

A. Learning How to Frame Our Problems

Some problems seem unsolvable, until someone suggest a new way of looking at the situation. Learning to re-frame our difficulties can be critical to solving the troubles we face. Consider this problem:

Train A leaves Baltimore for its 50-mile trip to Washington, DC, at a constant speed of 25 mph. At the same time train B leaves Washington, bound for Baltimore at the same speed of 25 mph. The world's fastest crow leaves Baltimore at the same time as train A, flying above the tracks toward Washington at a speed of 60 mph. When the crow encounters train B, it turns and flies back to train A, then instantly reverses its direction and flies back to train B. The supercharged bird continues this sequence until trains A and B meet midway between Baltimore and Washington. What is the total distance the bird will have traveled in this excursion between trains A and B?

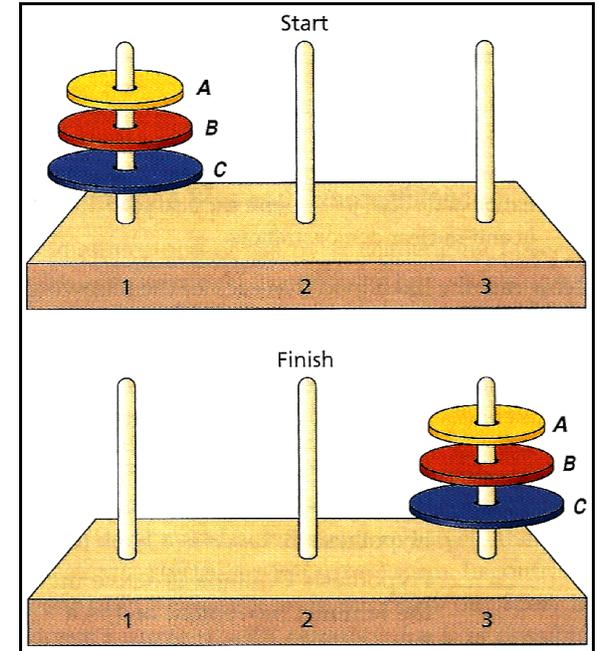
B. Blinded by the Mental Set

Sometimes the seemingly logical answer is the problem. Using containers A, B, and C with the capacities shown in the table below, how would you measure out the volumes indicated in the right-hand column? For example, in problem 1 you have a 21-

cup jug, a 127-cup jug, and a 3-cup jug. Drawing and discarding as much water as you like, how will you measure out exactly 100 cups of water?

Try to solve all seven problems in order, and write down your calculations.

Problem	Given jugs of these sizes			Measure out this much water
	A	B	C	
1	21	127	3	100
2	14	46	5	22
3	18	43	10	5
4	7	42	6	23
5	20	57	4	29
6	23	49	3	20
7	15	39	3	18



C. Breaking Down Our Problems

Some problems in life need to be overcome one step at a time. This is the process of sub-goal analysis – formulating subgoals, or intermediate steps, toward a solution. The value of setting subgoals can be seen in the tower-of-Hanoi problem.

The object is to move the rings one at a time from peg 1 to peg 3, in no more than seven moves. Only the top ring on a peg can be moved, and a larger ring can never be placed on top of a smaller one. The solution requires planning, checking, and revising hypotheses.

One goal of the HiSET exam is to see if you can solve problems. On a separate sheet of paper, give us your answers.