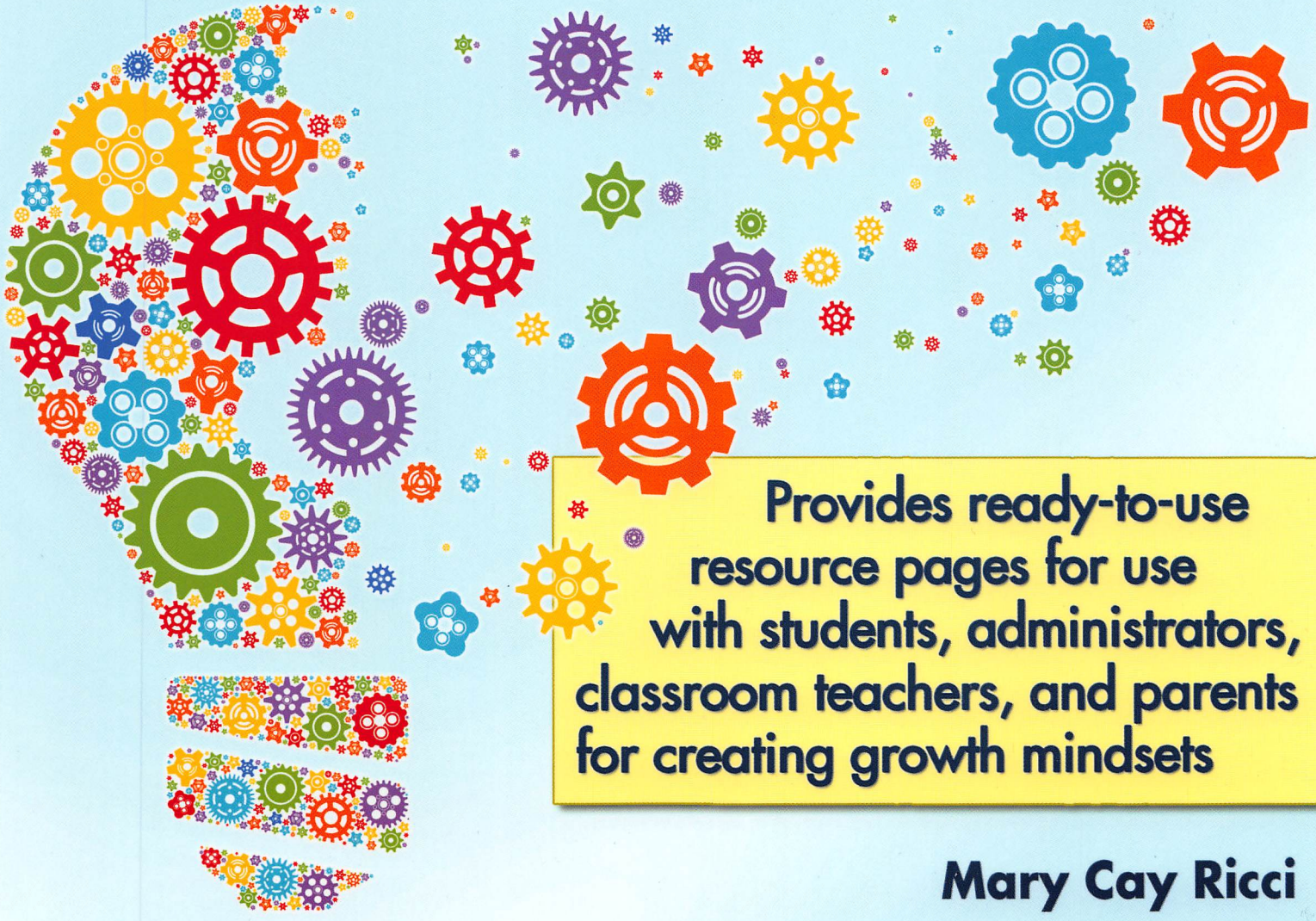
READY-TO-USE RESOURCES FOR

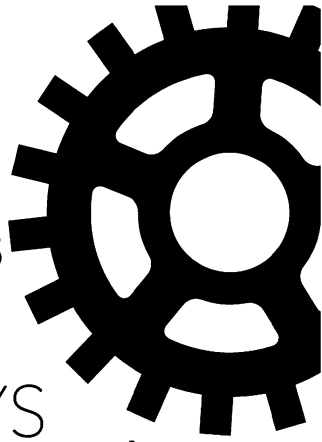
Mindsets in the Classroom

Everything Educators Need for School Success



Provides ready-to-use resource pages for use with students, administrators, classroom teachers, and parents for creating growth mindsets

Mary Cay Ricci



CHAPTER 8

WHAT ARE SOME WAYS TO HELP STUDENTS ADOPT A GROWTH MINDSET?

The resources in this chapter support students in adopting a growth mindset. A good place to start is finding out what students already know about the brain and teaching students about the role neurons have in learning. More and more studies are surfacing that emphasize the importance of teaching students about their own brains. Increase of motivation, willingness to accept new challenges, and healthier reaction to failure are only a few of the benefits a child will experience when he or she understands how his or her brain works. With tight timelines for curriculum and instruction and school districts' emphasis on consistent educational experiences among grade-level and content-area classes, educators are losing the flexibility to "add on" anything more to an already very crowded curriculum and instruction plan. Therefore creativity is needed when looking for ways to embed some conceptual neuroscience and growth mindset knowledge into instruction.

Keep in mind that many learning experiences must take place over the entire school year—students need to be constantly reminded that they have the ability to get smarter and that each and every brain has an elastic (neuroplasticity) quality to it. It all depends on how you use it. Therefore, we need to be innovative about ways to teach and revisit the concept of malleable intelligence. Begin to think about the subject area and grade level that you teach. Where are the opportunities to introduce some basic brain education and growth mindset concepts?

Several resources are provided in this chapter (additional ideas can be found in Chapter 8 of *Mindsets in the Classroom*) to help students build a conceptual understanding of what happens in the brain when they learn. Some of these resources also help students visualize the neural connections that are made and strengthened with learning, practice, and mastery.

Preasses What Students Already Know About the Brain

Previewing the skills or concepts prior to the preassessment help prime the brain and activate background knowledge. The preassessment preview for elementary students might be as simple as a series of questions that initiate a discussion like the following:

Teacher points to his or her head and says:

- "Who knows what is in here?"
- "What do we use our brain for?"

Teachers will explain to the students that they would like to find out what the students already know about the brain and how it functions. For example, you could say, "I am going to give you a paper, and I would like for you to do two things." Hold up a copy of the blank preassessment for the brain (see Resource 37: Blank Preassessment of Students' Brain Knowledge, p. 89). Ask students to draw a picture of what they think their brains might look like inside the blank outline of the head. Then, students should write down anything that they know about their brain. Remind students that this is not for a grade, but to help you learn what they already know. A preassessment for secondary students might be a written and visual response to this prompt: "Write and illustrate everything you know about the brain." After the students have completed the preassessments, review them, looking for patterns of responses (as illustrated on pages 102–103 in *Mindsets in the Classroom,* some may surprise you), and begin planning for instruction.

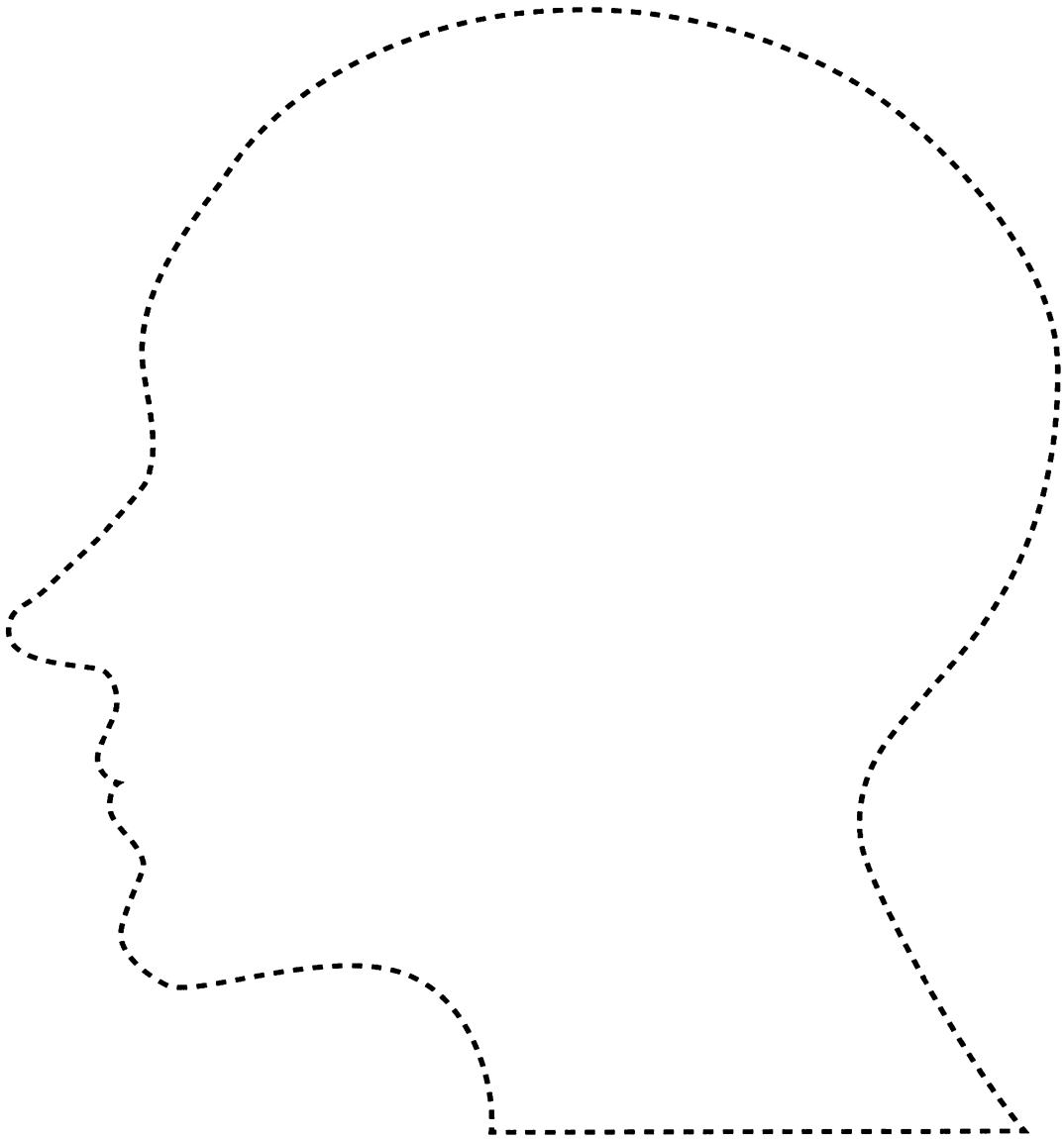
Before you implement these learning experiences, give students some background on how the brain works, telling them, "Inside the brain we all have brain cells called neurons. They are so small, we can't see them unless we have very powerful microscope. We have billions of neurons, some connect to each other and some are just sort of floating around." Show them a picture or diagram of a neuron using Resource 38: Neuron Illustration—Primary (younger kids; p. 90) or Resource 39: Neuron Illustration—Secondary (older kids; p. 91). Ask students to talk about anything they notice about the way the neuron looks. Then ask them to think about what might cause these neurons to connect to each other.

Resource 40: Students Become Neurons (pp. 92–93) provides a lesson for teaching students about neurons. It emphasizes what might be happening in the brain when you first learn something new, not understanding yet and not having mastery. I have used this with all ages; in fact, at the high school level, the entire class participated as neurons and they attempted to replicate their teacher's brain.

The Advanced Academics Office including their Primary Talent Development Teachers in Frederick County, MD, took this lesson a step further—they developed the My Connections (see Resource 41, p. 94) graphic to remind students of neural

Blank Preassessment of Students' Brain Knowledge

Draw a picture of what you think your brain looks like.



Write down or ask your teacher to write anything that you know about your brain.

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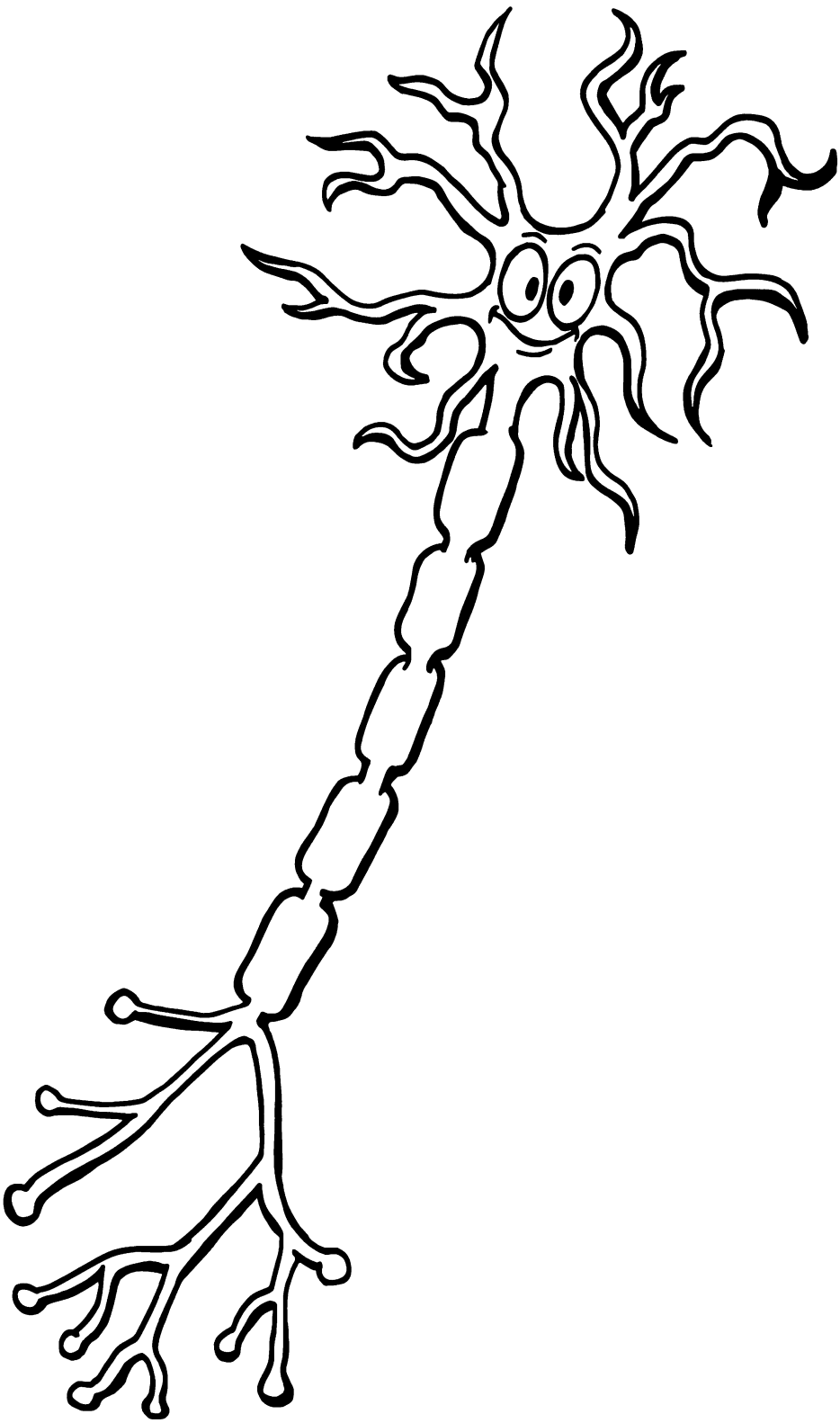
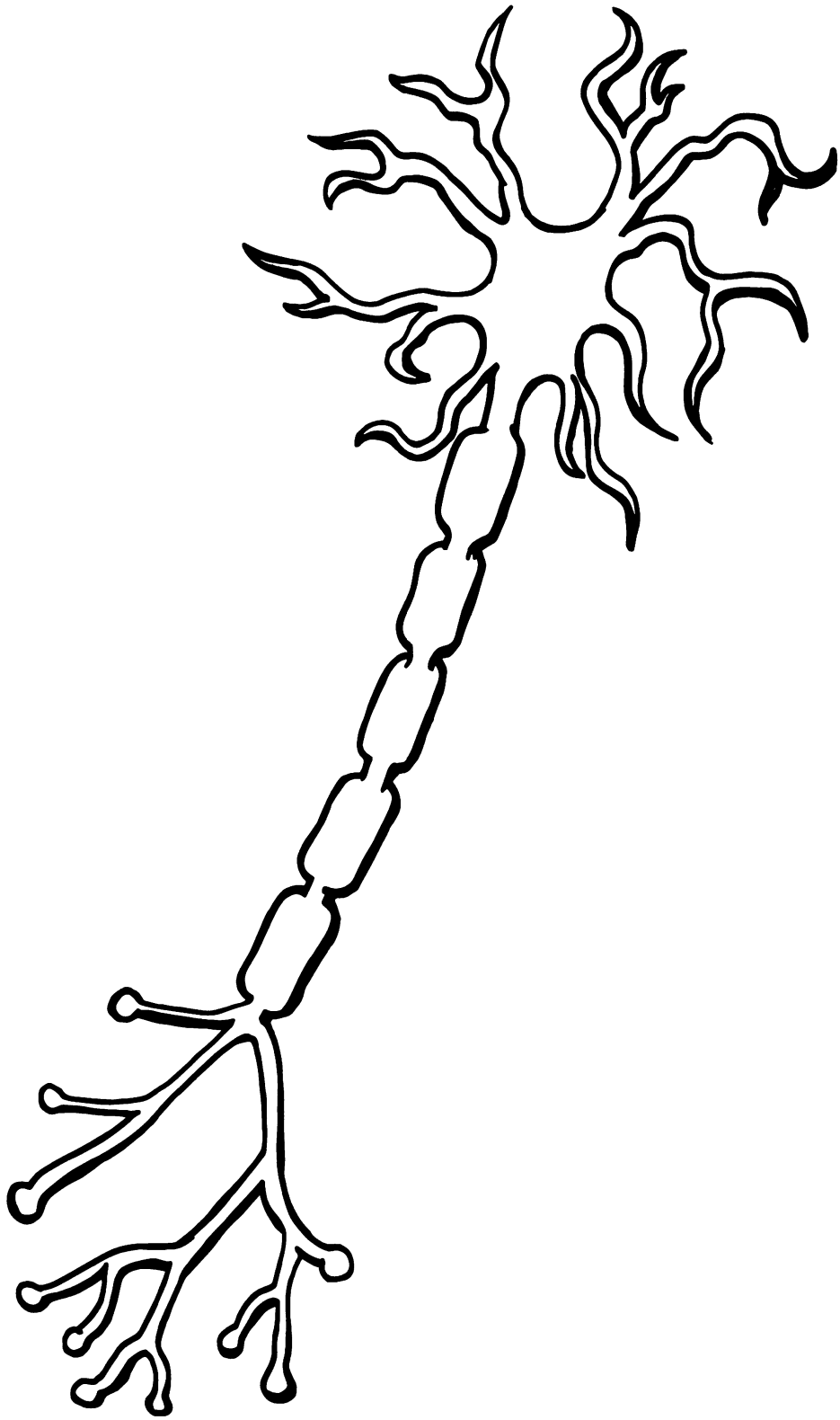
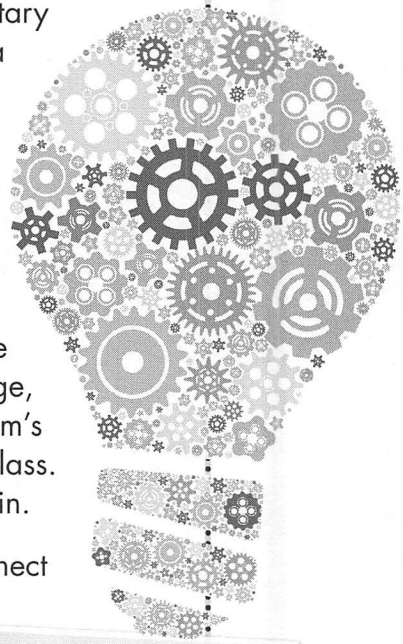
Neuron



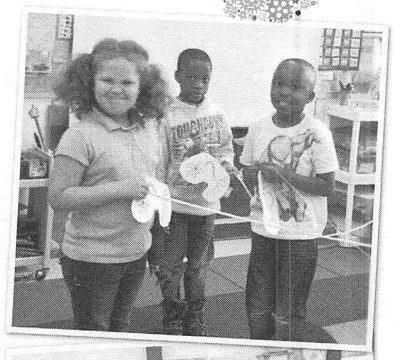
Neuron



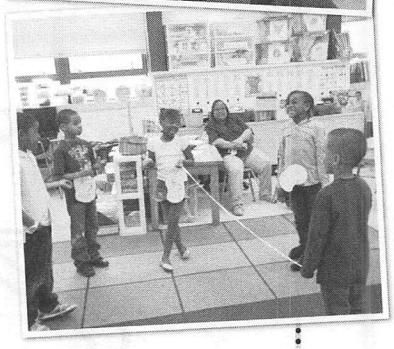
Students Become Neurons



1. Ask for three to five students to volunteer to be neurons. With elementary and middle school students, you can have them hold a picture of a neuron or hang a cardstock neuron around their neck. What I find successful is taking one of the neuron illustrations in Resources 38 or 39, make copies on cardstock, laminate if you can, and then cut them out with about an inch margin around them. Place a hole on any edge of the neuron and string a piece of yard or string through making a "necklace" of sorts. Students can wear these around their necks.
2. Ask the students if someone could share something new that he or she learned recently. Responses might include algebra, a foreign language, sewing, a sport, and so on. For illustrative purposes, we will choose Dom's response. Dom shared that he just began learning division in math class. Announce that this group of neurons now represents part of Dom's brain.
3. Take a thin piece of thread and ask two of the student neurons to connect using this thread, with each of them holding one end. This thin connection will represent division. Explain to the students that Dom is just beginning to learn how to divide, so this is a thin new connection—it is not very strong yet.



4. Ask Dom if there is something that he has learned and that he is getting better at but still might need some practice. In this case, let's say that Dom responds with "multiplication." At that point, two of the student neurons can connect using a thicker connection such as a piece of yarn. This represents a better understanding of multiplication than division, but it is not yet at mastery level.



5. Then ask Dom for an example of a math skill that he has mastered—something that he understands so well that he could teach it to others. Dom responds with addition. Now two or three of the student neurons that represent Dom's brain will be connected by a thick piece of rope. (When possible, I like to keep the colors the same among the thread, string, and rope)
6. Next, propose the following scenario:
   a. Let's look at Dom's division connection: It is represented by a thin piece of thread, but what will happen to this connection after Dom has more experience learning about and practicing division? Let's say that Dom persists and puts forth a lot of effort and eventually becomes an expert in division. How

will this connection change? At this point demonstrate how this thread of a connection is replaced with a strong, thick rope.

b. What if, instead, Dom decides that division is just too hard for him and he gives up? What will happen to this connection? (It will remain a "not yet" connection or disconnect entirely.)

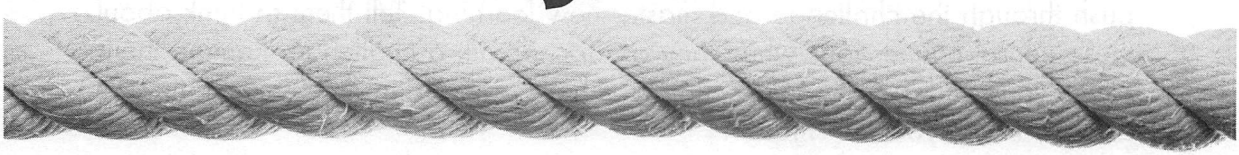
c. Think about this: When Dom is on summer vacation he does not practice his division skills at all. On the first day of school he is given a preassessment to see what he remembers about math. What do you think might have happened to his division connections? (They got thinner because they were not used.) They will strengthen a lot quicker since the learning is not completely new. He just has to practice.

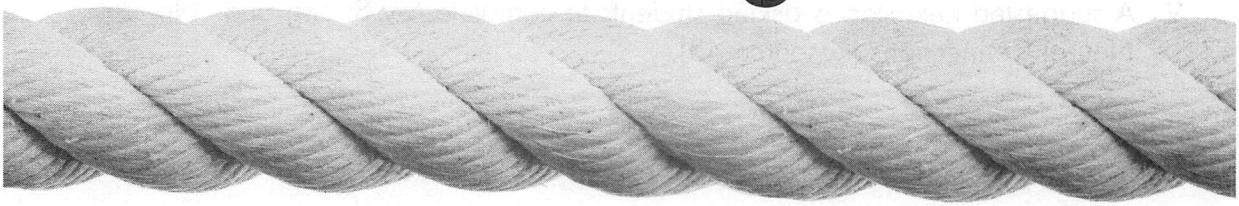
7. Ask students to think of a time when they felt frustrated learning something new. Ask them to visualize their neurons making stronger connections every time they push through the challenge and master new learning. Tell them to think about these neural connections when they are faced with a challenge. Remind them, "Once you build a strong connection, you have added density to your brain and actually made yourself smarter!"

8. Introduce the charts you will hang in the room: My Connections (Resource 41) and How Will Your Brain Grow and Learn Today (Resource 42)? You can also make copies for all of the students to keep on their desk, or inside their agenda book.

9. A suggested next step is asking students to complete My Strong and "Not Yet" Neural Connections (Resource 43).

My Connections . . .





I try, I practice, I GROW!

connections in their brain. This chart can be displayed and referred to as students are learning as a continuous reminder of strengthening neural connections. They also developed a visual called "How Will Your Brain Learn and Grow Today?" (see Resource 42, p. 96) This visual is another way to remind students of the different stages of neural connectivity.

Reflecting on Their Own Learning

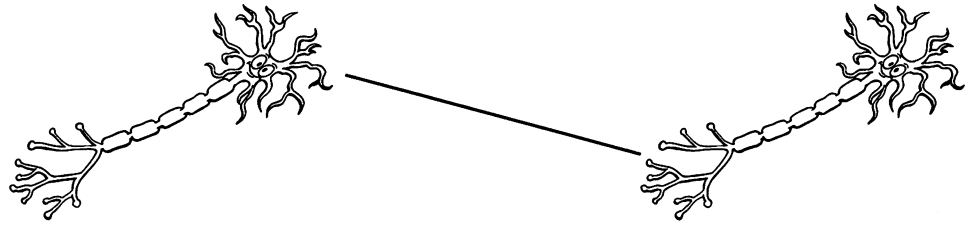
Ask students to think about skills they have recently learned as well as things they have known for a long time and understand fully. Using Resource 43: My Strong and "Not Yet" Neural Connections (p. 97), ask students to draw their strong and "not yet" neural connections. Ask students to think about things they understand and are very good at as well as things that they are just learning, but "not yet" understanding fully. The new learning will be represented by a very thin or dotted line, the "not yet" learning should be represented by a thicker line, and mastery learning should be represented by a very thick line between the neurons. (You may want to refer to Resource 42 to demonstrate this idea of the connections grower "thicker.") Older students typically fill up the brain with many connections. Remind younger students to draw their neurons small (they don't have to actually look like neurons) so that they can fit many connections in their brain. This is an interesting task to do quarterly so that they can compare their brain growth over time.

"Yet"

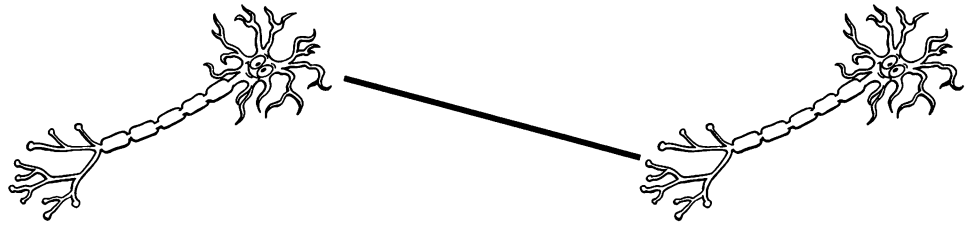
The power of *yet* has become very prevalent in education recently, between Carol Dweck's On the Power of Yet (https://www.youtube.com/watch?v=ZyAde4nIIm8) and Sesame Street's Power of Yet song (https://www.youtube.com/watch?v=XLeUvZvuvAs), I have seen that educators, parents, and coaches are embracing the importance of the word "yet." In fact, in several middle and high school classrooms I visited, I noticed the word "yet" in big letters hanging on the classroom wall as a reminder. Resource 44 (p. 100) is a sample lesson (that was inspired by Frederick County, MD's, Advanced Academics Office) that could be used to talk with students about the power of the word "yet." Resource 45 (p. 101) is a diagram that demonstrates how neurons and connections grow as students learn more—it illustrates the amount of growth that occurs between birth and age 7. This can be used within the context of the Power of Yet lesson or independent of the lesson

How will your brain learn and grow today?

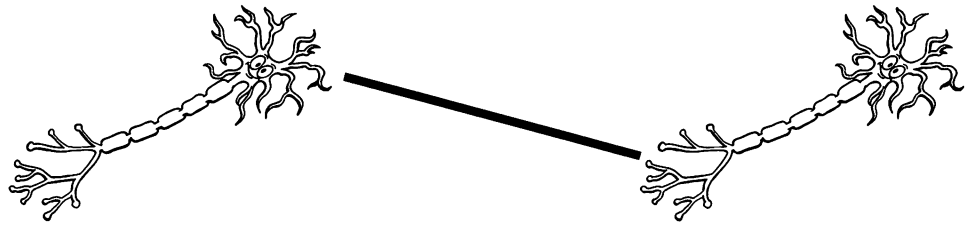
"I like to try new things."



"I keep trying until I can!"

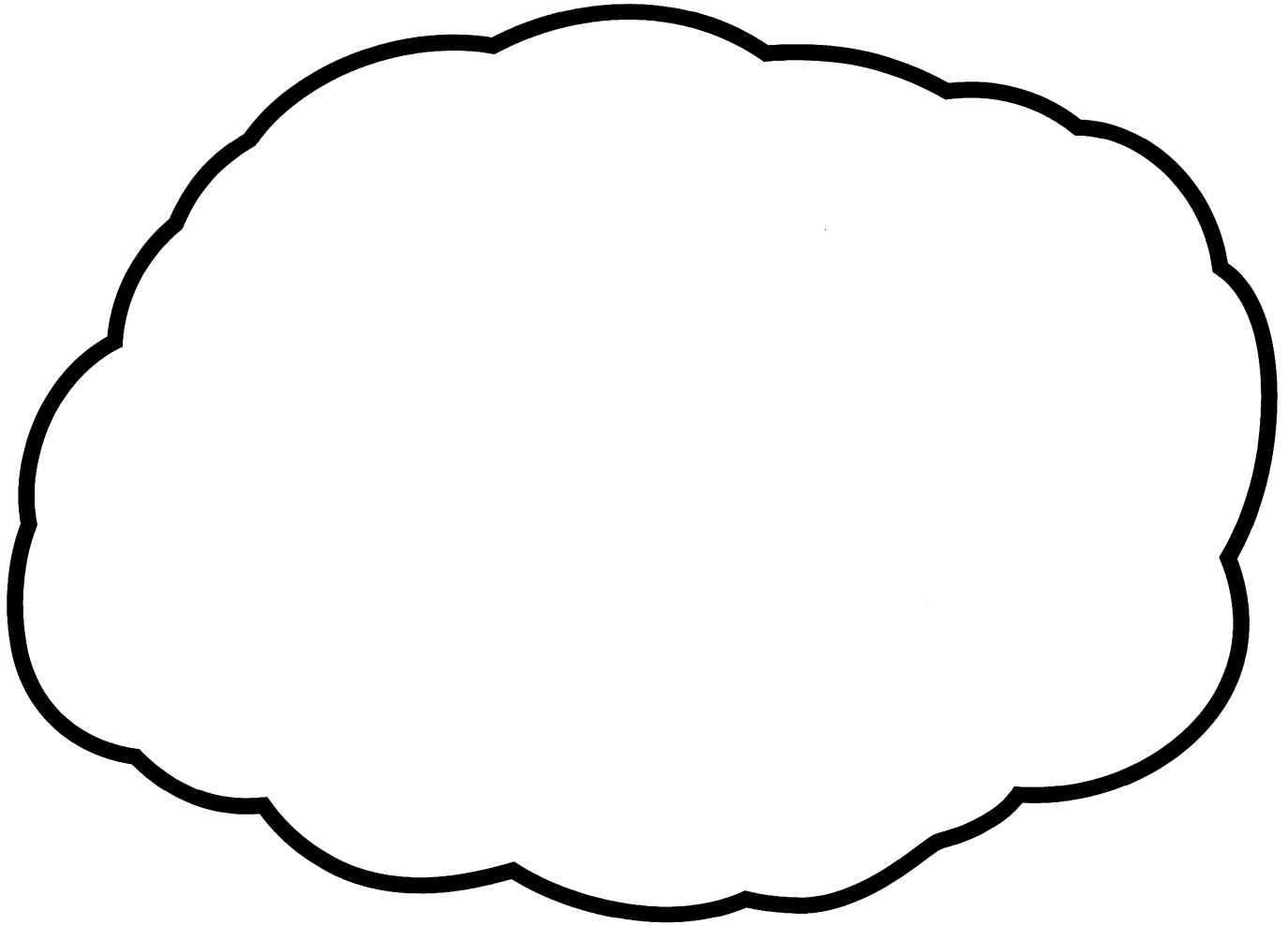


"My efforts and mistakes helped me learn! What's next?"



Making mistakes is one of the best ways your brain learns and grows!
The harder you try without giving up, the more you will learn.
GROW YOUR INCREDIBLE BRAIN TODAY!

My Strong and "Not Yet" Neural Connections



Brain

RESOURCE 44

The Power of Yet

Teacher's Notes:

- Use after students participate in and understand the neuron lesson in Resource 40.
- Even though part of this learning experience is based on a picture book, it provides a powerful metaphor for taking on many new challenges—it could really be used at all grade levels.

Materials

- a full spool of thread or a full ball of thin string or yarn
- book that demonstrates someone learning something new such as *Walk On! A Guide for Babies of All Ages* by Marla Frazee
- picture of neurons at birth and at age 7 (see Resource 45)
- a poster or sign with the word "yet"

Goals

- To explain that the brain grows and makes connections through experiences such as learning new things, struggling to understand, taking on challenges, persevering, learning from mistakes, trying new strategies, and putting forth effort.
- Students will understand and communicate that the harder we try without giving up (persevering) and sticking with something (stamina), the more we learn.
- Teacher and students will demonstrate how we can turn "I can't" statements into "I can't *yet*!" statements.

Instructions

1. Share this goal with the students: "Today we will review what we learned about the brain and explore how to make our connections stronger so that our brain can learn and grow."
2. Show a picture of a neuron and ask the students to share what they remember about it. Students may respond with the following:
    - Neurons are everywhere in your brain.
    - They are tiny brain cells that make signals to send messages that tell your body what to do.
    - You have billions of these in your brain.
    - They are really, really tiny.
    - They help you learn by connecting to other neurons.
    - Your brain grows by making connections.

If students do not mention the above, share the information with them.

3. Show students the picture of the neurons at birth and then of a 7-year-old. Use Resource 45 to display this.
4. Ask them what they notice in the illustration. Point out that the 7-year-old brain has more neural connections and is denser—ask them why they think this is.
5. Choose a book or piece of text that centers around learning something new. For illustrative purposes, this lesson will use *Walk On! A Guide for Babies of All Ages* by Marla Frazee
6. Share with students a time when you had to learn to do something new (e.g., tried a new cooking technique, tried to learn your way around a new city or country, practiced a new sport, learned to skate, learned a new language, etc.). Share your story and emphasize the roadblocks and struggles that you encountered along the way (e.g., fears, failures, support you needed to find, new strategies you had to use).
7. Share with students that you found a book that reminds you of your own experience. Ask students: *Do you remember what I had to do to make those connections stronger?* (Find support, make mistakes, persevere, build my stamina, practice, try new strategies, set smaller goals, etc.) Listen to this story and see how the baby reacts and what he or she has to do as he or she learns something new. (Have the three sizes of string/rope and two neurons visible in case students want to refer to them during the book discussion.)
8. Read the book in its entirety once, then ask: *Can the steps that the baby took be applied to learning to do anything?* Read the book again, stopping at the following places in the book for discussion and reflection.

Quote From the Book	Question to Pose
"You will need support. This is tricky because sometimes what you think will support you won't."	Think of a time when you wanted to try something new and you realized that you might need some kind of support from other people. Let's share some of those experiences.
"Now. Get a grip. Pull yourself up, stand."	How do you interpret the phrases "Get a grip" and "Pull yourself up"? What can these be applied to other than learning to walk?
"Are your knees buckling? That's okay."	When you learn something new, do you sometimes face challenge or a setback? How does that relate to the baby's knees buckling, and why is it okay?
"It may take some time, remember to breathe."	What does "remember to breathe mean"? Why is it important?
"Oops. It is very common to fall down."	What does this statement mean?
"You can try again, but first, run down the checklist."	What is on the baby's checklist? Why is this important?
"Look toward where you want to go."	How does this relate to something new that you are learning? (Mention a specific example of something they are learning in your class.)
"Take the first step. And another and another. It gets easier, huh?"	Why does it get easier? How does this baby's story relate to perseverance and resiliency? What would happen if babies gave up on learning to walk?

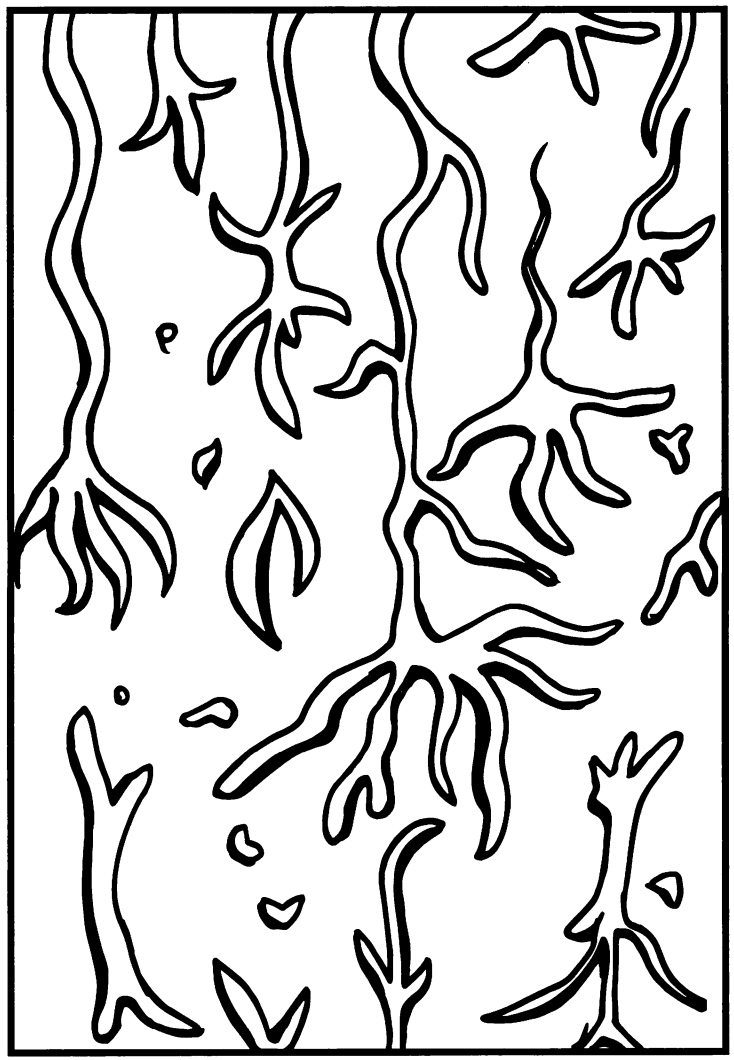
You may also want to discuss more deeply about all that the baby did in the story to make his or her connections strong for walking (find support, make mistakes, persevere, build my stamina, practice, try new strategies, set smaller goals, etc.).

9. Write on chart paper, smart board, sentence strip, or the board the following: "I can't _____." Tell the students there are some things that we just aren't so good at; we haven't developed those strong connections. Complete the sentence with something you can't do such as "I can't swim." Go back to the sentence and add the word "yet," so it becomes "I can't swim yet."
10. Ask the students think of something that they aren't good at **yet**. Have them stand or sit in a circle on the floor and tell them that they are now all neurons in a brain. (If students have their paper neuron "necklaces," they should put them on.) Each student will take turns and complete this sentence, "I can't _____ yet!" After they say the sentence, they will roll a spool of thread or ball of string/yarn to another student. Be sure to tell them to hold the end of the string with one hand while they roll the spool or ball of string with the other hand.
11. When everyone has had a turn, ask students to hold their connection and stand if they were sitting on the floor. Point out that all of these connection are "not yet" connections and when they do all of the things that the baby did—find support, balance, time, courage, resiliency, strategy, a path, practice, and perseverance—then the connections will get stronger.

Closure

1. Create a simple poster with the word yet in all capitals. Show this to students. Let students know that we all have things that we aren't good at yet, but if they practice, have determination, and persevere they will eventually accomplish their goal.
2. You may also give students a blank index card and ask them to write the word "yet" on it. They can tape it to the corner of their desk or workspace as a reminder.
3. Or, you could close with Sesame Street's Power of Yet song/video (sung by Janelle Monae, found at https://www.youtube.com/watch?v=XLeUvZvuvAs).

Diagram of How Neurons Change From Birth to Age 7



Birth

Age 7

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