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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: Students will learn about the concept of expandable intelligence.

Timeline: After the MAP Reflection - Approximately 25 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.

Option A *(Plain Text Version):*

- 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.)
  - 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?
- 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.
- Students will draw 6 pictures to help the students' brains add this new information to their long-term memories.
- 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 students that the brain has an amazing ability to remember pictures.
- Read the first section as a class and model the drawing and the response to the first one.
- Ask students to read silently the next section and complete the second drawing.
- Have students check for understanding with a partner 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…
- Students 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).
- 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 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.

Reading for Activity Option 1 or 2

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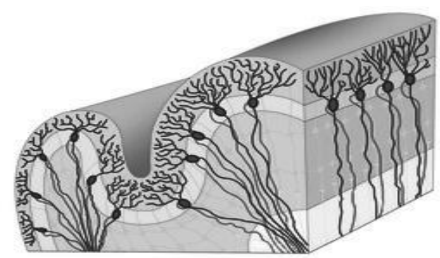
But most people don't know that when they practice and learn new things, parts of their brain change and get larger a lot like muscles do when they exercise.



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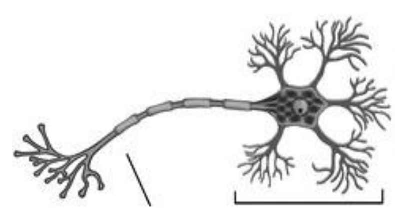
A section of the cerebral cortex

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.



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A typical nerve cell

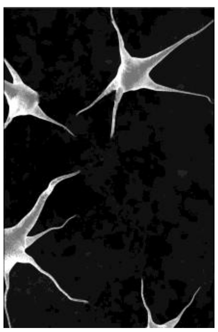
When you learn new things, these tiny connections in the brain actually multiply and get stronger. The more that you challenge your mind to learn, the more your brain cells grow. Then, things that you once found very hard or even impossible to do—like speaking a foreign language or doing algebra—seem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

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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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%! 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!

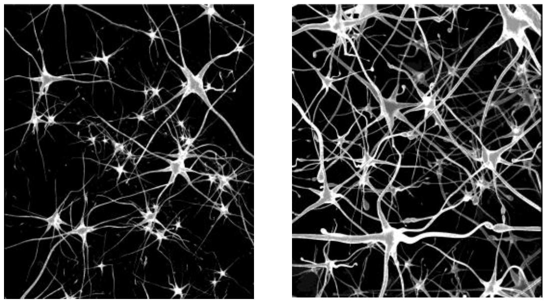
From the first day they are born, babies are hearing people around them talk—all day, every day, to the baby and to each other. They have to try to make sense of these strange sounds and figure out what they mean. In a way, babies are exercising their brains by listening hard.

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

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



At birth At age 6

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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. 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

E-mail questions or comments to:
Growyourbrain@aol.com

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

"You Can Grow Your Intelligence"

Directions: ①Read each numbered section. ②Draw a picture that represents the main ideas in that part of the article. ③Fill 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 _____________________

____.

