

Online Problem Solving

Mike Mahoney

Problems Worked	Difficulty	Type of Problem	Strategy Used	Developed Strategy	Declarative Knowledge	Procedural Knowledge
Three Glass (Jugs) Puzzle	Easy	Well structured, used same step by step procedure, solution strategy is predictable once determined, converged to one correct solution, with respect to solving in the minimum number of steps.	I tried to visualize how to isolate 1 oz. and 3 oz. in order to combine them to get the 4oz. needed.	Once I realized that the restriction on how much you could move, limited to available space or the quantity available to move, I realized I had 1, 2, 3 & 5 to work with, I was not able to get 2 and 2 isolated to combine to make 4, so I was left with working with 1 and 3.	Started with declarative knowledge, the solution is associated with addition and subtraction concepts.	Once a strategy is developed, this moves towards procedural knowledge as you can remember the <i>procedure</i> to solve the problem
Tower of Hanoi	Easy	Well structured, used same step by step procedure, solution strategy is predictable once determined, converged to one correct solution, with respect to solving in the minimum number of steps.	To make the 3 rd tower available to receive the largest disc.	After a little trial and error, I realized the least number of steps relied on the first move of the smallest disc.	Started with declarative knowledge, "knowing why" making the 3 rd tower available for the largest disc allows the quickest solution of the problem.	Once a strategy is developed, this moves towards procedural knowledge as you can remember the <i>procedure</i> to solve the problem.
Entrapment	Most difficult to solve, difficult to visualize, requires specific geometric knowledge.	Moderately structured, required varying strategies to fit the particular context, as each problem was arranged differently, Information needed to be gathered before converging to one correct solution.	To position the red dot as the mid-point of each leg of the triangle that the gray dots created. Required difficult visualization and some trial & error.	This was frustrating at first, I wanted more gray dots to work with. From the instructions, I interpreted "equal distance" as midpoint. With only three dots of each color, this led me to thinking about the midpoint of the legs of a triangle.	The declarative knowledge started with "knowing that" three gray dots make the vertices of a triangle, and the red dots are the midpoints of the legs of the triangle.	Procedural knowledge develops as you understand how to align the legs of the resulting triangle with two gray dots through the midpoint of one red dot.
Trio Match	Easiest to solve, because there are	Moderately structured, I wanted to claim well structured, because it was easy, however, because the shapes and colors	I scanned the shapes and colors in que and adjusted placement	After a few times playing, I developed a method of stacking different shapes or colors vertically and the same shapes and colors	Declarative knowledge: <i>Concepts</i> -ability to identify and cluster shapes and	After playing for a while, I developed a routine/procedure on how I placed

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	many acceptable solutions.	come to you randomly with each game, it requires varying strategies. There are many acceptable solutions. A smart player will gather information from the shapes and colors in que.	trying to plan for a trio.	horizontally, occasionally paying attention to diagonal shapes.	colors. <i>Principles</i> -ability to predict a trio by planning ahead.	the shapes and colors.
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