

Executive functions

Early childhood learning trajectory



What are executive functions?

Executive functions (EFs) are a set of skills that enable humans to control impulses, stay focused, prioritise, and achieve our goals. They have been described as an 'air traffic control system' for the brain. EFs include 3 higher-order thinking skills that emerge during early childhood, listed below.

- <u>Working memory</u> emerges first. It enables the brain to retain and use new and increasingly complex information for a short period of time.
- <u>Inhibitory control</u> emerges next. It is the ability to use thoughtful, rather than automated, responses and stay focused while managing distractions.
- <u>Cognitive flexibility</u> emerges last. It is the brain's ability to switch perspectives and refocus attention.

These skills continue developing throughout the early years, reinforcing and supporting one another, as well as providing the foundation for many other capabilities and behaviours.

EFs support the high-level thinking skills necessary for planning, problem-solving and goal-directed behaviours. EFs are also closely related to self-regulation or self-management, which enable children to control emotional impulses and behaviour. The cognitive component of self-regulation depends on EFs, for thinking as well as feeling.

Early Years Learning Framework

AERO's early childhood learning trajectories align with the Principles, Practices and Outcomes of the

Early Years Learning Framework V2.0.

The learning trajectories <u>user guide</u> provides further information and demonstrates how the Learning Outcomes can be mapped to domains.

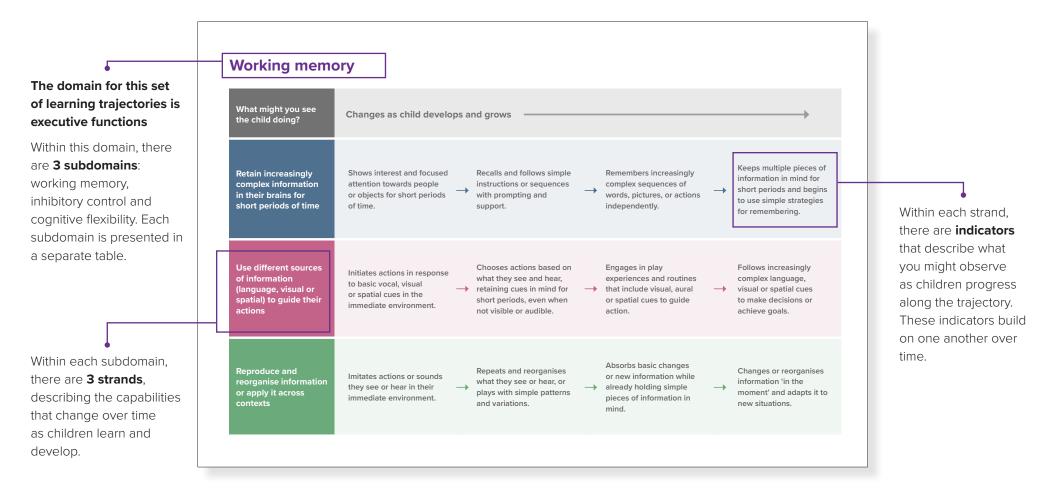
National Quality Standard

Quality Area 1 - Educational program and practice

edresearch.edu.au 1 of 7

How to use the early childhood learning trajectories

These learning trajectories will help you observe children's progress in executive functions and plan the next steps in their learning and development. They provide language and ideas for documenting children's learning and development, and for your conversations with families and colleagues about children's progress. The trajectory is not a checklist. You are encouraged to use your professional knowledge and judgement in determining how each child may demonstrate progress along each trajectory, and how best to support their learning.



edresearch.edu.au 2 of 7

Working memory

What might you see Changes as child develops and grows the child doing? Keeps multiple pieces of **Retain increasingly** Shows interest and focused Recalls and follows Remembers increasingly information in mind for complex information complex sequences of attention towards people simple instructions or short periods and begins in their brains for or objects for short sequences with words, pictures, or to use simple strategies short periods of time prompting and support. actions independently. periods of time. for remembering. Use different sources Chooses actions based on **Engages** in play Follows increasingly Initiates actions in response of information what they see and hear, experiences and complex language, to basic vocal, visual (language, visual or retaining cues in mind for routines that include visual or spatial cues or spatial cues in the spatial) to guide their short periods, even when visual, aural or spatial to make decisions or immediate environment. actions not visible or audible. cues to guide action. achieve goals. Absorbs basic changes Reproduce and Repeats and reorganises Changes or reorganises Imitates actions or sounds or new information while what they see or hear, or reorganise information information 'in the they see or hear in their already holding simple or apply it across plays with simple patterns moment' and adapts immediate environment. pieces of information contexts and variations. it to new situations. in mind.

edresearch.edu.au 3 of 7

Inhibitory control

What might you see Changes as child develops and grows the child doing? Responds to more complex Shows a rapid increase Shows self-control in **Delay impulsive or** most situations, with Stops or pauses some requests to stop or pause in self-control, automatic reactions to behaviour, and begins behaviours in response perseverance and occasional automatic events or provocations to a request. to control their own willingness to or impulsive responses delay gratification. observance of rules. when surprised or tired. Independently chooses Allows themselves to Adapts responses to Substitute thoughtful be redirected to a more Begins to substitute desired specific situations and thoughtful, rather than choices for automatic desirable behaviour after behaviours for undesirable contexts (real or imaginary), automatic, responses to an undesirable behaviour behaviours, with prompting. replacing usual behaviour responses accomplish tasks is paused. with purposeful choices. or goals. Begins using Resists distractions more deliberate strategies Increases and then begins Sustains focus on Stay focused on a to reduce the frequency a desirable task or easily, and recovers quickly to manage distractions task and manage of spontaneous shifts of experience in the presence after minor distractions to accomplish attention due to sudden to return to the desired tasks or goals, in distractions of distraction, with some interest in new things. experience or task. increasingly stimulating encouragement. environments.

edresearch.edu.au 4 of 7

Cognitive flexibility

What might you see Changes as child develops and grows the child doing? Adapts readily Notices new objects Readily switches to expected and Shift their focus or people in their Copes with transitions experiences or tasks, unexpected transitions, between different environment, and begins between spaces or and begins to deliberately and develops places, objects, people to shift their attention experiences with prioritise between them strategies to master or experiences and decide where fully without reverting increasing confidence. new environments or to a previous interest. to focus attention. situations. **Explores different** Sees situations from Shows interest in Experiments with different perspectives and different perspectives Shows basic alternative perspectives ways to solve problems or options to solve and explores options experimentation to solve and possibilities, achieve goals, based on problems or achieve for solving problems problems or achieve goals. options around them. with support. goals, beyond their or achieving goals immediate environment. Generates new ideas Incorporates new **Explores** new Change their thinking information or ideas or understanding with information and ideas. Changes their behaviour and responses based into existing thinking or increasing fluency by and remains calm and in response to something on new information or understanding, absorbing or adapting curious when existing they have learned. ideas with increasing ease ideas and information understandings and ideas are challenged. them other people. and accuracy.

edresearch.edu.au 5 of 7

Creating opportunities to support children's executive function skills

Working memory

- Encourage children to take breaks to calm their mind between periods of focus, to prevent being overwhelmed or overloaded.
- Engage in experiences where children remember and repeat actions, sounds or words, adding small changes on each repetition.
- Use 2-way conversations to practice absorbing and manipulating new information, gradually increasing complexity when the child shows signs of readiness.
- Involve children in helping with tasks that include sequences of actions or simple instructions, or ask them to teach these steps to others.

Inhibitory control

- Play games that encourage children to wait, persist or resist temptation. For example, 'hide and seek' or singing songs during wait times in routines.
- Engage in experiences involving turn taking or paying attention and suppressing reactions.
 For example, 'Simon Says' or 'Red Light, Green Light.'
- Help children set their own rules and limits in play, such as designating roles or actions, or defining the physical space or resources.
- Encourage children to share responsibility for routines that involve delaying gratification (such as packing up before going outside).

Cognitive flexibility

- Prepare children for transitions in daily routines by alerting them in advance and using action songs as prompts.
- Encourage children to make decisions and share opinions in a range of situations, exploring options in new and familiar environments.
- Use 'wondering aloud' and open-ended questioning to explore different perspectives and possibilities.
- Experiment and problem solve with children, encouraging them to overcome challenges with 'just enough' support.
- Engage in experiences that involve change and flexible thinking (such as manipulating different objects or playing games with changing rules).

edresearch.edu.au 6 of 7



About this resource

Our early childhood learning trajectories are designed for teachers and educators working in early childhood education and care (ECEC) services with children in the years before school. They can support ongoing professional learning, for individuals, and entire ECEC services and teams.

The early childhood learning trajectories describe how children learn and develop in these key domains:

- Executive functions
- Social and emotional learning
- · Mathematical thinking
- · Language and communication
- · Physical development.

While each learning trajectory describes children's progress in a single domain, they are designed to be used in interconnected ways. A single experience may support progress in multiple domains at the same time. Progress in one domain may depend on progress in another.



For more information on our learning trajectories research

- · Early childhood learning trajectory user guide
- Early childhood learning trajectories: The evidence base

More information

The AERO website features further guidance, including practice guides, case studies for early childhood practice. Visit the <u>Practice Hub</u> at <u>edresearch.edu.au</u> for more information.

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