



Creyos Cognitive Task Descriptions and Example Activities

Understand what the tasks measure and how they relate to common everyday activities.



The Creyos (formerly Cambridge Brain Sciences) cognitive tasks accurately measure core aspects of cognition that are key to an individual’s quality of life, such as short-term memory, reasoning, concentration and verbal ability. The tables below indicate how each of the 12 Creyos cognitive tasks relate to common everyday activities.

MEMORY			
Task	Definition	Adult Example Activities	Youth Example Activities
Number Ladder (Visuospatial Working Memory)	The ability to temporarily hold information in memory, and manipulate or update it based on changing circumstances or demands. This task involves reproducing a set of relationships between objects in space.	<ul style="list-style-type: none"> Following step-by-step instructions to carry out a task in a few different locations. Viewing a route on a map, then following the route from memory. Understanding positioning in sports, and carrying out pre-planned plays. Viewing a document, then carrying out the written instructions. 	<ul style="list-style-type: none"> Following step-by-step instructions, like doing a list of chores at different locations. Understanding positioning in sports, and carrying out pre-planned plays. Drawing something after seeing step-by-step directions on how to draw it.
Spatial Span (Spatial Short-Term Memory)	The cognitive system that allows for temporary storage of spatial information in memory. Spatial short-term memory deals with the relationships between objects in space, as opposed to remembering the specific order of numbers or words involved in verbal short-term memory.	<ul style="list-style-type: none"> Watching somebody perform a task step-by-step, then doing the same task yourself, such as in sports or gym classes. Navigating after getting directions from somebody pointing on a map. Implementing a strategy you have in memory, like an opening move in chess. Remembering positions of cars on the road while you make a difficult driving maneuver. Drawing or building something you saw being created, like when following a Youtube tutorial. 	<ul style="list-style-type: none"> Watching somebody perform a task step-by-step, then doing the same task, such as in sports or dancing. Being able to navigate after someone points out directions on a map. Noticing and remembering the positions of obstacles when riding a bicycle. Playing games in which you have to remember where you planned to move pieces—like chess or strategic video games. Drawing or building something you saw being created earlier.
Token Search (Working Memory)	Working memory is the ability to temporarily hold information in memory, and manipulate or update it based on changing circumstances or demands. This task involves self-directed searching, so there is a strategy component as well.	<ul style="list-style-type: none"> Systematically searching for a lost item in your home. Solving a mystery by remembering a set of clues, then rearranging them in your mind to tell a story and form a theory. Finding the most efficient way to complete a to-do list of tasks around your home before leaving in the morning. Efficiently navigating shifting priorities at work. Being an attentive listener by picking up on information you didn’t already know, and piecing together a person’s life story. 	<ul style="list-style-type: none"> Following the plot of a story by remembering what each character is planning to do. Being asked to find shoes in the morning, and checking all the usual places they could be found. Effectively prioritizing a list of homework tasks. Learning to be an attentive listener by remembering important details about a person like their name and how old they are, and listening for new details that you didn’t know before.
Paired Associates (Episodic Memory)	The ability to remember and recall specific events, paired with the context in which they occurred, such as identifying when and where an object was encountered.	<ul style="list-style-type: none"> Remembering which cupboard you put your groceries in. Learning what each button does in a new app or device. Remembering who you talked to yesterday, and at what time. Following safety procedures by pairing a potentially dangerous situation with warning signs or steps needed to stay safe. Learning a new language by pairing a word with its meaning. 	<ul style="list-style-type: none"> Remembering which toys or clothing go in which storage area. Telling a parent who you talked to, what you ate, where you went yesterday, and at what time. Learning new vocabulary, or a new language, by pairing a word with its meaning. Following safety precautions by knowing which actions to take in which situations. Learning all the buttons and symbols on a new computer, tablet, or app.

REASONING

Task	Definition	Adult Example Activities	Youth Example Activities
Rotations (Mental Rotation)	A function of visual representation in the brain, mental rotation is the ability to efficiently manipulate mental representations of objects in order to make valid conclusions about what objects are and where they belong.	<ul style="list-style-type: none"> • Navigating using a map, and knowing which direction you are facing. • Planning a new layout for a room. • Finding your way around a city using landmarks. • Creating or assembling—like when building a deck, or putting together furniture based on a diagram. 	<ul style="list-style-type: none"> • Not getting lost or turned around when coming into a familiar building through a different door than usual. • Easily learning to use games or toys that involve building, such as recreating your house with blocks. • Navigating using a map on your phone, or the mini-map in a video game.
Polygons (Visuospatial Processing)	The ability to effectively process and interpret visual information, such as complex visual stimuli and relationships between objects.	<ul style="list-style-type: none"> • Creating art, or drawing diagrams. • Repairing household items by spotting what is wrong with them and applying the right fix. • Identifying a mistake in a document at work. • Doing graphic design work or creating a web site. • Interpreting subtle facial expressions to know how someone is reacting to what you are saying. 	<ul style="list-style-type: none"> • Creating a science fair project display, or other arts and crafts. • Learning handwriting, how much space to leave between words, and the correct size of letters relative to the page. • Interpreting subtle facial expressions to know how someone is reacting to what you are saying.
Odd One Out (Deductive Reasoning)	The core cognitive ability to apply rules to information in order to arrive at a logical conclusion.	<ul style="list-style-type: none"> • Evaluating a complex argument and deciding if you agree. • Applying government rules to your finances to properly do your taxes. • Noticing the details of a story and making inferences beyond what is directly stated—such as a character’s emotions, or the story’s message. • Creating effective arguments for a position in a debate or essay. • Doing coding or using complex software. • Solving everyday math problems, such as splitting the bill at a restaurant. 	<ul style="list-style-type: none"> • Solving math problems in school. • Noticing the details of a story and making inferences beyond what is directly shown—such as a character’s emotions, or the story’s message. • Learning about non-verbal social cues expected in a situation, such as when eye contact is expected and when to give people space. • Creating effective arguments for a debate or essay. • Becoming good at computer programming or a complicated app.
Spatial Planning (Planning)	A fundamental property of intelligent behavior, planning is the ability to act with forethought and sequence behaviour in an orderly fashion to reach specific goals.	<ul style="list-style-type: none"> • Deciding the order of items to pack in a trunk or moving van. • Organizing your schedule to effectively balance work, chores, and social life. • Planning where to put your hands and feet when rock climbing. • Building or assembling furniture without any instructions. • Planning an itinerary for an upcoming trip 	<ul style="list-style-type: none"> • Independently organizing and prioritizing homework, chores, and fun activities. • Tidying up your desk or locker at school so you can fit everything you need inside. • Organizing pictures and text blocks on a poster to clearly communicate your conclusions. • Getting through a room crowded with people and objects without bumping into anything. • Planning where to put your hands and feet when going through an obstacle course or rock climbing.

CONCENTRATION

Task	Definition	Adult Example Activities	Youth Example Activities
Feature Match (Attention)	A measure of attention—the ability to focus on relevant details or differences.	<ul style="list-style-type: none"> Staying focused on a task when it counts, such as when driving. Identifying similarities and differences when comparing two things, such as two similar brands of a household product. Noticing small interpersonal details, like a partner's haircut, or subtle facial expressions indicating that somebody is upset or bored. Having good fashion sense by comparing outfits and choosing the one with the right look for the occasion. 	<ul style="list-style-type: none"> Keeping attention on the teacher at school, or on a homework task, for a long time. Noticing when someone is getting mad or sad, and changing what you say to make them more comfortable. Noticing the differences between options on a multiple-choice test so you can choose the correct one. Differentiating between similar-sounding words to write down the one you want. Checking over a worksheet to make sure you haven't missed any questions.
Double Trouble (Response Inhibition)	A measure of response inhibition—the ability to concentrate on relevant information in order to make a correct response despite interference.	<ul style="list-style-type: none"> Keeping your eyes on the road when driving, despite passing distracting signs or people. Blocking out background conversations when you're on the phone. Inhibiting your emotional gut reaction to a social media post to formulate a more rational response. Ignoring attention-grabbing buzzwords on product packaging to focus on relevant information. 	<ul style="list-style-type: none"> Ignoring a noisy classmate so you can concentrate on your work. Completing your chores even though you keep thinking about doing something more fun. Keeping a thought to yourself that shouldn't be spoken out loud, or putting up your hand instead of blurting out an answer. Figuring out if a story somebody is telling you is serious or if they are only joking. Having an age-appropriate response to being upset by keeping emotional responses to yourself, or walking away.

VERBAL ABILITY

Task	Definition	Adult Example Activities	Youth Example Activities
Digit Span (Verbal short-term memory)	A measure of verbal short-term memory—the ability to hold information in mind and verbally rehearse it for as long as necessary.	<ul style="list-style-type: none"> Understanding long sentences by remembering the beginning of the sentence by the time you get to the end. Writing down a phone number or entering credit card information. Taking notes during a meeting. Remembering all the points you wanted to bring up on a phone call. 	<ul style="list-style-type: none"> Taking notes and keeping up in class. Easily learning new words by listening to and remembering all the sounds in the word. Doing math, which requires holding numbers in memory while working on them. Following multi-step spoken or written directions. Understanding long sentences by remembering the beginning of the sentence by the time you get to the end.
Grammatical Reasoning (Verbal Reasoning)	A measure of verbal reasoning—the ability to quickly understand and make valid conclusions about concepts expressed in words.	<ul style="list-style-type: none"> Understanding complex everyday speech—e.g., "I didn't know that he wasn't going to show up." Giving clear verbal or written instructions to people who report to you at work. Reading a contract and understanding what you are agreeing to. Texting a clear description of an item to your partner so they can pick it up from the grocery store. 	<ul style="list-style-type: none"> Understanding what two adults are talking about, even when they use complicated language. Interpreting what people are saying to you, and thinking about what the speaker actually meant, without jumping to incorrect conclusions. Enjoying movies or shows with more dialogue, and less visual action.