



Virtual Seminar
May 5, 2020
12:30 pm

How Executive Skills Drive Reading and Learning at School...and at Home

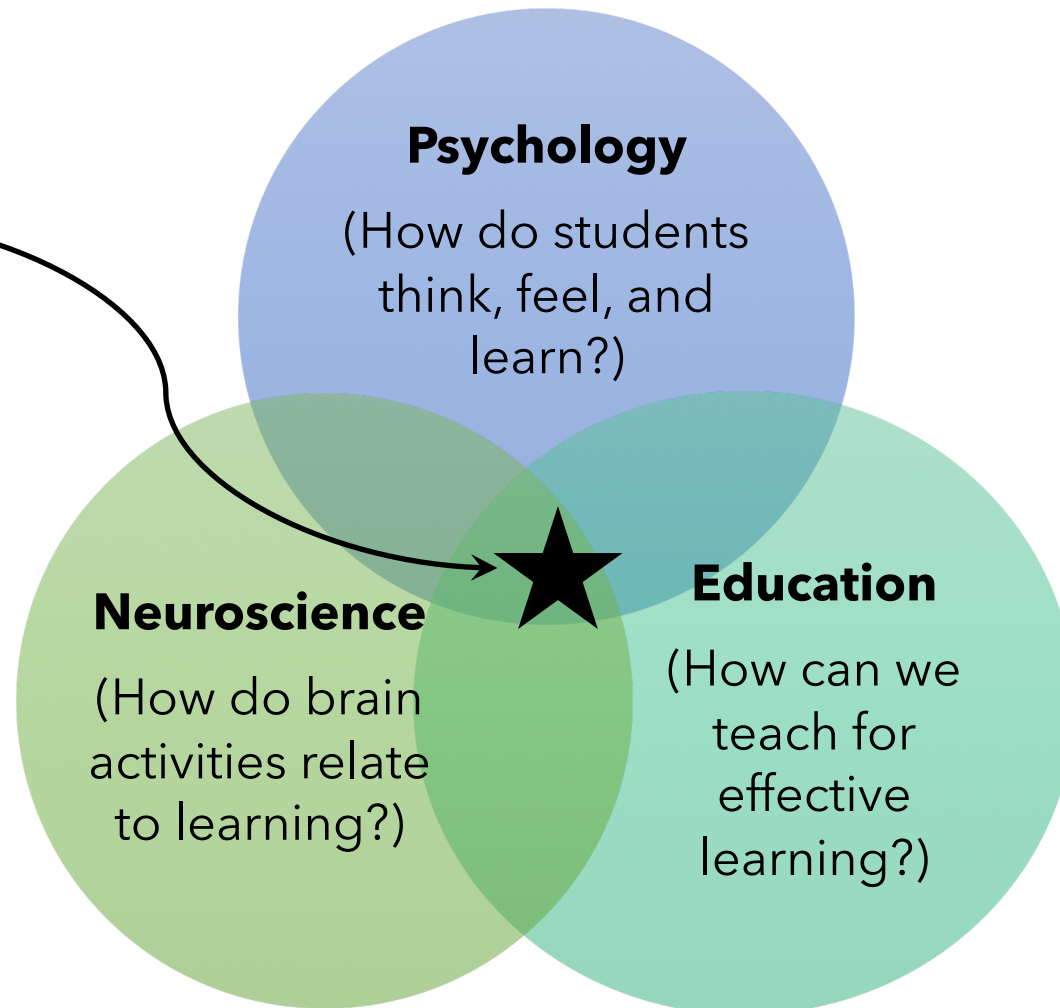
Implications for Teaching and Learning During a Pandemic

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[@KellyBCartwig1](https://twitter.com/KellyBCartwig1)



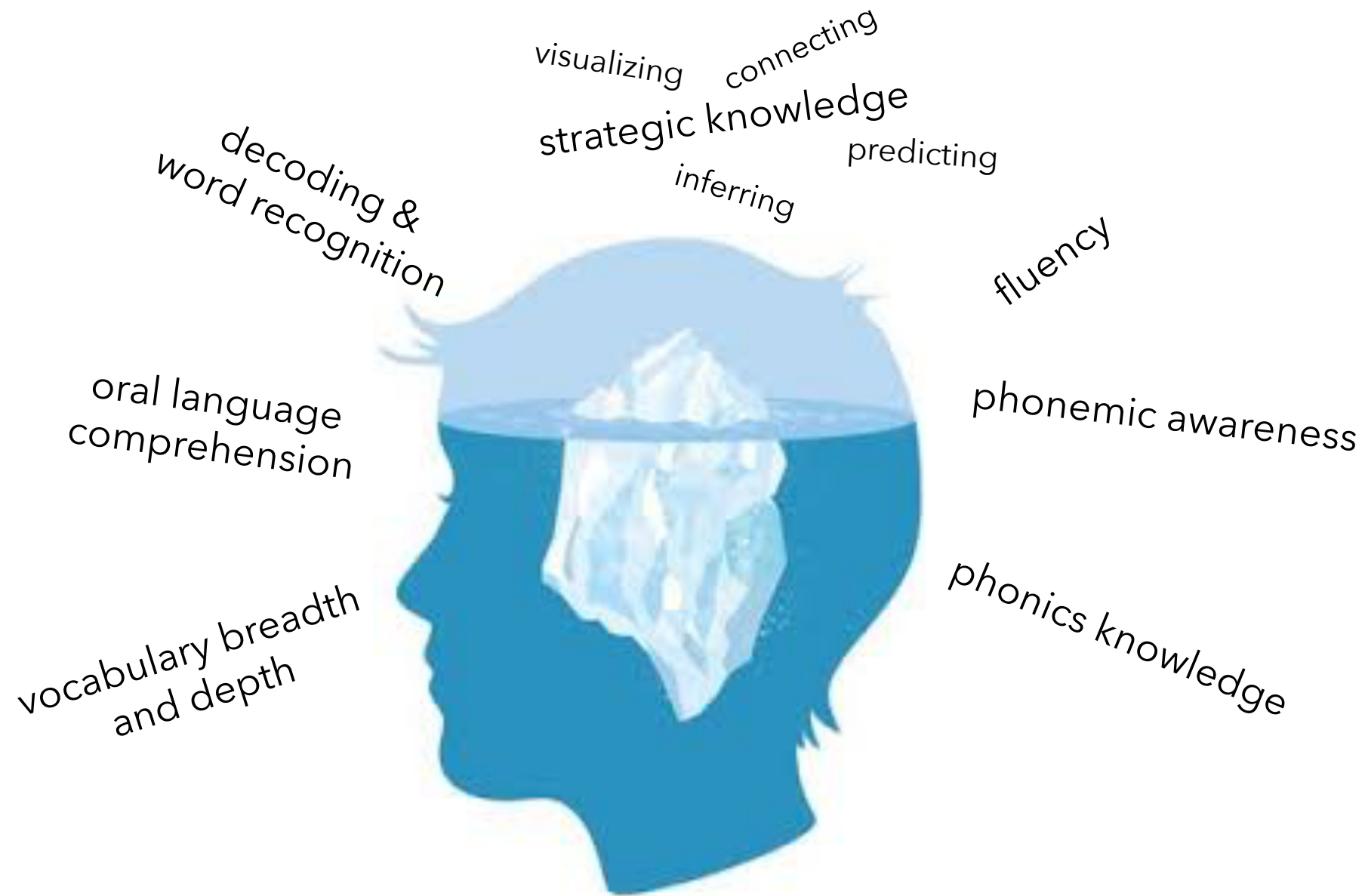
Working at an intersection...

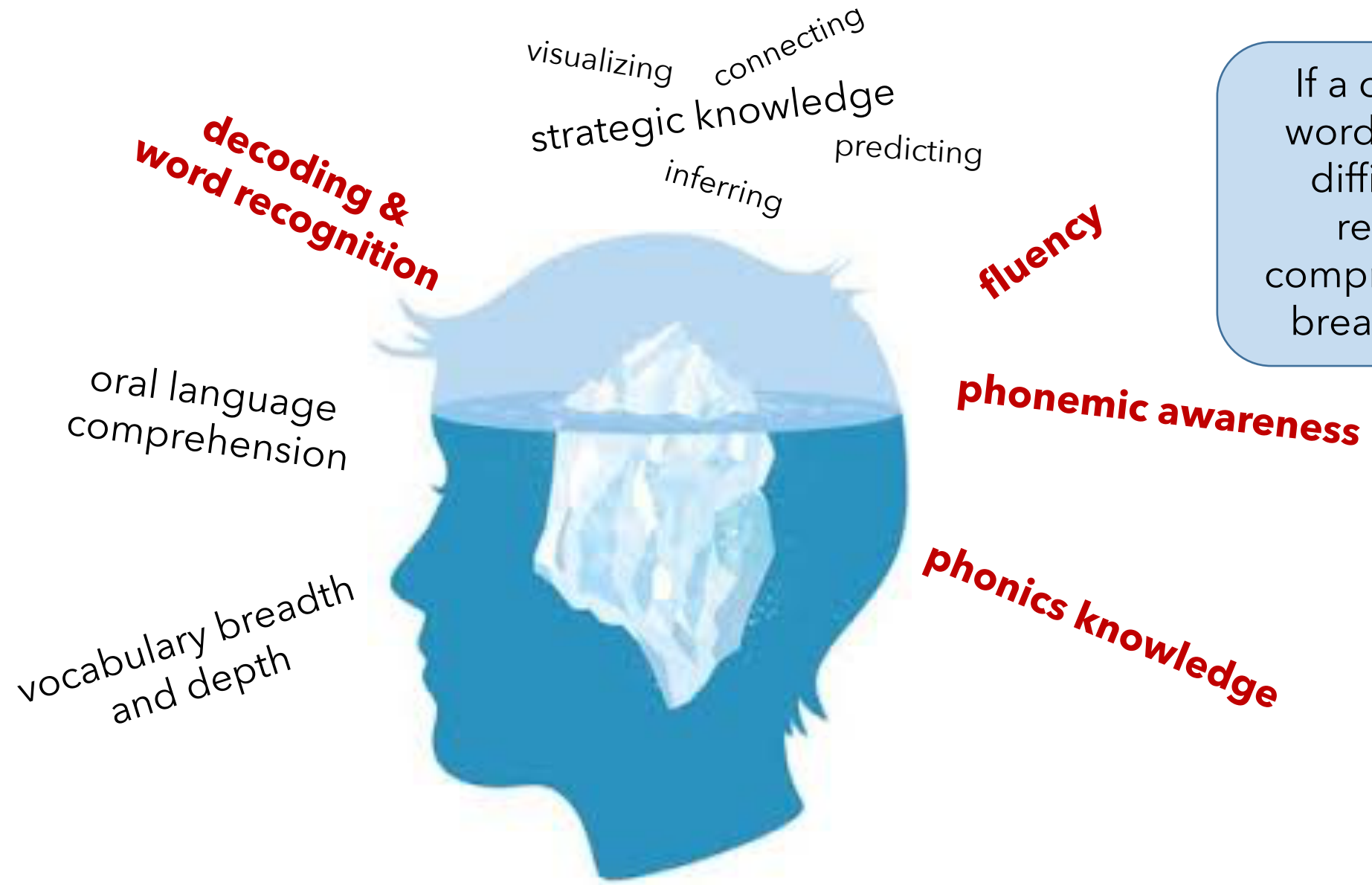
Today,
we are
here!



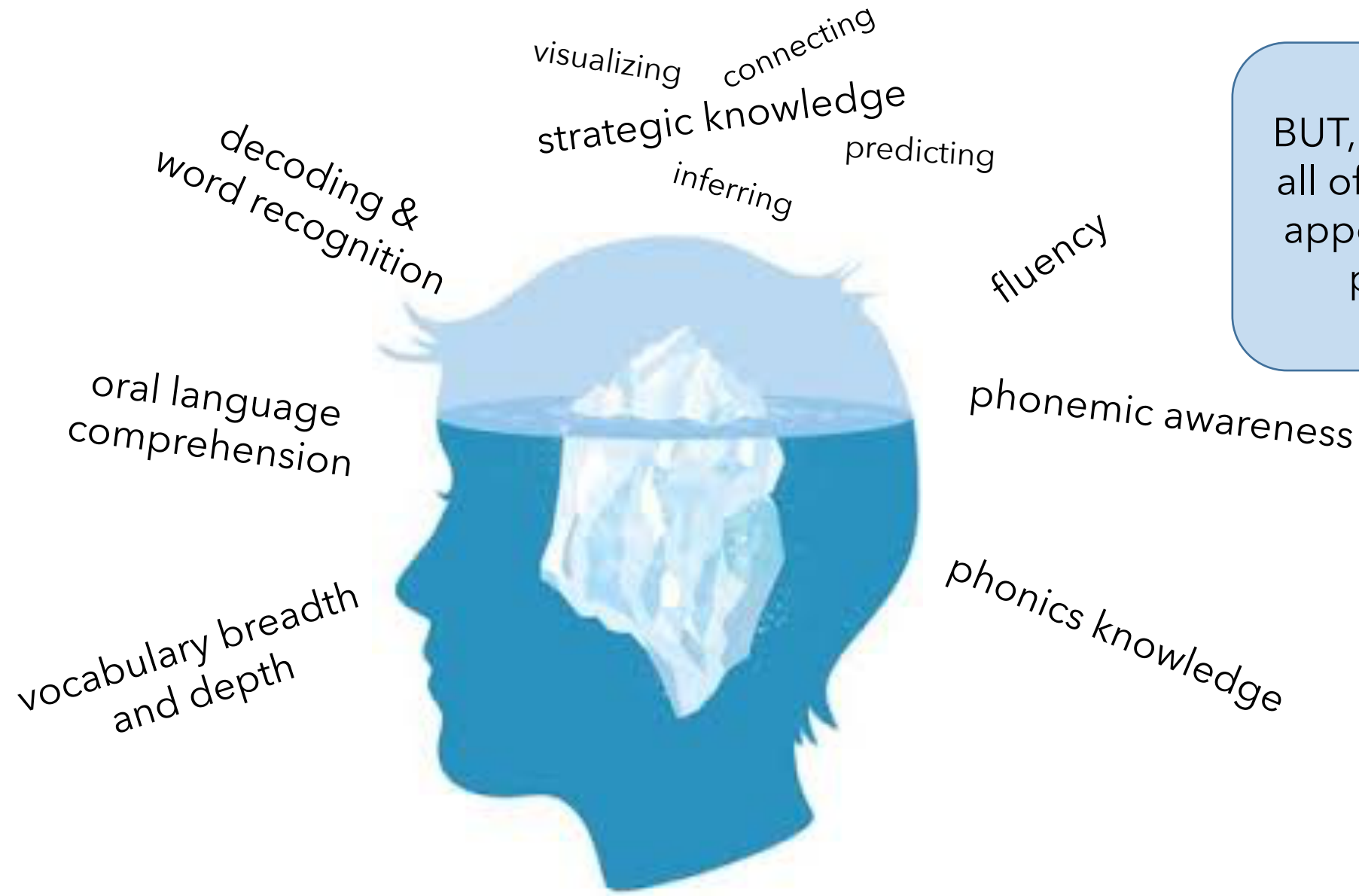


reading is thinking





If a child has word reading difficulties, reading comprehension breaks down



BUT, sometimes, all of these skills appear to be in place....

reading comprehension STILL looks like this
for some of our students...



PALS → 3rd ~~Grade~~ **SOL**

meaningless reading*
-- Dolch (1960)

*meaningless reading = specific reading comprehension deficits (**RCD**); "poor comprehenders" or "word callers"





executive skills*

mental skills we use to manage our thoughts, feelings, & behaviors to achieve goals

self-regulation!

in reading: a critical set of mental skills that enable the management of reading processes toward the end goal of reading comprehension

*Umbrella term: includes many skills, core (or basic) & more complex

Our plan today...

- What are executive skills?
- Why are they important?
- How are they affected by stress (like our current situation)
- How can they support effective reading and learning?

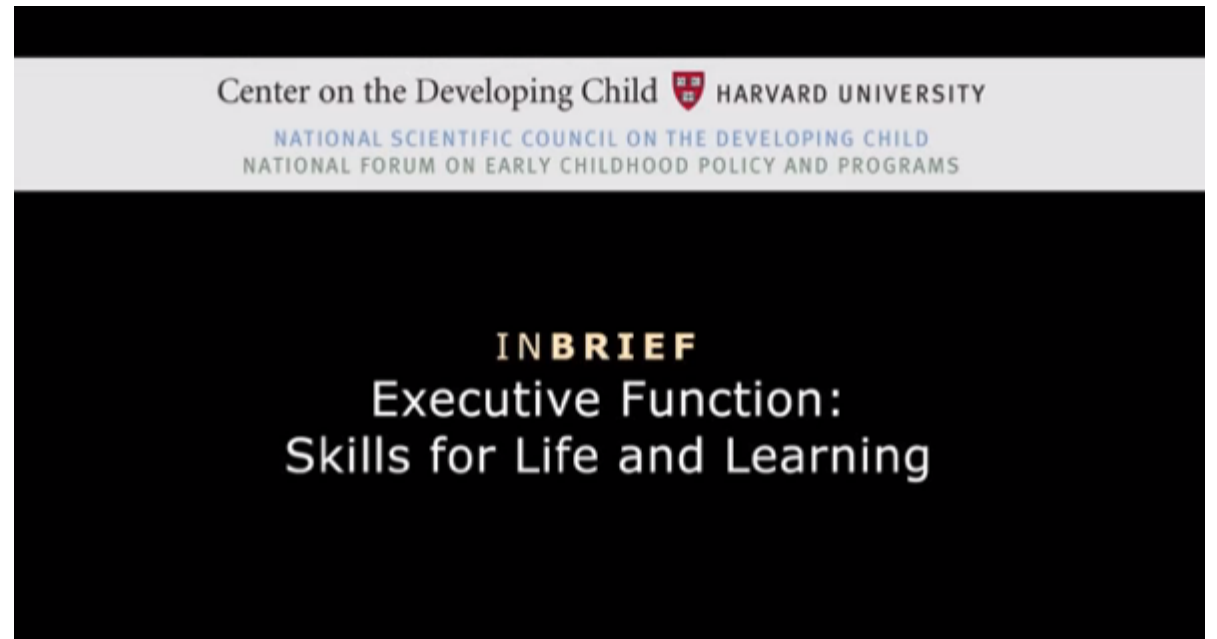
What are executive skills?

Video Example

https://www.youtube.com/watch?time_continue=1&v=efCq_vHUMqs&feature=emb_logo

While you watch, note:

- 3 specific skills
- Why are they important?
- Effects of stress



3 Core (or Basic) Executive Functions*

working memory

- 2 parts: storage & processing/transforming information
- e.g., remembering directions while carrying them out, building text meaning and updating while reading through a text



cognitive flexibility (shifting, switching)

- switching between ideas or activities; revising goals/plans; shifting
- e.g., transitioning from mealtime to work time, juggling words' sounds & meaning



inhibition (self control or inhibitory control)

- resisting impulses, controlling behavior, ability to STOP and THINK
- e.g., waiting turn, ignoring irrelevant word meanings or details, ignoring distractors in the environment while reading



*underlie more complex executive skills like planning, organization, & monitoring

Why are executive skills important?

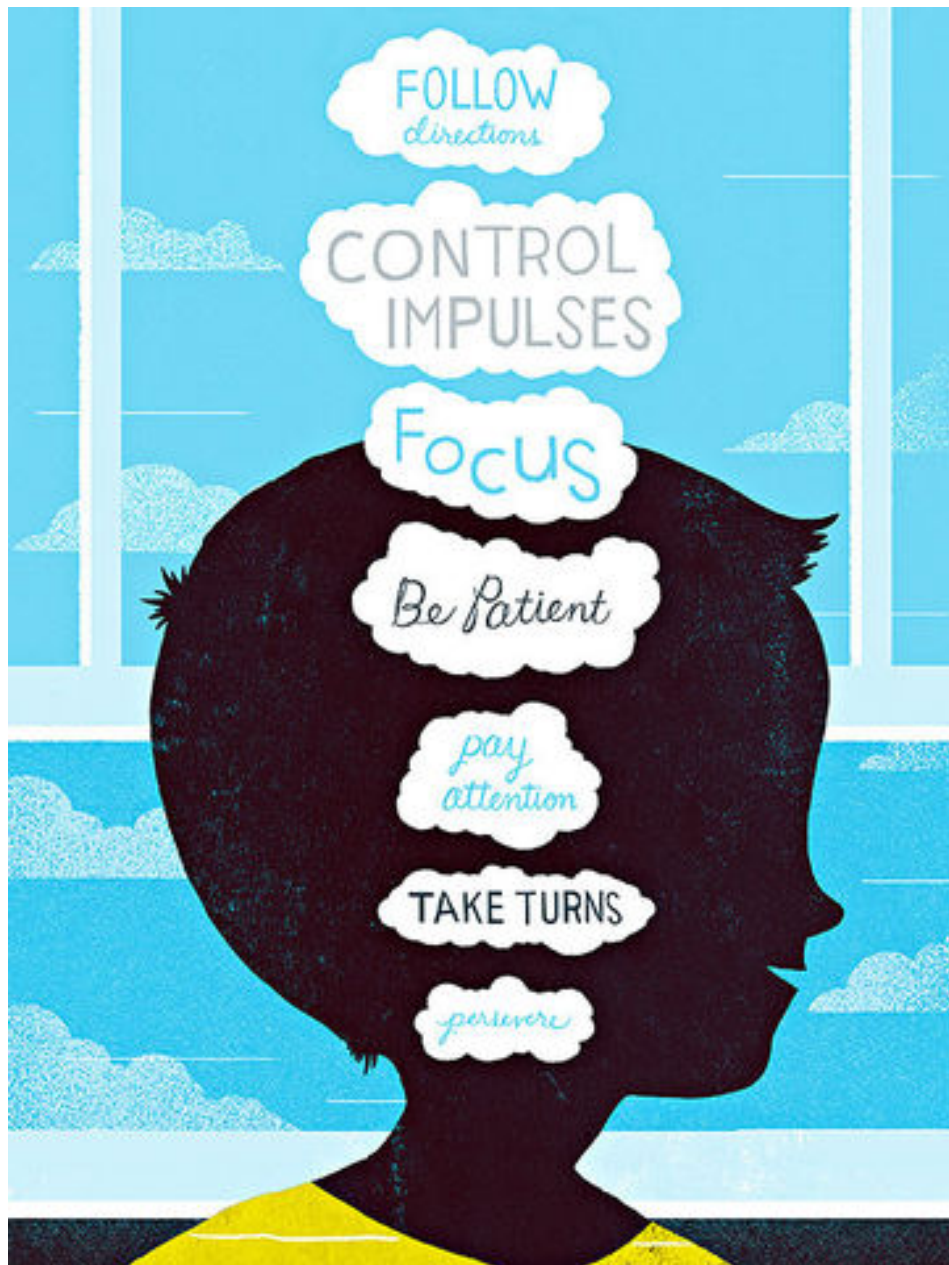


illustration by Christopher Silas Neal for
Parents Magazine:
[https://www.parents.com/toddlers-
preschoolers/development/the-executive-
function-skills-every-kid-needs/](https://www.parents.com/toddlers-preschoolers/development/the-executive-function-skills-every-kid-needs/)

Preschool executive functions predict...

Growth in emergent literacy, vocabulary, and math across Pre-K
(McClelland et al., 2007)

Kindergarten literacy and math skills (Blair & Razza, 2007)

3rd grade reading comprehension (Guajardo & Cartwright, 2016)

Math & reading achievement at age 21 (McClelland et al., 2013)

College completion by age 25 (McClelland et al., 2013)

LIFESPAN ACADEMIC SUCCESS!

Low self-control in preschool predicts

(Moffitt et al., 2011; controlled for IQ and SES)

- Worse **health**
- More teen “snares” that led to negative long term outcomes (early smoking, dropping out of school, pregnancy)
- Higher risk of substance dependence as adults
- Poor money management, less **wealth** as adults
- More **crime** (more likely to be convicted of a crime by age 32)

OVERALL LIFE OUTCOMES!

The Marshmallow Study...



The Marshmallow Study (Mischel et al. 1972)

- One marshmallow now, or wait and get two
- Self-regulation was related to:
 - higher SAT scores
 - better social, cognitive, and emotional coping in adolescence
 - educational achievement
 - adult self-worth
 - better ability to cope with stress as adults
 - less crack cocaine use (in vulnerable populations)
 - less aggression, bullying

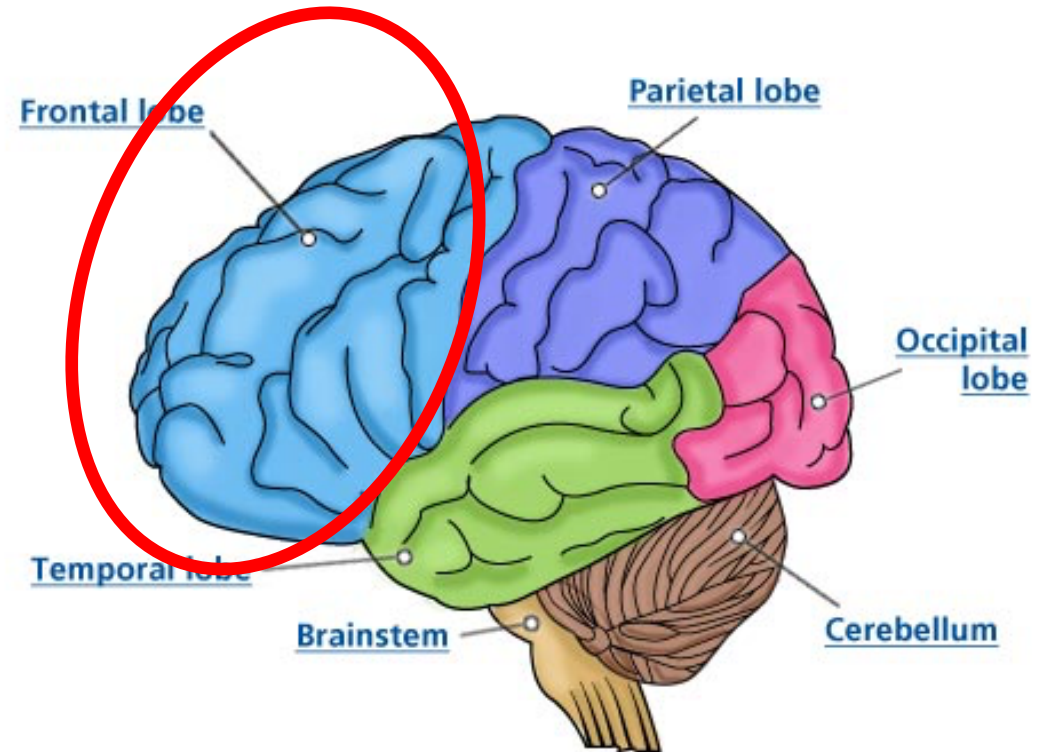
(Mischel et al., 2011)



How does stress impact executive skills?

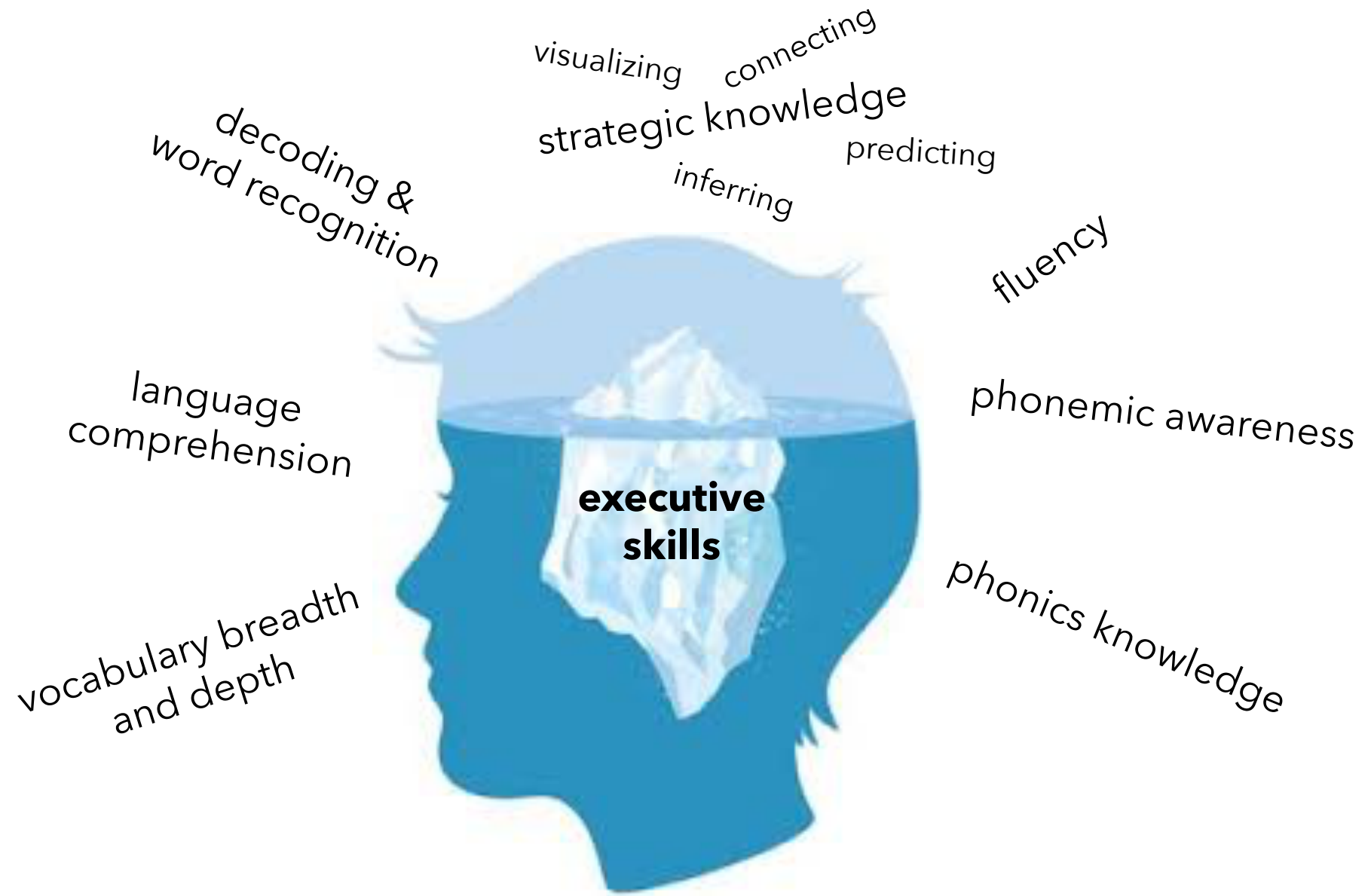
Executive Skills and the Brain

- Frontal lobes → Executive skills
 - develop from infancy to early adulthood
 - experiences drive development
- Stress reactions and emotions can override executive skills (logic)
 - upset children can't reason!
 - like a storm that takes over, the "overwhelm" prevents other responses



<http://www.babycenter.in/a6752/inside-a-childs-mind-a-visual-guide>

How do executive function skills support reading and learning?





**weak or
impaired
executive
skills**

vocabulary breadth
and depth

decoding &
word recognition

language
comprehension

strategic knowledge
predicting
inferring

visualizing

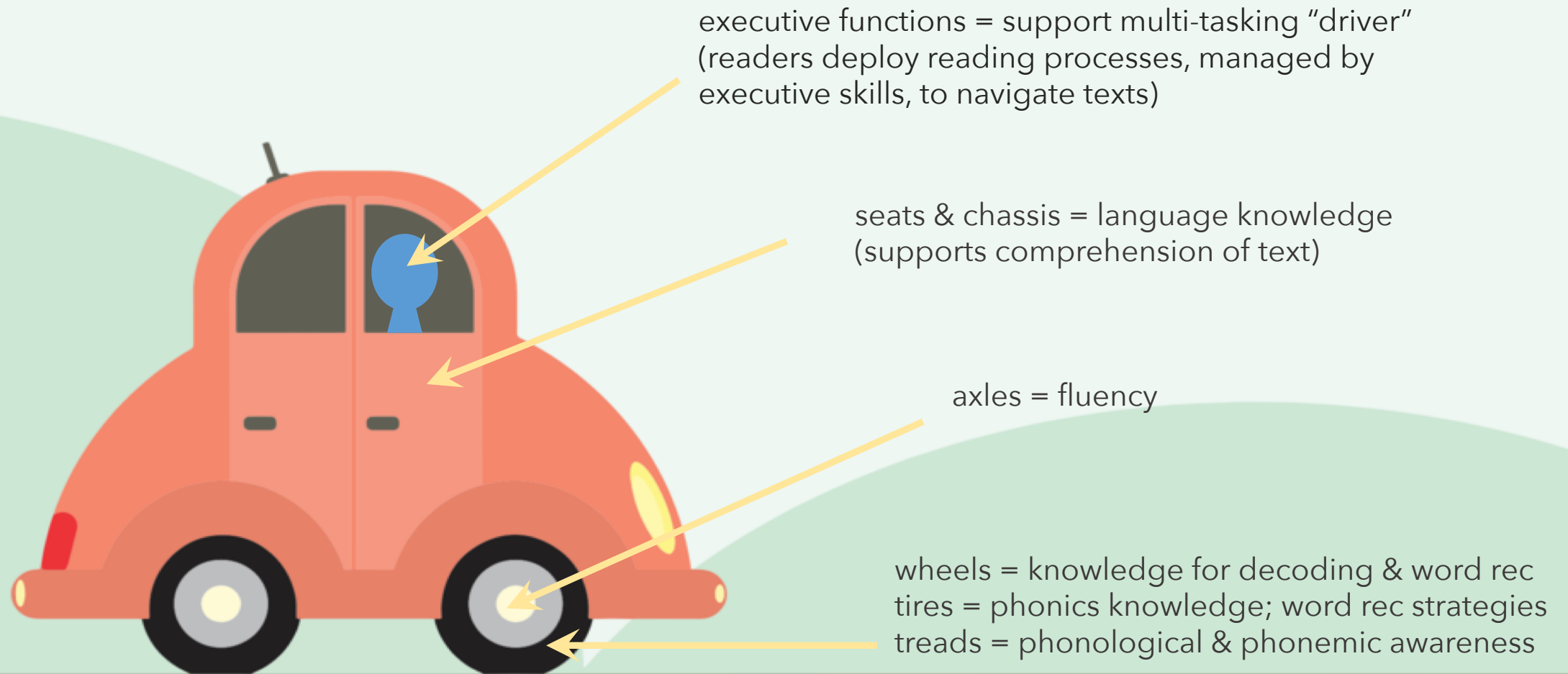
phonics knowledge

phonemic awareness

connecting

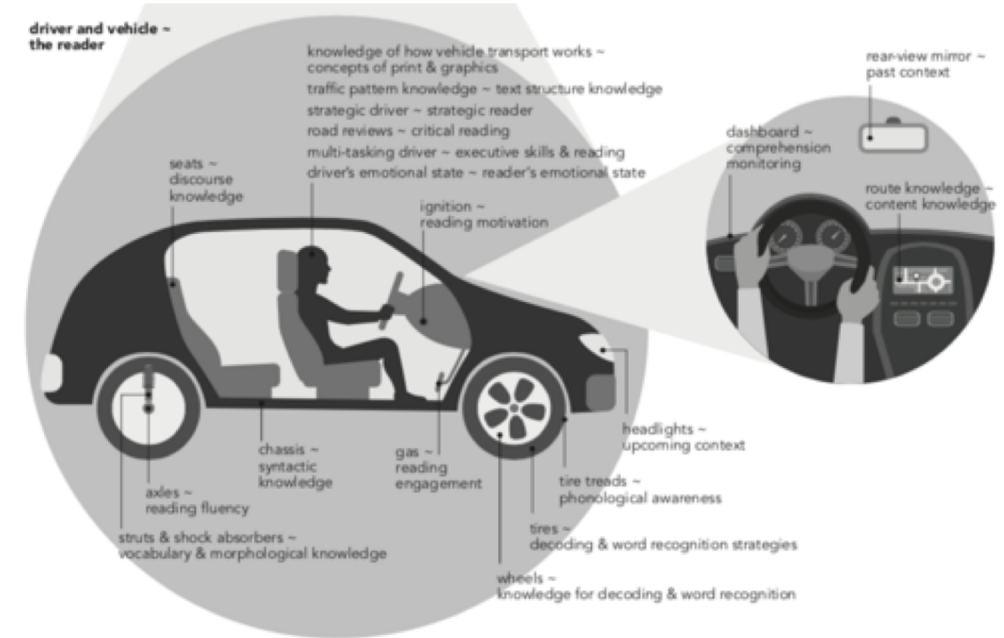
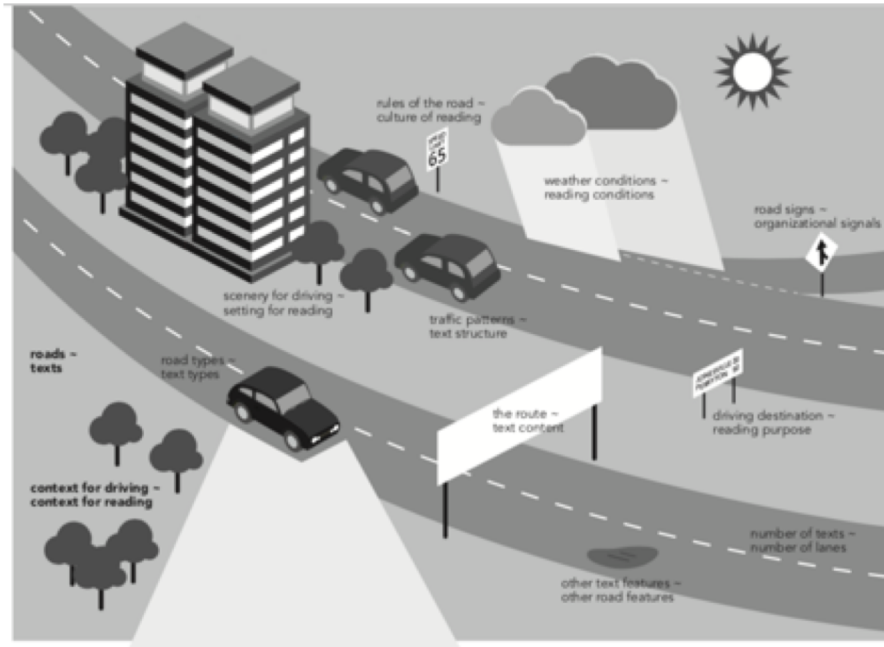
fluency

DRIVE Model: *Deploying Reading in Varied Environments* (Cartwright & Duke, 2019)



TEXT

For more detail on the DRIVE Model, see our two *Reading Teacher* pieces that are **FREE** to download!



The DRIVE Model of Reading: Making the Complexity of Reading Accessible

[Kelly B. Cartwright](#), [Nell K. Duke](#), First published: 27 June 2019 <https://doi.org/10.1002/trtr.1818>

Implications of the DRIVE Model of Reading: Making the Complexity of Reading Actionable

[Nell K. Duke](#), [Kelly B. Cartwright](#), First published: 27 June 2019 <https://doi.org/10.1002/trtr.1819>

Specific executive skills underlie successful reading comprehension...

planning & organization (Cutting, Materek, Cole, Levine, & Mahone, 2009; Locascio, Mahone, Eason, & Cutting, 2010)

working memory (Borella, et al., 2010; Cain, 2006; Carretti, Cornoldi, De Beni, & Romanó, 2005; De Beni, Palladino, Pazzaglia, & Cornoldi, 1998; Oakhill, Hartt, & Samols, 2005)

cognitive flexibility (Cartwright, Bock et al., 2017; Cartwright, Coppage et al., 2017; Colé et al., 2014; Søndergaard Knudsen et al., 2018)

inhibition (Borella, Carretti, & Pelegrina, 2010; Cain, 2006; Locascio, et al., 2010)

social understanding (Brown, Oram-Cardy, & Johnson, 2013; Cartwright et al., 2017; Guajardo & Cartwright, 2016; see Zelazo & Carlson, 2012, for a discussion of hot EF skills)

Introducing the executive skills...

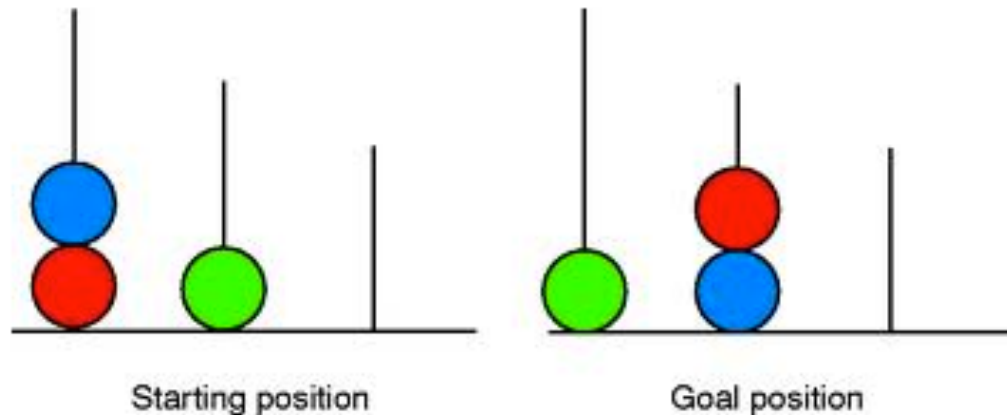
For each:

- definition & example(s)
- applications to reading
- applications to teaching and learning in the COVID-19 pandemic

1. Planning

(ability to implement multi-step tasks, in proper order, to reach a goal)

- Tower of London task: arrange balls or disks on pegs to match a goal (count number of moves, errors, speed)



How many moves would it take you to get these colored balls from the starting position to the goal position, moving only ONE ball at a time?

- Games that require planning: Jenga, Chess, Checkers

Planning and Reading

- Draws on many things we know good readers do
- Involves goal-setting and teaching students steps they can take to reach their reading goal for a particular text

My Plan to Understand

First ask: Why am I reading? What is my goal?

Then, with my goal in mind . . .

- Preview: Looking through the book, what do I see to help me get there?
- Should I pay more attention to some parts and slow down for others?
- Connect: What do I already know about this topic that will help me reach the goal?
- Question: What goal-related question(s) can I ask myself?
- Predict: What do I guess will be in this book?
- What other steps can I take to reach my goal?
- What will I know when I'm done?

FIGURE 2.2. A planning guide for your students.

From *Executive Skills and Reading Comprehension: A Guide for Educators* by Kelly B. Cartwright. Copyright 2015 by The Guilford Press. Permission to photocopy this figure is granted to purchasers of this book for personal use only (see copyright page for details).

Good readers are good planners: Know why they are reading and make a plan to get there

Planning & Learning During COVID-19

- Life is haphazard, unstructured right now – we must **create structure**
- Teachers: **make plans & stick with them** to provide security for students in uncertain times
 - set meeting times with students; share read alouds at same time, etc.
 - provide consistent social connection
 - plan means of communication and stick with it
 - plan student work expectations, turn-in processes
- Families: **develop a routine** (note, I did not say “make a schedule”)
 - find spaces and times where family members can work independently (e.g., work in morning, play in afternoon?)
 - plan times to come back together and connect (family game time, walk outside time, family movie time, meal time, etc.)

2. Organization

(Ability to recognize order, impose order, or create systems to manage information or objects)

How many sentences can you make with these words?

book fun a good reading is

Reading a good book is fun.

Reading a fun book is good.

A good reading book is fun.

A fun reading book is good.

A good book reading is fun.

A fun book reading is good.

Organization and Reading

Recognition of organization already in words and texts (or your head)

- spelling patterns (letter/sound organization)
- syntax (word order)
- conceptual knowledge & vocabulary
- text structure (narrative or various informational structures)

Ability to apply one's own knowledge of organization to words and texts (requires explicit knowledge of organization as a tool)

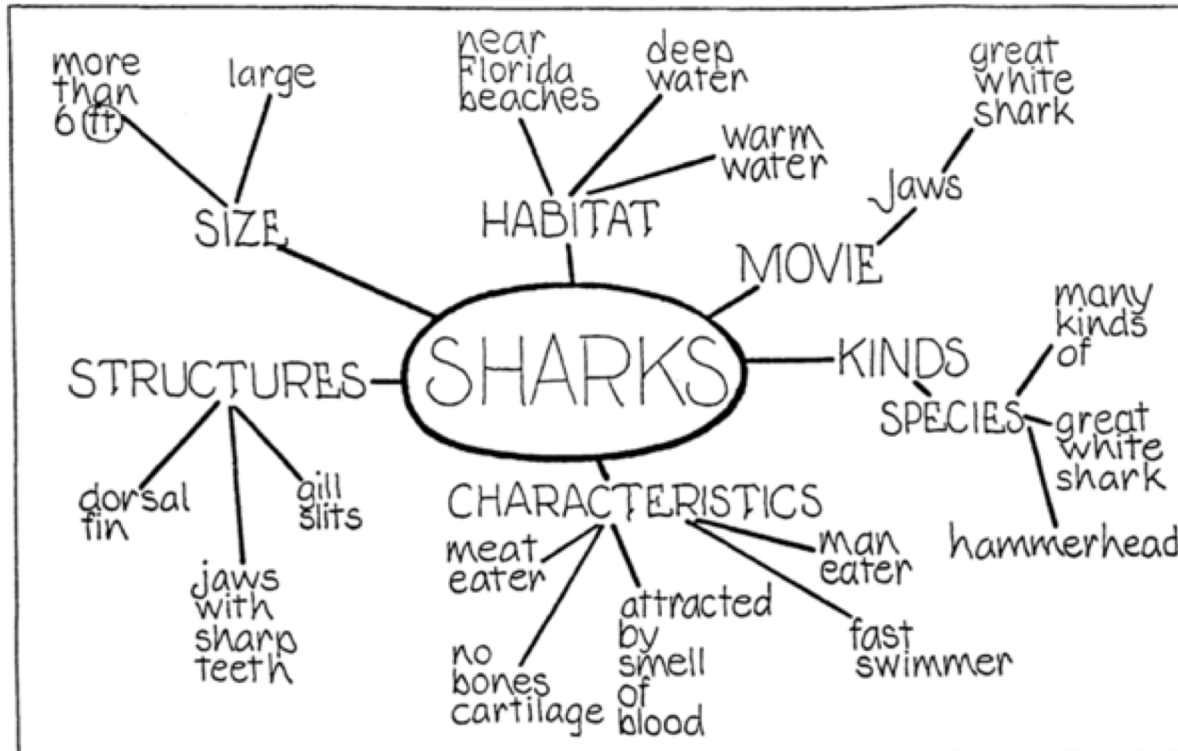
e.g., ability to USE a word's organization to decode it; or a text's organization to remember what's in it

Good readers are organized thinkers: They know how words, stories, and books are put together and use what they know to help them remember what they read

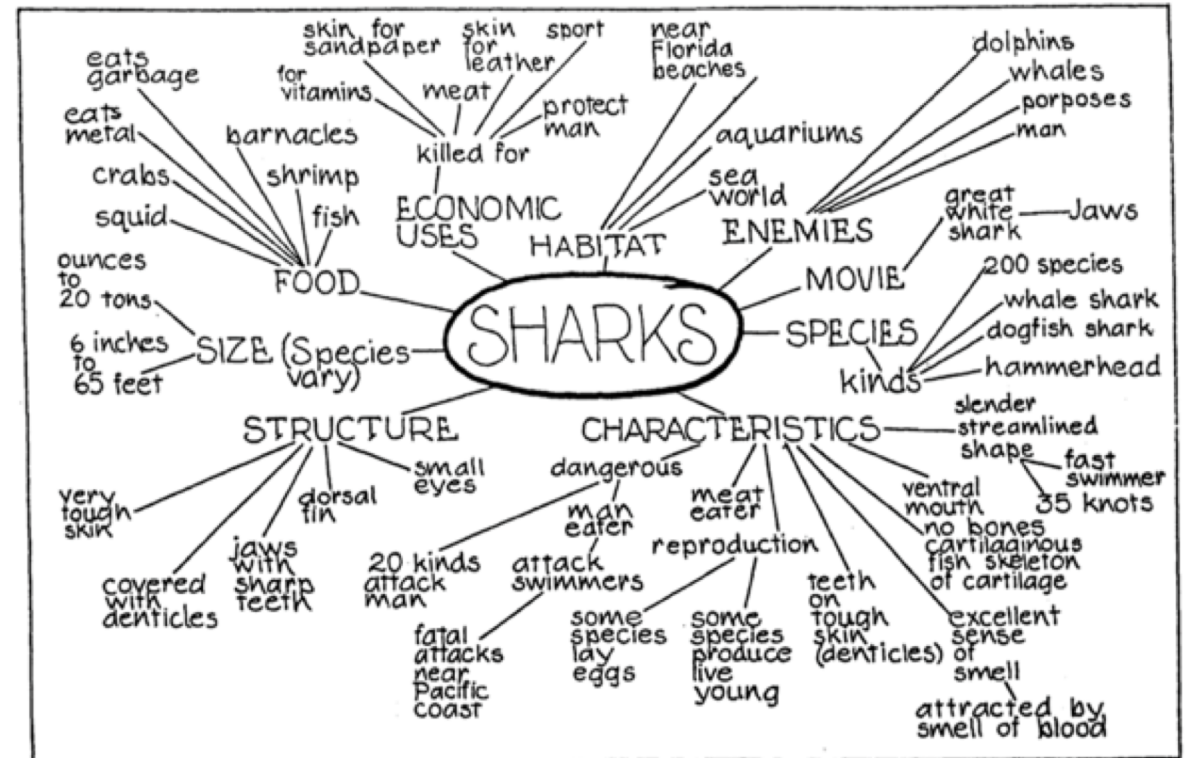
Assess Knowledge Organization

- Pre- and Post-reading Concept Maps (Johnson et al., 1982)

Prereading semantic map for Sharks



Postreading semantic map for Sharks



Language Organization: Scrambled Sentences

Syntax: the way language is organized to make meaning

Example:

quickly backyard dog the she in brushed the

You can assess this ability. Children with reading comprehension deficits (RCD) are significantly lower on this skill.

Supporting Language Organization: Word Grouping Activity (Weaver, 1979)

quickly backyard dog the she in brushed the

First: Which word is the **action** word?

Next: Group the rest of the words by answering these questions

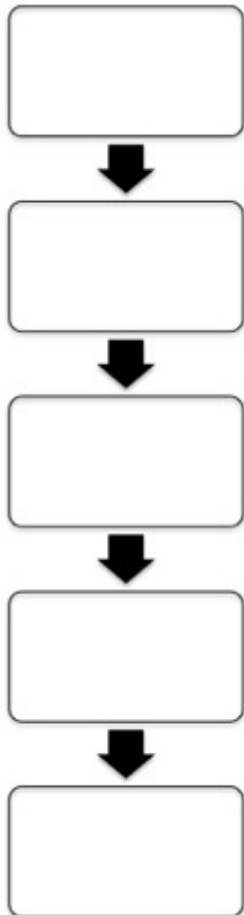
- **Who** did it? (The answer to this question usually goes before the action word.)
- **How** did they do it? (The answer to this question usually goes right before the action word)
- **To whom or what** did they do it? (The answer to this usually goes after the action word.)
- **Where** did they do it? (The answer to this usually goes at the end of the sentence.)

She quickly **brushed** the dog **in the backyard**.

Narrative Organization: Causal Connections in Stories

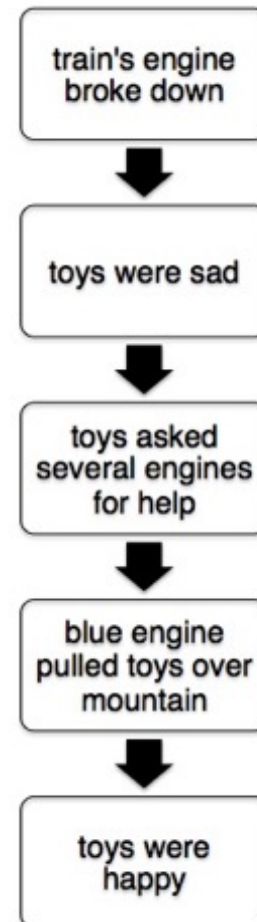
(van den Broek, 1989; Walker, Gopnik, & Ganea, 2014; Wolman, van den Broek, & Lorch, 1997)

In narratives, events are connected because of cause/effect



Think about The Little Engine that Could:

How are events causally connected?



Children with RCD struggle with understanding cause and effect in stories:

their retellings are like a string of unrelated events!

Narrative Organization: Causal Connections in Stories

Teach with story sequencing (putting pictures or sentences in correct order) with verbal explanation for WHY they are connected – **keep track of their use of connecting words.**



Children with RCD use few connecting words in comparison to peers with better comprehension

Teach Connecting Words:

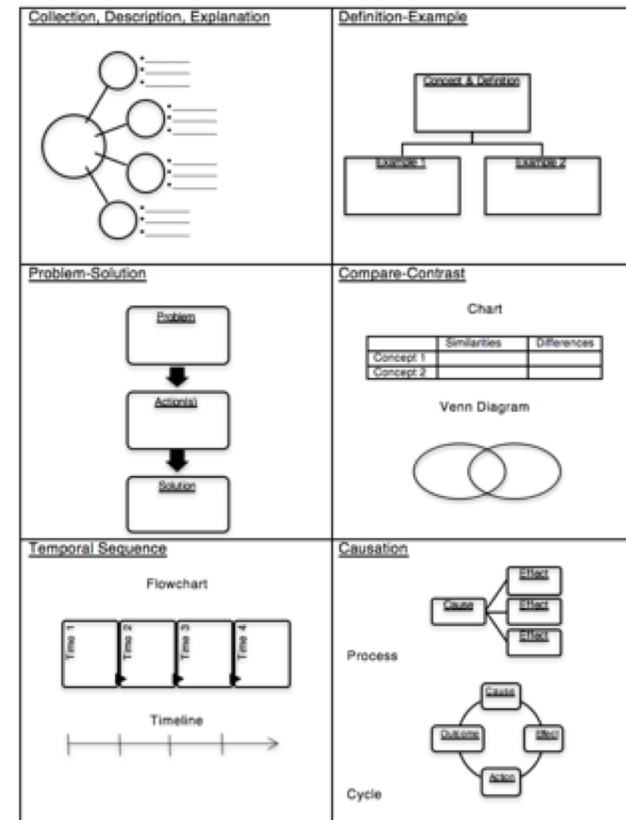
Independence:	and, additionally, now, as well, also, in addition...
Dependence:	if, but, because, so, so that, in order to, however, in contrast, or else, instead of...
Time Sequence:	later, first, next, since, and then, when, before, finally...

Informational Text Organization

Must be taught explicitly!

- collection, description, explanation
- definition-example
- problem-solution
- compare-contrast
- temporal sequence
- causation (process or cycle)

start with one at a time;
then, provide multiple
texts and have students
identify multiple
structures (some texts
have more than one, too)



Organization & Learning during COVID-19

- Avoid “overwhelm” (flooding families with options, providing long/thick packets of work without obvious structure)
- Provide structure for families and children, keeping in mind they are already overtaxed by stress (simpler structure, fewer pages, is better)

English (Only complete ONE each day; circle your choice)	Math (Only complete ONE each day; circle your choice)	Resource Bingo	Science (NOT every day. Only complete two each week; circle your choices)
1. Fiction reading and response	1. Math Games	Complete ONE each day. Put today's date on the square you complete today.	1. Friction
2. Nonfiction reading and response	2. Solving Problems		2. Electricity
3. Writing	3. Cooking with Family		3. Plants
4. Fictional story and questions	4. Practice Telling Time		4. Ecosystem
5. Nonfiction article and questions	5. Working with Money		5. Virtual (Computer) Activities
6. Paired passage activities	6. Virtual (Computer) Activities		
7. Virtual (Computer) Activities			

My Organizer for the week of 05/04/20

By the end of the week on **FRIDAY** I will turn in the work I completed on my chosen options.

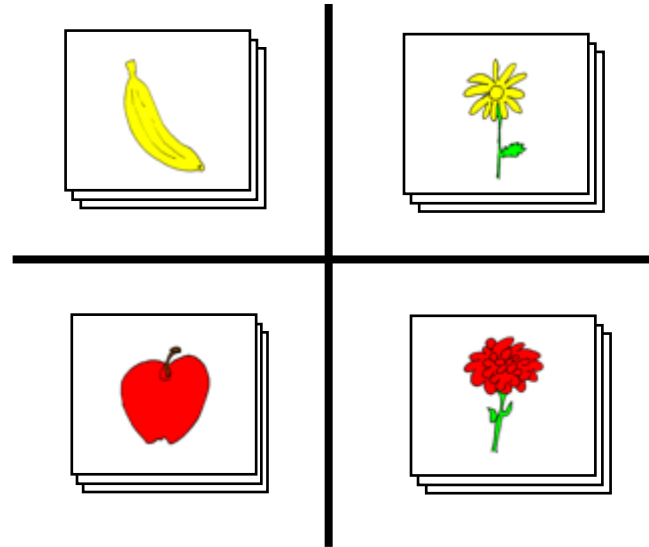
Step 1.) Write down the option you choose for each subject spend approximately 30 minutes on the topic

Step 2.) Check the option off on your check off list once it is complete and turn in

Week of 05/04/20	English 30 minutes	Math 30 minutes	Science 30 minutes Or Extension must do Science at least two days	STEM ,Library School Counseling Options
Monday 05/05				
Tuesday 05/06				
Wednesday 05/07				
Thursday 05/08				
Friday 05/09				

3. Cognitive Flexibility

(ability to consider multiple bits of info & actively switch between them)



What two ways are these cards sorted?

- Multiple Classification tasks

sort sets of cards along 2 (or more) dimensions at once; indicates the flexibility with which individuals can consider these dimensions at the same time



Cognitive Flexibility and Reading

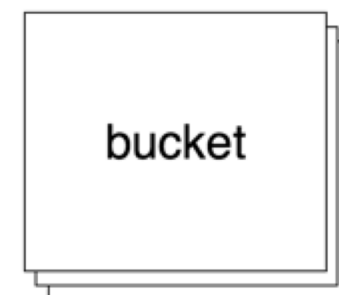
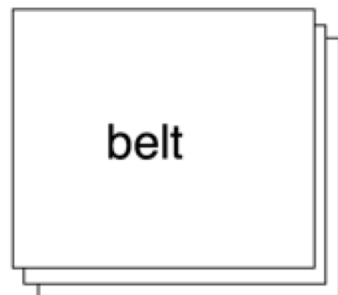
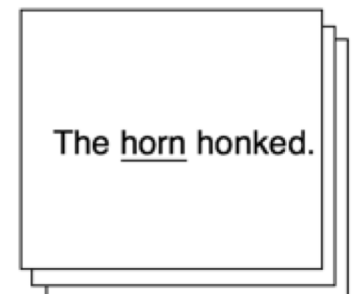
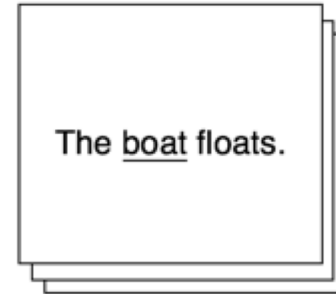
(Cartwright, 2002; Cartwright, Bock et al., 2017; Cartwright, Coppage et al., 2017; Cartwright, Marshall, Dandy & Isaac, 2010)

Good readers are flexible thinkers: They can think about (and do) lots of things at the same time

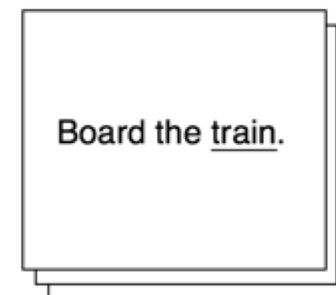
Assess by sorting two ways at the same time



Children with
RCD are
significantly less
flexible!



Can be TAUGHT and
improves reading
comprehension
(Cartwright, 2002; Cartwright et
al., 2017)
and word reading
fluency (Cartwright,
Marshall, Huemer, & Payne,
2019)



sound-meaning

syntax-meaning

Supporting Cognitive Flexibility: Multi-feature Questions - sound & meaning

I am thinking of a red food that starts with /b/.

I am thinking of a flower that rhymes with *lazy*.

Tell me a /p/ word that names a kind of food.

Cognitive Flexibility & Learning During COVID-19

Remember all that talk about planning and structure....

- Be ready to scrap your plans!
- **Stop and shift** (cognitive flexibility is also called "shifting")
- Be attuned to needs of students, children, and self
- "Give yourself grace" - and give others grace
- Use mindfulness techniques, go outside, be active

Example: Finger Tracing



<https://1000-petals.com/introducing-breathing-hand-tracing/>

<https://selspace.ca/modules/mindfulness/mindfulness-junior/mindful-moments-junior/>

4. Working Memory

(storage & processing: ability to hold information in mind while processing/transforming info.)

Let's try a sentence completion task...

- light, wheels, bananas

Another assessment: the letters backward task

- "I'm going to say some letters, and you repeat them backwards."
 - Q K becomes K Q
 - Z P N becomes N P Z
 - F T S B becomes B S T F

Games: "Johnny has a _____ in his pocket"

- **Pocket Game:** Students take turns, add an item each time; alphabetical order; say entire list PLUS their new item on their turn

Working Memory and Reading

- Storage AND Processing

- Constructing and remembering text meaning (storage), while
 - Decoding the words in text
 - Processing anaphors (e.g., pronoun references)
 - Encountering new ideas in a text & updating
 - Connecting text with prior knowledge
 - Inferring missing bits by connecting text parts or filling gaps
 - Using strategies to monitor/maintain meaning
 - Keeping goal of reading in mind while reading

Good readers have good memories: They can keep some things in mind while doing other things

Example: Working Memory and Inferences

It was 8:55, and the school bell rings at 9:00. Andy was pedaling as fast as he could, because he was worried that he might miss his test.

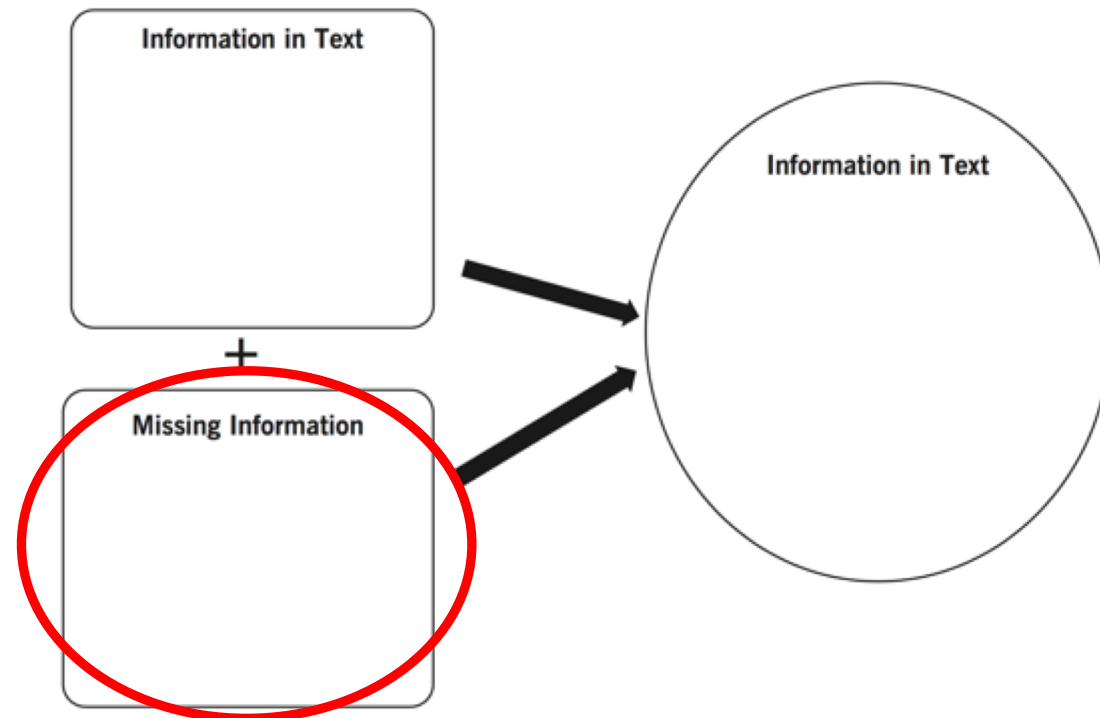
Where was Andy going? ([Text-connecting, local coherence inference](#))

How was Andy getting there? ([Gap-filling, global coherence inference](#))

Supporting Working Memory: Inferences

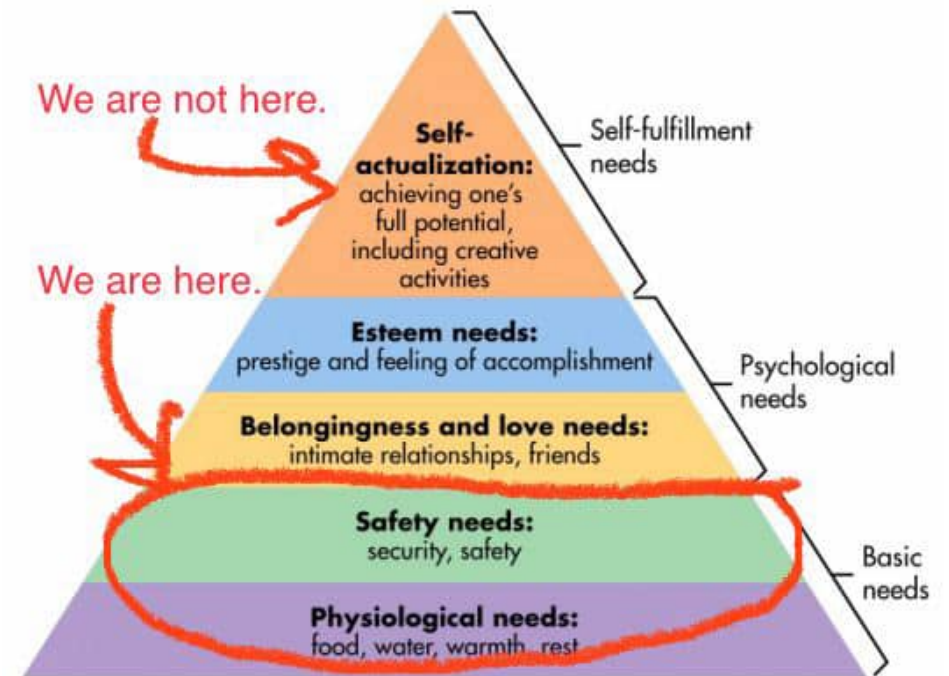
(Elbro & Buch-Iversen, 2013)

- Some inferences (global coherence, gap-filling) REQUIRE that readers supply information from their own heads
- "Authors expect us to figure some things out, like a detective!"



Working Memory and Learning During COVID-19





- Depth of processing may not be what you would expect
 - coping with stress of pandemic
 - challenges of home situation
- Stress limits working memory – capacity to process information is more limited
- Provide organizers and structure to allow “memory” to happen outside the head



5. Inhibition

(ability to wait, stop and think, and restrain habitual, potent responses; self-control)

In adults: color word inhibition (Stroop)

- Name patches of color    
- Read color words **green red blue red**
- Then, name the ink colors **green blue red red red**

In children: happy/sad task

- When you see a happy face, say "sad"
- When you see a sad face, say "happy"



Games: Simon Says, Taboo (trying NOT to say a target word)

Inhibition Problems

- Calling up irrelevant word meanings (**jam**: traffic jam or edible jam)
- Trouble ignoring irrelevant details
- Reflexively blurting out “stories” that are marginally related to a text
- Trouble ignoring distractions while reading
- Reflexively blurting out the first word that comes to mind with partial letter-sound information (“bring” for “bridge”)

Good readers are good at ignoring (inhibiting) things that are not important to understanding

Inhibition: Polysemy and Academic Language

- Poly = many; semy = meanings
- Sometimes we expect students to learn (or know) academic meanings for words that also have everyday meanings

readers (and listeners) must inhibit the common meaning and pay attention to the more specialized academic meaning!

“sentence” in language arts vs. math class
“some” (part) vs. “sum” (total)

Inhibition & Learning During COVID-19

Know that inhibition will be in shorter supply

- students will be distractible
- inhibiting stress-induced behaviors will be difficult

Instill coping mechanisms for these times. Plan ahead with children for times when they are upset or distracted and lack inhibition

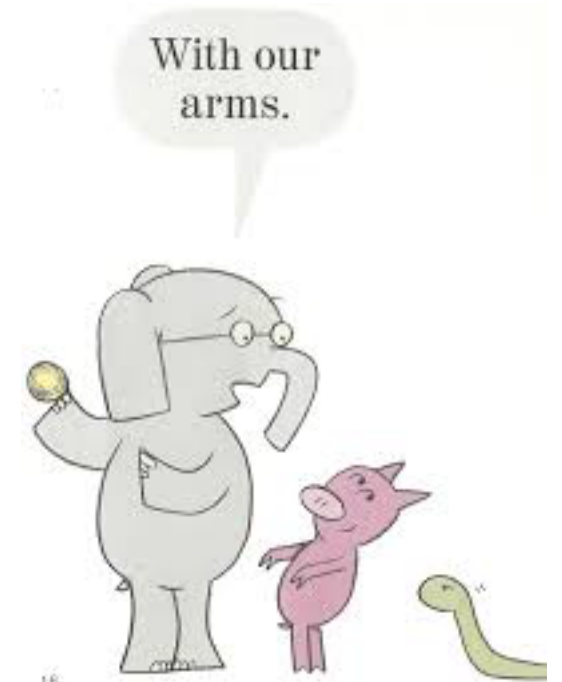
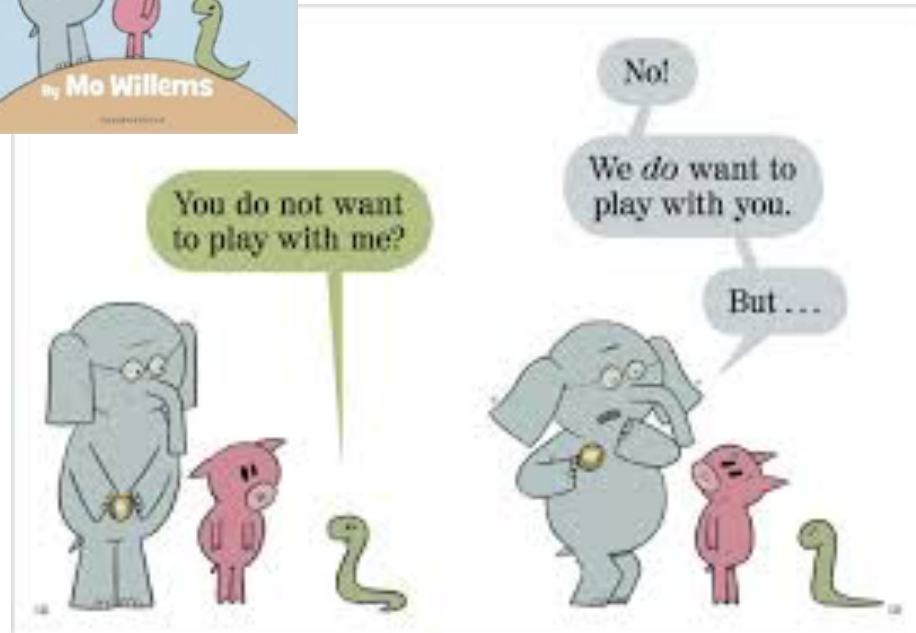
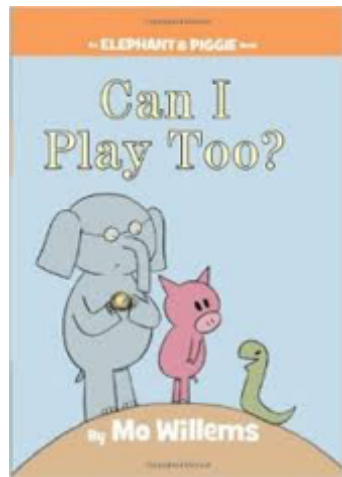
Say: "What strategies can you use when you have big feelings (are stressed, are overwhelmed, are distracted, etc.)? Let's make a plan together!"

- Breathing (Finger Activity)
- Jumping Jacks
- Take a Break



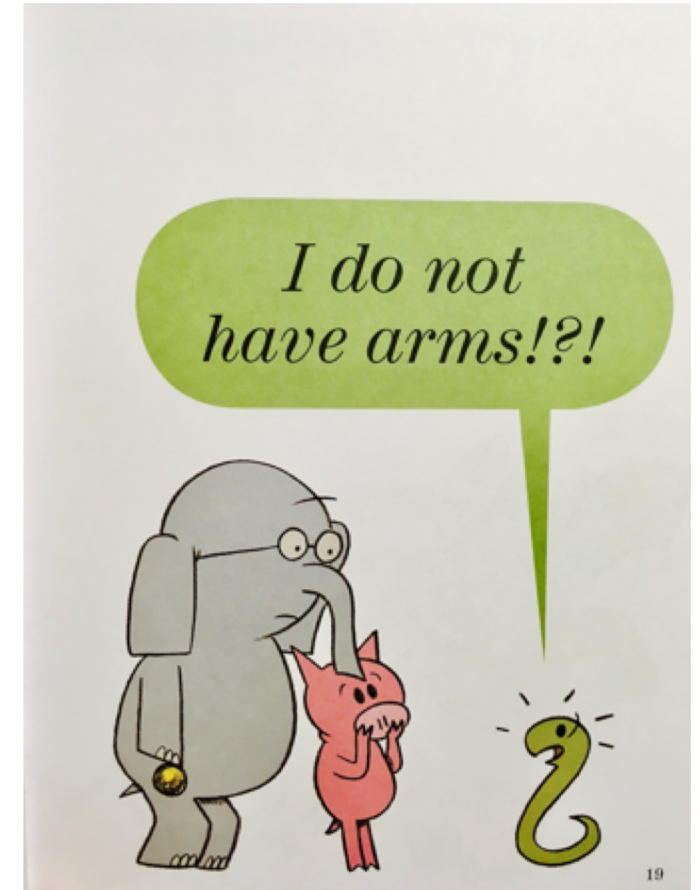
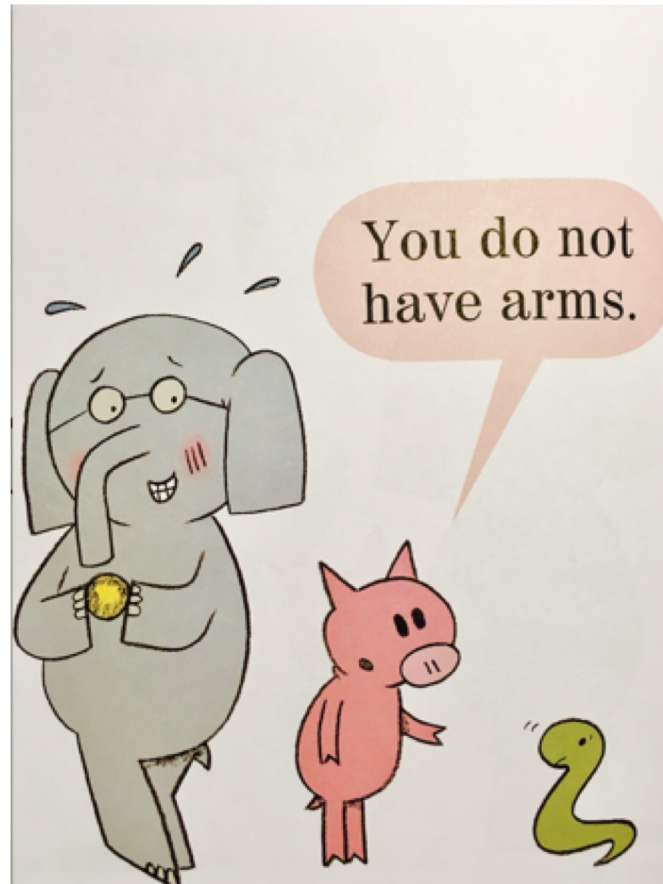
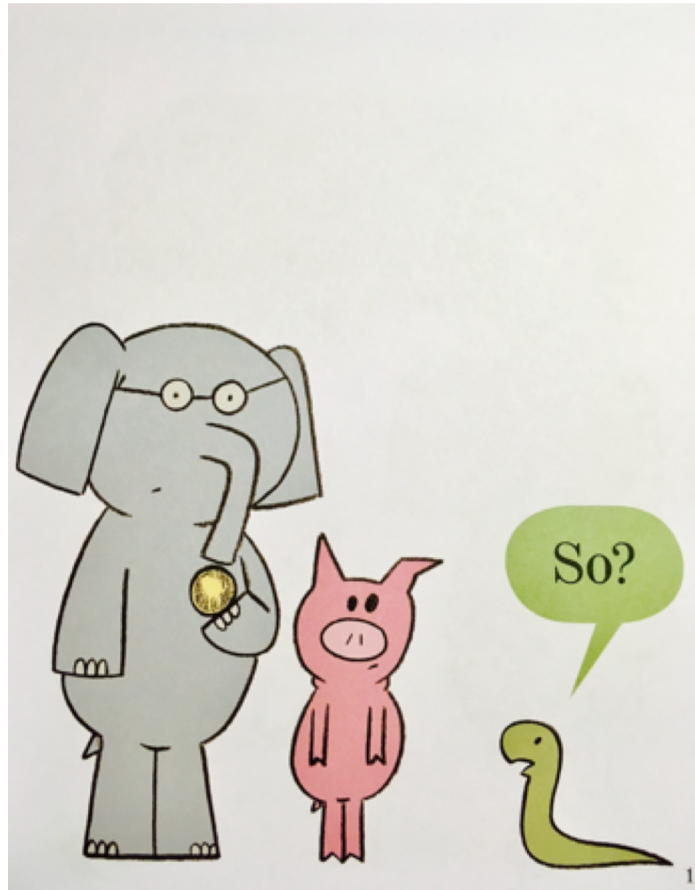
6. Social Understanding

(understanding internal mental states: thoughts, feelings, intentions, beliefs, desires...)



Social Understanding

(understanding internal mental states: thoughts, feelings, intentions, beliefs, desires...)



Social Understanding and Reading

(Carnine, Stevens, Clements, & Kameenui, 1982; Guajardo & Cartwright, 2016; Lysaker & Miller, 2002)

- Required to **understand WHY characters do what they do**
- Supports **social inference-making** - essential for narrative texts and social informational texts (e.g. history and social studies)
- Supports **understanding of author's purpose**
- Reciprocal: Adults who read more fiction have better social understanding! (Kidd & Castano, 2013)

Good readers are good "mind readers": Can think about characters' thoughts and feelings

Teaching Social Understanding

Mental and emotional state vocabulary

Assess how often these words appear in retellings or writing
Teach these kinds of words to improve social understanding

cognition words (thinking):

believe, bet, dream, figure, forget, guess...

motivation words (desires):

desire, hope, like, love, miss, need, want...

emotion words (feelings):

afraid, angry, bad, bored, cry, frustrated...



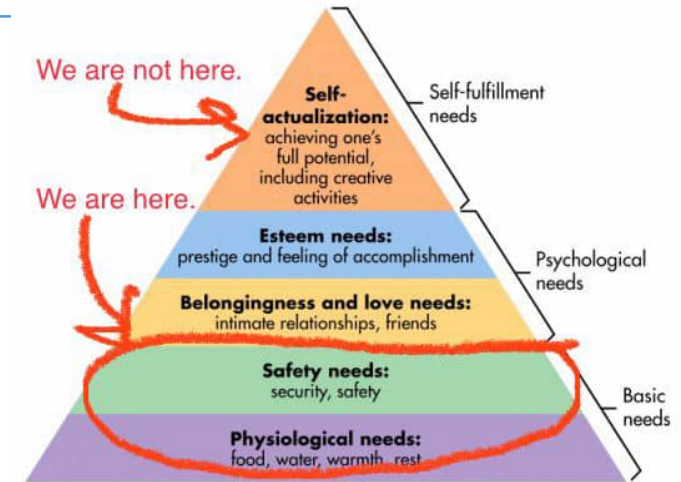
(e.g., Dyer, Shatz, & Wellman, 2000)

Social Understanding: Texts that highlight multiple perspectives



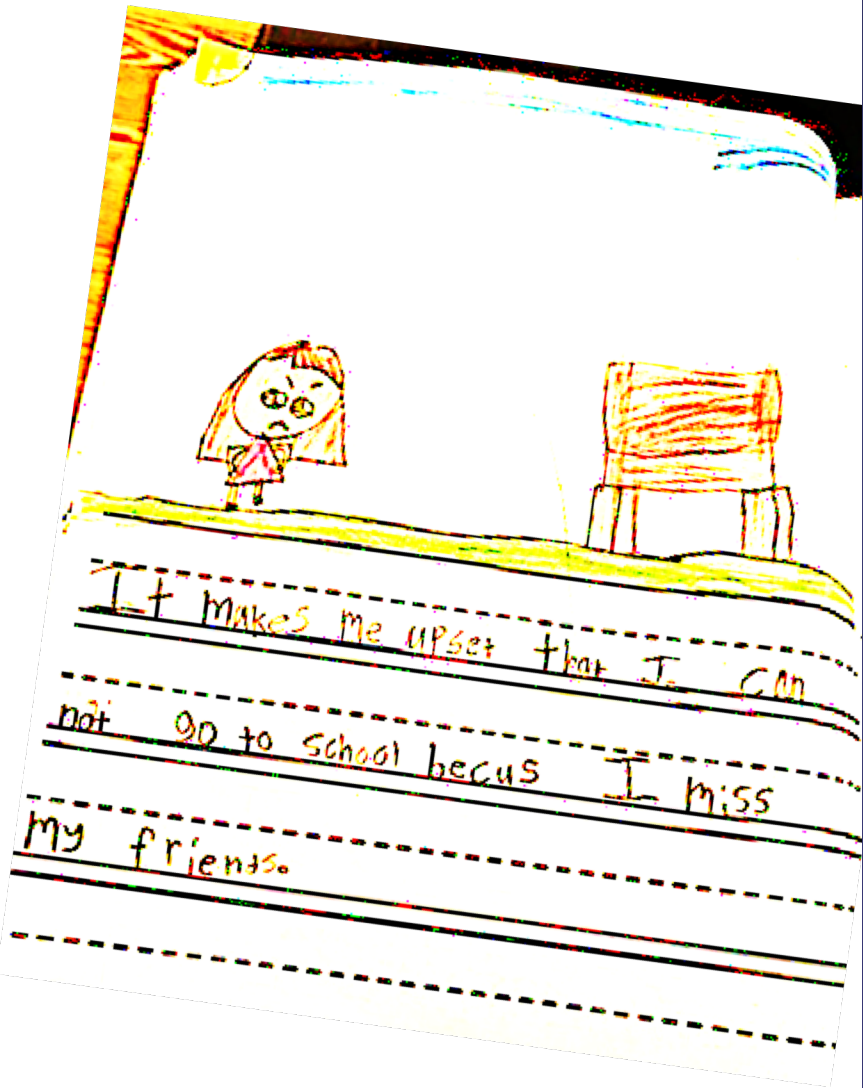
Social Understanding and Learning During COVID-19

- children have many negative emotions right now
- expect regression; acting out = coping and expression of need
- connect, connect, connect!
- acknowledge and talk explicitly about stress and feelings
- read books that facilitate expression of feelings
- have students write or draw



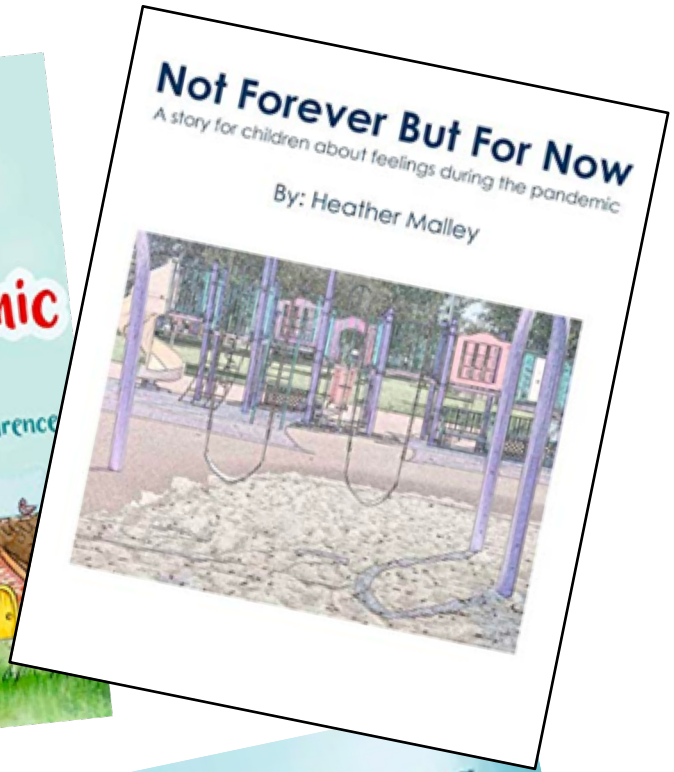
TODAY.COM
This is why your child is acting like a baby right now
Nighttime waking, potty accidents and other regression can accompany...

<https://www.today.com/parents/child-regression-signs-regression-kids-what-do-about-it-t177861?fbclid=IwAR3IXfAamaCUc53GGFhyoakdu5NLAhuAKvUhinCFzwSqFTu9cwTr7fHEjoo>

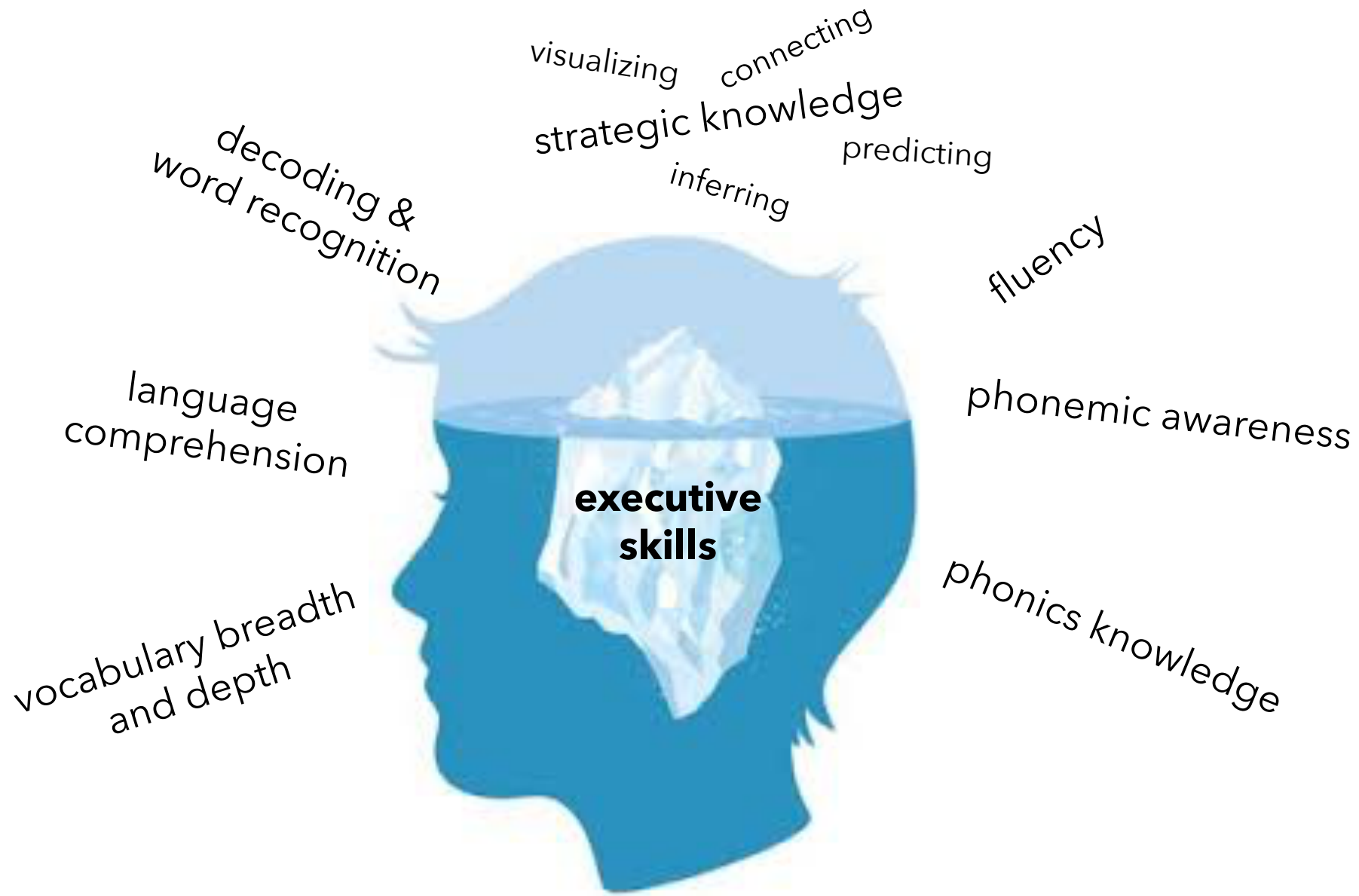


IT feels awful to be at home. It ~~is~~ is because I already did everything at home. Nothing has been fun really, it's just been work, work, work. We ~~are~~ barely get to go outside as a family. The hardest thing about being home is that you have to do school online. Who I miss is my teacher, because I don't get to say bye in person at the end of the year. The first thing I think of when this corona virus is go to school.





Pulling it all together...





**weak or
impaired
executive
skills**

vocabulary breadth
and depth

decoding &
word recognition

language
comprehension

strategic knowledge
predicting
inferring

visualizing

phonics knowledge

phonemic awareness

connecting

fluency

Specific executive skills underlie successful reading comprehension...

planning & organization (Cutting, Materek, Cole, Levine, & Mahone, 2009; Locascio, Mahone, Eason, & Cutting, 2010)

working memory (Borella, et al., 2010; Cain, 2006; Carretti, Cornoldi, De Beni, & Romanó, 2005; De Beni, Palladino, Pazzaglia, & Cornoldi, 1998; Oakhill, Hartt, & Samols, 2005)

cognitive flexibility (Cartwright, Bock et al., 2017; Cartwright, Coppage et al., 2017; Colé et al., 2014; Søndergaard Knudsen et al., 2018)

inhibition (Borella, Carretti, & Pelegrina, 2010; Cain, 2006; Locascio, et al., 2010)

social understanding (Brown, Oram-Cardy, & Johnson, 2013; Cartwright et al., 2017; Guajardo & Cartwright, 2016; see Zelazo & Carlson, 2012, for a discussion of hot EF skills)

What can we do to counter effects of stress?

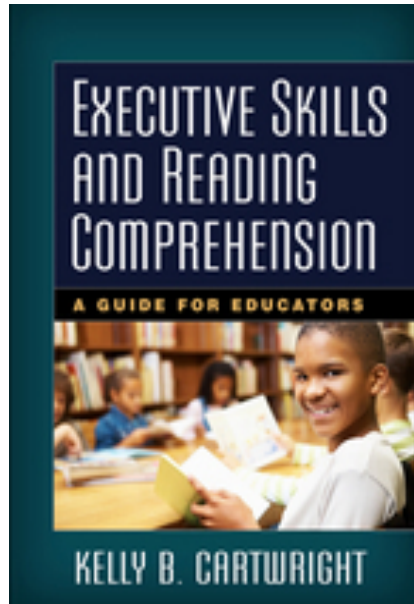
(using **your** executive skills to support their executive skills & learning)

It's all about **Prevention!**

- Be **Present** - connect; social-emotional support, connection
- **Predict** - anticipate stressful situations, needs
- **Plan** - schedule, activities, routines
- **Permanence** - offer stability; changes in routines induce stress
- **Prime** - the child (communicate, share plan & structure)
- **Prepare** - the environment (structure, materials)

When stress responses (i.e., big feelings!) occur:

- **Pause** - wait to respond; once the chemical storms of stress and heightened emotions are activated, we (and they) can't reason
- **Practice** - a stress-reduction strategy, activity, mindfulness method



Learn more about executive functions and reading comprehension in this book!



More Resources – Executive Function 101:
<https://developingchild.harvard.edu/guide/a-guide-to-executive-function/>

Thank you! Questions?

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For more information, visit:
<http://www.kellycartwright.com>

Learn more about poor comprehenders in this book.

