



Teaching with the Brain in Mind

Darlyne de Haan Ed.D

Introduction: About Me

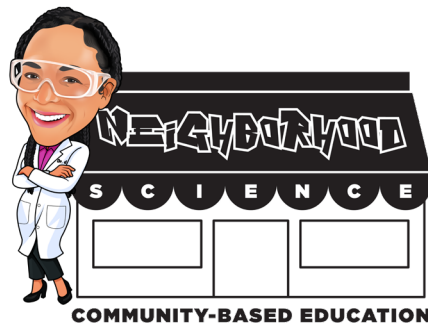
Dr. Darlyne de Haan

Presently the Director of Curriculum and Instruction for Math, Science & STEM.

- ❖ **Blogger** for TESOL- STEM in ELT
- ❖ A **former forensic scientist and chemist** with more than 20 years of experience in STEM,
- ❖ A **recipient and participant of the coveted Fulbright Administrator** Program for Fulbright Leaders for Global Schools, a program sponsored by the U.S. Department of State's Bureau of Educational and Cultural Affairs.
- ❖ A **passionate advocate** for **Changing the Face of STEM** to reflect the population.
- ❖ Brain Based Science **enthusiast**
- ❖ **Founder** of a nonprofit organization-Mad About Science, Inc.
- ❖ Brainbasedscience.com founder
- ❖ Neighborhood-science.com founder



de Haan Consulting, LLC



Links and Surveys

All documents, videos, etc. can be found at:

<https://www.brainbasedscience.com/presentation-resources.html>

Survey

pollev.com/darlynedehaa860

Agenda

The video game model is ideal for kids lacking in foundational knowledge, but it is not necessary for all kids at all times.

How it reacts to stress, and what the brain needs to operate optimally.

Understanding the basics of the Brain,

Part 1 The Brain



Part 2 Stress and Pleasure

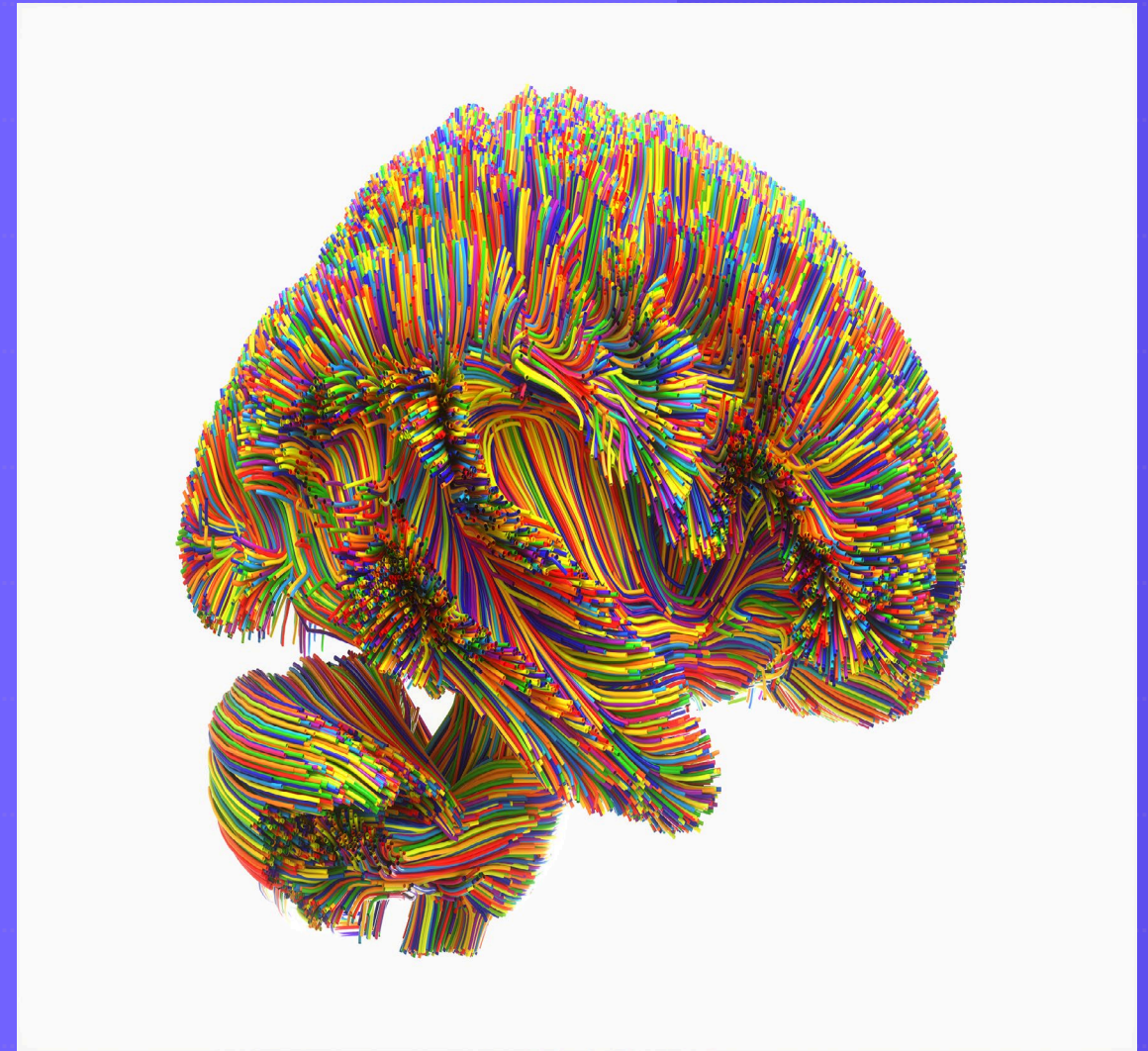
part 3 The Video Game Model

Part 4 Putting it All Together

Introduction

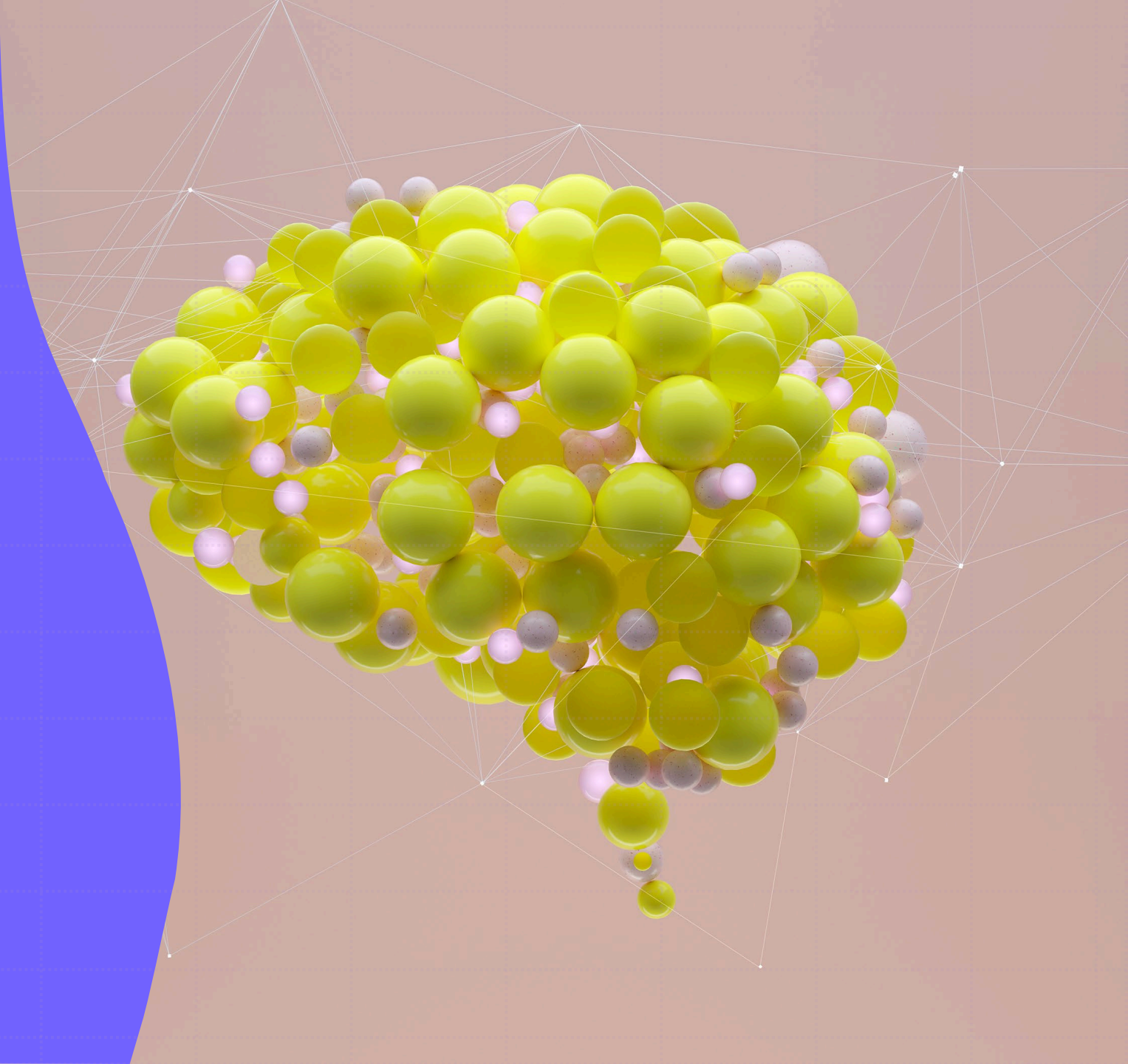
The brain is always changing, as a result of environment and experience. Every lesson, assignment, and interaction shapes your students' brains. Understanding how the brain converts information into learning provides keys to the best instructional strategies and learning experiences.

Upgrade Your Teaching, Jay McTighe, Judy Willis, M.D.



Topic One

Understanding the Basics of the Brain



Brain Survey

pollev.com/darlynedehaa860

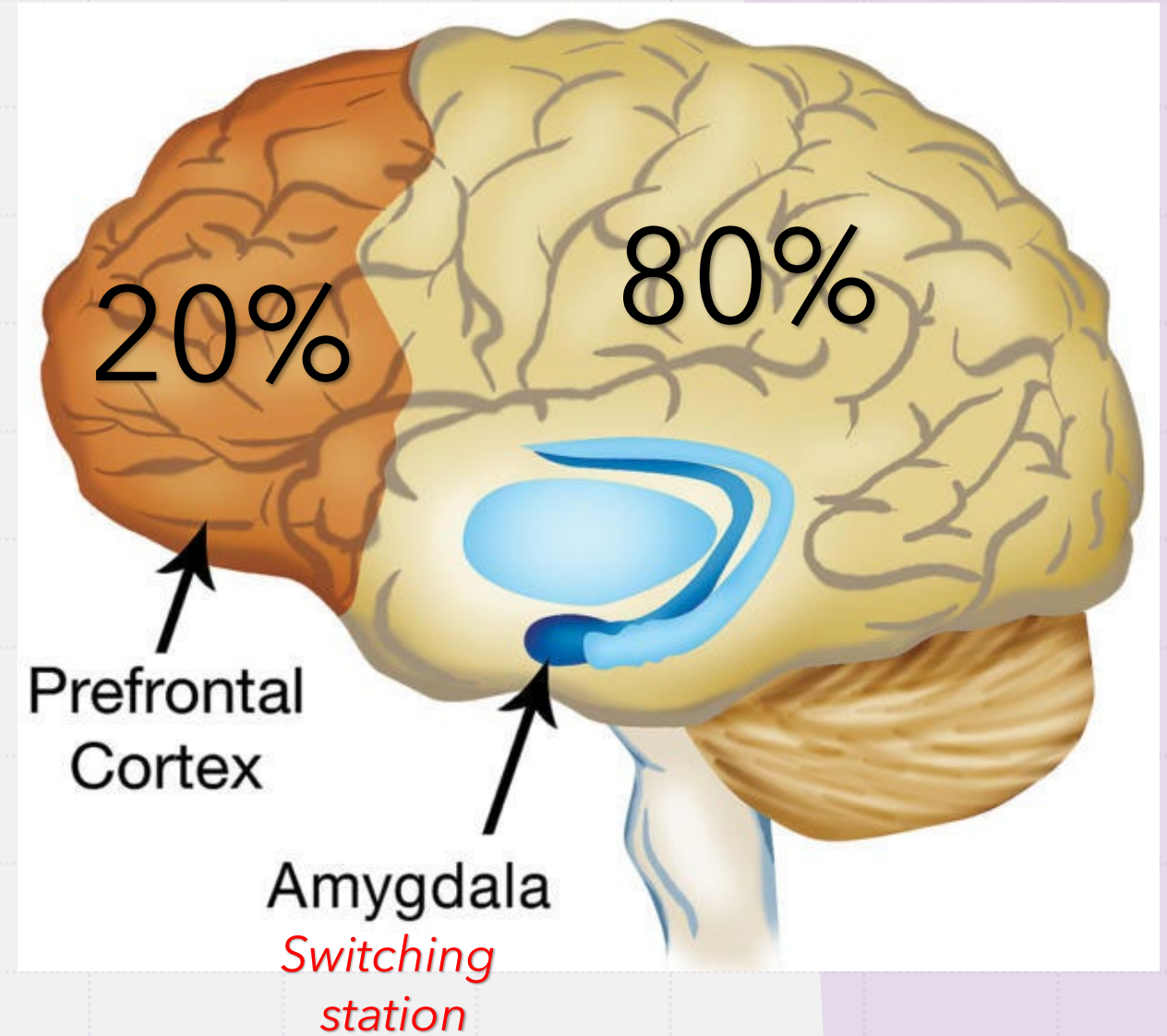
Name a Function of the Brain.

<https://www.menti.com/7h7kjo53gi>

The voting code **8568 9016** .

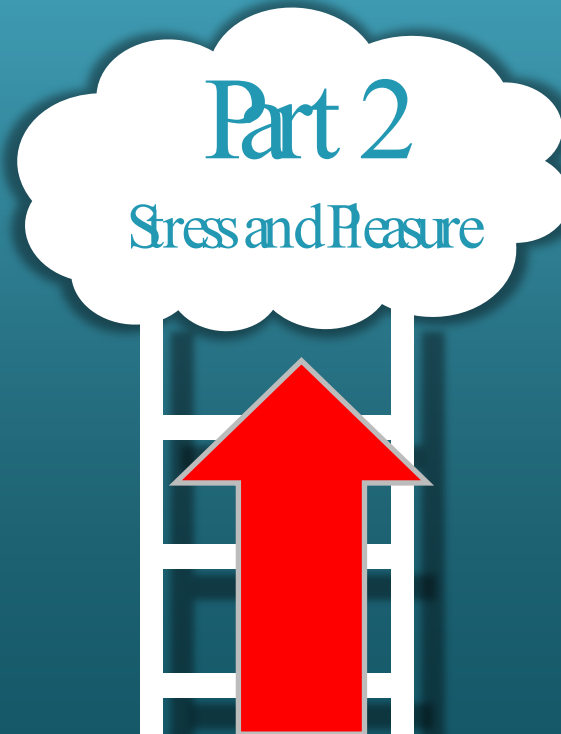


The Emotional/Primitive Brain

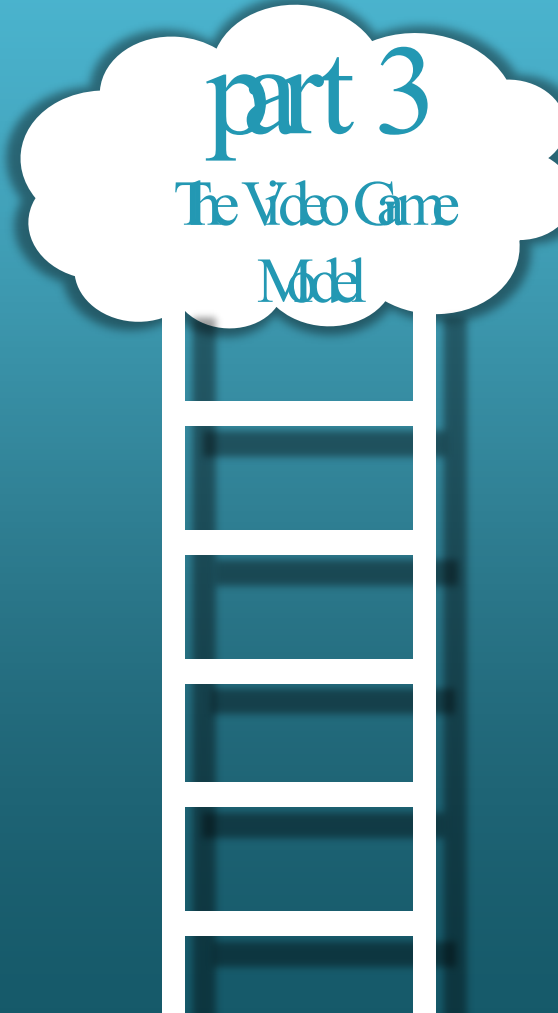




Understanding the
basics of the Brain,



How the brain reacts to
stress, and what the
brain needs to operate
optimally.



The video game model is
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but it is not necessary
for all kids at all times.



Part 4
Putting everything
together

Stress and Pleasure



Imagine the following scenarios. These are instances that the brain would feel **frustrated** or **bored**:

- You are dropped off at the top of a ski resort's steepest run when you've only had experience on the beginner slopes.
- You have to spend your day on the bunny hill when you're an expert skier.
- You play a game of darts with the target two feet away.
- You play a game of darts with the target 200 feet away.
- You are a 3rd grade student trying to do a crossword puzzle designed for experts.
- You are an adult trying to do a crossword puzzle designed for children.

Causes of UNSEEN Stress in School for Students?

- Peer Relationships
- Test-taking anxiety and oral presentations
- Physical, clothing, **language differences***
- No personal relevance* (Gaming Model)
- Frustration due to previous failure (fixed Mindset ©)
- Frustration from falling behind
- Boredom from mastery of content (Gaming Model)
- Making Students keep their monitors on during remote instruction

Stress for
Students?

Dr. Judy Willis

Dr. Judy Willis is a board-certified neurologist combined her 15 years as a practicing neurologist with ten subsequent years as a classroom teacher to become a leading authority in the neuroscience of learning.

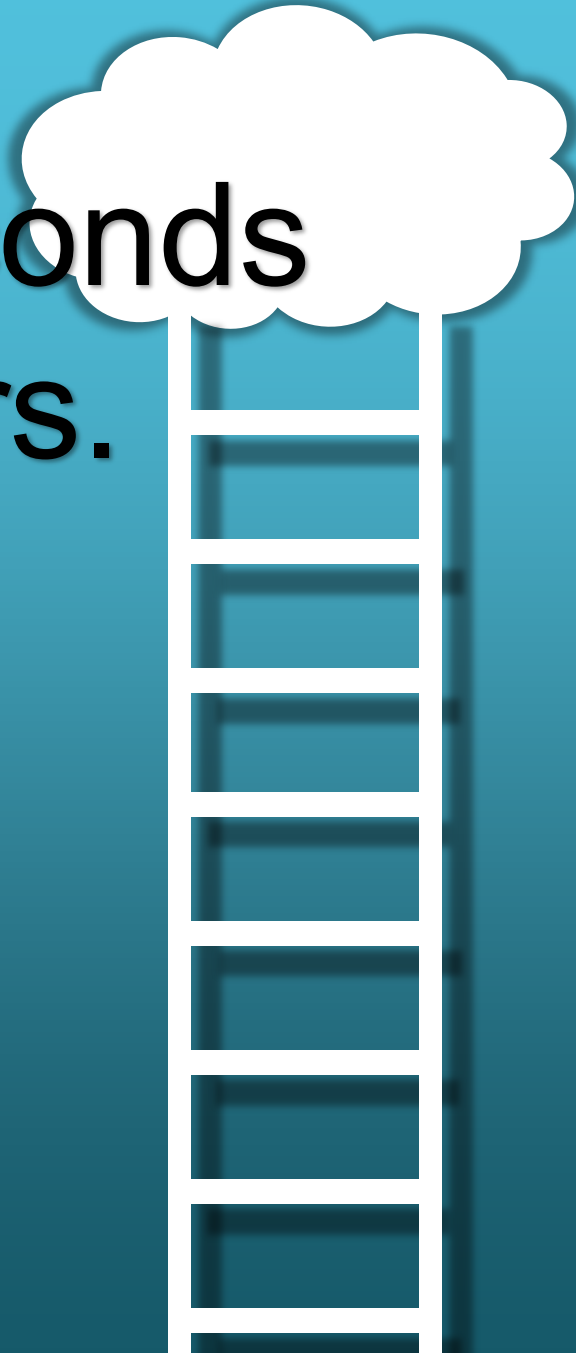
[Video Link](#)

Stress, The Brain, and Learning

Pencils Down!

You will be provided 10 seconds
to memorize the numbers.

1573298



Pencils Down!

You will be provided 10 seconds
to memorize the numbers.

1573298



Pencils Down!

You will be provided 10 seconds
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2498173215068



Pencils Down!

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Understanding how much information the brain can handle
at one given time.

Let's do a quick exercise!

Look at the following sentence for 10 seconds.
Write down the correct sequence.

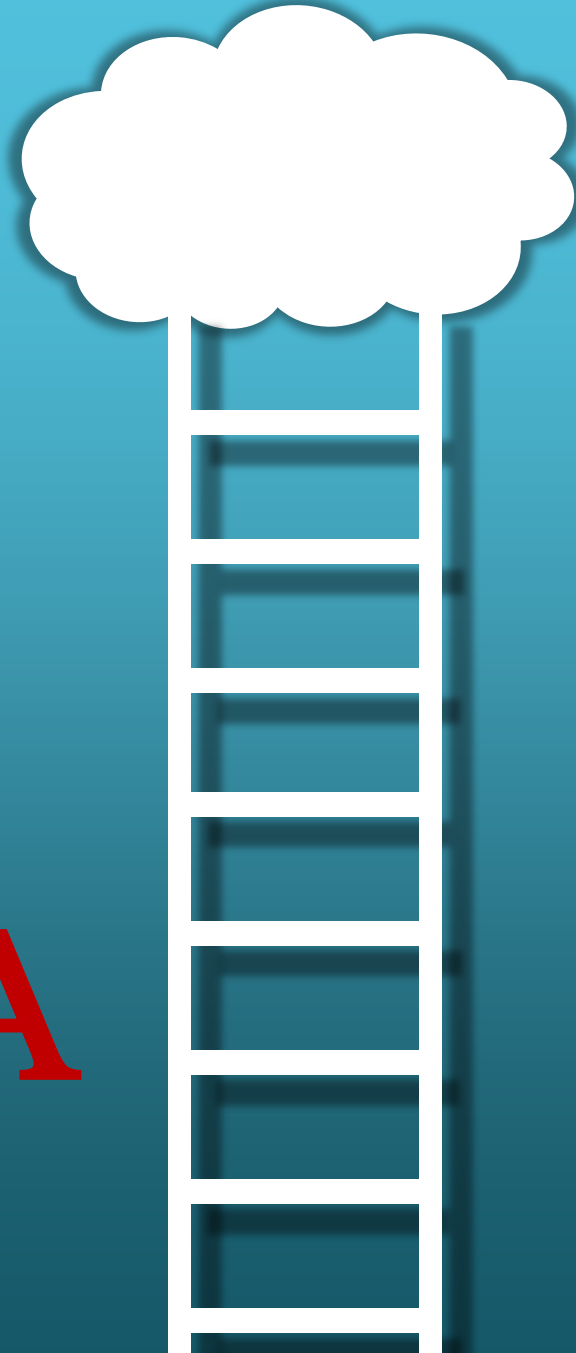
LSDN BCT VF BIU SA

STRESS

Understanding how much information the brain can handle
at one given time.

LSD NBC TV FBI USA

LSD NBC TV FBI USA



Understanding how much information the brain can handle
at one given time.

How to apply to
Your remote
classroom

This is an example of **CHUNKING** and
connecting
Content to **PRIOR KNOWLEDGE**

111



STEM CHALLENGE

Make a paper airplane that can carry a cargo and glide more than ten feet (not be hurled, but actually glide).

Bernoulli's Principle



Picture from <https://kidsactivitiesblog.com/77853/stem-paper-airplane-challenge/>

Know your goals and vocabulary for each phase of the STEM Challenge and plan the hands-on activities accordingly.

Show a simulation or video to provide a visual for the students.

Notice and Wonder

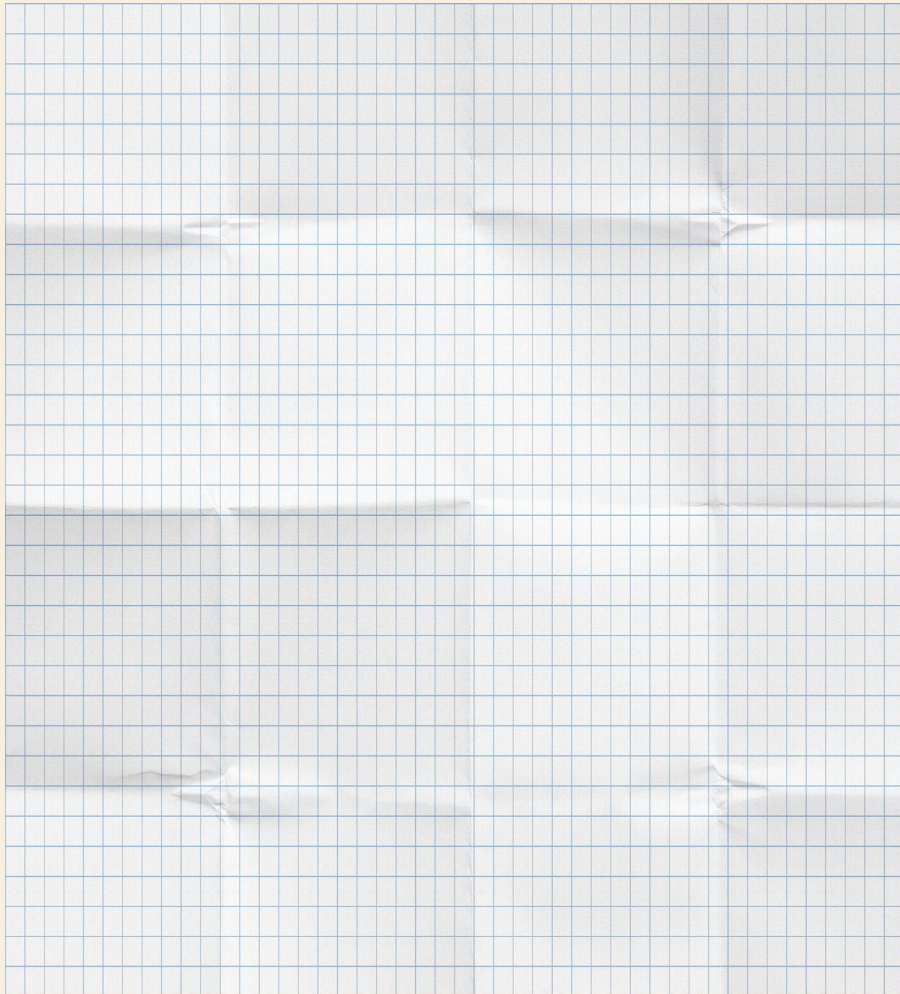
World Record Paper Airplane Flight

Have the students working in their 2-pairs in a Quad complete an Observation Chart. This is where students work in their pairs to write or draw their observations or questions on the chart paper next to the picture of the video or have a QR Code for students to revisit the video.





Teacher does a hands-on demonstration of air pressure but does not introduce vocabulary yet. The students will describe what they notice and why they think it is happening.



- As they are describing, you write their descriptions on the board or on chart paper in the front of the room.
- By having the students describe what they notice and why they think the paper is doing what it is doing, allows you to take their words and connect it to the science vocabulary word.
- Teacher is listening for key words to connect to vocabulary words for the unit.

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part 3 The Video Game Model

Part 4

So, how can this help me
in addressing learning
loss?

Video Game Model Mentality

Video Game Model

- What motivates learners to try their best?
- What factors negatively affect student motivation?



Video Game Model

Video Game Model Mentality

- What motivates learners to try their best?
- What factors negatively affect student motivation?

Challenge is a powerful motivator when students take on tasks they find meaningful and, through their efforts and perseverance, succeed.

<https://www.edutopia.org/blog/how-to-plan-instruction-video-game-model-judy-willis-md>



Video Game Model

If the brain is “wired” to stop expending effort when experience predicts a low probability of success...

THEN WHY...

With Gamers experiencing over 80% repeated failures, setbacks, and increasingly challenging work,
Why do they **continue** to **persevere** while **not** creating a negative Fixed Mindset of inability to be successful?



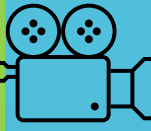
Video Game Model

How can education emulate the qualities of the most engaging video games for memory and motivation?

The factors include:
Goal Clarity
Achievable Challenges
Predictions
Feedback

Video Game Model

Video Game Model Mentality



Lower the barrier, not the bar



"The secret of getting started is breaking your complex overwhelming tasks into small manageable tasks, and then starting on the first one."

Mark Twain

GOLDILOCKS SYNDROME



So she tasted the porridge in the itty bitty bowl. It wasn't too hot and it wasn't too cold. 'Yumm.. This porridge is just right!' said Goldilocks. She liked it so much that she ate up every single bite.

The factors include:
Goal Clarity
Achievable Challenges
Predictions
Feedback

Video Game Model

Gamer's Delight and Drive:

The factors include:

- Goal Clarity
- Achievable Challenges
- Predictions
- Feedback

<https://www.edutopia.org/blog/how-to-plan-instruction-video-game-model-judy-willis-md>

Conditions for Successful Practice

The factors include:

- Learner must be sufficiently motivated to want to improve
- Learner must have all the knowledge necessary to understand the different ways the skills or knowledge can be applied
- The learner must understand how to apply the knowledge to deal with a particular situation
- The learner must be able to analyze the results of that application and know what needs to be changed to improve performance in the future.

How the Brain Learns, 2nd edition
David A. Sousa

Video Game Model

How can Teachers help learners meet these conditions:

The factors include:

- Start by selecting the smallest amount of material that will have maximum meaning for the learner- PIXAR
- Model the application process step-by-step.
- Insist that the practice occurs in your presence over a short period of time while the student is focused on the learning.
- Watch the practice and provide the student with prompt and specific feedback at various intervals to be filtered to correct and enhance the performance



The Benefits

- Students' successes and their improved confidence and attitudes;
- Their achievement on standardized tests.
- A reduction in the time required for basic behavioral management in the classroom.

How can you use this information?

- ❑ Find **the students' level of achievable challenge** by considering what is achievable in terms of differentiating your students' learning. (Have them select one thing that they want to achieve this week)
- ❑ Consider starting with **class** during a unit of instruction where most children are at similar levels of foundational knowledge.
- ❑ **Celebrate your success** by taking time to see the difference you made for your students' achievement, behavior, and/or attitudes, and be mindful of **how you feel when things go well**.
- ❑ You'll stimulate and strengthen your own neuronal network for differentiating and planning for your achievable challenge, and be ready to take on the next challenge, fueled by your dopamine-pleasure response.

What does this mean to you as a teacher?

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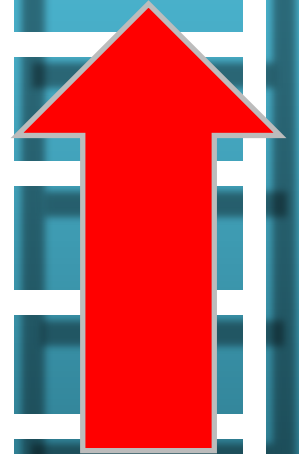
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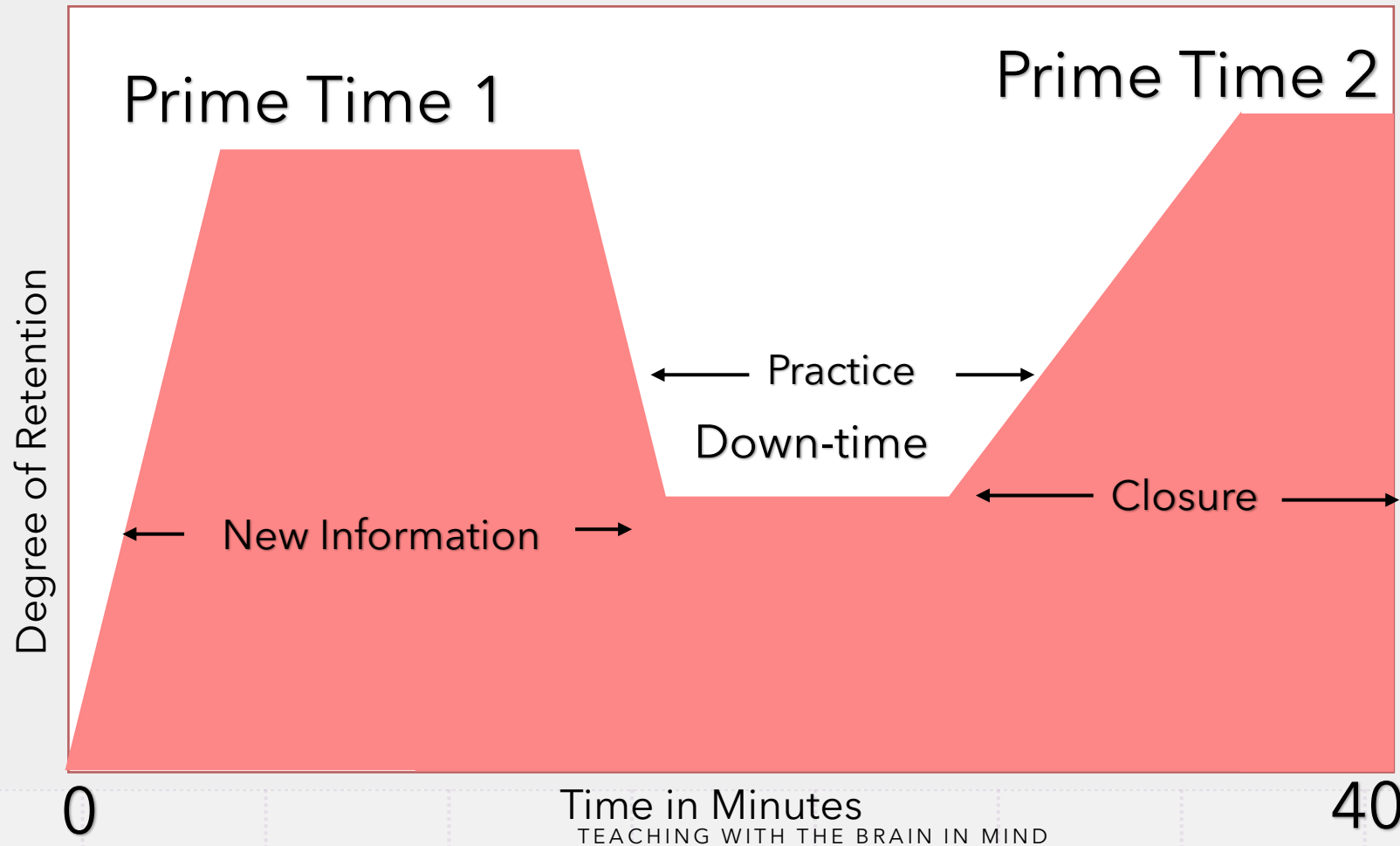
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Primacy-Recency Effect



2-PAIRS IN A QUAD

Organized Grouping of Students				
	A ₁	A ₂	B ₁	B ₂
1	EB	GC	KD	MJF
2	SH	LF	EM	WNI
3	SR	LR	VS	JS
4	SG	AV	LE	KT

How to ability group students	
High A₁ 	High Medium A₂ 
Low Medium B₁ 	Low B₂ 

Each Group contains a student in the top 25% of the class.

A and B are shoulder partners
 A's are face partners B's are face partners

GROUPING STUDENTS TO PROMOTE LANGUAGE AND CONTENT

Dr. Darlyne de Haan de Haan Consulting, LLC

TESOL IN FOCUS, MARCH 23, 2022

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1

The Brain is a primitive and emotional brain. It reacts just like it did since the beginning of mankind. .for Survival

2

The Brain does not distinguish stress or frustration from its environment. If it detects stress, in any form, the Amygdala jumps into action.

3

The Prefrontal Cortex is the rational brain. It is where learning and memory occurs. The Executive Functions are located here

4

Challenge for Educators:
Identify clear learning targets
Make the lesson meaningful and relevant
Proactively integrate or scaffold a few options that support the learner's progress and achievement of the goal.

5

If the Brain feels that the effort expended is having a low rate of success, the brain will tell the body to that this is repeated failure and a Fixed Mindset will develop in the student.

Take-Aways

Summary

The Brain is a powerful organ! Stress and frustration is real and the when the brain takes over, the only way to reengage the brain is by doing a brain break.

The Video Game model can be an effective instructional practice while still meeting the objectives of the lesson.

Change is not easy, so you must plan and have patience with the process.



The way to get started is to quit
talking and begin doing.

Walt Disney



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Thank you

