Webinar Transcript: Strengthening Executive Functioning Skills in the Classroom

By Dr. Christine Purcell, Dr. Marc Crundwell, and Jennifer Newton

[SLIDE – Welcome]
[Text on slide: Presented by: Dr. Christine Purcell, PhD., C. Psych, Dr. Marc Crundwell, PhD., C. Psych, and Jennifer Newton, Educational Coordinator.
Image of: Photographs of Dr. Christine Purcell, Dr. Marc Crundwell, and Jennifer Newton.]

Cindy Perras: That takes care of housekeeping for this afternoon, so let's get started. It is now my pleasure to introduce our speakers, Dr. Christine Purcell, Dr. Marc Crundwell, and Jennifer Newton, all from the Greater Essex County District school board, who will be presenting "Strengthening Executive Functioning Skills in the Classroom."

Dr. Christine Purcell is a licensed clinical neuropsychologist at the Regional Children's Center, specializing in learning disorders and developmental disorders. Dr. Purcell has worked for Greater Essex since 2012. Her clinical interests include self-regulation and social/emotional learning in young children.

As a licensed school and clinical psychologist, Dr. Marc Crundwell works in both the elementary and secondary panels providing assessment of students, consultation with school, staff, and parents, and he assists in the development of behavior and safety plans, as well as threat/risk assessments.

Jennifer Newton has worked for Greater Essex in various settings and roles including self-contained classrooms, learning disability classrooms, as a learning support teacher, and she has been a special education coordinator for the past 15 years. Jennifer has taught special education Part I at Queens University and has been a presenter at multiple PD sessions at both the elementary and secondary levels.

Welcome, Christine, Marc, and Jennifer. The cyber floor is now yours.

[SLIDE – Strengthening Executive Functioning Skills in the Classroom]
[Text on slide: Presented by: Dr. Christine Purcell, PhD., C. Psych, Dr. Marc Crundwell, PhD., C. Psych, and Jennifer Newton, B.A., B. Ed., OCT, Educational Coordinator.
Image of: Cartoon of two people sitting at a desk conducting a job interview. Interviewer asks "When do you find you're most productive?" Interviewee responds "When the bills are due?
Image of: Brain lifting weights]

Dr. Christine Purcell: Thank you, Cindy. It's Dr. Christine Purcell here and I have the pleasure of starting our webinar, "Strengthening Executive Functioning Skills in the Classroom."

[SLIDE – What are Executive Functions?]
[Text on slide: Definition: Executive function is the ability to maintain an appropriate problem-solving set for attainment of a future goal
Image of: Brain scan with left dorosolateral Prefrontal Cortex (PFC), medial PFC, and right dorsolateral PFC highlighted.]

First I want to start just talking a little bit about what executive functions are. And really what executive functions are, are any skills that we use to maintain an appropriate problem-solving set to achieve a future goal. So anything that we need to get started or organized, information or rules we need to hold in mind, anything we to do stay on task so we can achieve a goal is considered an executive function.

[SLIDE – The Executive Functioning Ladder]
[Text on slide: Response inhibition (6-12 months), working memory, emotional control, flexibility, sustained attention (12-24 months), task initiation, planning/prioritization (Preschool), organization, time management (Early elementary school), goal-directed persistence, metacognition (10-11 years).
Image of: Two arrows pointing down to indicate that each of these executive function skills are developed consecutively.]

So I just want to talk a little bit about how these executive functions develop. There is a sequence to the development of executive functions, in terms of brain-readiness to learn these skills. So you really can't develop mastery of a later skill until you've developed mastery of an earlier skill. And all kids don't obtain these skills at the same age or at the same level or to the same degree as their peers. And some individuals may always have challenges in certain areas.

So we can see what some of the executive functioning skills are. So things like being able to inhibit a response starts to happen around six months of age. We start to get some working memory at about a year. We can kind of sustain some attention starting around one or two. Planning, organizing comes a bit later. And some of the more complex skills like time management, directed goal persistence, really don't start to develop into -- until early elementary school. And this is just when we're starting to have our brains ready to begin to acquire and learn to develop these skills. Complex things like metacognition don't start to develop brain-readiness until about 10 or 11 years of age. And all of these executive functioning skills continue to develop until we're in our early adult years.

[SLIDE – Arousal – Stress and your Brain]
[Text on slide: Arousal – how one copes with and recovers from ongoing stress.

Over arousal – highly active, alert, ready to respond, fight, flight, or freeze.
Under arousal – lethargic, sleepy, difficulty concentrating.
Image of: A baby, labeled "So let me get this straight, I don't have to cry and yell to get my cookie?".]

So before we talk about executive functioning, I want to talk a little bit about how we get to use executive functioning. What's, kind of, the precursor. And so I want to talk a little bit about arousal, which is how we cope with and how we recover from ongoing stress. And all stress is, is really any demand that inter -- that increases our arousal level. So when we're over-aroused, we're feeling highly-active, alert, ready to respond. We might have a fight, flight, or freeze response. And when we're under-aroused, we feel lethargic, sleepy, and we have difficulty concentrating. And really what is stressful depends on the individual.

[SLIDE – Consider the impact of your classroom and school environment]
[Text on slide: Consider the impact of your classroom and school environment.
Image of: A very full classroom with the students taking part in many different activities at the same time.]

So throughout this webinar, we would like you to keep in mind each environment a student has to adapt to every day. So how do the adults and the physical layout hinder or assist in co-regulation? So when you're thinking about the impact of the classroom and school environment and what some stressors might be, it could be things like the number of children in the classroom, time limits, people speaking quickly, having to speak in public, not understanding instructions, social interactions, trying to remember classroom routines, having to sit still ... There are many more stressors that can occur in a classroom.

[SLIDE – The Brain's Arousal System]
[Text on slide: Students adjust their energy/alertness many times throughout the school day.
Image of: A winding road that goes up and downhill many times.]

So students adjust their energy, their alertness levels, many times throughout the school day. So this might be things like silent reading, then going to a group activity. Going to outdoor play; coming back to do math. Some students have more difficulty shifting in and out of different arousal levels than others. And so their arousal level might not be appropriate for the situation.

[SLIDE – Arousal and the Brain]
[Image of: Graph showing the development of the striatum and prefrontal cortex as the subject ages. Three images of brains, labeled children, adolescents, and adults, respectively, showing the relative level of development of striatum and prefrontal cortex. Image taken from Casey et al (2002).]

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So really, when we're adjusting our arousal level in a response to demands, it involves the entire nervous system. So when a demand is placed on an individual, the sympathetic nervous system activates brain and body functions that increase our arousal level.

[SLIDE]
[Text on slide: Demand/stressor. Affective state – fear, anxiety arousal. Regulatory systems +/-. Regulatory Cortical System. Emotional reactivity – Limbic system.
Image of: human brain showing the central structures of the brain.]

So as adults, we're pretty good at regulating our arousal levels. We have a fully-developed, mature nervous system. So when something stressful happens, we can, kind of, choose an appropriate strategy and maintain an appropriate arousal level.

[SLIDE]
[Text on slide: Same as above.
Image of: Same as above with added picture of a tiger.]

So for example, if there's a tiger about to eat me, I want to increase my arousal level pretty quickly. But if I identify the stressor as being something that's not stressful -- you know, it's just a picture of a tiger -- okay, I can regulate my arousal or downshift, pretty quickly.

[SLIDE]
[Text on slide: Same as above.
Image of: Same as above with picture of a tiger removed.]

So in an immature nervous system, I just want to talk about how this process occurs. So it's just a couple basic scientific concepts around us as mammals and how our nervous system develops over time. So how we grow and develop in the world. And how we come as children and adolescents into adulthood.

So really, where does this ability to make decisions, to self-regulate, to use executive functions, to choose what to focus on, what we want to take responsibility for, how we orient to our emotions ... Where do these skills come from and how do they develop? And the simple answer is that from a core nervous system point of view, human children really can't regulate their arousal levels and use executive functioning skills appropriately until they're late teenagers. And some researchers even put it beyond that. So really having a fully-functioning vagus nerve in the nervous system, a fully-functioning parasympathetic and sympathetic nervous system, having a fully-grown brain ... in all of this we're really late bloomers. And most of this is not happening until our late teens, and some in our early 20's, depending on what aspect of executive functioning you're talking about. So the earlier you go, particularly in children in the K-8

context, their system, their ability to downshift and regulate strong, physiological states -- to downshift arousal, to regulate strong emotional states, and use executive functioning appropriately is incomplete.

[SLIDE]
[Text on slide: Same as above.
Image of: Same as above with added picture of a test graded F and a stick figure saying "I hate you! You're a stupid teacher".]

So instead of having a stressor -- and as a child being able to evaluate that, "Maybe this is a situation where I don't want my arousal level to be really, really high. Maybe I want to downshift and consider that I didn't study and maybe what I'll do next time to achieve my goal ..." And they really can't do that, so what often happens when their arousal level is up, this is how an immature nervous system is picking a coping strategy. So he's stressed out, he's anxious, he's feeling aroused. And this little guy has picked probably the best coping strategy he has because he doesn't have the ability to access those executive functions.

[SLIDE]
[Text on slide: Text on slide: Demand/stressor. Affective state – fear, anxiety arousal. Regulatory systems +/-. Regulatory Cortical System. Emotional reactivity – Limbic system. \
Image of: three stick figures labeled fight, flight, and freeze. Stick figure representing a teacher writing a math equation on the board.]

And so often what we see when children are stressed and over-aroused is that they go into fight, flight, or freeze. And often it looks like defiance, but really what we're seeing is a nervous system that is coping the best way it can with stress. So this is an incomplete brain system, and it's really incomplete by design. We have a bias to see things as a threat. We have a bias to go into arousal. And this is really a survival strategy. Freak out; process later. And the reason that it's like this is because as children, we don't know what kind of environment we're being born into. So in a very stressful environment where there might be tigers that are going to eat you, these fight, flight, and free responses are very adaptive. But in our first world country when we're having other kinds of stressors, they're really not. And so we're looking to the adults in our environment to try and determine what stressors need us to increase our arousal level and what stressors are not that stressful and should make us downshift. So really from an evolutionary point of view, the completion of this brain circuit happens through adults. So again, the completion of the circuit -- the completion of a child's ability to self-regulate arousal -- happens through adults they can look to and attune to in their environment. And the adults in the environment and how they are modeling executive functioning and teaching these skills to children, is how they learn to modulate their arousal levels. And research shows that children need more skills than they are currently getting. And that the younger the child, the more vulnerable, the more trauma and

stress they've been exposed to, the more chaotic the environment, the more we as adults are the primary intervention and the more that we are acting as their frontal lobes.

[SLIDE]
[Text on slide: Demand/stressor. Affective state – fear, anxiety arousal. Regulatory systems +/-. Regulatory Cortical System. Emotional reactivity – Limbic system.
Image of: human brain showing the central structures of the brain.]

[SLIDE – What are Executive Functions]
[Text on slide: Variety of "higher-order" mental processes and behaviours. Enables self-regulation, problem-solving, and goal directed behavior. Integrates lower-level processes.
Image of: Football team with players, head coach, assistant coaches, etc.]

Dr. Marc Crundwell: So it's very important for educators -- or I think, as Karen says well -- to know exactly what executive functions are, because they allow us to identify those students who may be first struggling with executive functioning skills. And then it does give us the rationale to understand why we put very specific kinds of supports and accommodations into place to support those children. I think many of you have probably heard the metaphor before that executive functioning is like the CEO of the brain or the conductor of the orchestra. That conductor who's standing in front of a symphony as the single person who is in control of everything is happening in that orchestra. The executive functions are essential. Or the singular control of self-regulation, planning, and organizing. As we learn more about executive functioning, we've actually come to a better way to look at executive functions. And we believe a more appropriate way is to look at executive functioning as a team of conductors of a mental ability orchestra. Or as a staff -- a complete staff of a mental ability football team. So that football team has a head coach who assumes overall leadership, but also gives responsibilities to other coaches under them. So we have a coach for the offense, we have a coach for the defense, and we have a coach for the special teams. And under each one of those coaches, we typically have assistants who are helping them in those specific areas.

[SLIDE]
[Text on slide: Behaviour regulation – inhibit, shift, emotional control, initiate.
Metacognition – working memory, plan/organize, organization of materials, monitor.
Image of: chart that breaks executive function into its components]

Currently we view executive functions as having what we consider to be two major components. We have what we consider to be a self-regulatory function, and then we have a metacognition function. And we believe, or the research suggests, that the metacognitive functions are dependent first on those self-regulation functioning developing and working properly.

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So in terms of the self-regulation functions, or what we call behavioral regulation, the first function is the ability to inhibit behavior, or to stop one's own behavior. And that ability is really the gateway to all of the other executive functions. If a student has difficulty inhibiting behavior, then they can be very impulsive. They tend not to be able to stop when you ask them. Or when they're doing something they shouldn't be doing, they tend to have difficulty stopping. They can also have more difficulties inhibiting their thoughts because they have more difficulties inhibiting that cognition or that thinking that's happening in their head, so often they may appear more day-dreamy or they are frequently off-topic.

The next executive behavioral regulation function is what we call shift and flexibility. And shift and flexibility is what allows a student to adapt to new information as it's presenting itself in the environment. We always have new information that's coming at us; what do we do with that information? And we know that if a student tends to shift too quickly from one piece of information to another piece of information, then they're often very distractible. But if they shift too slowly, they are typically -- present with things like off-topic comments, or again, they're daydreaming more because they're not shifting when they should.

Then we have emotional control. And emotional control is that ability to inhibit emotions. And it allows for us to be able to modify an emotion before it -- we express it. So it's very important sometimes that if you're very upset with someone, that you don't want to show the full level of how upset you are. You know it's much better to modify that and make it a much more socially-acceptable level of emotion, but still express that you're upset with that person. So we -- when we look at emotional control, it is that ability to select a more adaptive emotional response to fit that current situation better. And it's also our ability to activate emotions as we need. But one of the key things with emotional control is also motivation. We know that children with executive functions often have significant difficulties with motivation. And motivation falls within this emotional control area. So students with difficulties in emotional control will often present as more emotional or more oversensitive. They're more immature than their peers, they have more difficulties managing frustration. And one of the key ones that we often see -- that we often may think is something else, is they often are very unmotivated. They really do have difficulties with internally controlling their motivation states.

The last one of the behavior self-regulation is what we call initiation. And initiation is the ability to actually begin a task or an activity. It's about being able to independently generate ideas, to take those ideas and respond, and it's also our ability to initiate and start problem-solving strategies. So again, difficulties in this area will be noted as difficulties with generating ideas, with being able to initiate many activities that we believe that a child should be able to initiate by themselves.

Now in terms of metacognition, we typically break metacognition into a number of different areas. And again, we believe that that metacognition is very dependent on those self-regulatory functions. And when we look at working memory, we divide working memory into two areas.

The first area we divide it into is non-verbal working memory. So non-verbal working memory is our -- what we often consider our mental workspace or our scratchpad. So non-verbal working memory really enables us to be able to have hindsight, to see a situation and have learned from that situation. It allows us to apply that to have foresight. It allows us to manipulate information in our memory. And it's a sense -- it also gives us our sense of time and our sense of event structure or sequence. So a lot of children who have difficulties in non-verbal working memory will show difficulties with poor time-management. They don't seem to learn from the past. And again, those are children who are often losing or misplacing items.

Verbal working memory is our ability to hold language online while we're processing other information. Or sometimes we're waiting. It's our self-talk. And it's that self-talk that facilitates our rule-governed behavior and our reasoning. So if you have difficulty with verbal working memory, you often are very forgetful, you tend to make careless errors, and often you have comprehension issues. But one of the biggest issues is you often have difficulty following rules. Even though you may know the rule, it may not present and be in memory when you need it to be there.

Planning and organization is the ability to manage current and future-oriented tasks and demands. It's really about being able to prioritize and select goals. It's about being able to have -- to analyze and synthesize information. And it's really also about strategy development. So you have -- if we -- if we have weaknesses in planning and organization, we're going to have difficulties in completing tasks efficiently, difficulties organizing materials. We're going to have difficulty formulating responses, sequencing activities, and managing long-term tasks.

Organization of materials is really our ability to know where our important materials are, and where we have them in different -- what we consider to be storage space. So difficulties in this area are going to be seen as difficulties knowing where materials are. These students will often lose items and they have a lot of difficulty with organizing situations as well.

And finally monitoring we often consider to be what we call self-monitoring. And self-monitoring is our ability to monitor our own progress and then determine if we're being successful or not. And a lot of students with executive functioning difficulties have a great deal of difficulty monitoring their own progress to determine, "Am I doing ok?" "Am I not doing okay?" "Do I need to switch to a different idea or a different plan because the one I have isn't working?"

[SLIDE]
[Text on slide: The executive functions are a diverse, but related and overlapping, set of skills. In order to understand a person, it is important to look at which executive skills are problematic for him or her and to what degree.
Image of: Illustration of brain in child's head. Brain is filled with cartoon images representing the many thought of the child.]

Now it is important to remember that executive functions are a diverse set of skills and that they overlap each other. But in order to understand a student with difficulties in executive function, we really have to focus on each student as an individual and look at what areas are problematic for that individual student. And to what degree are they problematic for that student.

[SLIDE – The "LOST" student.]
[Text on slide: Task setting/management:
- Initiation
- Strategy generation
- Planning
- Organization

Left frontal
Image of: Stick figure in a room with a large box labeled misc. Caption says: "Home organization tip: just give up".]

While each student's pattern -- individual pattern of difficulties are important, what we do know is that there are a few typical patterns of students we see with executive functioning difficulties.

So the first student that we often see is what we call the "lost" student. Their primary difficulties are with task-setting and task-management. And as a result, they present with difficulties in initiating tasks, with generating strategies ... so, you know what? You ask them, "Okay, what are three different ways you could do this?" They have difficulty generating those different strategies. And they have difficulty with planning and organization. And we know that that tends to be a left frontal issue.

[SLIDE – The "LAZY" student.]
[Text on slide: Apathy/drive:
- Drive
- Unmotivated
- Apathy
- Uninterested

Medial frontal
Image of: Cartoon panel. Two people are leaving a room, which has a sign outside that says "Seminar today: Motivating your staff". Both people have a carrot on the end of a

stick attached to their heads. The caption reads: "Frankly, I was expecting something a bit more sophisticated…"]

Then we have what's considered to be the "lazy" student. And the lazy student presents with difficulties in drive. They have difficulties in what we would consider to be motivation. And they often really do appear to be very unmotivated and sometimes apathetic, or very uninterested. These students seem to lack any motivation at all sometimes. And we know that's a medial frontal lobe area.

[SLIDE – The "LEAKY" student.]
[Text on slide: Environmental monitoring:
•   Self-regulation
•   Disinhibition
•   Impulsivity
•   Leaky breaks – Alphabet kids
Right frontal
Image of: Two cartoon panels. In the first panel a young boy and his grandfather are looking at dinosaur bones at the museum. The boy says to his grandfather "Those were the days, eh, grandpa?". The second cartoon panel shows a police man standing in front of a multi-car pile-up, speaking to reporters. He says "We didn't need a stop sign because they were supposed to self-regulate…"]

Then we have the "leaky" student. And this is the student who has a lot of difficulties in the environment, especially with self-regulation and monitoring their own behavior. We often call these children the "Alphabet Kids" because they will often have diagnoses such as ADHD, ODD, to name a few. Because they have a great deal of difficulty with self-regulating and stopping or inhibiting behavior, they're far more impulsive than other students.

[SLIDE – The "LEAKY" student continued]
[Text on slide:
•   Self-awareness/social awareness
•   Simultaneous processing
Image of: Three panel cartoon titled the 3 stages of self-awareness. Panel 1: two chickens are speaking. Chicken 1 says "You're an idiot". Chicken 2 replies "No!". Panel 2: Chicken 1 says "You're an idiot". Chicken 2 replies "Yes." Panel 3: Chicken 2 declares "I'm an idiot", unprompted.
Drawing of two neurotransmitters labeled norepinephrine and dopamine. Caption says "If I'm not paying attention… blame my neurotransmitters".]

We also see these leaky students having a lot more difficulties being socially aware. "How is my behavior affecting others?" "How do I --?" Picking up social cues that would help them maybe regulate their behavior. And also a great deal of difficulty with

simultaneous processing. It's very difficult for them to process more than one thing at a time.

[SLIDE – The "combination student]
[Text on slide: It is important to remember that many students with executive functioning difficulties will present with a combination of these subtypes.
Image of: a fast food combo meal.]

Now, while many students will fit into one of those profiles that I discussed, we do need to know that there are a number of students who will present with what we call a combination. So they'll have many different areas, or they'll have multiple areas of difficulties across many of those executive functioning areas.

[SLIDE – Accommodations and Strategies for Students with Executive Functioning Needs]
[Text on slide:
Environmental changes and supports
A.K.A. – External frontal lobe accommodations
Strategies taught to students to allow them to function more independently where there are needs.]

Now when we look at students and we say, "Well, how can we help students with executive functioning difficulty?" We know that they will require interventions. What are -- how do we focus those interventions? And in general we typically talk about two categories of interventions we must focus on.

The first is that we need to make changes to the environment in order to provide more external support and direction. So often these external environmental interventions require us as adults to basically become their external frontal lobe. And we're doing -- we're becoming that external frontal lobe by significantly increasing the structure in the environment for them.

The second category of intervention involves us working with these students to help them learn and develop strategies that they can use consistently. And these strategies hopefully over time will allow them to function much more independently. And we hope over time that those strategies become what we consider to be life strategies. So hence we often do refer to them as strategies for life. They are things that they can use going forward. And hopefully in time they can also build on and make more complex, to make them much more independent.

[SLIDE – Understanding Executive Functions by looking at One Day in Life Without Them]
[Text on slide:

Thinking about what life is like for a student with underdeveloped executive functioning skills gives us a better understanding of their needs.
These core skills affect our ability to manage life-tasks and the multitude of demands within the school and the classroom.]

So what we'd like to do is look at a student across a typical day. So -- and figure out what that student's difficulties are, where are the issues that they're having ... And I think sometimes when we use a case study approach, it may help us understand a little bit better, What are the concerns and what are the things that are the appropriate things to do with them?

[SLIDE – Meet Josh, a sixth grader who struggles with executive function. This is a day in his life]
[Text on slide:
7a.m. Argh! Josh knows that he has forgotten something. Ah, that's it – his cleats for today's game. He sprints back inside the house to get them… and leaves his backpack in the kitchen. He walks right past the checklist his mom made to help him remember what he needs for school. But it's too late; the bus is here and about to pull away! He's going to miss it again. Executive functioning demands?
Image of: Josh with his cleats in his hands walking past his backpack and checklist.]
So let's take a look at Josh and follow Josh across a typical day. Please take 30 seconds and read this scenario. And I'd like you to start to think about what difficulties he may be having in his executive functioning skills.

[SLIDE – So Josh needs support with…]
[Text on slide:
•	Organization/location of materials (where are the things he needs)
•	Planning (what order should I do things)
•	Self-monitoring (did I check the checklist; how am I doing)
•	Working memory (Mom's helping him to remember)]

So when we look at that, we know that Josh needs support with organization and location of materials. So, where are those things he needs? With planning: what order should I do those things? With self-monitoring: did I check the checklist? How am I doing? And also with working memory, because mom is really helping him to remember.

[SLIDE: External Frontal Lobe Accommodations]
[Text on slide:
•	Provide packing list
•	Prompt
•	Consistent place and time
•	Repeated practice
•	These external strategies are also applicable to the classroom
Image of: Four backpacks hanging in a row on hooks]

Jennifer Newton: Josh was provided with a list. This list needs to be kept in a consistent location. We know one of the things that Josh needs support with is actually finding his supplies. If we don't keep the list in a consistent location, Josh is going to get lost in the step of looking for his list. It's the same reason we tend to keep our keys in the same location every day. We have organized ourselves to quickly be able to locate needed daily supplies. In the beginning, monitoring Josh's progress and double-checking will be crucial to his success in learning to use these lists.

Initially we may be prompting him multiple times throughout the day. An alternative idea may be to use a magnet system, whereby Josh moves a magnet from a "needed" column to a "packed" column. This would provide consistent visual prompts, and may reduce any arguments with his mother.

Establishing a return from school routine will assist with organization. Josh should empty his backpack, put his homework in a designated location, and put his lunch pail and backpack in the same spot each evening when returning from school. Just like parking in the same general location at the mall so we don't spend time searching for our car when we're ready to leave.

Setting a consistent time for after-school activities, such as snack and homework and screen time, could all occur at approximately the same day. Homework should have an established place to be completed.

Repeated practice of these strategies will be needed to reinforce Josh's learning. Similar strategies can be generalized to our classroom settings.

[SLIDE: External Frontal Lobe]
[Text on slide:
• Make the invisible visible
• End sessions 10 minutes before bell
• With the entire class, review homework board, pending assignments due, project deadlines
• As a class, write in planner or use technology
• Collectively pack up materials, monitor.]

So as a teacher, we need to determine how we can act as Josh's frontal lobe. We need to ask ourselves, "What can we do to help him learn to organize? Learn to plan? And learn to self-monitor?" As Dr. Purcell highlighted, these skills are not developed at the same time, or equally, for all the students in our classroom. We can't assume students know how to organize themselves, where to start, or even to recognize what's important for them to write down.

By now you have probably all brought several students to mind. We have to think of practices that are within our control that we can embed in our daily teaching. We need to outwardly model organizational skills for students. In short, we need to make invisible -- we need to make the invisible visible.

One thing we could do is end lessons with enough time to allow for embedded instruction of organizational skills at the end of each school day. You certainly wouldn't pack for vacation 10 minutes before you boarded a plane and expect to remember your bathing suit and sunscreen, and even your passport, although you know it's crucial to have your passport to board that plane.

As a class we can review the homework, timelines, and due dates each evening. This would be good for some students, and yet essential for others.

We need to teach various ways to record the homework. Use of agendas, technology, taking a picture of the homework board and emailing it to parents or themselves, assigning homework buddies, or even designating a "While You Were Away" bin so students know where to access any missed information.

Teachers can further assist through the use of class blogs, programs, or apps that allow teachers to directly send messages to parents, guardians, and students.

As items are written down for homework each evening, we should have students actively gather those supplies for the information they just wrote down.

We need to actively monitor students who you know may need greater assistance with these skills. As a teacher, I would certainly utilize students as much as possible in this process. Students could be given the responsibility of updating the homework board, posting on the blog, or using apps.

[SLIDE: Strategies for Life]
[Text on slide:
•   Teach Josh how to make packing list
•   Have Josh check off completed items
•   Teach time management skills
•   Also applicable to the school setting and can be generalized across different tasks/situations
Image of: Example of a morning routine checklist.]

Dr. Marc Crundwell: In terms of strategies for life that are consistent with many of the external supports that Mrs. Newton just noted, we can teach Josh how to make a list of things he needs to put in his backpack, and teach him how to use it consistently. We can work with Josh to assist him in how to use the list he has created to check off each item

as he completes the list. Now for some children who are younger, we may have to substitute a list with pictures for the words.

We can work with Josh to develop time-management skills that he can use the night before and in the morning, including a very set routine he learns and follows every single day.

These lifelong strategies of lists and time-management strategies can be applicable also to the school setting. And importantly, can be generalized across different situations and tasks across many different environments. And ensuring that many of these strategies for life are taught in a way to help them generalize the different situations is extremely important.

[SLIDE: 11am]
[Text on slide:
Josh's teacher asks, "Who has a good answer to the first question I gave you yesterday about last night's reading assignment?" Josh squirms, hoping he won't be called on. He didn't write the questions in his planner and has no idea how to answer them. Executive functioning demands?
Image of: Josh sits in the classroom looking confused. He thinks to himself: "I wasn't thinking about those questions when I was reading. I don't even remember what the whole thing was about."]

So now let's take another 30 seconds and look at the scenario for Josh at 11am. Please again start to think about what difficulties he may be having in his executive functioning skills.

[SLIDE: So Josh needs support with…]
[Text on slide:
• Organization (questions not written down in planner)
• Working memory (forgot about the questions from yesterday given by the teacher)
• Initiation (no idea how to start to answer the questions]

So we know Josh needs support with organization: questions not written down in the planner. With working memory: he forgot about the questions from yesterday given by the teacher. And with initiation: he has no idea how to start to answer the questions.

[SLIDE: External Frontal Lobe]
[Text on slide:
• Start with review activity to activate prior knowledge
• Direct attention to key points
• Provide questions prior to lesson.]

Jennifer Newton: Josh thinks to himself that he wasn't thinking about the questions as he read. He admits to not writing them down, and not even remembering what the reading assignment was about from last night. These stressors may cause Josh to freeze and not take in any of the learning that's about to occur. Josh didn't think of the questions as he was reading because he didn't have them copied down. A written list of questions provided to Josh, posted to a blog, or a screenshot on his iPad may have been helpful for Josh.

Setting the expectations for work will be important. "As you read tonight, I want you to be focusing on the questions, because tomorrow we're going to be taking these up."

The teacher could also use differentiated responses for students. Perhaps some of the students will write the questions down as noted, while others will use cloze passages or assign specific questions to answer. It could then be predetermined that those students will be responsible to provide the answers to the class the next day.

A review activity based on the reading from the night before at the beginning of the lesson may have been helpful for Josh to activate the knowledge of what he has previously read.

Additionally, the teacher may develop a cue system with students. When the student is confident they know an answer, perhaps the cue is that they raise their left hand. The teacher has pre-agreed to only call on the student when their left hand is raised. This would allow the student to focus on the lesson and the learning, rather than on being worried that they are going to be called on and not be able to provide an answer.

[SLIDE: Strategies for Life]
[Text on slide:
•   Highlight key words
•   Take notes while reading
•   Graphic organizers
•   Active listening
Image of: Examples of a graphic organizers and listening strategies]

Dr. Marc Crundwell: In terms of strategies for life that could support some of the external frontal lobe interventions, one of them is certainly to teach Josh the strategy of highlighting key words while he's reading, because that can be important for him to remember and draw his attention to those words the next day.

We could also teach Josh some strategies to improve his notetaking skills while reading. One of the things that we may work with Josh is to teach him how to use graphic organizers to make notes, so that he's not trying to just madly write what the teacher is saying, but that we have an organizer that helps him understand where the right place is to put those.

For some students like Josh, we could also practice active listening skills to support their development over time.

Now, as Josh will be required to complete a wide variety of independent assignments, write verbal responses, and work on projects, they require often a great deal of organization and planning. There are also a number of other interventions that we should be aware of in order to support Josh as well.

[SLIDE: Use up regulating and down regulating strategies as appropriate]
[Image of: Examples of activities for up regulation including: slither like a snake, swing like a monkey, chomp like a crocodile, stand like a flamingo. Examples of activities for down regulation, including: take a deep breath in, like you are smelling a flower, blow the air out, like you are blowing out a candle.]

Jennifer Newton: Some students can be highly-active or overly-sensitive to stimuli, yet others may appear disengaged or inattentive. Dr. Crundwell previously referred to these students as lazy, lost, or leaky. Not being at your optimal level of arousal may make a student appear to be any one of these. It is important as much as possible to create an arousal level that best fits the learning situation that is about to occur. Just as Dr. Purcell mentioned earlier, students need to adjust their energy and alertness many times throughout the day. When coming in from recess or gym, the teacher may need to use some down regulation strategies prior to beginning a math lesson. Perhaps it's a breathing exercise with the whole class or an app that an individual student uses. Maybe the class takes a cool-down walk, or stands like a flamingo.

After a period of long, challenging work, students may start to lose concentration and they need help to up-regulate themselves back to optimal arousal levels. DPA (daily physical activity), swinging like a monkey, or slithering like a snake may reinvigorate some students.

[SLIDE: How's your Engine Running?]
[Text on slide: High-Low chart
High
Just right
Low
Image of: Hand draw chart titled: How is your engine running? Chart is arranged in a semi-circle split into three equal sections. The first section says: Too Slow – sleepy, I can't focus, I need an energy boost for my mind and body. Middle section says: Just right – calm, I can concentrate, my mind and body are able to focus on my work. The last section says: Too fast, over-excited, I can't focus, I need to calm my mind and body. An arrow points to the middle section.]

We should teach students to be aware of their own states of arousal, and what they can do to move into the "just right" category to be ready for learning. We need to notice how students' engines are running at different parts of the day across different activities.

One example we could use we see currently on the screen, is a visual meter. The teacher should verbalize any observations they make, and then make those observations visual to the class. So one example would be here: "I think we are losing focus. I can hear quite a bit of chatter and I see many people off task." The teacher could then go on to discuss if the class is feeling too slow, just right, or too fast, and move the arrow to the appropriate category. Again, making the invisible visible to students. It is not enough that we are aware of what students need; we need them to be aware of what they need.

[SLIDE: MOVE]
[Text on slide:
Shift or squirm in chair
Rock own body
Roll head and neck
Bounce
Tap foot
Tap pencil
Stretch
Image of: Girl sitting happily in a chair]

In the next few slides, we will find a few examples of activities that may assist in up- or down-regulating students and yourself through movement, sight, or sounds. As an adult, can you identify things you do when you are reaching cognitive overload? I know I take -- tap my foot. I take washroom breaks. Not because I have to go to the washroom, but for the movement. I walk in the hallways, and I'll get a cold drink. Think about what you do in a small manner to maintain an appropriate arousal level that a child with a less-mature nervous system may need to do in a much larger, more intense, or exaggerated way. Consider the frequency, duration, and intensity of that movement. How do you regulate yourself? Do you chew gum? Do you shift in your chair? Do you bounce your leg? Do you tap your pencil? Roll your head and neck? Or doodle while listening to the teacher? Do you have students who prefer to stand at their desk and walk around while they are working, as opposed to sitting in their chair?

[SLIDE: LOOK]
[Text on slide:
Oil and water toys
Dim lighting
Fluorescent lighting
Cluttered desk

Image of: Girl looking at oil and water toy.]

Do you utilize your sense of sight to assist yourself in regulating? Can you think of any students who would benefit from watching oil or water toys, or watching a quick video of waves breaking on the shore? Does a cluttered desk area distract some students in your class? Have you utilized the trick of dimming your lights to feel cooler, and in turn calm your class?

[SLIDE: LISTEN]
[Text on slide:
Classical music
Hard rock
Quiet room
Noisy room
Sing or hum to self
Image of: child listening to music on headphones.]

Do you change the noise in your environment to up-regulate or down-regulate yourself? Do you notice that when your class is louder, some students are more off-task or become louder themselves? Does quiet classical music make you sleepy or allow you to concentrate? Do you need rock-n-roll music to study? Are you like me? I can't concentrate at all with any sound. I need a very quiet room. Do you find yourself humming or talking to yourself while in deep concentration or trying to memorize items? Many teachers allow students to use devices to listen to music during periods of long, independent work. As adults, we often allow ourselves to take breaks by doing any number of these things. Students need breaks as well, but often find it difficult to implement these breaks in an organized fashion.

[SLIDE: External Frontal Lobe Accommodations]
[Text on slide:
•   Clear desk of clutter
•   "To Do" and "Done" folder or basket
•   Limit extraneous visual info
Image of: Example of a "done" basket with a list of reminders for students to make sure they have completed the task appropriately.]

Earlier in this presentation, Dr. Purcell asked us to consider the impact of the classroom to help our students co-regulate. The environment assists with co-regulating the arousal level of a class or for individual students.

For many students, simply prompting them to have workspaces clear of clutter or providing an alternative workspace with needed supplies is important in order for them to start the task. Extraneous, visual information on presentations, slides, worksheets, and classrooms should be kept to a minimum to avoid distracting some students.

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"To Done" -- "To Do" and "Done" folders may be helpful for some, while still others may need visual checkoffs. Here in the picture you will see a combination. It's a "Done" basket, but with a reminder for students to ensure that they have completed the task as asked.

Can you limit the amount of information a student has to self-organize in their desk? Can you consider having separate places for materials and notebooks, instead of collecting all of the materials in the desk? Can textbooks be kept on a shelf? And pencils in a can, for example?

[SLIDE: External Frontal Lobe]
[Text on slide:
• 	 Written directions and steps
• 	 Written routines
Image of: Example of lists written by the teacher that visually show directions, steps, and routines.]

Concrete reminders assist students with working memory difficulties. Consistent procedures allow students to use working memory on the task at hand, as opposed to trying to remember process, directions, and procedures. Some students will need visual step-by-step guidelines as reminders of the procedures and expectations that they are to follow. Teachers should model how to use these posted charts in their room, and reference them frequently through the use of strategies such as SpeakOutLouds. Remember, the goal is to make the invisible visible to students. If they cannot remember the steps or actions thay are to follow, they will not be able to complete a task given to them.

[SLIDE: External Frontal Lobe]
[Text on slide:
• 	 Choice in activities
• 	 Provide calming places that are not seen as punitive
Image of: Example of a worksheet that gives the student the choice of which activity to complete. Picture of an area of the classroom where students can work with less distraction.]

Providing choices and activities, process and product, often allow for a student to draw on their strengths and may assist with initiation. Students may know where to start to complete a task if they have a choice in how to complete it.

Noticing when students need a break is important. Teaching them how to ask for a break, whether that be from a predetermined signal or a formalized process -- again, it is not enough for the adult to know what the student needs. We need them to know what they need.

Many classrooms have quiet workspaces, areas with lower lighting, or an interior where students can choose to work free of visual distractions.

[SLIDE: External Frontal Lobe]
[Text on slide:
• Graphic organizers
• Break the assignment into parts
• Provide ongoing feedback
Image of: Examples of different types of graphic organizers.]

Larger tasks can be broken down into smaller, more manageable units of work in order to assist students with where to begin, and help teach them time management skills. Many goals can be developed with students in order to help them meet the targets and sequential steps. As Dr. Crundwell has previously pointed out, students can be taught how to use graphic organizers for this purpose. Feedback on progress should be given so that students don't wander too far off the desired target.

[SLIDE: External Frontal Lobe]
[Text on slide:
Guided notes
Teacher prepared
Leave blank space for students to fill in key concepts, facts, definitions
• Provide framework students can preview
• Keep students focused and engaged
• Help you monitor student comprehension
• Serve as a review document]

Guided notes are one way to maintain student focus. Students who may be under- or over-regulated, guided notes are handouts prepared by the teacher that leave blank spaces for important information. Things like facts or concepts. As the teacher lectures, a video is played, or an experiment is completed, students would follow along and fill in the missing information. Guided notes provide students with templates to follow, assisting with initiation. By the end, the students have completed a summary of important materials in an organized fashion. These notes can further serve as a review for any sort of assessment that may occur.

[SLIDE: External Frontal Lobe]
[Text on slide:
Context clues cloze exercise
Used during reading activities
Allows teacher to highlight key information
Image of: Examples of a cloze passage.]

Similar to context clues -- similar to guided notes, cloze passages for reading provide context clues for a student like Josh who may need key terms highlighted. Or for students who struggle to determine what the key points actually are, what information they should be paying attention to, or what it is they are expected to write down. Cloze passages are great for building the vocabulary of students, and often times word banks are supplied with these passages.

[SLIDE: External Frontal Lobe]
[Text on slide:
• 		Use of technology to assist with organization
Image of: Logos of various assistive technology, including: Edsby, Bloomz, Seesaw, Remind, Livingtree, and Class Dojo.]

Technology can certainly assist with organization across many aspects of a child's day and activities. A student can set an alarm on their iPod, say to go off at 3 o'clock, so they remember not to get on the bus, but to head to soccer practice.

Use of a visual timer to complete an activity in a given timeframe, paperless payment systems so students are not forgetting money for field trips or food days, schedules of games and school activities can be posted on blogs, and daily homework reminders. Countless apps and programs are available to assist with this. On the screen you will see an example of several of those currently in use. LivingTree, Seesaw, Bloomz, Class Dojo, Remind, and Edsby. Many of these have spilled over into other uses. My son's baseball coach this year is actually a school principal. He uses the Remind app to send notices to all players and parents about all things baseball. Coaches, band teachers, and drama teachers could all use the app in a very similar fashion.

[SLIDE: Strategies for Life]
[Text on slide:
• 		Use different-coloured supplies for each school
• 		Colour code day-planner to match subject codes
• 		Assist in learning how to use a day-planner to track assignments (paper or electronic)
• 		Use visual timers to assist the student in time management.
Image of: colour coding by subject, a day planner with colour coded subjects, and a visual timer]

Dr. Marc Crundwell: In terms of strategies for life, one important aspect to work with Josh is to help him learn how to use different-colored supplies for each school subject. So language may be red, math may be blue, social studies may be orange. This allows him to keep his school subjects organized, and increases the ability in finding them quickly because they're color-coded. We can also work with Josh to develop a strategy so that his day planner matches the color-coding from each subject. So when he needs

to grab homework, if he has color-coded it he knows which color books he needs to grab for the homework that he has.

We could also work with Josh to help him learn how to effectively use a day planner or an agenda to track homework, projects, or other events. Now for me as a psychologist, what I know is that we rarely actually ever teach students how to unlock the true power of a day planner. But these are the students who truly benefit from these strategies if we teach them and we reinforce them. So students with executive functioning issues really do need to learn how to use those day planners. And at a level more than just writing the homework down on their page every single day. If you've -- if any of you have every been exposed to Franklin Day Planner Training, you know what I mean. Because it allows -- it really taught you how to break down your planner and break down every assignment that you have and put it in an order and prioritize.

We also know that for many of these students we have the computer technology, and we have many electronic day planners that many students may be much more willing to use because it's on a computer or it's on a phone, versus doing it from a paper/pencil standpoint.

We could also use visual timers to assist students with time management. Because we know that students with executive functioning really do struggle with the time and time concept. So we -- there are many apps that can provide a visual timer for older students.

[SLIDE: Strategies for Life]
[Text on slide:
•   Highlighter or colour-coded underlining system for note-taking
•   Most word-processing software has highlighter functions
Image of: Example of text with colour-coded highlighting technique applied.]

In terms of supporting reading, reading comprehension, we can work with Josh to help him learn how to color-code or develop an underlining system with highlighters. We could make each color have a specific purpose so Josh could scan the page and know where to look for what he needs. So for example, we could learn -- or we could teach Josh to mark all the new terms of vocabulary in yellow, main topics in green, and each subtopic in pink. Now this won't work for textbooks, a chapter of a textbook. It will work for handwritten notes or printed-out notes. It probably does work better for shorter assignments because it can be really overwhelming to do large, large pages of -- or chunks of text. We also know that most word processing software now also has highlighter functions. So this technique can also be used on almost every single word processor that a child could access.

[SLIDE: Strategies for Life: Apps for Organization]
[Text on slide:
Organization/Planning/Scheduling

- Checklists Lite
- My Homework
- Remember the Milk
- Hi Future Self
- Scrumboard
- Focus Me Do
- Work Tracer

Note Taking and Organization
- One Note
- Dragon Dictation
- Audio Note
- Quick Voice
- Note Pro HD
- Penultimate]

There are also a number of programs or apps that can be easily acquired and used in terms of a lifelong strategy to assist organization, planning, and schedule, as well as for notetaking and organization for notes. So for example, organization, planning, and scheduling -- things like My Homework, Checklists Lite, are all excellent for a child being able to track homework. And on the notetaking side, something like One Note is excellent because it allows you to break it into sections. It allows you to integrate pictures. It has all that functionality. Many kids as they get older may find Dragon Dictation very helpful for notetaking and organization. There is an excellent app called Audio Note. And Audio Note allows a child to videotape or to audiotape when the teacher is talking, but it also allows him to -- if you put a diagram up on the board, to actually press a button and then he can draw the diagram right there in the notes. So there is many -- there's a lot of functionality in apps that can really help with notetaking and organization. If any of you love the yellow sticky note for planning, Scrumboard is actually a program that has been designed to help you take your sticky notes and put them on an iPad, and arrange those sticky notes and check them off as you go along. So there are many great apps and programs that can be used to assist students with both organization, planning, and taking notes.

[SLIDE: 1pm]
[Text on slide:
It's the best part of the school day… lunch! At a table with his friends, Josh shouts at a mile a minute and jumps in and out of his seat. He doesn't even notice that the lunch monitor is glaring at him and his friends look annoyed. Executive functioning demands? Image of: Josh sits at the lunch table between two friends. He says: "Last night I was playing my video games and it was AMAZING!!! There were like eight-five CRAZY MONSTERS and I GOT ALL OF THEM POW-POW-POW-POW-POW-POW!!!." His friends sitting next to him are thinking to themselves "Sooooo weird" and "He never lets anyone else talk!"]

So let's look at Josh one more time. So please take 30 seconds and read the scenario, and start to think about what difficulties he may be having in his executive functioning skills.

[SLIDE: So Josh needs support with…]
[Text on slide:
- Self-monitoring (doesn't notice impact of his talking on his friends and the lunch monitor)
- Self-control (difficulties jumping in and out of seat and constantly talking)
- Focus and attention (not focused or attentive to the reactions of his peers)]

So we know Josh needs support with self-monitoring: he doesn't notice the impact of his talking on his friends and the lunch monitor. He needs support with self-control: he has difficulties, he's jumping in and out of his seat and he's constantly talking. And he's having issues with focus and attention: he's not focused or attentive to the reactions of his peers.

[SLIDE: External Frontal Lobe]
[Text on slide:
- Review of expectations during lunch
- Lunch expectations visual reminider in the classroom
- Pre-established activities
- Movement breaks
Image of: Bin labeled "I'm through… Now what to do?"]

Jennifer Newton: We know that some students find unstructured time difficult to self-regulate. We can all think of students who get in trouble only at recess or lunch because they can't meet the expectations. It is important to have pre-established expectations, review these expectations just prior to lunch or recess, and have a visual reminder of the expectations. Sometimes students needed to be provided with ideas or pre-established choices of activities. Things that may be helpful include social stories to help establish expectations and assist Josh with the cues he is missing. Teaching kids board games and card games to fill the time. Providing concrete lists of things they could choose to do, such as drawing, conversations starters, choosing the iPads. Jobs could also be discreetly assigned to provide movement breaks to students.

[SLIDE: Strategies for Life]
[Text on slide:
Organization/Planning/Scheduling
- Social lessons in turn taking, listening
- Teach monitoring arousal
- Assist students in determining the size of the problem
- Social scripts

•   Help the student find a passion
Images of: Cover of the children's book "My Mouth is a Volcano", a chart to help students monitor and understand arousal levels, titled "Size of the Problem", and an example of an exercise for lowering arousal level, in which students sit still like a frog.]

Dr. Christine Purcell: So as Jennifer said, often we have kids who really struggle during unstructured times. And they can really benefit from social lessons in turn-taking, how to recognize when others are listening and when they're not, using books that help teach how to monitor the arousal level -- there's one to the right there that's a very good one, "My Mouth is a Volcano." Using other strategies like reading. Also helping students determine the size of the problem using graphics like the one at the bottom of the screen to help them understand, "Is this something that I can really recover from and move on, or do I need to talk about this?" And also the social scripts. Developing those, practicing them, can help interact with peers. Also helping students find a passion can help them learn important skills and create friendships with other children who have similar interests.

[SLIDE: How Am I Feeling?]
[Image on slide: Central circle labeled "How am I feeling?" surrounded by three other circles, labeled sad, mad, and happy]

Also working on emotional literacy and emotional vocabulary can help children during unstructured times. So often children who have executive functioning needs struggle with emotional understanding, monitoring, and regulation. And as kids and even as adults, we tend to label how we're feeling in response to a situation with either mad, sad, or happy. Those are kind of the basic emotions that are default emotions. And how we label what we're feeling in a situation really affects how we respond to that situation. So if you think about us as adults, if we're driving in our car and we get cut off and we say, "Wow, I'm really mad," we react as if we're mad. So we might say a few things to the driver that cut us off or, you know, we might accelerate or do some things that are consistent with being mad. But if we, you know, can actually evaluate, "You know what? I wasn't actually really mad; I was scared," then we behave as if we are scared in that situation. So helping children expand their vocabulary using things like Word Walls, using repeated readings that are centered on an emotion to help them expand their vocabulary, can really help them understand better what they're feeling in a situation.

[SLIDE: MAD]
[Image of: Central circle labeled "MAD" surrounded by four other circles. One circle is labeled: insecure, humiliated, hurt, disrespected, jealous, resentful. The next circle is labeled: inadequate, alienated, embarrassed, devastated, inferior, worthless. The third circle is labeled: irritated, suspicious, insignificant, shocked, rejected. The last circle is labeled: threatened, provoked, aggravated, disappointed, judged.]

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So tell me a time when you felt hurt. Or tell me a time when you felt embarrassed. You can use character examples from books. And you could help them label. "I can see you are really disappointed." So when we can really label those feelings as hurt or embarrassed or disappointed, then we tend to behave in the way that we have labeled the feeling. Whereas if we just label everything as mad, then pretty much the only thing we tend to do is blow up.

[SLIDE: 3pm]
[Text on slide:
In soccer Josh is so focused on getting the ball that he doesn't keep in mind what direction he's supposed to run once he gets it. He quickly heads for the nearest goal and kicks the ball – right into his own team's net. Executive functioning demands?
Image of: Josh standing in front of his team's goal looking confused. The goal keeper looks frustrated and seems to be yelling at Josh.]

Dr. Marc Crundwell: So let's look at Josh. Please take 30 seconds, read the scenario, and start to think again about what difficulties he may be having with his executive functioning skills.

[SLIDE: Josh needs support with…]
[Text on slide:
• Shifting attention (ongoing changes in the game progress)
• Working memory (what are the rules of the game again; keeping the rules in mind)
• Environmental awareness (where is the goal I am supposed to be shooting on; not able to use actions of peers to follow game rules).]

So we know Josh needs support with shifting attention: there's ongoing changes in the game as it progresses. With working memory: what are the rules of the game again? And keeping those rules in mind. And environmental awareness: where is the goal I'm supposed to be shooting on? Am I able to use the actions -- or not able to use the actions to follow the peer -- or to use the peers as how to follow the rules?

[SLIDE: External Frontal Lobe]
[Text on slide:
• Review the expectations and game rules
• Visual markers that show the direction of the game
• Point out ahead of time which goal his team is defending
Image of: diagram of a soccer field with each team represented by a different colour of dots.]

Jennifer Newton: So one thing we can do is flip that classroom. Have students watch a video of the game or the rules at home the night before. A guided note may be provided along with this purpose. Students could then refer to their guided note or watch the

video over again as needed. Reviewing the expectations and the rules prior to starting the game will be important. Pointing out ahead of time what net each team is defending. As a class, they could point or echo back that information. Visual markers of players and goals may also be helpful. Students can wear different colored jerseys and nets could be marked accordingly.

[SLIDE: Strategies for Life]
[Text on slide:
•   Teach the student to mentally visualize and rehearse the activity before the start of the game
•   Deep breathing
•   Give time and space to respond instead of react]

Dr. Marc Crundwell: In terms of strategies for life, many of these apply in the gym, during specific games, or during group activities, for example, on the playground. These strategies can include teaching Josh to mentally visualize and rehearse the activity or the game before he starts it. We could work with Josh in terms of deep breathing exercises to help him calm down or to stay calm if he's getting frustrated while playing a game. Or we can also work with Josh to help him learn how to take extra time and space. So instead of responding -- You know what? Take some time and take some space.

[SLIDE: 8pm]
[Text on slide:
After hours of cajoling from his mom, Josh finally sits down to do his homework. But, ugh, where to begin? He knows he has several projects and papers that need attention, but what's due when? What needs done for tomorrow? Overwhelmed, he puts his head down. Executive functioning demands?
Image of: Josh lays his head on his desk, looking discouraged. Josh thinks to himself: "I don't even know where to start."]

So let's look at Josh one last time. Please take again 30 seconds, read the scenario, and start to think about what difficulties may be having -- he may be having in his executive functioning skills.

[SLIDE: Josh needs support with…]
[Text on slide:
•   Planning/organizing (late start to homework)
•   Setting priorities (what should he do first; when is each thing due?)
•   Initiation/starting task (how does he even start).]

So we know Josh needs support with planning and organization: he's got that late start to homework. Setting priorities: what should he do first? When is each thing due? And initiating starting: how does he even get started?

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[SLIDE: External Frontal Lobe]
[Text on slide:
- Set a schedule
- Use a graphic organizer/planner to determine homework order
- Have student time activities
- Homework completed at a consistent time and location with all necessary materials ready
- To-do/done system

Image of: example of a graphic organizer used to plan homework in advance and track completion.]

Jennifer Newton: We have now come full circle from 7 o'clock this morning. Josh is setting himself up for a rushed, unorganized morning and incomplete work the next day. We can see how lacking skills in organization, initiation, working memory, planning, and self-monitoring can contribute to students feeling overwhelmed and stressed. There are many ways that we can assist Josh, including following set routines and set schedules, sitting -- setting consistent time and locations for work, having a consistent place for supplies, breaking down large tasks into smaller, manageable units, teaching Josh to organize himself with an agenda or technology, using an organizer such as on the screen, to determine what needs to be completed first, color-coding subjects, providing ongoing monitoring and guidance, using apps or programs to communicate with parents and guardians so that a team can be formed around Josh. Perhaps using a timer to time activities so Josh can see how long he is expected to work before taking a break, or how long a task should take him to complete. Establishing "to do" and "done" systems may also be helpful. Setting the environment. Do you need music? Choose your lighting. A snack? Perhaps claim a short period of physical movement prior to starting work.

[SLIDE: Strategies for Life]
[Text on slide:
- Use a homework planning sheet
- Complete simple and shorter tasks first
- Schedule a short break
- Check off each homework assignment when completed
- Build in a reinforcing activity

Image of: an example of a graphic organizer that can be used to plan and track homework completion.]

Dr. Marc Crundwell: In terms of strategies for life which really build on what Mrs. Newton was saying, we want to take that skill of a homework planner and really develop that as something that he can use to increase his independence. So what we want to do is work with Josh in order to help him develop that strategy. Learn how to organize his homework. Let's look at completing this simple and shorter task first. Working with estimating how long it takes him to do a -- homework. Often we know, kids with executive functions have significant difficulty with that sense of time. They often don't

know how long. And we need to, over time, teach them to be much better at recognizing that. Having him check off each homework assignment when it's completed. And often for many children with executive functioning difficulties, also teaching Josh to A) build in breaks when he needs them. But also to build in reinforcing activities when he actually completes his homework. If we can do that with students with executive functioning, it does increase their motivation. And we know that motivation is often an area that kids with executive functions struggle with.

[SLIDE]
Image of: a chart showing the process of development of executive functioning from ages 5 to 22+.
5 Years – Inhibition of impulses dominates
7 Years – Increase in working memory, attention, and flexibility
10 Years – Inattention, impulsivity, and distractibility decreases
12 Years – Development spurt: goal setting skills
13 Years – Gender cross over. Boys have higher levels of attentional capacity and working memory (to 11 and 13 repectively) but this changes here.
14 Years – Developmental spurt: working memory
12 – 15 Years - Ongoing increase in planning skills
From around 15 years – Working memory, shifting attention, and inhibitory control relatively stable ad close to adult level
16 Years - Developmental spurt – Attentional capacity. Ability to set goals and plan/prioritize is at adult levels but nature of strategies change. More likely to give weight to pros over the "cons".
15 – 18 years - Planning skills matching maturity
19 Years – Cross over in reward sensitivity". Weight now given to negative possibilities as well as possible
20 Years - Minor improvements in executive functions but strategies continue to change (e.g. More consistent view of experience)]

Dr. Christine Purcell: So in summary, the development of executive functioning skills is a lifelong process. And it's important that adults have appropriate developmental expectations. So students don't develop executive functioning skills evenly. And many do not -- or, and they may not develop some skills to the same degree as their peers.
[SLIDE: Summary]
[Text on slide:
•   Development of executive functioning skills is life-long
•   It is important that adults hold appropriate developmental expectiations
•   Students do not develop executive functioning skills evenly and may not develop some skills to the same degree as peers
•   Students with executive functioning needs require supports in many environments (home, school, community)

- Accommodations for executive functioning must structure the entertainment to make students more successful (external frontal lobe) as well as teach life strategies.]

So students with executive functioning needs require support in many environments including the home, the school, and the community. And accommodations for executive functioning not only should make changes to their environment to make them more successful, but also require adults to act as an external frontal lobe as well, to teach them life strategies until they can do them on their own.

[SLIDE: Final Thought]
[Text on slide:
While it is important to change the environment and provide strategies, it is also important to utilize a student's strengths as much as possible. Students have within them a group of talents and these are the key to reaching high levels of personal achievement.

Teachers can:
- Help students identify or confirm their own strengths
- Help students discover how they operate
- Help students use strengths to assist in areas they would normally consider a weakness
- Partner together students who have different areas of strength
Each person's greatest room for growth is around their greatest weakness.

Animation: The word weakness is then crossed out and replaced with the word strength]

And one final thought. While it's important to change the environment and provide strategies, it's also important to use a student's strengths as much as possible. So all students have inside of them a group of talents, and these are the key to their reaching high levels of personal success and achievement. So teachers can help students by identifying and confirming their own strengths, by helping students discover how they operate, using their strengths to achieve potential, and drawing upon those strengths to help them in areas they would normally consider as a weakness.

Partnering together students who have different areas of strengths can also help students achieve success.

So the last thought is that each person's greatest room for growth is not their greatest -- or their area of greatest weakness. But each person's greatest room for growth is their area of greatest strength.

[SLIDE: Thank You!]

[Image of: a dog straining to reach a cupcake on a table.
Text superimposed on image:
Decisions exhaust our willpower. We each have one reservoir of will and discipline, and it gets progressively depleted by any act of conscious self-regulation.]

Thank you for joining us for this webinar. And I hope it was enjoyable and useful for you.

[SLIDE: Q & A]

Cindy Perras: Thank you so very much Christine, Marc, and Jennifer for providing our participants with an opportunity to deepen their understanding of executive functioning skills. You had incredibly helpful -- some excellent suggestions for our educators today. If anyone has questions, you may either click the Raise Hand button on your control panel to be unmuted to ask our presenters a live question, or you may type your question into the chat box on your dashboard and I will read your question to our presenters.

Okay. First question here. And Christine, Marc, and Jennifer, I'm not sure how you're going to decide who gets to answer which question.

Dr. Christine Purcell: We'll figure it out.

Cindy Perras: Okay. "So many wonderful strategies were presented today. How would you help a student who is reluctant or refuses to engage in implementing strategies?"

Dr. Marc Crundwell: You know, I think one -- this is often a common issue with many students with executive functioning because they have such great difficulty managing frustration, and that frustration does turn into a very negative opinion of their own abilities and their willingness to try things. So typically with a student like that, we do have to -- I think one of the things that Christine talked a lot about was to find some of their strengths and try and utilize some of those strengths to get them doing things and seeing that they can be successful using those strengths. I think the other thing is for many children with executive functioning issues, you have to remember that they have difficulties with -- part of that motivational difficulty is also with reinforcement, self-reinforcing themselves. So often for many of those children, many kids who suffer with the executive functioning issues, you can improve that by actually putting in place some kind of reinforcement program where they are positively reinforced in order to initially start to do some of those things, in order to build their motivation, right? Because if you have extreme difficulty with their motivational system -- and it is that child -- you know, that kind -- it's like -- a little bit like ADHD where, you know, that executive functioning child where, you know, they haven't done any work in 30 minutes and you say, "Recess is in 10 minutes; if you don't get this done, you're not going outside." Now that becomes an external reinforcer. That's external. And all of a sudden they can do it because they want to go out for recess. But you provided that external. So sometimes we do have to

start with some reinforcement programs to try and get them at least being willing to do some of those things and take some risks.

Dr. Christine Purcell: Yeah. And I just want to add that often we see kids, and the adults that are working with them will say they're not motivated. And I will usually say, "You're right." And the reason that usually kids are not motivated is because either it's something they can't do or they don't know how to get started. So really, again, using their strengths. Finding out what it is, if it's just they don't have a strategy. If the work is too overwhelming. They need a blueprint. They need things broken down. They need it explained in another way. Or if they, you know, really do just need that, kind of, motivation, "Why is this meaningful to me?" Or sometimes giving a choice can help with those kind of motivation pieces.

I think we're good on that. Yeah, okay.

Cindy Perras: Great. Thank you very much. I have a question here from a parent who joined the webinar today. And Tara is asking, "As a parent, how do you recommend these strategies that you discussed with teachers?"

Dr. Marc Crundwell: You know, I think -- you know, for a parent, I think it's very important that, you know, parents are willing to go into the school and to have a conversation with their teacher about what their concerns are. And then try to work with -- you know, as a cooperative partnership to figure out how to put some of these strategies in place. And again, if we can put -- again, many of these strategies for life -- even some of the -- a lot of the external, you know, aka "frontal lobe strategies" as well, are ones that can be used both in the home and in the school. So if they start working collaborative as a team to put those in place in both environments, I think that that really cements a partnership. And with that partnership I think it's very helpful for then parents and teachers to work together very successfully.

Dr. Christine Purcell: And I think providing examples of what works at home and giving examples and observations of what you see the student is struggling with. And perhaps offering some of those technology examples. And just asking the teacher if they're willing to implement them and partnership with the parent.

Cindy Perras: Okay. Thank you very much. Another question here. We have a webinar participant who is curious to know how students as young as seven and eight years of age are getting diagnosed with difficulties in executive functioning if the research shows that executive functioning isn't developed until well into the teenage years.

Dr. Marc Crundwell: So, you know, Christine talked about the developmental sequence of some of the -- of the development of executive functioning skills. We do know that, again, that there is a typically a trajectory. And at different ages we expect children to have a certain level of those executive functioning skills. Yes, they're going to get better

each year, but there's a certain level that we would expect developmentally, trajectory wise. If a child at age seven is significantly behind in many of those executive functioning areas, so that there really is a very large gap between where we would expect them to be, and that gap is really impacting them within the school on a day-in, day-out basis -- and often, often impacting them in the home as well -- then we as psychologists typically look at, What is the degree of the gap and how significantly is it impacting them. And based on what we would expect and where they are, Is the gap impacting them significantly enough that we do consider it -- you know, to -- for us as psychologists, we often use the term "deficit." That that deficit is significant and we know that, you know what, compared to where they should be, it is far behind. And that it really is impacting them day-in and day-out. So we do have that ability to make those diagnosis based on that -- understanding the trajectory and then determining how far behind they are on the trajectory. And in this example, for a seven-year-old.

Cindy Perras: Okay. Thank you very much, Marc. "Are there any exercises to help strengthen working memory?"

Dr. Marc Crundwell: You know what? There are a number of games that can work with executive -- to work with working memory. So those games that require basically the child to hold information in memory, and then to use that information in a little bit, are very helpful. We do know that working memory is one of the harder areas in some ways to remediate, in the sense that working memory is only so large; it can only -- for some people they can only hold so much information in their memory at one time. But typically for most children the best way to build working memory is games that require a great deal of need to remember information. So a lot of the board games, for example. We are starting to see some programs and apps coming out as well that are targeting working memory as well. So basically for most children it would be working through games or working through more fun-based activities that would require them to hold information in their memory and to sometimes change that information. Or to be able to use that information later.

Cindy Perras: Okay. Thank you, Marc. I think we have time for one more question. And I do want to reassure everyone who has posted questions that if we didn't have time to answer them on the presentation today, they will be answered. So our final question: "In the presentation, ADHD and executive functioning difficulties --" No, sorry. "You separate ADHD and executive functioning difficulties. But by definition, don't all students with ADHD have executive functioning difficulties?"

Dr. Marc Crundwell: You know what? It is a very confusing area. And ADHD children do have the same initial deficit in behavioral inhibition that does tend to result in many of their difficulties. However, what research tells us is that probably only about 50% of children with ADHD also present with executive functioning issues. So there are -- and many children with executive functioning issues do not have the classic symptoms or diagnostic criteria for ADHD. So many children -- probably 50% of children with ADHD

will -- could need a secondary diagnosis of having issues with executive functioning. But many children with executive functioning do not have the symptomatology or the pattern that would say that they also have an attention deficit as well.

Cindy Perras: Okay. Well thank you very much. That's all the time that we have today for questions, so we are going to end our question and answer session at this time.

[SLIDE: Other Questions?]
[Text on slide:
Email: info@LDatSchool.ca
Twitter: @LDatSchool
Image of: LD@school logo]

Cindy Perras Should you still have further questions, please either email us at info@LDatSchool.ca or send us a tweet to @LDatSchool, and we will ensure your questions get answered.

[SLIDE: Educators' Institute]
[Text on slide:
Registration now open for school boards! Educators' Institute: Come see what everyone is talking about. August 23rd & 24th, 2016, Hilton Mississauga/Meadowvale. Registration opens to the public June 1st
Image of: Educators' Institute promotional banner.]

Cindy Perras: LDatSchool's third annual Educators' Institute will be held August 23rd and 24th, 2016 in Mississauga. Registration for school boards is open. And please note that public registration begins tomorrow, on June 1st. Additional information on our bilingual institute is available on the LDatSchool website.

[SLIDE: Thank You!]
Cindy Perras: On behalf of the LDatSchool team, I would once again like to thank Christine, Marc, and Jennifer for their presentation. And thank you to all of our participations for joining us. Please remember that we will be sending out presentation slides as well as a short survey following today's webinar. The feedback we receive through this survey provides us with important information for producing future webinars. As a reminder, we will be sending out a link to this recorded webinar in approximately three weeks. Thank you again for participating in our final LDatSchool webinar, and have a wonderful day.