The Body
The Brain
and
Learning

I wish I'd known then
what I know now

Maggi Breckenridge
Bellingham Public Schools
What question or wonders do you have about The Body, the Brain and learning?

Try to come up with 3 questions and write them down.
"Designing educational experiences without knowledge of the brain is like designing a glove without knowledge of the hand."

Leslie Hart
Learning Specialist
Key Concept

Executive Functions:

- Directive capacities of the mind
- Multiple in nature, not a single capacity
- Part of neural circuits that are routed through the frontal lobes
- Cue the use of other mental capacities
- Direct and control perceptions, thoughts, actions, and to some degree emotions

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Self Regulation Executive Function “Clusters”

**ATTENTION**
- Perceive
- Focus
- Sustain

**ENGAGEMENT**
- Energize
- Initiate
- Inhibit
- Stop
- Pause
- Flexible
- Shift

**OPTIMIZATION**
- Monitor
- Modulate
- Balance
- Correct

**EFFICIENCY**
- Sense
- Time
- Pace
- Sequence
- Execute

**MEMORY**
- Hold
- Manipulate
- Store
- Retrieve

**INQUIRY**
- Anticipate
- Gauge
- Analyze
- Estimate Time
- Compare

**SOLUTION**
- Generate
- Associate
- Prioritize
- Plan
- Organize
- Decide

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Hands on Learning Solutions
A Growth Mindset Drives Motivation and Achievement

- I can get smarter
- Learning is my goal
- Effort makes me stronger
- I'd spend more time and work harder
- Higher Achievement

Attention span is directly related to the type and level of affect experienced.

Better affect equals better attention and better Learning.

(Immordino-Yang, Posner, 2012)  
(Pekrun, Goetz, Frenzel, Barchfeld, Perry, 2011)
3 Attention Systems
Posner and Fan, 2007

**Orienting System:** orients self in time and space related to others or target stimuli
(when and where)

**Alerting System:** Keep up guard or looking for rewarding situation
(how)

**Executive Functioning System:** Vital to learning, helps person decide what is important and deserving of brains focus
(what)
Teacher are the most important resource for students.

Teachers have a greater impact on students than any other variable

(Darling-Hammond, 2000)
Importance

The more specific the language used by a teacher the more likely it is that the student will be activating the brain networks needed for effective performance.
System 1 – Fast, effortless, automatic

System 2 – Slow, effortful, non-automatic

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Research Shows:

**System 1 learning**
Memorization, mass practice may help us pass a test. It may feel like real learning. However over time a week, month, or year we will forget 70-80 percent of it.

**System 2 learning**
Effortful learning, deep learning using our executive function will stay with us. Over time we will remember 70-80 percent.

Taken from "Make it Stick" by Brown, Roediger, and McDaniel
Homework

"Good" homework helps
And
"busywork" disguised as homework does not work.

For good homework,
we must explain its purpose,
give feedback,
and use its content in class activities.
https://www.youtube.com/watch?v=yTlbq4hHC98&feature=youtu.be
All Learning requires a foundation of prior knowledge

Culturally Responsive Teaching matters

http://crtandthebrain.com/
Key to Learning

Executive Function-Executive Skill-knowing how-Process

Attention-knowing what to pay attention to/ focus on

Memory- Practices to interrupt forgetting
Practices for Interrupting forgetting and Building Memory
Spaced Practice

Arrests forgetting
Strengthen retrieval routes
Essential for hanging onto the knowledge you have gained

When you let yourself get a little rusty between sessions
Effortful Retrieval Practice:

Practice at retrieving new knowledge or skill from memory is a powerful learning tool and provides durability of retention.
Testing as a Tool

1. Students who take a practice test have a better grasp of their progress than those who simply re-read materials.

2. Testing enables an instructor to identify gaps and misconceptions and adapt instruction.

3. Corrective feedback after tests keeps students from incorrectly retaining material they have misunderstood and produces better learning.

Retrieval---testing----interrupts forgetting
Interleaving

The practice of two or more subjects or skills enables more potent learning than massed practice of a subject or skill.
Varied Practice

Find different ways to learn and practice
Elaboration:

The process of finding additional layers of meaning in new learning

- Relating material to what you already know
- Explaining to someone, in your own words what you learned
- Explaining how something relates to life outside of class
- Create a metaphor
- Create a visual image
Reflection

Involves several cognitive activities that lead to deeper learning:

• Retrieving knowledge and earlier learning from memory
• Connecting new experiences to old
• Visualizing
• Mental rehearsing what you might do differently
Cues: for Learning and Teaching in Flow
by Bill Hubert

Tools of the Mind: The Reggio Emilia Approach to Early Childhood Education
Elena Bodroghko, Deborah J. Leong

Teach Like Finland
33 Simple Strategies for Joyful Classrooms
Timothy D. Walker
THINKING, FAST AND SLOW
DANIEL KAHNEMAN

MAKE IT STICK
THE SCIENCE OF SUCCESSFUL LEARNING
PETER C. BROWN, HEINZ L. ROZIGER, III, MARK A. MULLIS

MADE TO STICK
CHIP HEATH & DAN HEATH
NEW YORK TIMES BESTSELLER
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