so.



“The best ways to improve students’ perseverance and strengthen their academic behaviors is through **academic mindsets** and **learning strategies**. This is the central point emerging from our review” (Farrington et al., 2012).

Highlights from the CCSR Report:

- We can **positively change student mindsets** in a real world setting, which impacts real performance in academics and more broadly.
- Mindset interventions **reduce the achievement gap** (REL, 2012).
- Focusing on study skills **without the mindset** component is ineffective.
- Embedding mindset cultivation in a school-wide context and as a **part of school culture is most supportive to learners**.

“Notably, across the empirical literature, one’s **beliefs about intelligence** and **attributions for academic success** or failure are more strongly associated with school performance than is one’s actual measured ability (i.e., test scores).”

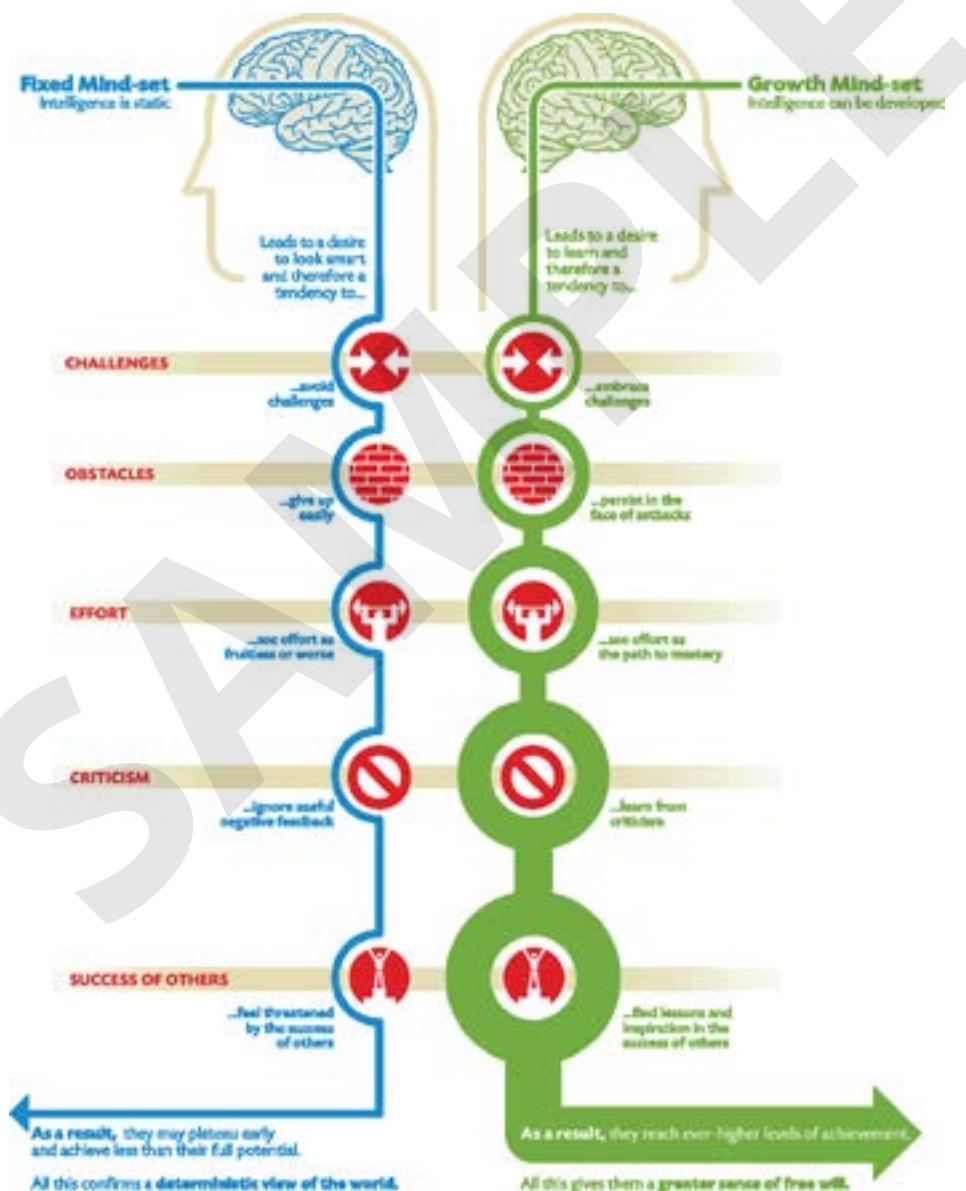
- Farrington et al., 2012

Among these critical academic mindsets, the growth mindset plays a central role in helping students to forge a sense of self-efficacy. At Mindset Works®, we have developed the Brainology® program to help teachers and schools **cultivate a growth mindset and improve the learning strategies of their students**.

The Growth Mindset: An Overview

Mindset is a powerful yet simple idea discovered by Professor Carol S. Dweck of Stanford and her colleagues in decades of research on motivation, achievement, and success. Mindsets are beliefs individuals hold about their most basic qualities and abilities. In a growth mindset, people believe they can develop their brain, abilities, and talents. This view creates a love for learning, a drive for growth, and a resilience that is essential for great accomplishments. On the contrary, people in a fixed mindset believe that basic qualities such as intelligence and abilities are fixed and can't be developed. They also believe that talent alone creates success, and therefore see effort as a sign of weakness rather than as an effective strategy needed to reach one's full potential.

The following diagram shows how people with different views of intelligence respond in different situations:



Decades of research show that when people understand that they can develop their intelligence through learning, they are motivated to seek challenge, value learning, invest effort, and persist through difficulty—and they achieve more highly. **Moreover, the growth mindset can be taught.**

Brainology®: Developing a Growth Mindset

Brainology® is designed to help students to develop a growth mindset and, as a result, to reach a higher level of academic achievement. Students in 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 students' sense of self-efficacy and their motivation to learn.

Brainology® is based on decades of research by leading experts in the area of motivation. Psychologists **Carol S. Dweck, Ph.D. and Lisa Sorich Blackwell, Ph.D.** discovered that developing a growth mindset helps students to value learning, invest effort, and improve their academic performance. (See Blackwell, Trzesniewski, & Dweck, 2007.) They developed the **Brainology®** program to help students cultivate a growth mindset by teaching them the powerful combination of the malleable brain lesson and effective study skills.

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. In addition, the program teaches a practical set of skills for tackling academic challenges by showing students how to apply what they have learned about the brain to their schoolwork.

The Brainology® program has been implemented in hundreds of schools with great results. When students realize that they control their learning, they are motivated to apply effort and take an active role in learning. Teachers note positive changes in students' behavior (becoming engaged in class, reflecting, asking questions, doing homework), as well as in the higher student achievement that results from more motivated students with higher expectations of themselves.

Brainology® is a blended learning curriculum that includes an interactive multimedia online program and classroom activities across five units. The corresponding online module, nested as part of the second lesson of each unit, provides the foundation of the unit's instruction. In it, students 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. Students gain experience in visualizing and applying these ideas through interactive activities and exercises. Throughout the program they reflect on their challenges and their learning in an e-Journal, and they engage in classroom activities to connect, reinforce, and practice what they learn in the context of their own experiences. This curriculum helps students understand that they have great, untapped potential and that the development of their mental abilities is largely within their own control, as well as provides them with study habits and skills that they can use to achieve highly. This Brainology® Implementation Guide will help you support your students by providing the background, planning preparation, lesson plans, and strategies for teaching Brainology®.

Cultivate a Growth Mindset through Process Praise

Focus on leading your students' mindset shift

There's a lot you can do every day, in every interaction with your students, to reinforce the growth mindsets they are developing. For example, the type of praise a student receives profoundly influences his or her mindset. Research has shown that praising students for their intelligence after they succeed on a task can set them up to hold a fixed mindset. They seek to protect themselves by avoiding challenge; and when they do encounter failure, their motivation and performance plummet. On the other hand, when students are praised for their effort and strategy, they get excited about challenges and stay resilient in the face of failure. So it is important that you reinforce the growth mindset with process praise.

How? Here is an excerpt from an article Prof. Dweck wrote for *Educational Leadership*:

Praising students for their intelligence, then, hands them not motivation and resilience but a fixed mindset with all its vulnerability. In contrast, effort or "process" praise (praise for engagement, perseverance, strategies, improvement, and the like) fosters hardy motivation. It tells students what they've done to be successful and what they need to do to be successful again in the future. Process praise sounds like this:

- *You really studied for your English test, and your improvement shows it. You read the material over several times, outlined it, and tested yourself on it. That really worked!*
- *I like the way you tried all kinds of strategies on that math problem until you finally got it.*
- *It was a long, hard assignment, but you stuck to it and got it done. You stayed at your desk, kept up your concentration, and kept working. That's great!*
- *I like that you took on that challenging project for your science class. It will take a lot of work—doing the research, designing the machine, buying the parts, and building it. You're going to learn a lot of great things.*

What about a student who gets an A without trying? I would say, "All right, that was too easy for you. Let's do something more challenging that you can learn from." We don't want to make something done quickly and easily the basis for our admiration.

What about a student who works hard and doesn't do well? I would say, "I liked the effort you put in. Let's work together some more and figure out what you don't understand." Process praise keeps students focused, not on something called ability that they may or may not have and that magically creates success or failure, but on processes they can all engage in to learn. —Carol Dweck, 2007

In addition, keeping a consistent and visible growth mindset orientation in your classroom can be a key component of reinforcing what your students learn in the Brainology® program. Here are a few more suggestions for integrating Brainology® terminology and activities into your classroom:

- Are your students losing focus on the lesson? Ask them if they are "using all their channels"!
- Are your students struggling with a difficult challenge? Remind them that their neurons are growing most when things seem most difficult.
- Do your students have projects to complete? Have them use the Brainology® Study Guide and Study Plan!
- On each lesson you will find a Feedback Corner with some suggestions for feedback related to the lesson. These statements can also be used more generally.

Brainology® Curriculum Overview

Each of the five units of Brainology® is comprised of 4 lessons, including a “Connect It,” a “Check It,” a “Practice It,” and an “Apply It,” (see page 34 for additional information about each lesson type). The Brainology® online module is nested in each unit’s “Check It” lesson. The topics covered in each unit are described below:

Structure of the Online Curriculum

The Brainology® Online Curriculum is composed of a ~10 minute introduction and four ~30 minute units (depending on how much time the students spend on optional activities such as reading Chris’ & Dahlia’s e-Journal entries and entering their own).

- **The Introduction to Brainology®** presents the curriculum and its purpose, the characters that will guide the students throughout the program, and the tools available (e.g., the e-Journal, Map, Brain Book, and Help). Users also create an inventory of their personal challenges so they can more easily relate the Brainology® lessons to their lives.
- **Unit 1: Brain Basics** introduces the basics of brain structure and function. This unit also explains what is required to maintain readiness to learn and how attention and concentration are supported. This unit teaches students the physical aspects of thinking and learning, which underlie a growth mindset.
- **Unit 2: Brain Behavior** teaches students that the brain functions by sending chemical messages through a network of nerve cells, and that these cells are responsible for thought. This insight provides a foundation for understanding how learning changes the brain. Students also learn how emotions can influence the brain and are taught strategies for managing their negative emotions and enhancing their positive ones.
- **Unit 3: Brain Building** fosters students’ discovery of how learning changes the brain. They learn that through repeated practice, connections in neural networks grow. This is the key to the growth mindset. Students learn that intelligence can be developed through mental exercise, and they are introduced to activities that promote learning.
- **Unit 4: Brain Boosters** extends the concept of the malleable brain to teach students about memory processes. The unit also introduces a variety of study strategies that capitalize on the way the brain works and learns to deepen and reinforce students’ understanding of the growth mindset, and how to apply these tools toward growing their abilities.

Ground yourself in mindset theory

While it is possible to spend a lifetime investigating the psychology of motivation and achievement, you don’t have to in order to be very successful with Brainology®. Some background in the theory is needed, however. If you have the time, the inclination, and the opportunity, we recommend that you read Dr. Dweck’s book, *Mindset: The New Psychology of Success*.

If this isn’t the right moment for you to read the book, we suggest reading these three articles (which are all freely available on the internet):

- “Even Geniuses Work Hard”
- “The Power (and Peril) of Praising Your Kids”
- “Boosting Achievement with Messages that Motivate”

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Building Students' Confidence, Fulfillment, and Achievement Through the Understanding of Expandable Intelligence



Get Set!

Part II. Planning & Setup:
Scheduling & Technical
Guide for Teachers

GET SET! Curriculum Overview

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Planning Your Brainology® Implementation

This section of the guide covers the activities required to carry out a successful Brainology® implementation. The material in the **Get Ready!** section should have provided a general overview of the goals, content, and operation of the program. The next step is to review what needs to happen and make detailed plans. A well-known maxim holds that failing to plan is planning to fail. A little preparation goes a long way towards ensuring a successful implementation of Brainology®.

Identify and prepare the implementation team

The critical first step is to identify who will be leading the implementation. If you are a teacher who has brought Brainology® to your classroom on your own initiative, look in the mirror. If you are an administrator, an instructional coach, a counselor, or other educational leader who has brought Brainology® to a group of classrooms, you need to decide whether or not you will be part of the day-to-day implementation. If not, identify who will be responsible for leadership, coaching, and coordination.

Whoever is responsible for leading the implementation should start by sharing this guide with the rest of the team. We recommend spending some time with the team to review the process and plans and ensure that everyone is becoming well-prepared.

If you're not leading the implementation, coordinate with whoever is to be sure you're fully aware of the schedule.

Plan the implementation schedule

The key features of a best-practices implementation of Brainology® are these:

- The units and lessons are implemented in the order suggested.
- All of the classroom activities are completed.

As a result, you should plan to spend about fifteen hours over at least six weeks on Brainology®. There is considerable flexibility in the implementation process:

- With a little extra reinforcement along the way, the units can be spaced two or even three weeks apart.
- Many of the classroom lessons can be spread out over two or three days if you prefer not to devote a complete period to them.
- The online Brainology® units can be paused and resumed, so those can each be split over a couple of days, too, if necessary.
- Some components of the classroom lessons can be assigned as homework.

Your implementation can occur in one classroom, or can be part of a school-wide implementation. In the case of school-wide implementation, consider how the computer lab sessions will be spaced out and whether the lab sessions could occur in a content area class, while the classroom-setting lessons occur in another setting (like an Advisory or Homeroom).

You should feel comfortable planning the schedule to coordinate with your own circumstances (length of class periods, holidays, testing schedules, availability of computer lab time, etc.). We strongly recommend that you take the time to plan specific dates for Brainology®, especially those for the online lessons if technology access is limited – even if you expect to have to adjust them later.

Scheduling options

Brainology® is a blended learning curriculum that requires a total of about 15 hours of classroom time to teach, including about 2.5 hours of online activities, in 20 sessions over 5-20 weeks. It can accommodate different schedules, as follows:

- Length of Class Period: The optimal length of a class period for Brainology® is 45 minutes, which permits ample time for each lesson to be completed within one session. It can also work within shorter (30 minute) or longer (60 minute) periods.
- Number of Sessions per Week: Brainology® can be taught in 1-4 sessions per week.
- Number of Weeks to Complete: Depending on the length of class periods and number of sessions per week, Brainology® can take from 5-20 weeks to complete.

Here is a sample implementation schedule:

Sample 10-week, 20-session implementation schedule with 40 min. per session					
Week	Unit	Day	Lesson	Day	Lesson
1	Intro	Tuesday	Intro-1	Thursday	Intro-2 (online)
2			Intro-3		Intro-4
3	Unit 1	Tuesday	1-1	Thursday	1-2 (online)
4			1-3		1-4
5	Unit 2	Tuesday	2-1	Thursday	2-2 (online)
6			2-3		2-4
7	Unit 3	Tuesday	3-1	Thursday	3-2 (online)
8			3-3		3-4
9	Unit 4	Tuesday	4-1	Thursday	4-2 (online)
10			4-3		4-4

We recommend doing no more than one unit each week so that students have time to reflect, integrate takeaways into their own lives, and incorporate the offline materials.

Each unit also contains alternative activities to accommodate learners with different needs and skills.

On the next page you will find a blank Brainology® Planning Calendar. You can also find an automated planning tool online at <https://www.mindsetworks.com/teacherschedulems>. It may be helpful to include the calendar in your lesson plans and fill in the dates for when you plan to complete the activities.

Brainology® Planning Calendar

Unit	Lesson #	Lesson	Date
Intro	I-1	“Connect It”: Mindset Assessment Profile (MAP) and Reflection	
	I-2	“Check It”: Online Brainology® Intro and “Check It” Questions	
	I-3	“Practice It”: You Can Grow Your Intelligence	
	I-4	“Apply It”: Values Lesson and Reflection	
1 Brain Basics	1-1	“Connect It”: Information Search and Brain Health Scan or Inventory	
	1-2	“Check It”: Online Brainology® Unit 1 and “Check It” Questions	
	1-3	“Practice It”: Effective Effort	
	1-4	“Apply It”: John’s History Test	
2 Brain Behavior	2-1	“Connect It”: Overcoming Challenges	
	2-2	“Check It”: Online Brainology® Unit 2 and “Check It” Questions	
	2-3	“Practice It”: Stress Symptoms Scan or Inventory and Emotions & Learning Handout	
	2-4	“Apply It”: Alicia’s Presentation	
3 Brain Building	3-1	“Connect It”: The Two Mindsets Part 1 and Reflection	
	3-2	“Check It”: Online Brainology® Unit 3 and “Check It” Questions	
	3-3	“Practice It”: Mindset Scan and Reflection	
	3-4	“Apply It”: Scientific Research Brief	
4 Brain Boosters	4-1	“Connect It”: The Two Mindsets Part 2	
	4-2	“Check It”: Online Brainology® Unit 4 and “Check It” Questions	
	4-3	“Practice It”: Brain Study Plan or Learning Strategies Scan	
	4-4	“Apply It”: Class Motto	

Technical Setup: Using the Mindset Works® Website

As previously outlined, each unit of the Brainology® curriculum includes an online module. As a teacher you have visibility into your students' progress and interaction with the online module of each unit. You also have access to administrative tools to manage student accounts (and your own). This section provides step-by-step instructions for those interactions with the website, organized approximately in the order you will need them as you proceed through your implementation.

Creating and managing your own account

Joining a school account

If you don't already have a user name and password, and your school has already purchased Brainology®, your site leader has an **Access Code** that you will need to register. If you're having any difficulty identifying your site leader or any uncertainty about the **Access Code**, feel free to contact Brainology® support at support@mindsetworks.com or 888-344-6463. Once you have the **Access Code**, follow these steps:

1. Go to the Brainology® website homepage at www.mindsetworks.com.
2. Click on the orange **Sign Up** button in the upper right corner of the page.
3. Select **Educator**, and continue the registration process.
4. **Check your email** to activate your account. Check your spam folder if it hasn't arrived within a few minutes.
5. When you create an account, you are automatically enrolled in a Free Preview of Brainology®. To gain full access to your Programs, go to **My Account**, then **My Programs**.
6. On the **My Programs** page, enter your **Access Code**
7. You now have full access to the online Brainology® modules, the supporting materials, and the rest of the administrative controls.

Changing your password and profile picture

1. Go to the Brainology® website homepage at www.mindsetworks.com and Login.
2. Go to **My Account**, accessed at the top right corner of the page after Login.
3. Select **My Profile**. You can change your personal information on this page.

Resetting your password or retrieving your Login information

Note: Your password is securely encrypted and cannot be retrieved by anyone. If you forget your password, you must reset it on the Mindset Works® website.

1. Go to the Brainology® website homepage at www.mindsetworks.com and Login.
2. Select the **Forgot Username**, **Forgot Email address**, or **Forgot Password** and follow the prompts to the appropriate instructions.

Set up for your classes

Creating Classes and Class Codes

The Brainology® administrative system organizes students by classes. Typically, a teacher will create one class for each group of students. Creating a class generates a Class Code. Teachers distribute the Class Code, and then students can create their own Brainology® login usernames and passwords using the code supplied by the teacher.

To create classes and their associated class codes, follow the steps below.

1. Go to the Brainology® website homepage at www.mindsetworks.com.
2. **Log In**, and then go to **My Account**.
3. Go to **My Students**. Select the blue button to **+Add New Class**.
4. Enter a name for your class, then select **Save Class and Add Students**.
5. Next, select **Add Students** for the class you just created.
6. Locate the **Class Code** in the grey box. This code can be used to register your students in Brainology®.

Adding Students to Your Class

Follow the instructions on the page to Add Students to your class. You have three options:

1. **Option 1: Student Self-Enrollment**
Distribute the **Class Code** to your students, and they will self-register at www.mindsetworks.com. Instructions for the student are on the next page; you may wish to print them out and have them on the first day you do Brainology® online. If you choose this enrollment option, be sure to write down the Class Code and keep it safe so you can give it to your students for their first log in.
2. **Option 2: Teacher Created Pre-Made Accounts**
Download our spreadsheet template from the Add Students page. Next you will fill in your students' names, usernames, passwords, and grade level, and upload it on the same page. This is the Batch Upload option.
3. **Option 3: Create Individual Accounts**
Enter the information into the fields on the Add Students page one student at a time.

Viewing your list of students

To see a list of the students who have registered with Class Codes you have provided, follow these steps:

1. Go to the Brainology® website homepage at www.mindsetworks.com
2. **Log In**, and then go to **My Account**.
3. Go to **My Students**.
4. Locate the class you wish to view, and select **View Class**.
5. Here you can see a quick snapshot of the students' names, usernames, and status in the program.

Instructions for Students: How to enroll in Brainology® with a Class Code

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

1. Go to the Brainology® home page at 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 teacher gave 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!!!

Student Login Information

Name: _____

Username: _____

Password: _____

Keep this in a safe place or give it to your teacher.

Changing your students' passwords

Student passwords are securely encrypted and cannot be retrieved by anyone. If a student should forget his or her password, follow these steps to create a new one.

1. Go to the Brainology® website homepage at www.mindsetworks.com.
2. **Log In**, and then go to **My Account**.
3. Go to **My Students**.
4. Locate the class of the student who needs their password reset, and select **View Class**.
5. Find the student's name, then select **Change Password**.
6. Enter the **New Password** and confirm.

Tracking your students' progress

Viewing student data at a glance

Teachers can view their students' progress and reflections in the Brainology® program. You can see responses to Pre- & Post-Program Surveys, e-Journal reflections, lesson dates and levels complete.

To view student data:

1. Go to the Brainology website homepage at www.mindsetworks.com.
2. **Log In**, and then go to **My Account**.
3. Go to **My Students**. Find the class you wish to see, and select **View Class**.
4. Find the student whose data you wish to review, and select **View Data**.

Downloading and viewing your students' data

To see how far your students have progressed through the online Brainology® units, see their responses to the brief mindset assessment survey incorporated within the online Brainology® units, or see their e-Journal entries all in one spreadsheet for the whole class, follow these steps:

1. Go to the Brainology® website homepage at www.mindsetworks.com.
2. **Log In**, and then go to **My Account**.
3. Go to **My Students**. Find the class you wish to see, and select **View Class**.
4. Select the dark blue button **Download Student Data to Excel**.
5. Open the Excel document and review the data.

Licensing

Viewing your available licenses

The licenses your school has purchased are held in a pool associated with the organizational access your site leader provided to you. Each time a student registers using a Class Code, a license is removed from the pool. To see how many licenses are available to you, follow these steps:

1. Go to the Brainology® website homepage at www.mindsetworks.com.
2. **Log In**, and then go to **My Account**.
3. Go to **My Programs**.
4. Locate the Brainology® program package, and select **View Order**.

Purchasing additional licenses

The licenses your school has purchased are held in a pool associated with the organizational access your site leader provided to you. Each time a student registers using a Class Code, a license is removed from the pool. To purchase additional licenses:

1. Go to the Brainology® website homepage at www.mindsetworks.com.
2. **Log In**, and then go to **My Account**.
3. Go to **My Programs**.
4. Locate the Brainology® program package, and select **Add Licenses**.

Brainology® Tips for the Computer Lab

Checklist for the Online Program

- ❑ **Headsets/earphones:** Remember to bring them or ask students to bring their own.
- ❑ **Make 3x5 cards** for each student with his/her name, Brainology® username, and password. You can use these cards to “call on” students later during discussions/sharing out. For those using workbooks, have students record this information on the inside of the front page.
- ❑ **To Launch Brainology®**, students must either sign up with a class code and set up an account, or be signed up by batch upload by you or an administrator. If you have a list of usernames and passwords, provide them to the students on the 3x5 cards. When they log in, they simply click **Go to Brainology®!**
- ❑ **Pause!** When students go to the restroom or pencil sharpener, make sure they don’t leave the program running. Ask them to click the pause button before walking away.

Online Program Navigation

- ✓ **The map** on the left tells you where kids are. Click it to check on students who are behind or going farther than you want.
- ✓ **Save and Exit** button is important to click when students are finished to make sure the students can pick up where they left off.
- ✓ Be available for the miscellaneous tech support that the students will need. **Walk around a lot** the first few online days to monitor and help.



BRAINOLGY®

FOR SCHOOLS

Building Students' Confidence, Fulfillment, and Achievement Through the Understanding of Expandable Intelligence



Go!

Part III. Lesson Guides and
Material for Teachers

Part III: Lesson & Material Guide for Teachers


Overview

This section of the Implementation Guide contains detailed information about the content of each module of the Brainology® Online Curriculum, as follows:

- **The Introduction to Brainology®** presents the curriculum and its purpose, the characters that will guide students throughout the program, and the tools available (e.g. the e-Journal, Map, Brain Book, and Help). Users also create an inventory of their personal challenges so they can more easily relate the Brainology® lessons to their lives.
- **Unit 1: Brain Basics** introduces the basics of brain structure and function. This unit also explains what is required to maintain readiness to learn and how attention and concentration are supported. This unit teaches students the physical aspects of thinking and learning, which underlie a growth mindset.
- **Unit 2: Brain Behavior** teaches students that the brain functions by sending chemical messages through a network of nerve cells, and that these cells are responsible for thought. This insight provides a foundation for understanding how learning changes the brain. Students also learn how emotions can influence the brain and are taught strategies for managing their negative emotions.
- **Unit 3: Brain Building** teaches students how learning changes the brain through the growth of connections in neural networks with repeated use, the key to the growth mindset. Students learn that intelligence can be developed through mental exercise, and they are introduced to activities that promote learning.
- **Unit 4: Brain Boosters** extends the concept of the malleable brain to teach students about memory processes. The unit also introduces a variety of study strategies that capitalize on the way the brain works and learns to deepen and reinforce students' understanding of the growth mindset, and how to apply these tools toward growing their abilities.

Differentiating Instruction

Throughout the next five Go! Curriculum Guides, many lessons have been modified so that you can differentiate and scaffold your instruction for the unique needs of your students. Several lessons have two options: Option A is intended for On-Level or Advanced Learners, and Option B is intended for Below-Level Learners (based on a 7th grade level).

Whenever you see the  icon, look for tips to differentiate your instruction for process, product, or content, and ways to scaffold the material for all learners

- **Process** refers to how a student comes to understand the material.
- **Product** refers to the work product in which the student demonstrates mastery.
- **Content** refers to adjusting the material based on prior knowledge of the student.

Organization

Each unit of this Teachers' Guide contains the following sections:

- I. Overview and Goals** provides a description of the instructional goal of the unit, the key challenge in student motivation, recommended readings, and key content contained in the unit.
- II. Lesson Plans** has suggestions for teacher practice, and an explanation of the research-based principles underlying these recommendations, and a sample outline of lessons for that unit.
- III. Reproducibles and Handouts** contains instructions and printable materials for classroom activities that support the learning of the key concepts in that unit of Brainology®. These activities are organized as follows:

Connect It lessons are geared to prepare students for the upcoming online module that is completed during the "Check It" lesson. In these lessons, students activate their prior knowledge and/or prior learning in the Brainology® program to heighten their readiness to learn the core concepts of the current unit. These lessons connect to students' lives, to their experiences with other texts or learning, and to other lessons in this program.

Check It questions are provided for use as a formative assessment. Teachers can allow students to fill in the "Check It": while working in the online module, to keep them focused on the main points of the teachings. "Check It" questions may be used to diagnose the extent to which students have grasped the information in each unit. If the "Check It" shows that students have gaps in their understanding and need further practice, the teacher can differentiate and remediate using the Additional Activities provided.

Practice It activities are provided for the purpose of deep practice. In these lessons, students have the opportunity to interact with the information at an instructional level towards the goals of increasing understanding of the content and learning to use their knowledge independently.

Apply It activities can be used to enhance metacognition by allowing students to apply their new knowledge in a variety of ways. These scenarios can also be used to assess the depth of student understanding in relation to the content in Brainology®.

Additional Activities are included at the end of each unit. While not a part of the core curriculum, they are meant to deepen students' understanding of the key concepts. The Additional Activities provide opportunities to express this understanding through a wider variety of learning modalities, and to apply them to their own learning.

Supplies: Please review the lesson plans prior to instruction to be sure you have the necessary materials. Remember that with each "Check It" lesson, students will need access to a computer and headphones.

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FOR SCHOOLS

Building Students' Confidence, Fulfillment, and Achievement Through the Understanding of Expandable Intelligence



Go! Introductory Unit

Introductory Unit

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Introductory Unit: An Overview

Unit Goal

Students complete a Mindset Assessment Profile which will explore their beliefs and attitudes about learning, effort, and challenge. The MAP is used as a pre- and post-program lesson, with the expectation that once students finish the Brainology® program, they will have moved toward a growth mindset. In this unit, students are also introduced to the Brainology® online program and resources, and to the concept of a growth mindset through reading and reflecting on an article which presents evidence of malleable intelligence.

Lessons

Lesson #	Lesson	Lesson Plan	Handout
Intro-1	"Connect It" – <ul style="list-style-type: none"> Mindset Assessment Profile (MAP) survey Brainology® Reflection Questions 1-6 	pp. 45-46	pp. 47-50
Intro-2	"Check It" – Complete both, together: <ul style="list-style-type: none"> Online Brainology® Introduction "Check It" Questions 	p. 51	p. 52
Intro-3	"Practice It" – "You Can Grow Your Intelligence" <ul style="list-style-type: none">  Option A: Plain Text Version OR Option B: Interactive Text Version 	pp. 32-34	pp. 35-39 pp. 42-46
Intro-4	"Apply It" – Values Lesson & Reflection <ul style="list-style-type: none">  Option A: Advanced Version OR Option B: Basic Version 	pp. 74-75	p. 76 p. 77

Key Concepts

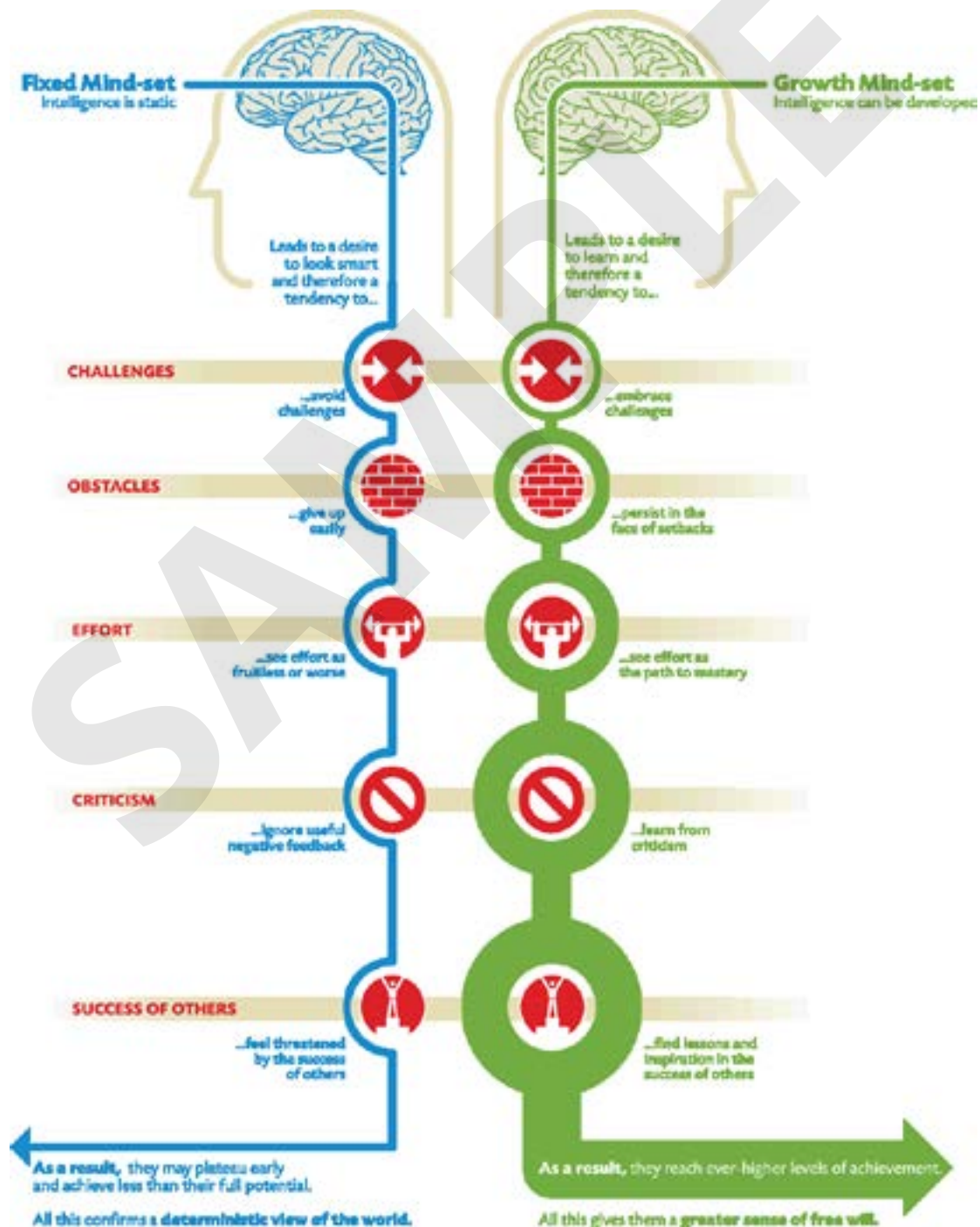
Mindsets are those implicit beliefs we all hold about our most basic abilities and intelligence. People in a fixed mindset believe their abilities and intelligence are largely fixed and outside of their control, whereas people in a growth mindset believe that their intelligence and ability can be developed through their own efforts. Having a growth mindset helps people be motivated to push themselves to reach their true potential.

Suggested Teacher Reading

Dweck, Carol (2010). Mindsets and Equitable Education. *Principal Leadership*, 10(5). 26-29.

The Growth Mindset

Discovered by Professor Carol S. Dweck of Stanford in decades of research on motivation, achievement, and success, **mindsets** are beliefs individuals hold about their most basic qualities and abilities. In a **growth mindset**, people believe they can develop their intelligence, abilities, and talents. This view creates a love for learning, a drive for growth, and a resilience that is essential for great accomplishments. On the contrary, people in a **fixed mindset** believe that basic qualities such as intelligence and abilities are fixed, and can't be developed. They also believe that talent alone creates success, and see effort as a sign of weakness rather than as an effective strategy needed to reach one's full potential. The following diagram shows how people with different views of intelligence respond in different situations.



Brainology®: Developing a Growth Mindset

Brainology® is designed to help students to develop a growth mindset and, as a result, to reach a higher level of academic achievement. Students in 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 students' sense of self-efficacy and their motivation to learn.

Brainology® is based on decades of research by leading experts in the area of motivation. Psychologists **Carol S. Dweck, Ph.D. and Lisa Sorich Blackwell, Ph.D.** discovered that developing a growth mindset helps students to value learning, invest effort, and improve their academic performance. (See Blackwell, Trzesniewski, & Dweck, 2007.) They developed the **Brainology®** program to help students cultivate a growth mindset by teaching them the powerful combination of the malleable brain lesson and effective study skills.

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. In addition, the program teaches a practical set of skills for tackling academic challenges by showing students how to apply what they have learned about the brain to their schoolwork.

The Brainology® program has been implemented in hundreds of schools with great results. When students realize that they control their learning, they are motivated to apply effort and take an active role in learning. Teachers note positive changes in students' behavior (becoming engaged in class, reflecting, asking questions, doing homework), as well as in the higher student achievement that results from more motivated students with higher expectations of themselves.

Brainology® is a blended learning curriculum that includes an interactive multimedia online program and classroom activities across five units. The corresponding online module, nested as part of the second lesson of each unit, provides the foundation of the unit's instruction. In it, students 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. Students 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, and they engage in classroom activities to connect, reinforce, and practice what they learn in the context of their own experience. This curriculum helps students understand that they have great, untapped potential and that the development of their mental ability is largely within their own control, and provides them with study habits and skills that they can use to achieve highly.

BRAINOLGY®

FOR SCHOOLS



Introductory Unit:

Lesson Plans, Reproducible
Handouts, & Answer Keys



www.mindsetworks.com

 **Introductory Unit Lesson 3, “Practice It”: You Can Grow Your Intelligence**

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

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

Length: Approximately 30 minutes

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 student’s prior knowledge, ask them to generate research questions about intelligence. Record the research questions on chart paper. (Some examples are below.)
 - a. What is intelligence?
 - b. Do all humans have equal intelligence? How do we know?
 - c. What are the most “intelligent” animals on Earth?
 - d. What are the best ways to measure intelligence? How do we know?
2. Ask students if they would like to learn how to grow their intelligence, and explain that the class will be reading research today about how to grow their intelligence.
3. Students will draw 6 pictures to help the students’ brains add this new information to their long-term memories.
4. Pass out copies of the worksheet and discuss non-linguistic representations of concepts (works of art) 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 students that the brain has an amazing ability to remember pictures.
5. Read the first section as a class and model the drawing with a rough sketch and a response to the first one.
6. Ask students to read silently the next section and complete the second drawing. Let them know this only needs to be a rough sketch. They should focus more on the main points than the drawing.

(Instructions continued on the next page)



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.

**Introductory Unit Lesson 3, “Practice It”: You Can Grow Your Intelligence, cont.**

7. Have students check for understanding with a partner using these frames:
 - a. I made a connection to the article when I read... because...
 - b. The article explores my research question... when it talks about...
 - c. The article raises a new question for me, which is... because...
8. Students can finish the article and record one research question from the class list about which they would like to independently research (for homework or in a lab setting).
9. Students can report back their findings to the class individually, with partners, or in small groups. Use this opportunity to differentiate for all levels of learners.

SAMPLE

FEEDBACK CORNER

Try responding to students who...

are making progress with,

“I see you using your strategies/tools/notes/etc. Keep it up!”

succeed with strong effort with,

“All that hard work and effort paid off! Congratulations! You just got smarter!”



Introductory Unit Lesson 3, “Practice It”: You Can Grow Your Intelligence, cont.

Instructions for Option B (Interactive Text Version):

1. To activate student’s prior knowledge, ask them to generate research questions about intelligence. Record the research questions on chart paper. (Some examples are below.)
 - a. What is intelligence?
 - b. Do all humans have equal intelligence? How do we know?
 - c. What is animal intelligence measured as compared to human intelligence?
 - d. What are the most “intelligent” animals on Earth?
 - e. What are the best ways to measure intelligence? How do we know?
 - f. Why are some people more intelligent than others?
2. Ask students if they would like to learn how to grow their intelligence, and explain that the class will be reading research today about how to grow their intelligence.
3. Students will draw 6 pictures to help the students’ brains add this new information to their long-term memories.
4. Pass out the copies of the Interactive Text and read as a class as the students complete the prompts and thought bubbles.
5. Have students record one research question from the class list that they would like to search for information about as independent practice (for homework or in a lab setting).
6. Students can report back their findings to the class individually, with partners, or in small groups. Use this opportunity to differentiate for all levels of learners.



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 in a whole class setting with some read-alouds by the teacher, some by student volunteers, and some independent reading. The additional research component can be modeled by the teacher using a projector or smart phone and a simple Internet search.

FEEDBACK CORNER

Try responding to students who...

are making progress with,

“I see you using your strategies/tools/notes/etc. Keep it up!”

succeed with strong effort with,

“All that hard work and effort paid off! Congratulations! You just got smarter!”

Brainology® Intro Unit Lesson 3, "Practice It": Reading for Lesson - Option A

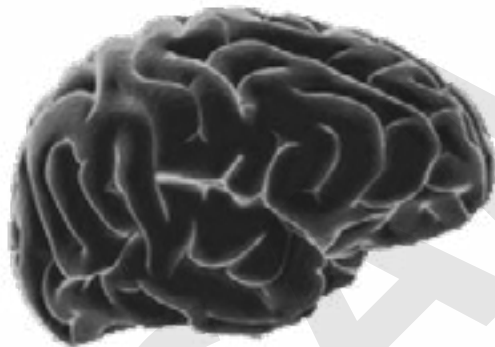
You Can Grow Your Intelligence

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!"

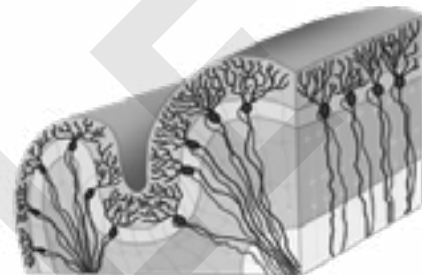


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But most people don't know that when they practice and learn new things, parts of their brain change and get larger a lot like muscles do when they exercise.

HEALTH & SCIENCE News You Can Use

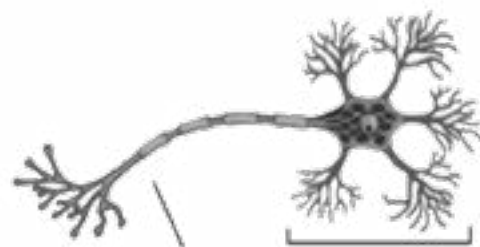
Brainology®



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.

1



Axon

Dendrites

© Fotosearch

A typical nerve cell

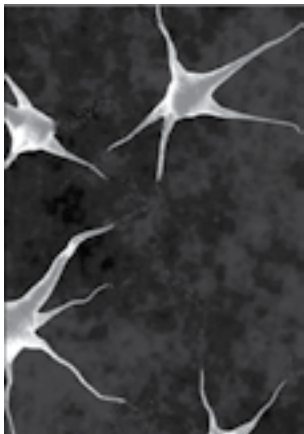
When you learn new things, these tiny connections in the brain actually multiply and get stronger. The more that you challenge your mind to learn, the more your brain cells grow. Then, things that you once found very hard or even impossible to do—like speaking a foreign language or doing algebra—seem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

2

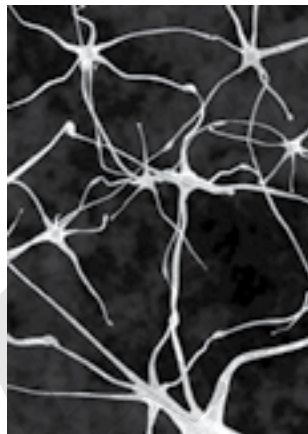
Brainology® Intro Unit Lesson 3, “Practice It”: Reading for Lesson - Option A, cont.
How Do We Know the Brain Can Grow Stronger?

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.

Effect of an Enriched Environment


Nerves in brain of animal living in bare cage



Brain of animal living with other animals and toys

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Animals who lived in an enriched environment 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.

HEALTH & SCIENCE News You Can Use

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%!

3

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!

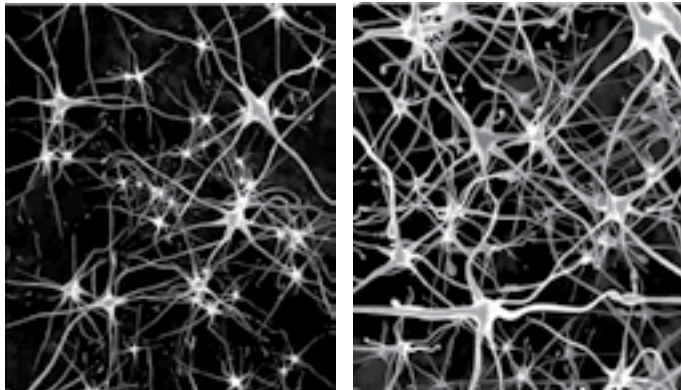
From the first day they are born, babies are hearing people around them talk—all day, every day, to the baby and to each other. They have to try to make sense of these strange sounds and figure out what they mean. In a way, babies are exercising their brains by listening hard.

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.

4

Brainology® Intro Unit Lesson 3, “Practice It”: Reading for Lesson - Option A, cont.
Growth of neuron connections in a child from birth to 6 years old


At birth

At age 6

©2010 Mindset Works

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 of 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 student 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.

5

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!

6

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

You Can Grow Your Intelligence

Directions: 1) Read each section. 2) When you get to a number, stop reading and 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 _____ _____ _____ _____ _____ _____

Brainology® Intro Unit Lesson 3, "Practice It": Plain Text Version - Option A, cont.

<p>4</p>	<p>The way babies learn to speak is represented in my picture because _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>5</p>	<p>Everyone has a brain that can be exercised, and what I drew shows _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>6</p>	<p>Summary: Things that I learned from this article are _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>and are represented by my picture because _____</p> <p>_____</p> <p>_____</p>

Brainology® Intro Unit Lesson 3, “Practice It”: Plain Text Version - Option A, cont. ANSWER KEY

“You Can Grow Your Intelligence”

Directions: 1) Read each section. 2) When you get to a number, stop reading and 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.

<p style="text-align: center; font-size: 2em; font-weight: bold;">1</p>	<p>This picture of a <u>cerebral cortex (or a drawing resembling a tree, e.g.)</u> represents the main idea because <u>the cortex of the brain contains billions of tiny nerve cells called neurons that are connected by branches. The branches allow the cells to communicate and enable us to think and solve problems.</u></p>
<p style="text-align: center; font-size: 2em; font-weight: bold;">2</p>	<p>My picture represents the branches (dendrites) growing between brain cells because <u>the brain is learning something new and the dendrites between brain cells are multiplying and becoming stronger.</u></p>
<p style="text-align: center; font-size: 2em; font-weight: bold;">3</p>	<p>My picture represents the difference between animals who had toys and stimulation and those animals that did not because <u>in the brains of the animals that had toys, the branches and connections between the neurons/nerve cells are thicker (i.e. stronger) and more numerous. The neurons in the brains of the animals without toys don't even have branches that connect with other neurons.</u></p>

Brainology® Intro Unit Lesson 3, “Practice It”: Plain Text Version - Option A, cont. ANSWER KEY

4	<p>The way babies learn to speak is represented in my picture because <u>as babies learn to talk, the neurons in their brains grow dendrites (branches) that are thicker and stronger. By the time most children are age 3, the neurons in their brains are much more strongly connected than at birth, enabling them to speak in complete sentences.</u></p>
5	<p>Everyone has a brain that can be exercised, and what I drew shows <u>a brain prior to learning something new, when the neurons and dendrites were few and not well-connected. After learning a new skill (math, reading, piano, a sport), the neurons will be bigger, more numerous and more strongly connected with other nearby nerve cells.</u></p>
6	<p>Summary: Things that I learned from this article are <u>that everyone can grow their brains and become smarter, but it takes practice and hard work</u>, and are represented by my picture because <u>the neurons that I've drawn represent a brain after learning a new skill/becoming better at math, reading, etc. The neurons are bigger, and the dendrites connecting them are thicker and more numerous.</u></p>

Brainology® Intro Unit Lesson 3, “Practice It”: Reading for Lesson - 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 either 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...



Brainology® Intro Unit Lesson 3, “Practice It”: Reading for Lesson - Option B, cont.**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.

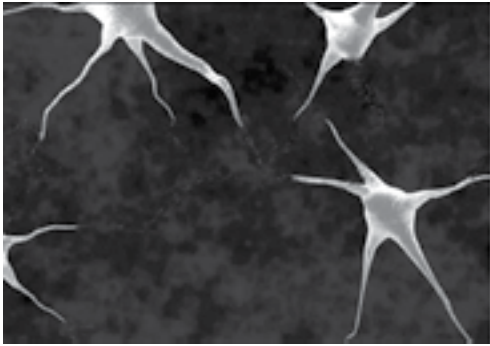
If you continue to strengthen these connections, things that you once found very hard to do—like remembering information for a test or doing algebra—seem to become easy. The result is a stronger, smarter brain.

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

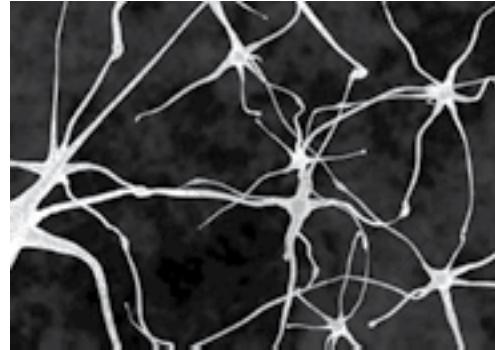
IF...	→	THEN...
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Brainology® Intro Unit Lesson 3, “Practice It”: Reading for Lesson - Option B, cont.**The Secret... continued**

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.



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



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

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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%.

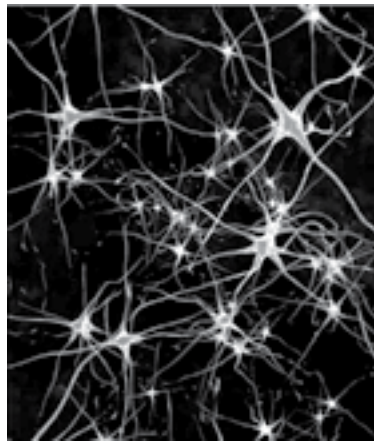
Hmm... it is interesting to me that...

Brainology® Intro Unit Lesson 3, “Practice It”: Reading for Lesson - Option B, cont.

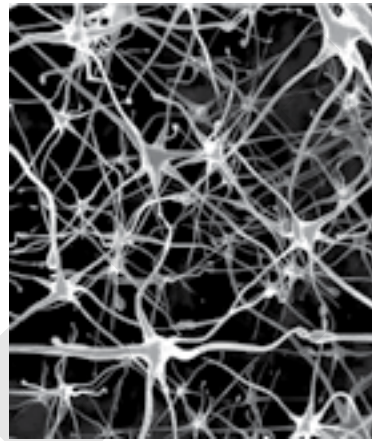
Children’s Brain Growth

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?

Neuron connections in a child from birth to 6 years old



At birth



At age 6

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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.

Brainology® Intro Unit Lesson 3, “Practice It”: Reading for Lesson - Option B, cont.

Why doesn't EVERYBODY do this?

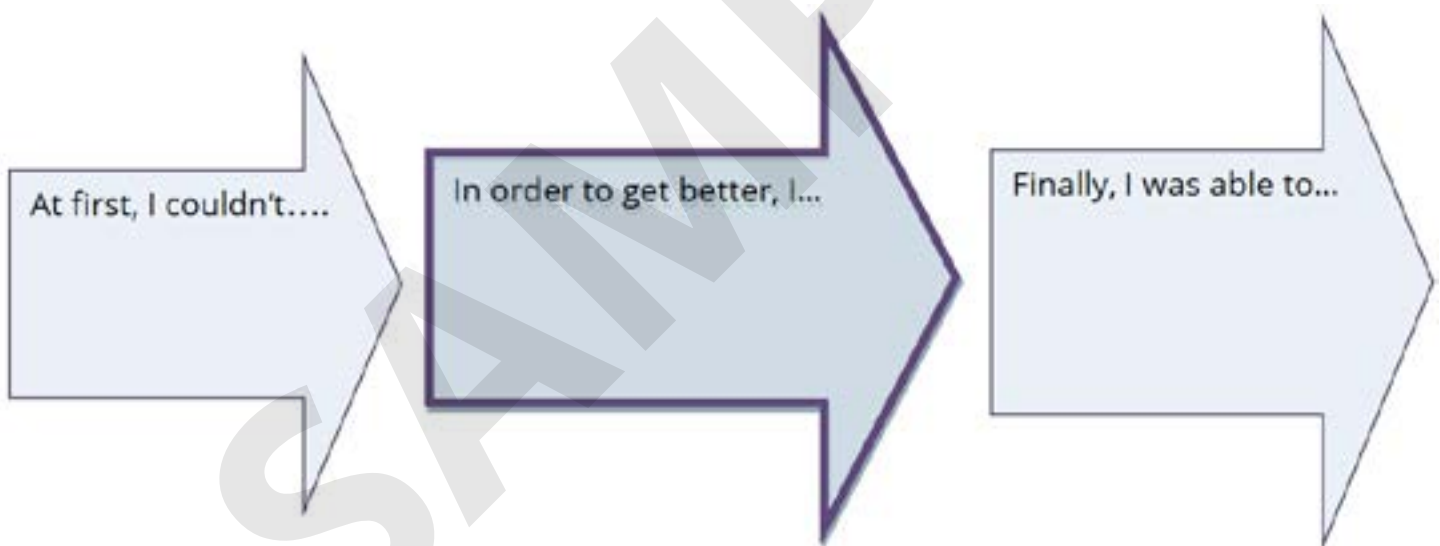
Many people miss out on the chance to grow a stronger brain because

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

Reflection: Remember a time when you worked extremely hard on something that was at first difficult,

Can you relate?

but after practice and effort you were able to succeed.



How did you feel when you were successful?

Was it worth the effort? Explain.

Brainology® Intro Unit Lesson 3, "Practice It": Reading for Lesson - Option B ANSWER KEY

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.

What do YOU think?

Subjective - responses may vary.

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...

Your muscles will get weaker and smaller.



Brainology® Intro Unit Lesson 3, “Practice It”: Reading for Lesson - Option B, cont. ANSWER KEY

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 *studying*.

In other words... Muscles will grow with exercise and the brain will grow with *studying and learning*.

Here’s the secret:

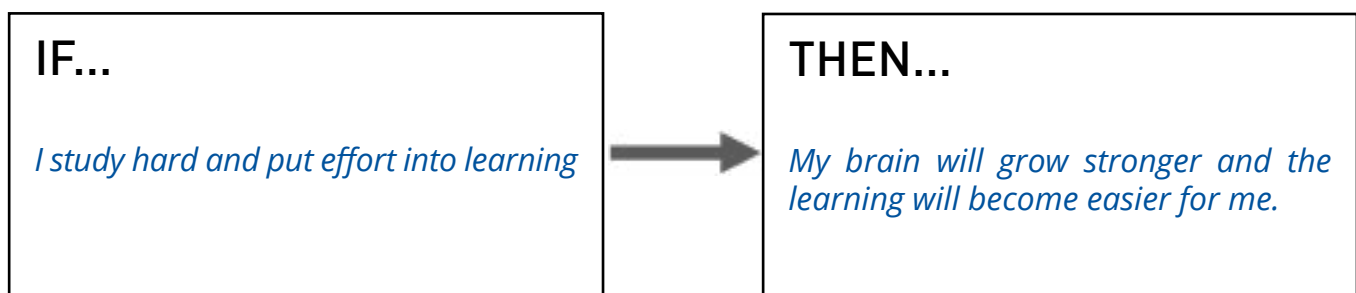
Inside the cortex of the brain are billions of tiny nerve cells called neurons. The nerve cells have branches connecting them to each other in a complicated network. Communication between these brain cells is what allows us to think and solve problems.

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.

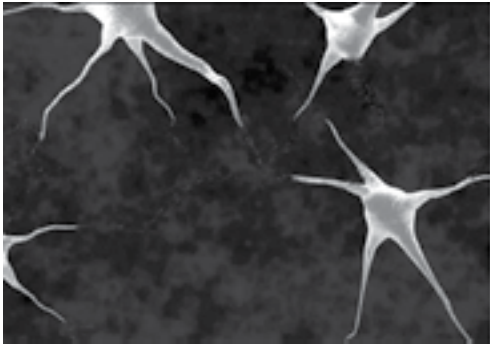
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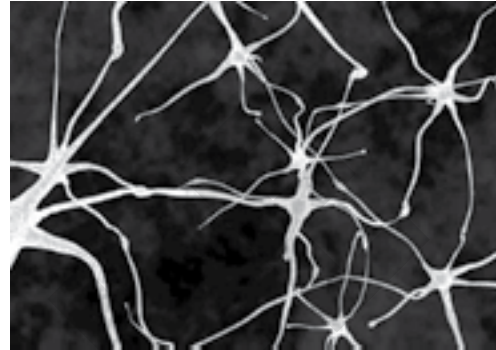
Brainology® Intro Unit Lesson 3, “Practice It”: Reading for Lesson - Option B, cont. ANSWER KEY

The Secret... continued

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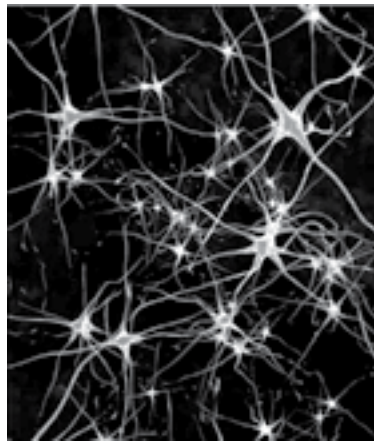
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Brainology® Intro Unit Lesson 3, “Practice It”: Reading for Lesson - Option B, cont. ANSWER KEY

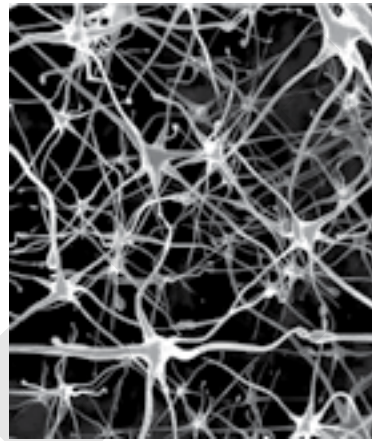
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Do you think this child developed strong language skills by the age of six? Why or why not?

Yes, because of the numerous and thick (strong) connections between the neurons in the child’s brain.

How do you think this child grew all of those neuron connections and pathways?

The child spent years listening to others speaking and then attempting to speak himself/herself. Learning a language requires much practice and makes the brain stronger.

The Real Truth about “Smart” and “Dumb”

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