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The E in STEM

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Online Problem Solving Project

1. I worked through the Tower of Hanoi, Entrapment, and Wolf, Sheep, and Cabbage.
2. Wolf, Sheep, and Cabbage was the easiest to solve.
3. I found this problem the easiest to solve because the constraints of the problem were simply stated at the start of the game. Everything needs to get to the other side of the river and the wolf will eat the sheep and the sheep will eat the cabbage if left alone. Additionally, this problem had very few components and had the same constraints and structure every time that I tried to solve it.
4. Wolf, Sheep, and Cabbage is a well structured problem. It always uses the same step-by-step solution and once you figure out that solution, you can solve this problem every time. The solution is predictable and there is only one possible way to solve the problem. All needed information was given at the start of the game.
5. I read the rules and quickly tried to memorize them. Then, I started the game. On my first try, I tried to just move each item across the river one at a time. I did not realize that I could use the boat to transport an item back to the original side of the river. Once I realized this, I was able to quickly solve the problem on the next try.
6. I developed this strategy by rereading the rules to the game. I realized that the rules did not mention that the items could only be transported by the boat once. I also created a diagram in my head of what items could be left together and which items could not be left together. This problem reminded me of Rock, Paper, Scissors. Figuring out how to solve this problem felt like figuring out a strategy to win that game.
7. To solve this problem, you needed to know that the boat can transport one item at a time, the wolf will eat the sheep if the two are left alone, the sheep will eat the cabbage if the two are left alone, and items can cross the river multiple times.
8. To solve this problem, you needed to know how to place items in the boat and how to make the boat move across the river.
9. I found Entrapment to be the most challenging for me to solve.
10. I found Entrapment the most difficult to solve because it is different every time. Each

gameboard is unique. Although there are not many rules to this game, the rules do look very long and complex at first glance. I also did not find the diagrams in the rules to be very helpful. I was able to complete some gameboards quickly but others took a relatively long time.

11. Entrapment is a moderately structured problem. It requires varying strategies that can be adapted to each gameboard. Different strategies can be used but there seems to be only one correct solution for each gameboard. The solution is not always the same.
12. In the beginning, I tried to plan out where I was going to place each gray circle before placing it. I realized that I would quickly forget where I planned to place each one. I then started to place the gray circles on the gameboard and move them around until I was able to complete each game. I slowly moved the gray circles.
13. Planning out every move that I wanted to make before actually placing any of the circles did not seem to work for me. I realized that I needed to actually place the circles on the board to be able to visualize the halfway point of the lines.
14. To solve this problem, you needed to know how many red and gray circles you would have. The gray circles can be moved but the red circles cannot. To win, each red circle must lie midway between two gray circles. The red circles will turn green when they are midway between two gray circles. A line will also appear between the two gray circles.
15. To solve this problem, you needed to know how to place the circles on the board and that the circles can be moved once they are on the board. You can also completely remove your gray circles from the board.