Firing Up Neurons! Understanding neuroscience to build strategies for our learners

Jill Henriksen, Psy.D.
Sarah Heller, Ed.D., BCBA, LBA-NY
Merrick Union Free School District
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Overview

01 Provide an overview on the neuroscience science of learning

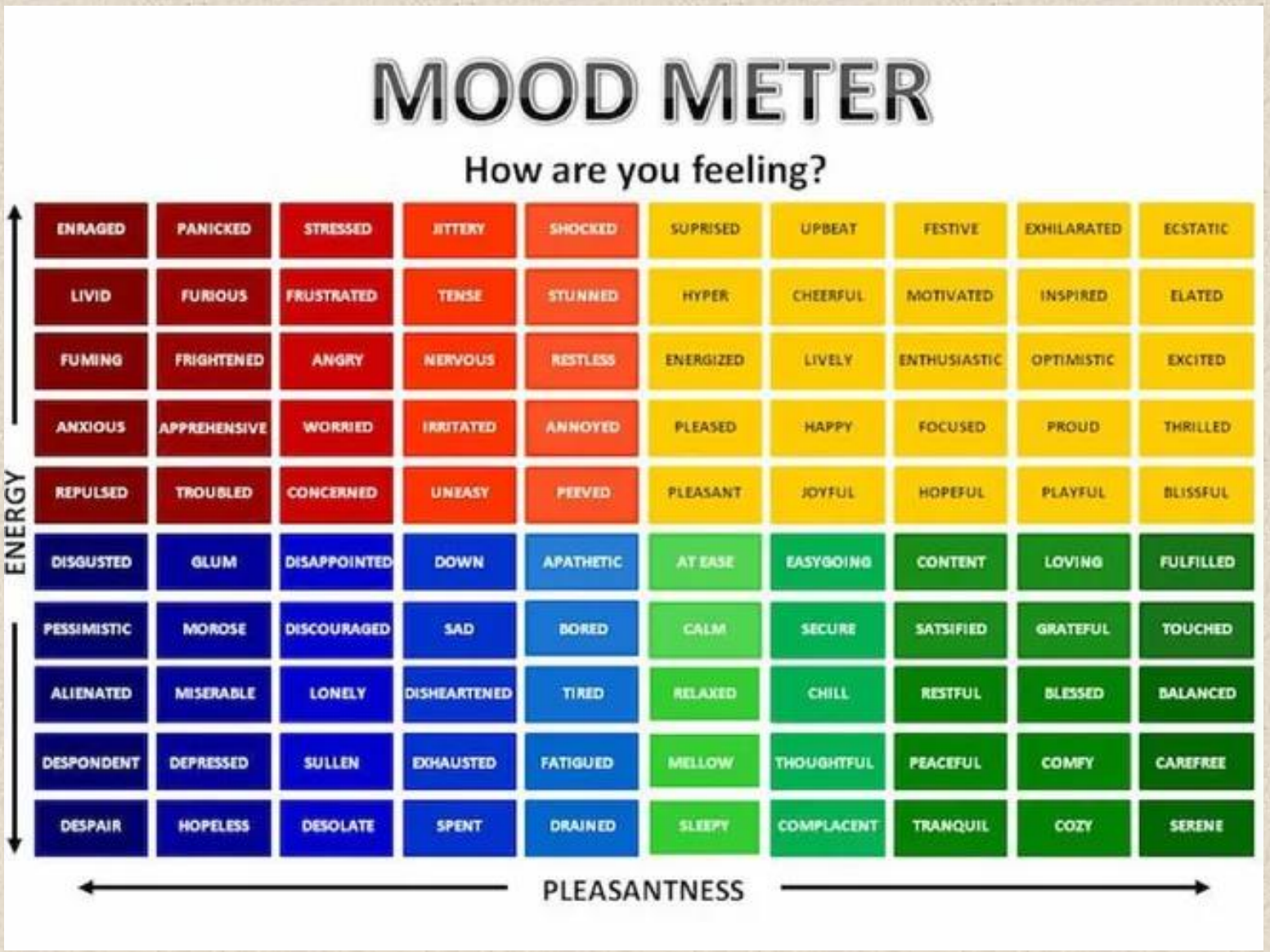
02 What does it mean to grow your brain?

03 Learn how using neuroscience approaches in your classroom can improve emotional health and self-regulation strategies for your students.

04 Design strategies and a plan to incorporate neuroscience techniques into your classroom routine.

Let’s Watch a Video!

Observations?



Neuroscience of Learning – POP Quiz

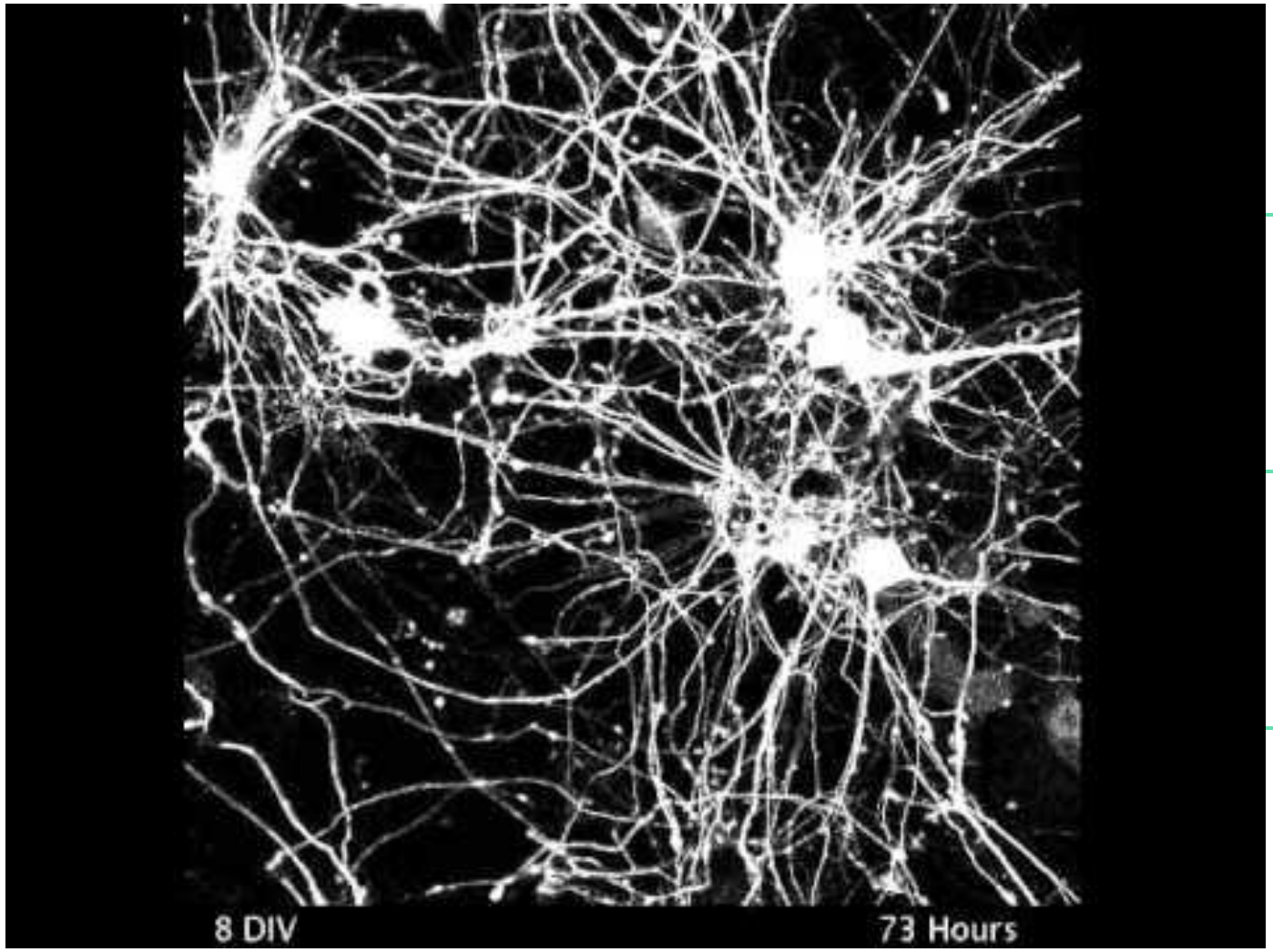
I believe that potential is unknown and unlimited.

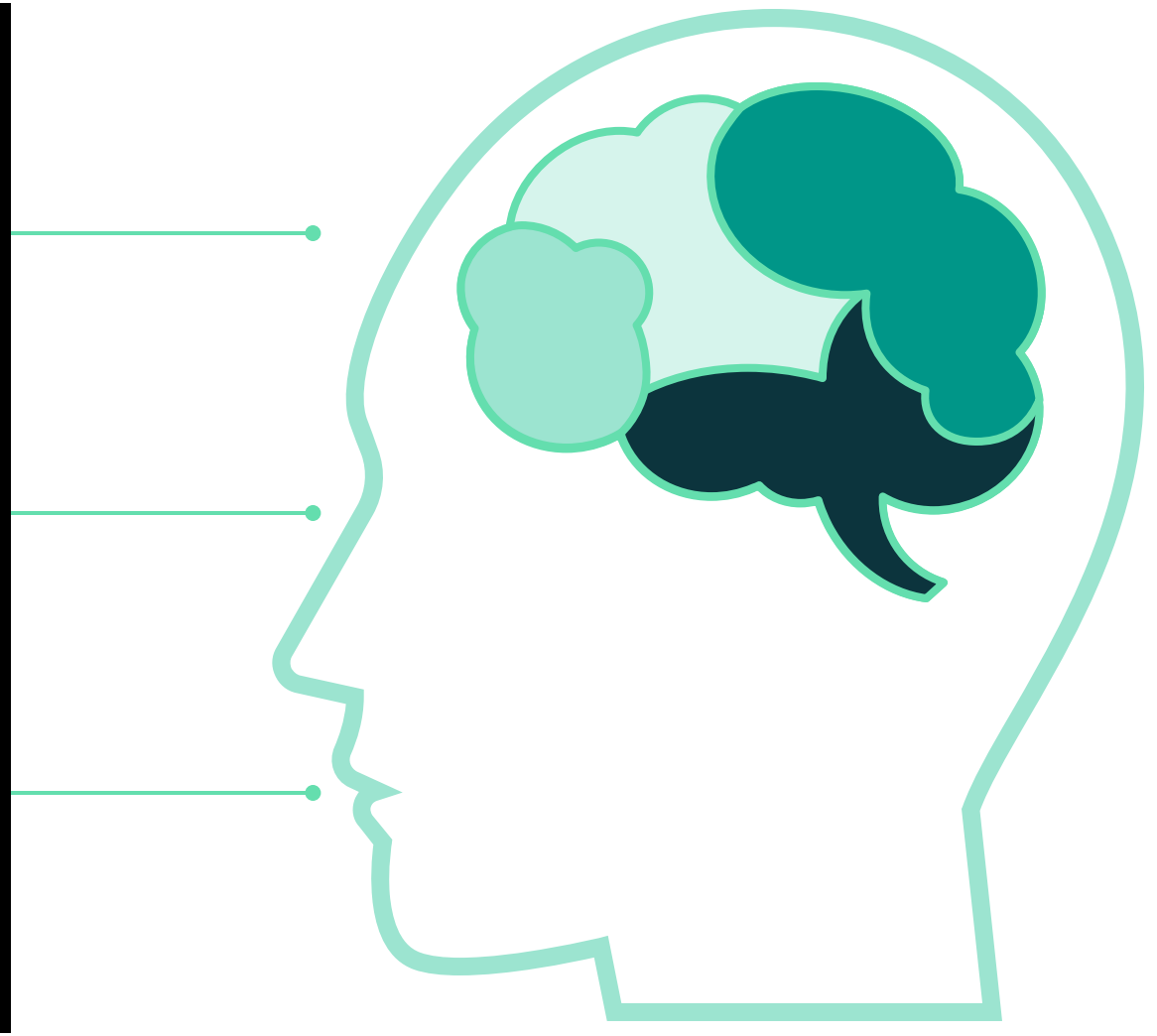
I believe in the malleability of intelligence.

I believe my students can get better at anything if they choose to put in the necessary effort.

I believe learning should be hard and mistakes and challenges are part of the process.

How Exciting is Learning & the Brain!



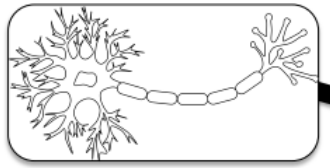


Connecting Neurons

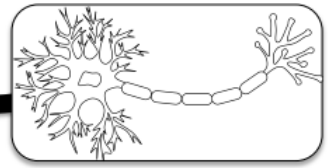
Name: _____

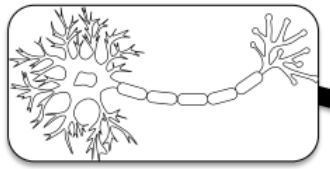
In our brain we have billions of brain cells called **neurons**. Some neurons connect to each other and some are on their own. When you are learning something new and you don't give up, even when it is hard, the neurons in your brain are making strong connections. When you build strong connections, you are making yourself smarter! When something is too hard and you give up, the connection will not get strong or will not connect at all.

MY STRONG CONNECTIONS

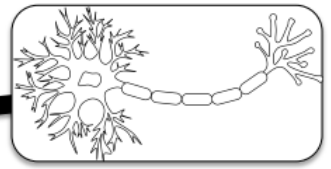


I know a lot about _____!

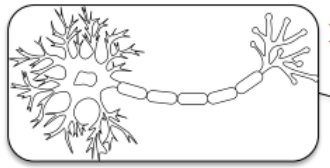




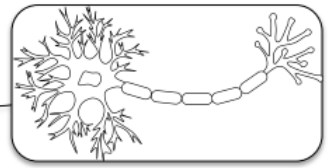
I am really good at _____!

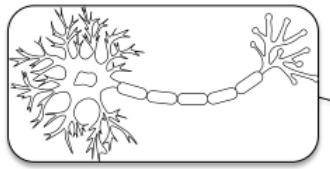


MY NEW LEARNING CONNECTIONS

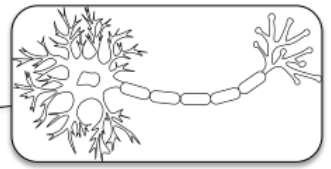


I don't know too much about _____ yet!





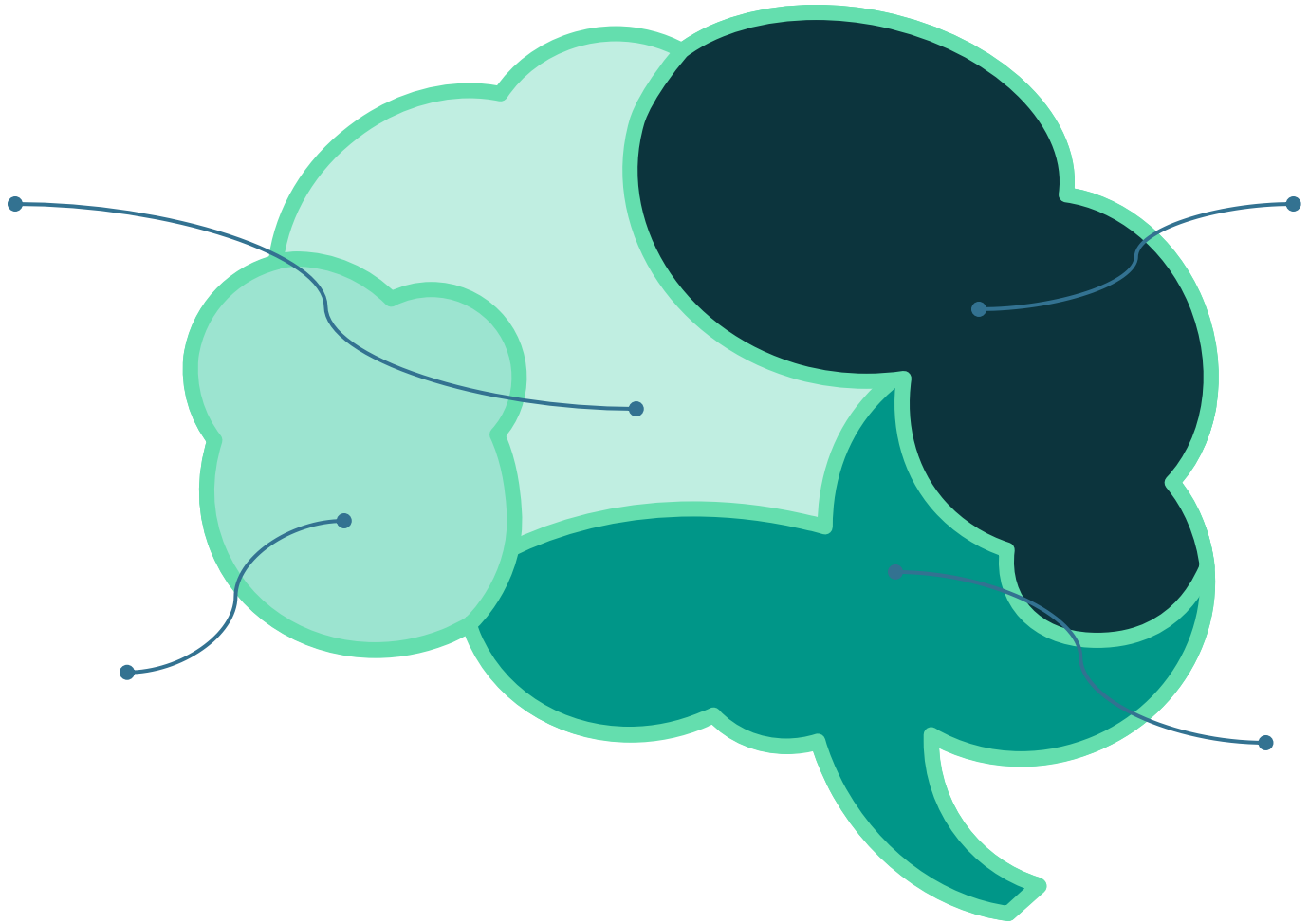
I am **not** really good at _____ yet!



My Amazing Brain! ~ A Primary Resource about the Brain | TpT (teacherspayteachers.com)

What do we know about learning?

Learning is Hard!



A productive struggle is a normal part of the learning process

It's OK to make mistakes

Let's celebrate struggles, obstacles, mistakes, and setbacks.

Learning

- Learning occurs when we connect neurons together!
- Repeated practice, guided by feedback to correct errors, paves a new more efficient road.
- A productive struggle leads to better learning outcomes.
- Students learn better when they discover the details for themselves.

The Productive Struggle

Retrieval

Frequent practice forces the retrieval of memories, telling the brain to make those signals more permanent

Fill in the blanks versus multiple choice

Interleaving

Do not let students completely move on from previous learning. Include a few questions from past lessons on current tests and set aside a few moments each day to review previous concepts to help students deepen their learning.
Ask students to use their long-term memory instead of solely relying on recent material

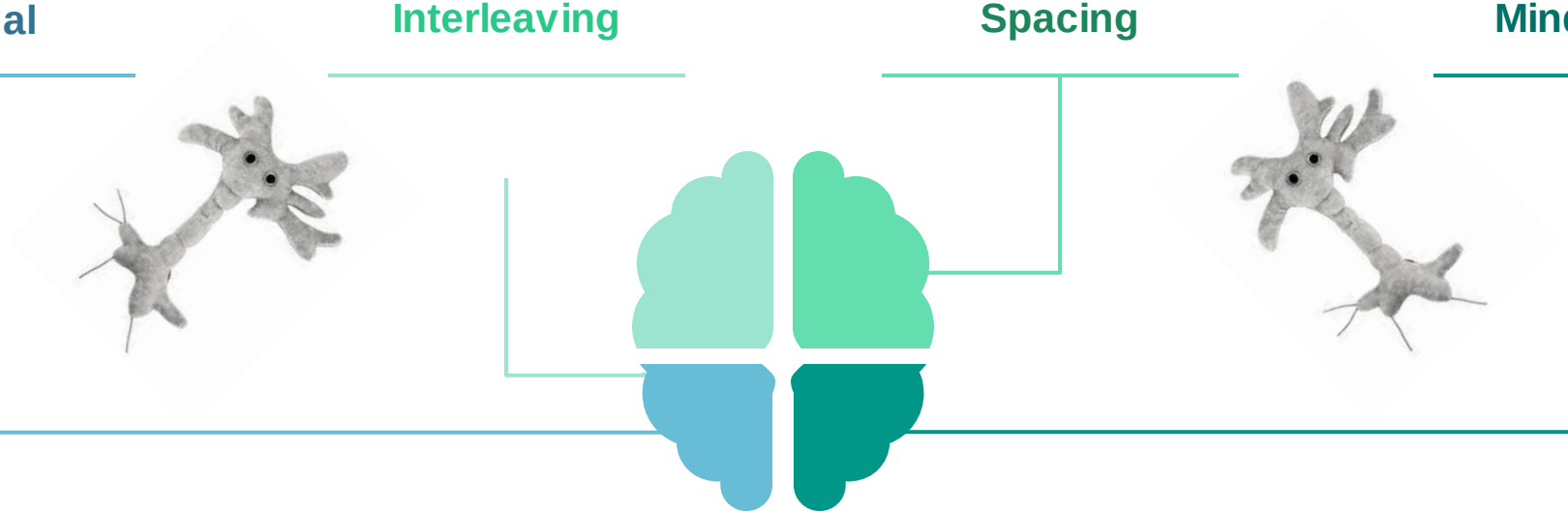
Spacing

The brain has a short attention span and needs repetition. Touch upon important concepts, multiple times per week, through different modalities, in brief sessions.

Mindfulness

Taking a few minutes to breathe and pay attention to the present moment is also a skill!

Mindfulness sessions can stimulate the production of myelin, increasing connectivity within the brain.



There are no more critical life supports than passionate, informed teachers who can resuscitate students' joyful learning.

When educators learn about how the brain appears to process, recognize, remember and transfer information at the level of neural circuits, synapses and neurotransmitters, and when they share that knowledge with students, they share empowerment with their students. Informed teachers help students understand their ability to change their brains and experience success and renewed confidence.

Neuroplasticity

We believe in explicit teaching about neuroplasticity!

We believe in the importance of teaching student's how the brain changes through learning.

We believe these teachings will have an impact on students' perceptions of their own abilities.

Into the Classroom

Talk about the brain

Provide a basic explanation of the brain

Provide cool brain facts!

Explain Neurons & Pathways

Use this language often!

"You're changing your brain!“

Use analogies and visuals

Mistakes and the productive struggle

Celebrate making mistakes

Discuss them in your optimistic closures

Stress and the Brain

Fear and Stress impede Learning.

Only when information is processed in the brain's prefrontal cortex can new learning be incorporated into the networks of long-term memory.

Understanding Emotions & The Brain

Credit: Dr. Dan Siegel – The Hand Model of the Brain.

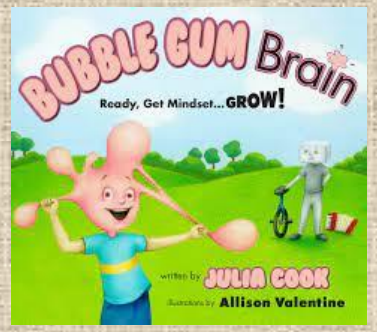
https://www.youtube.com/watch?v=f-m2YcdMdFw

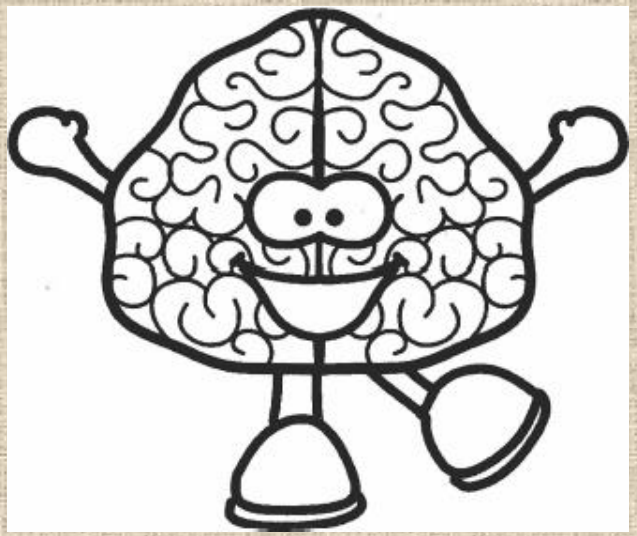
Metacognition

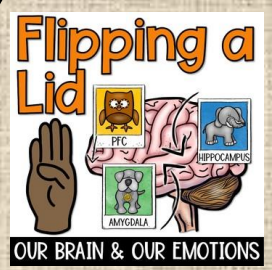
- Thinking about your thinking!
- Engage students early to start thinking about the best ways they learn.
- Using metaphors to help students to understand that they are in control of their brains!

Get Ready to Grow Your Brain!

- How To Draw A Healthy Brain - YouTube
- Growth Mindset Mini-Book by Sam Van Gorp | Teachers Pay Teachers







Teacher Cindy Chernett Brown suggests using an interactive visual to help children understand neuroplasticity.

Two students hold up colorful pictures of neurons.

The teacher then provides many pieces of cut yarn to represent connections between neurons.

She asks a member of the class to tell her a **skill** they are working on, such as soccer. She then asks students what you can do to **get better** at the game of soccer.

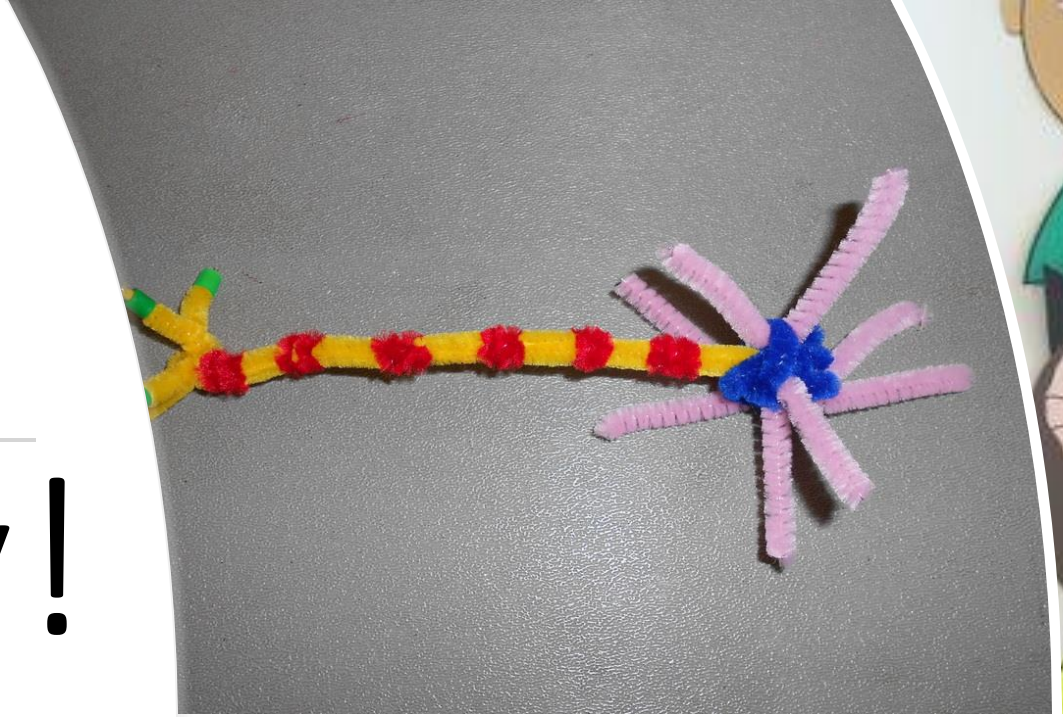
Each child who gives a suggestion selects a piece of yarn and gives one end to each of the students holding the neurons. After many examples, the class can see how thick the collection of yarn is getting.

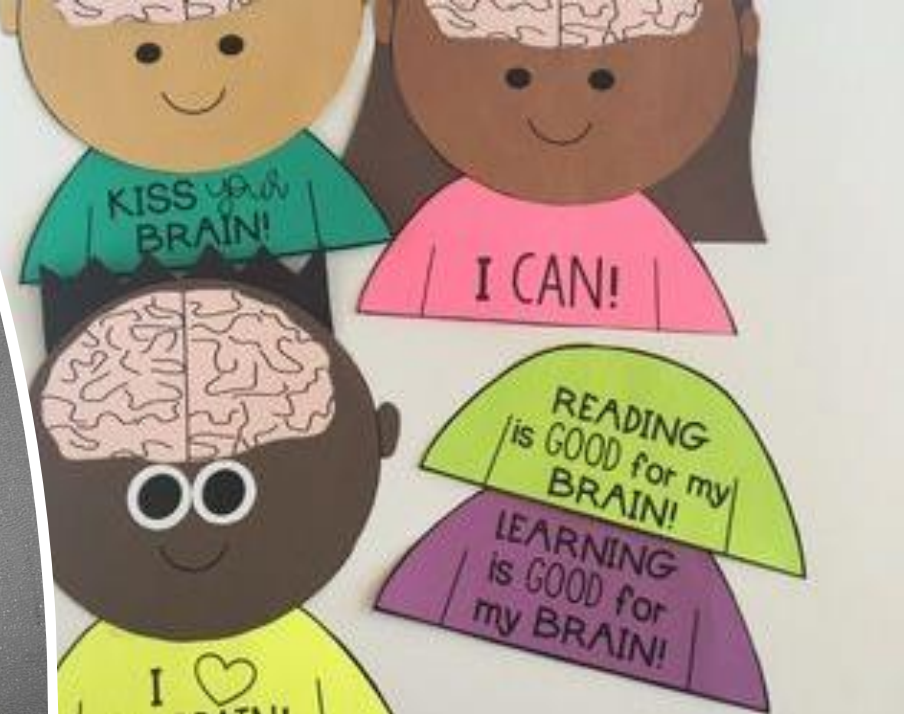
The teacher then gives excuses for not going to soccer practice, such as weather, injury, or the season-ending. With each excuse, she takes away a piece of yarn (representing connections between neurons).

Talk About it in Morning Meeting

[About the Brain: Neuroplasticity Activities – Big Life Journal]

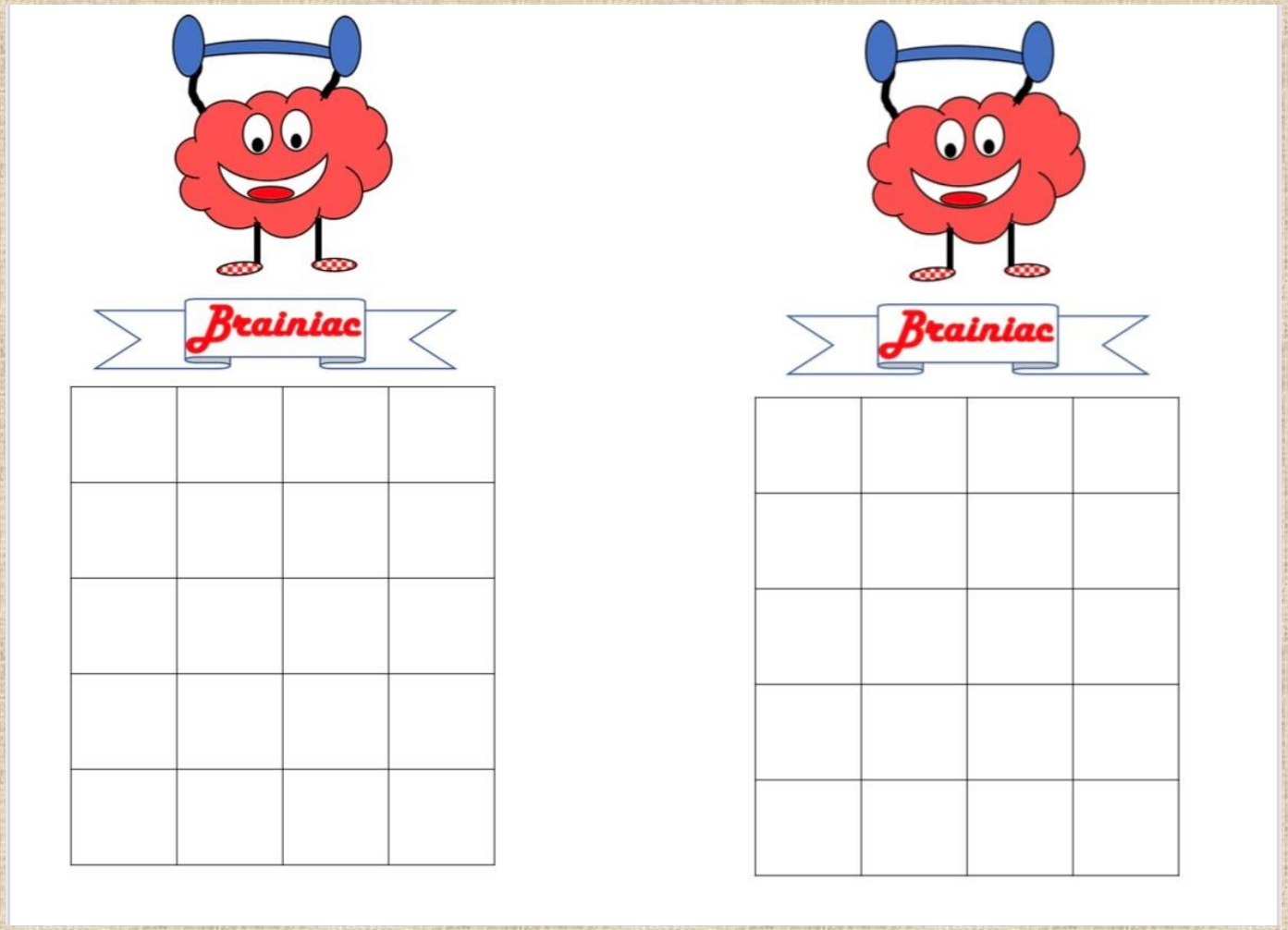
Be Crafty!

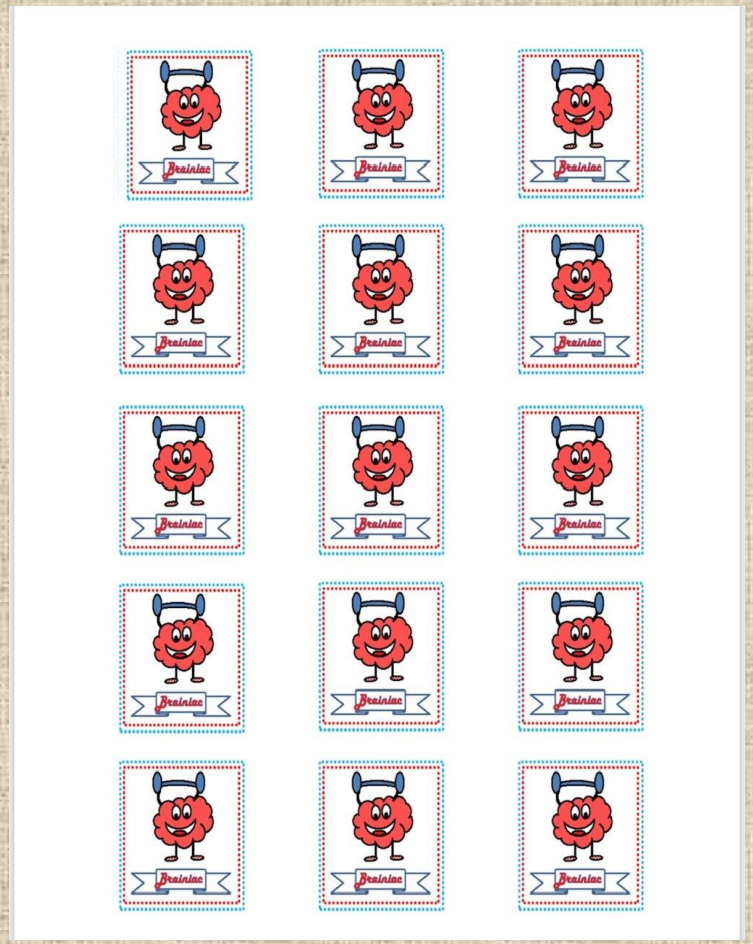



KISS your BRAIN!
I CAN!
READING is GOOD for my BRAIN!
LEARNING is GOOD for my BRAIN!


The Crafty Classroom

Incorporate into your incentive plan





Use the Language!

What is happening with your neural pathways right now?

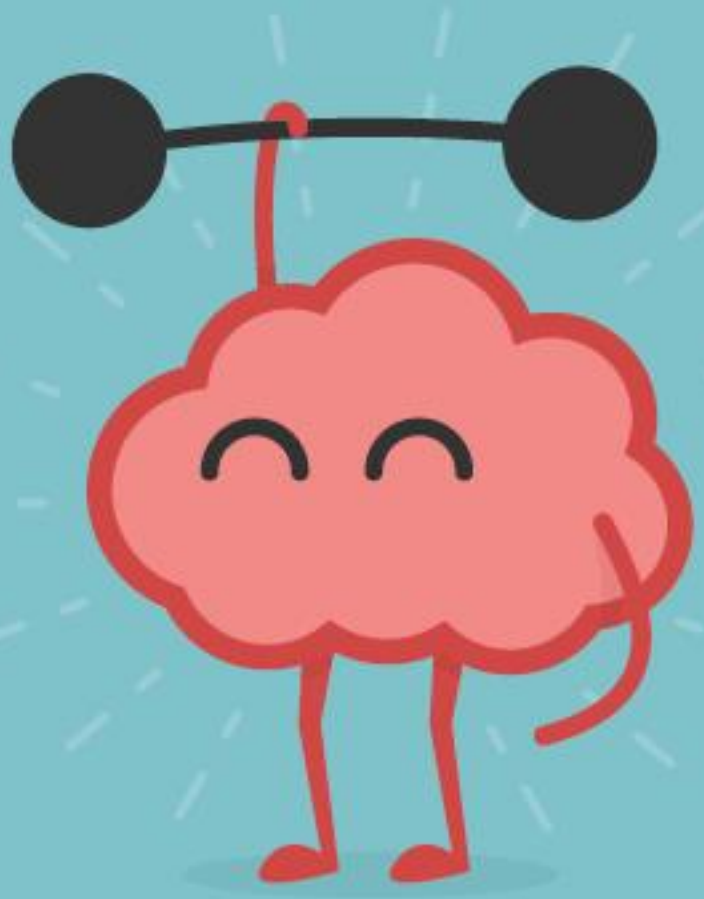
Use your bubble gum brain!

Fire up your neurons!

How do we make our pathways stronger

"I am a learner”

"I can do hard things!”



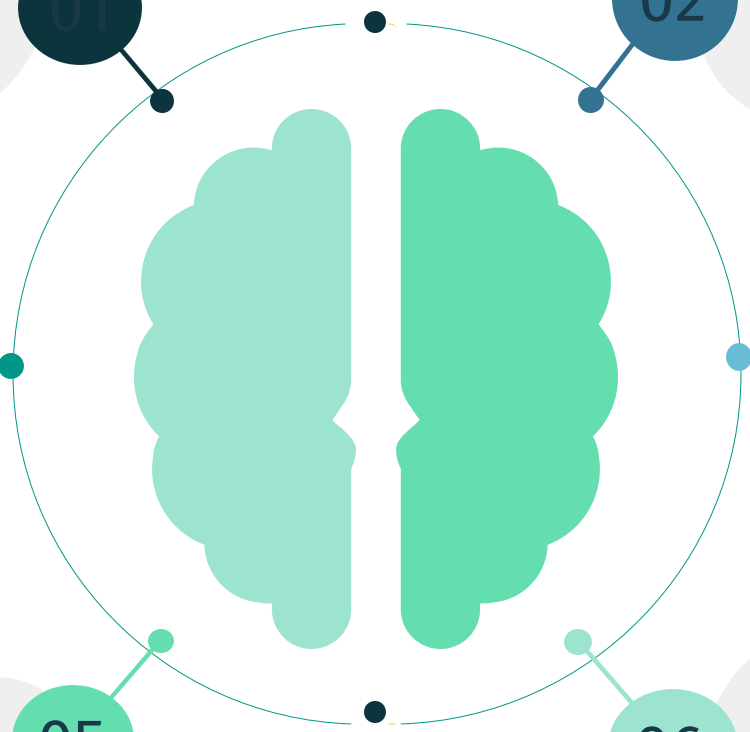
"My brain is a muscle, and making mistakes is like lifting weights!"

"I can grow my brain when I am learning"

Growing Mindsets
Optimistic Closures

01 Was there anything you felt stuck with today? What ways can you try next time to get unstuck?

02 Tell me about the best mistake you made today!



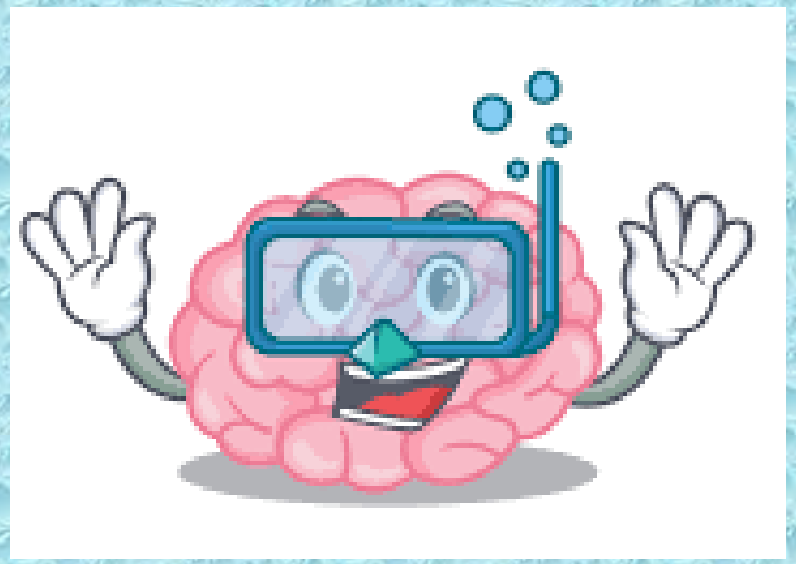
03 Did you grow neurons today? Tell me how!

04 How did you use your power of "YET" today?

05 What did you do today to grow your brain?

06 Did you do anything today that was easy for you? How can you challenge yourself next time?

Diving Deeper



- Edutopia
- Article: The Neuroscience Behind Productive Struggle
- Article: A Neurologist Makes the Case for Teaching Teachers About the Brain

Resources and Credit

- https://www.mineolagrows.com/
- https://mrswintersbliss.com/growth-mindset-ideas-freebies/
- https://www.teacherspayteachers.com/Product/Grow-Your-Brain-Brainiac-Clipart-and-Incentive-Materials-5844143?st=475c54a200c14f6ac730ca54d0c34bc2
- https://biglifejournal.com/blogs/blog/teach-kids-growth-mindset-neuroplasticity-activities
- https://www.teacherspayteachers.com/Product/Growth-Mindset-Mini-Book-2950265?st=d20e357890e5186b0a9557ea95603aab