Cognitive Functions

Reuven Feuerstein defines cognitive functions as "thinking abilities" that can be taught, learned, and developed. Feuerstein has categorized the cognitive functions according to the three major phases of the mental act—namely, input, elaboration, and output. Although artificially separated into three phases, they don't necessarily occur separately in life. However, the subdivision is useful to analyze and describe thinking as well as determine what factors might negatively affect thinking. This model can be used by teachers and parents to better understand and help the child who is experiencing difficulties with a particular task.

For example, if a child fails in the task of classification, it is not enough to comment on the child's poor intelligence or inability to classify, but rather, the underlying causes of the difficulty, which can be found in one of the three phases of thinking, should be sought.

The inability to classify, for instance, may be due to underlying functions such as imprecise data gathering at the input phase, or poor communication skills at the output phase.

> "A detailed analysis of a student's cognitive functions requires an in-depth understanding of the three phases of the mental act." — Feuerstein Institute

*Please note: You can use the EM cards as you would any of the card games (Blink, Qwitch, Set, deck of cards) and also as you would other activities (animals, Extreme Memory, etc).

	EFFICIENT/INEFFICIENT THINKING ABILITIES (COGNITIVE FUNCTIONS)	EM GAMES *	GOOD QUESTIONS (MEDIATION)
GATHERING/INPUT	**Focus and perceive** data through senses. *Blurred and sweeping perception*		What do you see? How many? What color? What direction? What do you hear, feel, taste, touch, smell?
	Systematically search. Systematically approach new objects or information *Unplanned, impulsive, and unsystematic exploratory behavior*	**EM Cards, Animals, Numbers, Vowels**: read/search left to right **Spot It**: starting at 12:00 and going clockwise	Where are you starting?
	Use labels Without a name, one can't think about it. *Lack of/impaired receptive verbal tools which affect discrimination (objects, events, relationships do not have appropriate labels)*	**EM Cards, Spot It, Blink, Set**: naming objects	What is the name of what you see? What is the *best* name for that? What is another name for that? What else do you see?
	Know orientation in space *Lack of/impaired spatial orientation (lack of stable systems of reference)*	**Colored Arrows**: L/R/U/D and N/S/E/W **EM Cards arrows** **Stare**: boy's right, in front, etc.	What is to *your* right/left/front/back? What is to *my* right/left? North/south/east/west/northeast?
	Aware of time How much, how old, how often, sequence of events *Lack of/impaired temporal concepts*	Timed exercises **Stroop Animals** **Stare** and **Presidents**: 10 categories	When do you see this happening? Past/present/future? In what order did this happen?
	Conserve Constancies	**EM Cards, Spot It**: constant card	What do you know to be true? What is constant and does not change?

What attributes must stay the same for an object to retain identity? *Lack of/impaired conservation of constancies (size, shape, quantity, orientation)*	**N-back**: symbols and colors become constants	
Collect precise and accurate data *Lack of/deficient need for precision and accuracy in gathering data*	**Color Code Let's Match/ Xtreme Memory**	Do you have the correct information/materials? What parts do you need to finish this project/problem?
Use more than one source of information 2 ideas in the mind at same time assists in comparing/higher order thinking *Lack of capacity for considering 2+ sources of information at once*	**N-Back**: remember sequence	Can you tell me what you think about ____ and ____. How are they similar? Different?

	EFFICIENT/INEFFICIENT THINKING ABILITIES (COGNITIVE FUNCTIONS)	EM GAMES	GOOD QUESTIONS (MEDIATION)
PROCESSING/ELABORATION	**Define problem** What am I to do? *Inadequacy in perception of existence/definition of problem*	**Color Code**	Tell me what's happening. What else do you see/know? Is there a strategy you think you can use? Have you ever had this problem before?
	Search for relevant cues What is relevant to the problem? *Inability to select relevant vs nonrelevant cues in defining a problem*	**Color Code Stare cards**	What do you need? What part is relevant/important?
	Spontaneous need to compare Seek similarities/differences on their own *Lack of spontaneous comparative behavior*	**EM Cards, Blink**: sort Finding a **SET**: how are they the same and different **Stare** **Tic Tac Toe**	Tell me why you chose that one? How are they similar? Different? What does it mean to compare? How do you know that's a good choice?
	Recall and use several pieces of information (working memory) *Narrowness of psychic field/focus*	**N-back** **Make a List** **Reading comprehension**	Can you make a picture in your mind while I read to you? Do you see in color or black and white?
	Understand reality/cause and effect *Episodic grasp of reality, live from moment to moment*	**Tic Tac Toe**, Drawing and Erasing	If you do this, what will happen? Stop and think. If you put your cube on ____, where will I go next? If you play that card first, what card can you play next?
	Use logical evidence *Lack of/impaired need for pursuing logical evidence*	**Stare**	Does this make sense? Why or why not? I wonder why this worked so well? How did you know to do it this way?
	Abstract thinking/visualizing *Lack of/impaired internalization*	**N-back (Who's in Charge?)** **Tic Tac Toe/Xtreme memory** (with symbols): symbols have meaning	What do you see in your mind right now? Can you draw what you saw on the card from memory?
	Use hypothetical thinking If this is true, what else must be true? *Lack of/impaired inferential hypothetical thinking*	**Perplexors** **N-back**: "If this was number, whose turn is it?"	If you do this, what will happen? What do you predict will happen next?

Test hypothesis *Lack of/impaired strategies for hypothesis testing*	Color Code	What strategies do you have? How can you prove that this is true? Hmmm…I wonder how you could find out?
Form categories Understand relationships, apply conceptual labels *Non-elaboration of certain cognitive categories because the verbal concepts are not part of individual's verbal inventory on receptive level, nor mobilized at the expressive level*	**Animals/Spot It**: categories **Blink:** sort, say "same number/color/shape"	What is one thing all these things have in common? What category do all these things belong to? (colors, shapes, numbers, months)
Understand big picture *Lack of/impaired summative behavior*	**Stare**: What's the main idea? How many things are there?	What steps do you need to do this? What do you need to do 1st, 2nd, 3rd, etc. Are there enough? Will there be extra?
Make a plan States steps and reason *Lack of/impaired planning behavior*	Color Code	What is your plan? What's the first thing you need to do?

	EFFICIENT/*INEFFICIENT* THINKING ABILITIES (COGNITIVE FUNCTIONS)	EM GAMES	*GOOD QUESTIONS (MEDIATION)*
EXPRESSING/OUTPUT	Consider another point of view *Only see the world through own eyes*	**Tic Tac Toe** **Stare** and **Presidents**: which hand or side?	Where do I want to put my cube next? If you were the person in the picture, what is on your right?
	Project Virtual Relationships *Difficulties in projecting virtual relationships*	**Stare** Using dots to teach how to make a square, triangle	Can we solve this by thinking about other times we faced a problem like this? How are these two things related?
	Perseverance *Blocking*	**All exercises**	I will help you. Hurray, you got the first step done! Do you want to try it again, or are you ready for the next part? How does it feel to do something difficult/easy?
	Just moment… Let me think *Trial and error*	**N-back** **Stare**	Stop and think. Did you take a moment to think about it? I'll give you some time to think about what you want to do.
	Give a thoughtful response *Lack of/impaired tools for communicating adequately elaborated responses*	**Stare/Presidents**	Stop and think a moment, what is the best way to say that? No rush, think before you answer me.
	Use precision and accuracy Do it right, take your time; say or complete it accurately *Lack of/impaired need for precision and accuracy in communicating one's responses*	**1-9 Numbers** **Extreme Memory**	I can see you are working hard at that. Compare it to the model, is there anything you want to change?
	Visual Transporting *Deficiency of visual transport*	**Tic Tac Toe**	Look here…now there…are they the same or different?
	Self-Control: Think before speaking or acting *Impulsive, acting out*	**Tic Tac Toe** **Color Code**	I know it's hard to wait, but how can you help yourself be patient?