

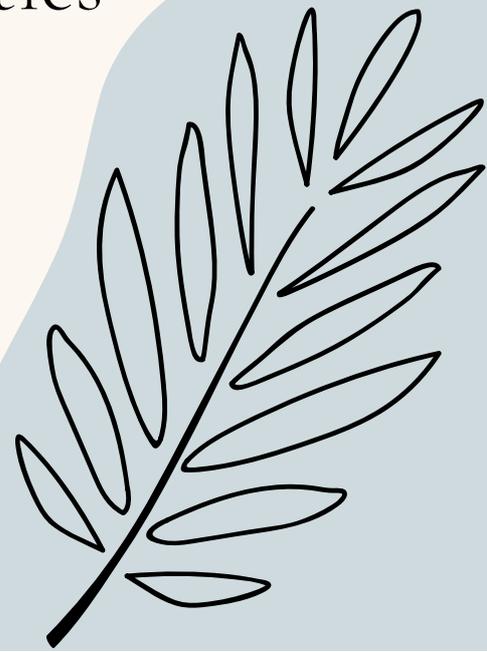
# Supporting Executive Functions in the Classroom

A Handbook for Teachers

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# What are Executive Functions?

Executive Functions (EFs) are high level mental processes that allow us to take actions towards selected goals through active and conscious efforts such as planning goals, selecting actions, and maintaining attention.

There are three main branches of EFs:

Working Memory → The ability to hold relevant information in your mind and then be able to use it

Cognitive Flexibility → The ability to change perspectives when thinking, and adapt and adjust

Inhibition → The ability to push aside irrelevant information & distractions

# The Importance of EFs

The development of EFs occurs over many years, even into adolescence and adulthood. However, supporting school age children is essential!

EFs play a role throughout an individual's life whether that is in education, work, or personal situations. EFs impact social skills as well as academic skills.

EFs have been shown to be predictive of :

- School readiness
- School success
- Job success

Impacted EFs have been associated with :

- Mental health challenges
- Physical health challenges

Promoting EF development in school age children can have long term impacts in a number of areas.

# EFs, Teachers & SLPs

As children enter school, the demands on EFs increase. This occurs through the school curriculum, the presence of more distractions, and a continually changing environment. The school-age period is an essential stage for the development and use of EFs.

Having strategies and methods to support EFs is important for all children. In particular, it's essential for children who have challenges with EFs. Some of these children may be receiving Speech Language Pathology (SLP) services, which can be further supported by their teachers.

Teachers and SLPs can work together in that SLPs can give supportive strategies to teachers, and teachers can implement these strategies in the classroom. Ultimately, teachers and SLPs working together helps support the students and their learning!



# Specific Populations

Supporting EFs is important for all children in the classroom, but in particular for those children with challenges with EFs. Challenges with EFs can be viewed in a variety of different populations, including the following.

- Developmental Language Disorder (DLD)
- Attention-Deficit/Hyperactivity Disorder (ADHD)
- Autism Spectrum Disorder (ASD)
- Down Syndrome (DS)
- Traumatic Brain Injury (TBI)
- Fetal Alcohol Syndrome Disorder (FASD)

Having one of the diagnoses listed above does not mean for certain the child will have challenges with EFs. However, it does reflect that they are at a higher risk. It is important to be conscious of this risk factor to support them with the help and services they could benefit from.



# Factors that can Impact EFs

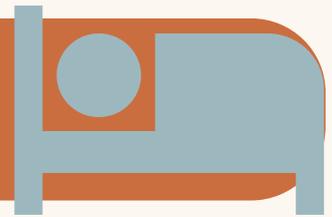
A wide variety of factors can impact EFs. Being aware of how students' EFs and their abilities can change throughout the school day can help teachers strategize at what times of the day the students may be more attentive or receptive to new information.

Below are some factors that can impact EFs :

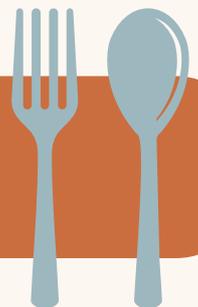
- Stress



- Fatigue



- Hunger

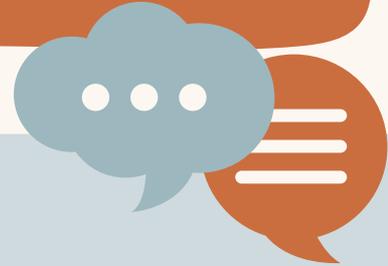


- Lack of physical activity



# EFs and Language

EFs and language are closely related and interact in a reciprocal relationship. EF abilities impact language, and language abilities impact EFs!



## EF Impact on Language :

- EF resources may compete with language resources
- Difficulties with the ability to hold onto instructions as they complete an activity, or hold onto story information for reading comprehension
- Challenges with perspective-taking, acting insightfully, and pragmatics (reading social cues)
- Difficulties with inhibiting competing incorrect vocabulary, impulse control, topic maintenance, and maintaining attention on the task at hand
- Challenges with attention to verbal or written language as well as attending to comments
- Difficulties with motivation

## Language Impact on EFs :

- Language resources may compete with EF resources
- Frustrations of not being able to use language in the way they intend can have negative impacts on attention, motivation and inhibition
- Difficulty with asking for help they may need
- If they have trouble understanding the activity, they may not pick the right goal to work towards

# Working Memory

Working Memory - the ability to hold relevant information in your mind and then be able to use it

An important distinction to make is between short-term memory and working memory. Short-term memory involves storing information, but with little processing. In contrast, working memory involves both information processing and storage. Working memory is important for students to complete tasks in class.



## Examples of working memory in the classroom :

- Following verbal instructions
- Explaining the content of a story when asked questions about it
- Holding onto a question, thinking of an answer, and then sharing it with the class
- Recalling a list of numbers, but saying them in the reverse order

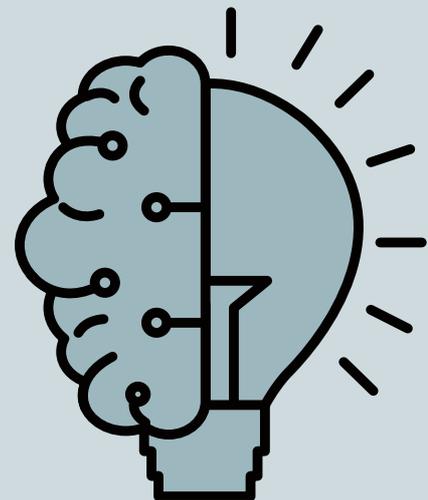
# Cognitive Flexibility

Cognitive Flexibility - the ability to change perspectives when thinking, and to adjust and adapt

Cognitive flexibility is important in the classroom, with children demonstrating their ability to take up new information and incorporate it into their learning and actions. Cognitive flexibility also plays an important role not only in the child's ability to adapt to changes in academic activities but to changes in the environment around them as well.

## Examples of cognitive flexibility in the classroom :

- Thinking about a situation from someone else's perspective
- Finding many ways to categorize the same group of items
- Imagining different endings to the same story
- Changing from addition to subtraction during an activity



# Inhibition

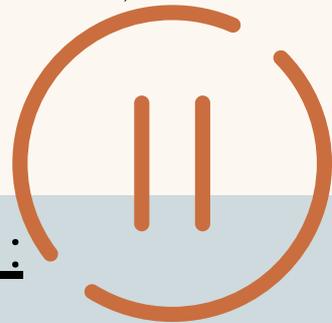
Inhibition - the ability to push aside irrelevant information and distractions

Inhibition can be challenging for many young children. It can further be broken down into the following components.

*Cognitive inhibition* - suppressing unrelated thoughts or memories to the task at hand

*Selective attention* - selecting and focusing on what stimuli to focus on, and what to suppress

*Self-control* - controlling behaviours, actions, or emotions to stay on task



## Examples of inhibition in the classroom :

- Raising their hand and waiting, before sharing their answer
- Remaining focused on the task and not being easily distracted by their surroundings
- Thinking about the answer, and not answering a question with their first thought
- Waiting to start an activity until the instructions are read

# Supporting EFs in the Classroom

There are a wide variety of small changes that can be implemented to help students and support EFs. It is important to understand that additional cueing and support *does not* hinder the development of EFs. Giving students support helps them develop these skills!

In implementing supports, it is important to remain consistent and have repeated practice to help with EF development. Studies have shown that when consistent EF practice and support is incorporated into school curriculum, it helps improve EFs.

EFs can be supported through general environmental changes and with more specific changes during classroom activities!

# Most Effective Approaches to EFs in the Classroom

Research has shown that teaching EFs in the classroom is more effective in the following situations.

- When EFs are incorporated into the curriculum it creates a more naturalist learning environment, and easier to transfer to other areas.
  - Encouraging students when they are putting in the effort towards EFs helps students form a better understanding of their own strengths and weaknesses while encouraging motivation.
  - Teaching metacognition (thinking about thinking) explicitly helps promote EFs.
  - Using structure in the classroom to teach EFs is beneficial. In addition, using modelling, high amounts of practice, and feedback is favourable for EF learning.
  - It is beneficial to grade students not only based on their final answers in activities but also on the strategies they used.
  - It is effective to encourage students to understand what strategies work best for them.
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# Strategies to Support EFs

## Working Memory:

- Provide visual aids or cues with verbal instructions
- Focus on one activity at a time
- Break down large tasks into smaller ones
- Provide short instructions
- To promote working memory, encourage children to make connections between concepts, make a story to link ideas, draw notes or write down keywords

## Cognitive Flexibility:

- Encourage perspective taking
- Encourage creativity and finding multiple solutions to a problem
- Ask guiding questions to promote thinking in new ways
- Switch between activities after a certain amount of time (ex: addition, subtraction, multiplication)

## Inhibition:

- Encourage pausing to think before answering
- Work in a quiet environment, reduce distractions
- Use fidget toys to help channel movement
- Create a routine with set goals

# Tips & Tricks - Environment

The following is a list of strategies that can be implemented in the general classroom environment to support EFs.

## Reduce Distractions

- Reduce background noises and visual distractions (ex: not overly bright lighting, have less clutter in the classroom or on desks)

## Have a Daily Schedule

- Have a visual schedule of the plan for the day (ex: on a poster or chalkboard)
- Use consistent routines whenever possible
- Cross/check off activities when completed

## Colour Coding

- Use class-wide consistent colour coding for subjects. This includes their folders, binders, and notes on the class calendar or agendas.
- Consistency is key!

## Use Student's Agendas & Calendars

- As a class together, use the student's agendas to write down important dates, deadlines, or activities (ex: field trips, themed days)

*Tip:* Involve the students! Whether that is asking a student to read the daily plan to the class or to check off the activities as they are completed.

# Tips & Tricks - Activities

## When Providing Instructions for Activities

- Provide both verbal and visual instructions (ex: say the instructions and then draw or write a visual cue on the chalkboard)
- Have visual cues visible throughout the activity
- Have a checklist for the students to complete
- Break down large tasks into smaller ones

## Motivation

- When possible, select a topic of interest for the class. Or allow the students to choose their own topic or book of interest

## Encourage Creativity

- Encourage perspective-taking, thinking about different solutions for the same problem

## Incorporate Movement Breaks

- Incorporating breaks and movement helps solidify the information learned, get energy out, and is motivating to work towards

## Use Timers or Time Management Strategies

- Using timers helps students pace themselves throughout the activity and is encouraging (ex: ten more minutes of work, and then time for a movement break! )

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