Anchor Activity

Category: EFFORT

The Brain Is Like a Muscle

Background

When students believe they can get smarter with effort, they are more likely to work hard in school and see failures and mistakes as opportunities to learn. This activity introduces basic biology of the brain, highlighting that mental activity creates stronger connections between the nerve cells. To understand this concept, students learn that the brain is like a muscle, which gets stronger through exercise—being challenged to think harder. In scientific experiments, students who learned about the brain as a muscle significantly improved their school performance (Blackwell et al., 2007).

Objective

Students begin to build growth mindsets by encountering the idea that the brain is like a muscle that becomes more powerful with effort.

At a Glance

Students first reflect on what it feels like when they're asked to do something hard. Then they learn that the brain is like a muscle and talk about how this message can help them when they face challenging tasks or assignments.

Related Anchor Activities

Learning from Failure and Mistakes

Selecting Struggle Strategies

Developing a Growth Mindset

Resources Needed

- ☐ Projector and screen
- ☐ Selected video or PowerPoint presentation:

  Khan Academy video:
  https://www.youtube.com/watch?v=WtKJrB5rOKs

  PowerPoint presentation and handouts by the Thrive Foundation for Youth:
  http://www.stepitup2thrive.org/mindset/group-lessons/

  YouTube video on neural connections:
  https://www.youtube.com/watch?v=t4np5wLAhWw

  Shorter YouTube on neuroplasticity:
  https://www.youtube.com/watch?v=ELpfYCZa87g

Activity Steps

Students participate in a visualization activity that prepares them for writing a letter.

Opening Activity

1. Ask students to close their eyes and think about a time when they had to do an assignment or study for a test or learn something in school that they thought they couldn't do.
2. Ask them to imagine that they are at that moment again. Briefly ask students the following questions without pausing to ask individual students to respond:
   - What are you thinking at this moment?
   - What are you feeling?
   - Is anything happening to your body, such as to your breath, your pulse, or your eyes?

Writing the word down diminishes the likelihood that students will change their words based on other students' words when you go around the class later.

3. After finishing that brief visioning exercise, ask students to think of *one word* that captures how they were thinking or feeling when they were facing the academic task they thought couldn't do or that they didn't want to do. Ask students to write their word down on a piece of paper.

Stress to students that they can only choose *one word* to capture their feelings and that they can be as creative as they want to in choosing that word.

4. Quickly go around the group and ask students to share the word that described how they felt when they had to tackle an academic task they thought would be extremely difficult.

   Do not pause to ask students to explain the words they share, but if a few students' words are either unclear or intriguing, you can go back and ask them to explain their choices after all students have shared their words.

Students reflect on how they handle moments when they feel they can't accomplish a task.

5. Ask the full group how they handle moments when they feel like they can't accomplish an academic task. Allow a number of students to share honest answers to that question.
   - If no student says that they might not do the assignment or might not work hard on it, ask students if any of them might react to an academic challenge that way.
   - Tell students that while not doing a really challenging task or not working hard on it is understandable, it can greatly undermine chances of becoming a successful student. If you skip one hard assignment, you may skip another hard assignment, and pretty soon you are way behind and will have to work even harder to catch up or will suffer the consequences of not succeeding in the class or maybe in school in general.

Main Activity

Introduce to students the idea that the brain is like a muscle through a mini lecture or showing a video.

6. Tell students that today they are going to discuss an idea that can be very helpful at moments when they think an assignment or a test or something else they are asked to do in school is too difficult for them.
7. Ask students this question: *If you go into a weight room to work out and get stronger, is it better to lift heavy weights or light weights?*

Let students offer answers to your question until someone explains that it would be better to lift heavier weights because you break down the fibers in your muscles and then they grow back stronger.

8. Tell students that your brain is actually very similar to your muscles. When you challenge it, you actually make it stronger.

You can explain this concept to students in one of two ways: (A) through a mini lecture or (B) using one of several videos. Resources for both of these options are provided below.

9. Mini lecture: Deliver a short lecture that explains the idea that the brain is like a muscle using the following points:
    a. The brain is made up of billions of nerve cells that work together through a neural network that passes electrical and chemical signals from one cell to another.
    b. These signals are really our thoughts—both conscious and unconscious—and they control what we think, say, feel, and do.
    c. When you challenge yourself mentally, such as by working hard on a difficult problem or task, the nerve cells in your brain send more signals to the other nerve cells in your brain.
    d. This firing of electrical and chemical signals back and forth between the nerve cells does two things: (1) it creates new pathways between the cells in your brain and (2) it deepens the pathways that already exist between cells in your brain.
    e. Because those neural connections are the pathways through which your thoughts travel, multiplying and deepening those pathways is like building more roads in a place without many roads. You will be able to go more places (i.e., think more thoughts) and do it faster (i.e., think more quickly) than you were able to before you challenged your brain.
    f. We know from scans of the brain conducted by scientists that you can see these connections multiply and deepen when you challenge yourself mentally. We also know that parts of your brain can actually grow physically when they are challenged and store more information.
    g. So when you challenge yourself mentally, you are actually growing your brain.
10. Videos: Use one of the resources listed below to convey to students that the brain is like a muscle.
    a. Khan Academy has produced a video that describes the changes in the brain that occur when it is stimulated and challenged. You can find that video at https://www.youtube.com/watch?v=WtKJrB5rOKs.
    b. A PowerPoint presentation and handouts for students and parents that teach the idea that the brain is like a muscle can be found on the Step-It-Up-2-Thrive web site, which is sponsored by the Thrive Foundation for Youth, one of Search Institute's partners and funders. You can access those resources at http://www.stepitup2thrive.org/mindset/group-lessons/.

c. The YouTube video compares creating new neural connections in the brain to building a bridge across a ravine: each time it happens, the task gets easier. The video can be accessed here: https://www.youtube.com/watch?v=t4np5wLAhWw.

d. The shorter video available here explains how brains change with effort (neuroplasticity) using animated graphics: https://www.youtube.com/watch?v=ELpfYCZa87g.

Students articulate the value of thinking about the brain as a muscle that gets stronger when it works hard.

Closing Activity

11. End the session by asking students why it might be helpful to remember that the brain is like a muscle the next time they face an academic challenge they think might be too difficult.

Draw out of the discussion the idea that if you know your brain will benefit from working hard, you might be more willing to embrace the challenge even if you don't think you will be able to get the right answers quickly or maybe at all. Even if you don't get the score or grade you would like, you are still making your brain smarter by trying.

REACH Technique: Remind students that working harder can make them smarter

When students are preparing to tackle or are struggling with an academic challenge, remind them that they are creating new connections in their brains and as a result they are getting smarter.

Suggestions for Getting Started

1. Remind students that smart is not what they *are*—it's what they work to *become*.

2. If students seem unmotivated, reflect on whether the lesson or task is in the "Goldilocks" level of academic challenge—not too high, not too low. If the level of challenge is not in that zone, how might you adjust or scaffold the experience for growth that exercises the brain? Stimulating the brain to grow requires a challenge that's beyond what's comfortable but not overwhelming.

3. Periodically ask students to reflect on times when they've worked very hard at something and eventually became good at it. Ask how they can apply those strategies to "exercise" the part of the brain that is being stretched in your classroom.