

CORE COGNITIVE SKILL EXERCISES OVERVIEW

The Core Cognitive Skill Exercises help to build the cognitive skills (mental skills, intelligence, learning skills, learning tools and processing skills) that form the foundation for learning capacity. Any core cognitive skill that is weak generally makes learning difficult. These include processing speed, attention, memory, visual processing (VP), auditory processing (AP) and logic and reasoning. Each of the core exercises overlaps several cognitive skills, builds a different specific combination of skills and each is focused on different primary cognitive skills. A brief description of each exercise and the cognitive skills each addresses is presented below.

Students build cognitive skills through intense drilling. The exercises have multiple levels and multiple speeds (usually three or four) within each level. The current level/speed is indicated on the student homepage next to each exercise icon. Tap beat has only eight levels, whereas Attention Arrows has 40. Students begin at level 1 and advance through speeds and levels when they pass each current round at 90% or greater. Each level adds a different challenge. It is important for students to read the instructions in order to understand the new requirements for a new level. Speeds within a level change the amount of time to complete the task or make the elements of the task move or display faster. Students are challenged to pass a given level at the fastest speed possible. If a student has passed speed 3 and is unable to pass at the fastest speed, after three tries they will be advanced to begin working on the next level. The levels of advancement are designed to continue challenging the student without leaving them at either extreme of ongoing boredom or frustration.

Exercise rotation logic has been added to automatically determine the time each student needs in the various exercises to get maximum benefit. Currently each exercise is set to a minimum of 6 minutes of active time in an exercise. Once a student completes a round and the timer is at six minutes or more, the student will be taken back to the menu when they click OK or restart. That exercise will be disabled until all exercises have been completed for that cycle, then the cycle is repeated. As experience is gained, the time on exercises may be increased or decreased to ensure students work most on those exercises where skills are weakest.

To gain sufficient benefit, students need to spend one hour per day, five days a week for a minimum of twelve weeks on the exercises. For scheduling purposes, it is most practical to do the program for a complete semester. Students need to advance as quickly and as far as possible on each exercise. However, there is value in students diligently practicing even if they don't pass a level on a given day.

ATTENTION ARROWS

Major: working memory, sustained attention, divided attention, selective attention, visual manipulation, concentration

Minor: processing speed, orientation (reversals) and color discrimination

Different colored arrows appear on the screen. They will either be stationary or flowing up, down, left or right. Some levels have distractions. Students must click on the corresponding arrow key on their keyboard. There are four different speeds. Higher levels require students to manipulate the

arrow direction visually and respond according to the directions. For example, the instructions may require the student to answer as if the arrow were rotated one quarter turn clockwise from what they see—the higher the level the more complex the instructions.

COMPREHENSION FIGURES

Major: comprehension, VP-manipulation, working memory

Minor: selective attention, VP-discrimination, divided attention, processing speed, logic and reasoning

A description of a graphic is presented. Students must select the right answer from four possible graphic solutions. For example, find a square inside a triangle that is next to a star. Higher levels use a code. For example: a shoe equals a square, a tree equals a circle and a car equals an octagon. Find a shoe inside a car that is above a tree. The graphic answers are shown with the geometric shapes so the student must translate and remember the code.

FIXATION NUMBERS

Major: sustained attention, selective attention, divided attention, saccadic fixations, math computations

Minor: working memory, processing speed, logic and reasoning, VP-discrimination, sensory-motor integration

Numbers are flashed on the screen one after another. The student inputs a number on a keypad based upon the instructions. Lower levels just input certain numbers seen. Higher levels require the student to remember a previous number and do simple math to arrive at the final answer.

DELAYED MATH

Major: divided attention, working memory, sustained attention, selective attention, math computations, processing speed

Minor: logic and reasoning, long term memory, VP-discrimination, AP-discrimination, comprehension, sensory-motor integration

Similar in style to Fixation Numbers, students are asked to remember multiple numbers presented and perform simple math calculations.

PATTERN GROUP

Major: logic and reasoning, VP-discrimination, divided attention, working memory, processing speed

Minor: comprehension, selective attention, long term memory, VP-manipulation, sustained attention, saccadic fixations

Students must complete a pattern with a set of three cards. All sets must either be all alike or all different based upon different graphics on the cards. Depending upon the level, the student will select either one, two or three cards to complete the set.

VISUAL PUZZLE

Major: VP-manipulation, VP-discrimination, selective attention, processing speed, working memory

Minor: sustained attention, long term memory, logic and reasoning, comprehension, saccadic fixations

Students must join pieces of a puzzle together. In more advanced levels pieces will come apart and some must be rotated to fit. Numbers are introduced throughout the puzzle with a plus, minus or multiplication sign and students are asked to provide a final answer at the end of the puzzle. This exercise is much more challenging than a traditional jigsaw puzzle game.

TAP BEAT

Major: sensory-motor integration, sustained attention, selective attention

Minor: visual manipulation, divided attention, AP-discrimination, logic and reasoning, processing speed, working memory, VP-orientation

Students must hit either the up or down arrow to keep a beat and in advanced levels, indicate whether the last tone was higher/lower pitch or volume than the previous tone.

VISUALIZATION GOLF

Major: visualization, working memory, visual span, sensory-motor integration

Minor: logic and reasoning, selective attention, divided attention, processing speed, VP-manipulation, VP-discrimination

Students must navigate a golf ball through a golf course with obstacles. The challenge is that while the ball is being moved, the course disappears. So the student must imagine the course from memory.

AUDITORY ANALYSIS LETTERS (SOUND SELECTION)

Major: AP-analysis, AP-discrimination, AP-segmenting

Minor: sustain attention, selective attention, divided attention, working memory, long term memory, processing speed, comprehension

Introduction to 17 key letter sounds. Students will select the required answer based upon their ability to analyze and segment sounds that make up words.

MEMORY MATCH

Major: working memory, sustained attention, divided attention, selective attention, visual manipulation, concentration

Minor: processing speed, orientation (reversals) and color discrimination

Benefits include improved short term memory, improved attention span, improved spatial memory and visual processing and improved processing speed.

Students will see X number of faces on a screen with various characteristics. The screen goes blank and then a new screen appears with a wide variety of choices from which to match the previous faces.