

Section 5: Executive Function & Working Memory

Understanding Executive Function

Executive Functions (EF) are important skills that help us plan, organise, start and finish tasks. Good EF skills help children manage homework, plan out written work, organise what they need before they start an activity and help manage behaviours such as shouting out in class. These skills allow children to manage their thoughts, attention, behaviour and emotions, making it easier for them to learn.

Research shows that EF is key in understanding learning difficulties. Children with learning difficulties often feel overwhelmed, which can lower their confidence and make learning challenging.

Children with underdeveloped EF need to discover how they learn best, a process called metacognition. This helps children understand and control their learning, helping them to self-monitor and self-evaluate. They need extra help and clear explanations on how to improve organisational skills, time-management skills and how to prioritise work.

Understanding Working Memory

Working memory is like temporary storage in the brain that helps us remember and use information right away. Children with working memory difficulties may struggle with reading and writing tasks.

Working memory is different from short-term memory. Short-term memory holds information for a short period, while working memory helps us organise and use that information in the moment. Both are essential for tasks like reading, writing and solving math problems.

Children with weak working memory may find it hard to follow instructions and keep up with classroom activities which may cause a wider gap in their literacy attainments. For children who struggle with reading and writing, working memory issues can make school activities even harder.

Processing Speed

Processing speed refers to how quickly the brain can take in and use information. If a child has a slower processing speed, they may struggle to keep up with lessons and complete tasks on time. Since working memory and processing speed are linked, children with slower processing speeds often have trouble using their working memory, making learning even more challenging.

Section 5.1

Foundation Stage (Age 4-6)

Executive Function & Working Memory



Impact

May confuse spellings (for example, 'was' as 'saw')

May forget the first sounds when blending words

May struggle to remember letter sounds

May struggle to recall what a letter looks like or forgets how to form letters

May struggle to remember things learned before

Practical Strategies

- Practise words with magnetic letters and ask your child to recall letters in order
- **EA Guidance Video: Visual Sequential Memory (2:20 mins)**

- Practise using 'onset and rime' (for example, 'bat' as 'b-at') and look for word patterns

- Use flashcards with letters on one side and pictures on the other. Review these daily
- Ask your child to say the letter sound and letter name:
 - Letter sound, /a/ as in apple
 - Letter name say "a"
- **EA Guidance Video: Introduce the flashcard and flashcard routine (1:03 mins)**

- Practise using a tracing and copying routine, saying the letter sounds and letter names aloud:
 - **EA Guidance Video: Handwriting Routine (2:26 mins)**

- Revisit previous learning through repetition, using games, quizzes and flashcards

Impact

May forget what he/she was planning to write once he/she begins

May struggle to remember the alphabet

May struggle to identify whether two words rhyme

May lose his/her place on the page

May struggle to understand the story as he/she cannot remember what has been read

Practical Strategies

- Use recording devices to record ideas or sentences before they are forgotten. He/she can listen as often as needed

- Sing the alphabet song, breaking it into smaller chunks and using memory tricks for example, mnemonics

- Read books with rhyming words and sing nursery rhymes together

- Encourage use of a reading ruler or his/her finger to keep his/her place

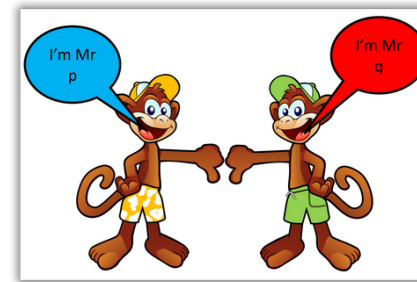
- Before starting a new reading book do a 'walk through' beforehand. Look at the pictures and summarise what is happening on each page in one sentence. This gives your child an idea of what to expect when he/she starts reading and can help him/her make sense of the story
- When reading, stop often and talk about what is happening. Can the story be linked to your child's world or experiences?
- When you finish reading ask your child to sum up what the story was about

May confuse **b/d, p/q**

May write the letters in words in the wrong order (e.g. 'siad' instead of 'said')

Practical Strategies

- Use visual aids and memory tricks to help recall letter direction. Remind him/her of the direction of similar letters such as 'b', 'd', 'p' and 'q' by showing visual aids:
 - **Printable Resources: Letter Orientation Prompt | Literacy Inclusion Toolkit**



- Say the letter names before writing a word
- Use **mnemonics** to re-learn words when your child has stored the incorrect spelling. For example, '**p**eople **e**at **o**melettes, **p**eople like **e**ggs' for the word 'people'

People

People eat omelettes,
people like eggs



May have trouble recalling and following instructions

May struggle with remembering visual information

Practical Strategies

- Practise using listening and memory games. Start with simple, short instructions and gradually increase the number of steps
- **EA Guidance Video: Auditory Sequential Memory (3:01mins)**
- Play auditory memory games such as “I went to the market and I bought...” Each person must remember the list of things that was ‘bought’ previously. For example,
 - Child: “I went to the market and I bought a banana.”
 - Parent/Carer: “I went to the market and I bought a banana and a tin of beans.”
- Give instructions one at a time. Remove distractions. Ensure you have your child’s full attention



- Give opportunities to practise with activities like ‘I Spy’ or ‘Simon Says’ to improve visual memory skills:
 - **EA Guidance Video: Visual Sequential Memory (2:20 mins)**

Section 5.2

Primary Stage (Age 7-11)

Executive Function & Working Memory



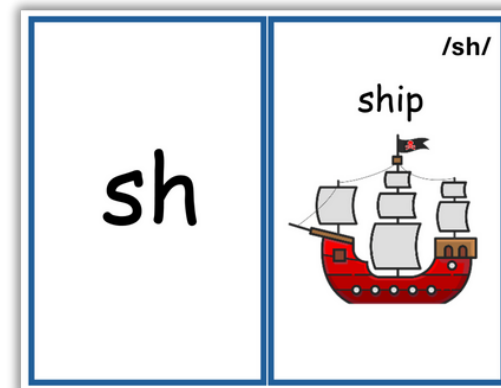
May be unable to say the alphabet or put the letters of the alphabet in order

May have difficulty in remembering letters and their sounds

Practical Strategies

- Sing the alphabet, as the tune helps working memory
- Chunk the alphabet into 4 groups (**A-D**, **E-L**, **M-R**, **S-Z**) use the mnemonic (memory aid) '**All Elephants Make Squirts.**' Practise ordering each section until the full alphabet has been covered

- Using flashcards with letter on one side and matching picture on the reverse may help your child remember the letter shape and sound. E.g.:
 - Sound out 'sh'
 - Matching clue word 'ship'
 - Picture of clue word can be provided, or your child could draw his/her own picture
 - **EA Guidance Video: Introduce the flashcard and flashcard routine (1:03 mins)**
- Practise how the letter is formed using the following routine:
 - **EA Guidance Video: Handwriting Routine (2:27 mins)**



Impact

May lose place easily if disturbed when reading

May guess words in reading with no awareness of strategies that may help

May find longer words hard because it is difficult to remember all the sounds

Practical Strategies

- A ruler/reading ruler can help your child keep his/her place



- Remind your child of reading strategies:
 - Break the word into chunks (syllables)
 - Look across the whole of the word
 - Look for rhyming words - hall/ball/small
 - Read the rest of the sentence to see if it makes sense. You can cross check with picture

- Use onset and rime to sound out words, rather than the individual sounds
- The onset is everything before the vowel (for example, b in bat) while the rime is the vowel and everything after (at in bat). This provides two units to be sounded out, rather than three individual sounds in 'b/a/t' (b/at) or four in 'f/l/a/t' (fl/at)
- Break longer words into syllables
- Look for prefixes (re-) and suffixes (-ing). Breaking a longer word into root word and prefix or suffix creates smaller chunks, which is easier to read. E.g. swimming becomes swim + ing; reporter becomes re + port + er

Impact

May find it difficult to remember and hold onto information

May struggle to understand long and complicated sentences when reading

Practical Strategies

- Information is easier to remember when it is attached to meaning for example, sounds are easier to remember when taught with a key word and a picture
- Secure new learning by using fun and interactive games
- Play Pairs or Snap with key words
- Teach Visualisation. Create pictures in his/her mind of what has just been read
- **Printable Resource: Visualisation - Reading Prompt Chart | Literacy Inclusion Toolkit**



- Use highlighter pens to highlight key information in the story
- Show how to skim and scan to find answers, scanning over the text without reading every word
- Use 'who,' 'where,' 'when' questions to look for a name/place/time in the reading excerpt
- Digital copies of text can be read aloud using Texthelp Read&Write, Immersive Reader or Microsoft Read Aloud. Hearing the text read aloud will help your child to focus on understanding
- **Read&Write Quick Reference Guide | Texthelp**

Impact

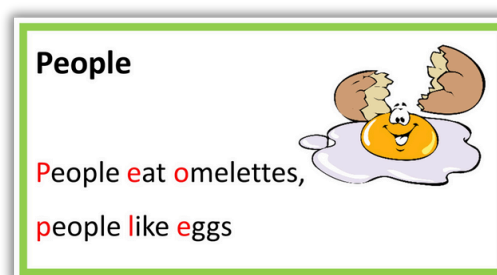
May struggle to recognise spelling patterns

May be unable to remember spellings of tricky words, for example 'are,' 'said'

Practical Strategies

- Help your child to group spellings in onset or rime groups for example, (onset) **flat flag fled** or (rime) **oat, boat, coat, float, throat**
- Highlight spelling patterns and sequences for example, 'snow' and 'grow'
- Use spelling sequences/patterns to help your child spell related words, for example, 'light,' 'fright,' 'sight'

- Use the 'Look, Visualise, Say, Cover, Write, Check' strategy to learn High Frequency Words:
 - Look at the word
 - Visualise (picture) the word
 - Say the word
 - Cover the word
 - Write the word
 - Check to see if it is correct
- Use rhymes and mnemonics to remember tricky words. For example,
 - people - **p**eople **e**at **o**melettes, **p**eople **l**ike **e**ggs
 - any - **a**nts **n**ever **y**awn
 - said - **S**ally **A**nne is **d**ancing



Impact

May be unaware of spelling rules and makes repeated spelling mistakes

May struggle to use punctuation

May struggle with spellings and grammar

May struggle to remember what he/she wants to write

Practical Strategies

- Look at **spelling rules** together and use rhymes, videos and songs to remember
- The Read&Write prediction tool can be used to help with spelling when completing independent writing using a keyboard

- Read back what is written or use Text-to-Speech to read back and find any punctuation errors
- Show your child how to self-correct using a mnemonic for COPS (Capital letters, Omissions (words left out), Punctuation, Spelling)

- Use Text-to-Speech to read back what has been written. This will show mistakes in punctuation and word use
- Use voice typing to dictate stories
- **Read&Write for Windows: Support Tools for Students with Dyslexia**
- **R&W Flier for Home**
- Use story planners/writing frames to keep focus



Impact

May be unsure what books/items are needed for each activity

He/she can be poorly organised and appear forgetful and may struggle to begin tasks

May have difficulty remembering what was said to complete a task

May struggle to remember information and forget what he/she has been asked to do

May need lots of repetition before information is stored in long-term memory

Practical Strategies

- Make a checklist of items needed for activities each day
- Encourage your child to check a visual timetable
- Keep activities short and allow movement breaks to keep your child's focus:
 - [AAIS Time Out Video](#) | [SEND Plan](#)

- Encourage routines to aid memory
- Keep instructions short and use simple language
- Ask your child to repeat back what you have said, to check he/she understands. "I want you to get your coat. What do you need to get?" If the child doesn't respond, repeat using the same phrase (do not add lots of extra information such as "Your green coat, the one in the hall.") Instead say, "I want you to get your coat."
- Use visual prompts/aids to help recall information
- Remove distractions and background noise
- Playing games such as Snap, Pairs or "I went to the shop to get..." can help to develop memory skills

- Multisensory strategies help transfer information from short term to long term memory
- Provide lots of revision and practice. Use games such as card games or ICT-based games to make this engaging

Section 5.3

Post Primary Stage (Age 11+)

Executive Function & Working Memory



Impact

May struggle to manage the time given to a reading and comprehension task

May be 'rigid' in thinking and view text literally

May lose place while reading longer passages

May become frustrated writing ideas down as he/she struggles with spelling and remembering details

Practical Strategies

- Use count-down timers. Model how to use the timer to monitor how much time is left to complete an activity

- Read together different text such as jokes, riddles, tongue twisters and discuss the different meanings words can have

- Encourage use of a ruler to help keep his/her place
- Use Text-to-Speech software to listen to longer passages
- Read&Write has 'Text-to-Speech' feature which reads text aloud, and built-in reading rulers or screen masking to help him/her focus



- Use voice typing or dictation tools. Longer pieces of work can then be edited with built-in tools and read back for understanding and revision
- **EA Guidance: Microsoft Dictate Help Sheet | Literacy Inclusion Toolkit**

Impact

Often misspells high frequency words

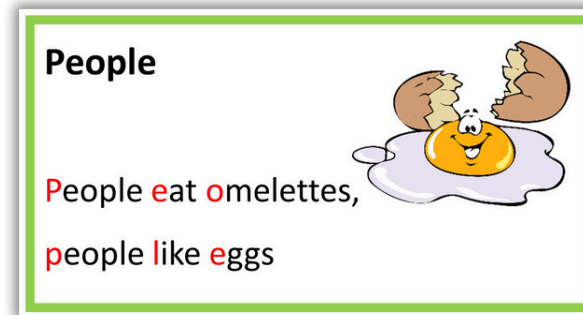
May be slow to start a writing activity or task

Your child may be unsure of what he/she needs to do

May forget to use punctuation

Practical Strategies

- Use mnemonics for words commonly misspelled, for example:
 - People - **p**eople **e**at **o**melettes, **p**eople **l**ike **e**ggs
 - **Printable Resource: Post Primary Mnemonics (Subject Specific) | Literacy Inclusion Toolkit**



- Encourage self-questioning before tackling a task:
 - What am I being asked to do?
 - What are the key points?
 - Where will I find my information?
 - How long do I have?
- Have visual prompts/writing frames to plan before writing a task

- Use visual prompts or checklists to check work:
 - **Printable Resource: COPS Proofreading for Dictated Sentences | Literacy Inclusion Toolkit**
 - **Printable Resource: COPS Proofreading Prompt | Literacy Inclusion Toolkit**

Impact

May forget the necessary materials for different subjects and for homework

May struggle to begin and stay focused on homework, as concentration is difficult to maintain

May struggle to keep important dates and times in mind and keep track of deadlines

Writing may contain spelling mistakes

Practical Strategies

- Colour-coded school timetable with a different colour for each subject. A copy of this could be kept in the bedroom or on the fridge
- **Printable Resource: Editable Colour Coded Timetable | Literacy Inclusion Toolkit**
- Match the timetable colours to the materials/books for each subject
- Help to pack his/her bag in the evening until he/she is confident doing it independently

- Develop a checklist to help organise the materials needed:
 - Take out the things that you need for homework (including instructions). Put what you are going to do first on top
 - Make sure that you have what you need to complete the first task (homework diary, worksheet, pencil, etc.)
 - Set a timer for 10 minutes to keep on task
 - Take regular brain and movement breaks:
 - **EA AAIS: Time-Out Activities | SEND Plan**
 - **EA AAIS: Quick-Fixes | SEND Plan**

- Use a colour-coded timetable for exam dates and times
- Use To-Do list apps on smart phones or desktop applications to help him/her have responsibility for time, for managing tasks and for developing independence

- When beginning a new topic, make a list of the key words related to it. Refer to the list when writing

Impact

May struggle to stay on schedule and keep focused when studying

May find it hard to prioritise assignments and manage his/her time effectively

May have poorly presented written work

Practical Strategies

- Encourage your child/young person to work for a focused period and then take a break. Use a study technique such as:
 - The **Spaced Practice** technique which allows information to be stored into the long-term memory over a longer period rather than cramming everything in the one session, such as, 2 hours over 3 evenings instead of 6 hours in one evening
 - **Pomodoro Technique** - work for 25 minutes, break for 5 minutes; repeat up to 4 times; long break for 20-30 minutes
- Read&Write has an audio maker feature, which will turn any text into an audio file. This provides a different way of revising the information

- Use **Eisenhower's Principle** to help prioritise what is important:
 - Important and Urgent - Revise for tomorrow's exam
 - Not important but Urgent - Help at Computer Club today - Delegate
 - Important but Not Urgent - Today's homework
 - Not Important and Not Urgent - Plan my art project due in a month

- Support touch-typing skills so that typing can become fast and efficient. Doorway Online offer a free touch-typing course:
 - **Doorway Online**
- Read&Write contains a word prediction feature, which can improve typing speed and assist with spelling
- Speech-to-Text could be used instead of writing or typing. Microsoft Word has a built-in dictate function that will type as you talk

Impact

May struggle with retrieval of information

May be unsure of where to start when studying for exams

Practical Strategies

- Discuss what he/she is learning about in school. Encourage him/her to repeat back to you what he/she is learning/memorising
- Help create mnemonic devices to support his/her memory, such as remembering the order of the planets from the sun:
 - **My Very Educated Mother Just Served Us Noodles**, (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune)
 - **Printable Resource: Post Primary Mnemonics (Subject Specific) | Literacy Inclusion Toolkit**

Letters for Roman Numerals in Value Order

I = 1, V=5, X=10, L=50, C=100, D=500, M=1,000

Use mnemonic:

I Value Xylophones Like Cows Dig Milk



- Develop 'study skills', for example, how to read and summarise in short note/card form
- Demonstrate how to highlight the key points in a text, using a coloured highlighter
- Demonstrate how to summarise information using a graphic organiser, such as a flowchart or mind map

Impact

May be slow to start or complete a task if reading is too difficult

May struggle to understand longer pieces of text

May be unsure of the meaning of words in written passages which can prevent full comprehension

Practical Strategies

- Access reading material on relevant topics and teacher's notes via digital platforms to have notes read aloud

- Help highlight the key points in the text using different coloured highlighters
- Create a graphic organiser such as a flowchart or mind map to present the information in another way
- Visualisation can help with comprehension:
 - **Printable Resource: Visualisation - Reading Prompt Chart | Literacy Inclusion Toolkit**
- Listening to audio books while following the text at the same time can aid comprehension
- Join your local library **how to join online**. Once a member you can either:
 - Listen or read online via **Libraries NI website** or **Overdrive**
 - Download the BorrowBox or Libby app onto your smart device. **How to download BorrowBox and Libby to your device and log in**
- Use real-life experiences to make connections and associations to what he/she has read

- Talk about the meanings of key words before reading
- Read&Write can be used to create personalised vocabulary lists with the word, the definition and a related image. The definition can be read using Text-to-Speech