

Online Problem Solving Assignment

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1. Which problems did you work through?

I completed Tower of Hanoi, Wolf, Sheep, & Cabbage, and Entrapment. Before this lesson, I had never heard of any of the games so this was the first time for me to complete all three.

2. Which problem was the easiest to solve?

For me, the easiest problem or game to solve was Entrapment.

3. Why was it easy to solve?

Entrapment was the third game I attempted, and I correctly completed it on my second try. As I was working on this problem, I was thinking about why it could have been easier for me than the other two. I cannot exactly put my finger on it but in my mind, it is a more mathematical problem than the other two and reminded me of creating graphs and pictures on graph paper which typically has to be very linear. What is interesting is that I did not get it correct on the first try because for some reason I was thinking diagonal lines could not be used. Once I figured out diagonals could be used, I was able to solve it very quickly.

4. What type of problem was it (see Kirkley, 2003 article pg. 8)? Explain.

I could be wrong, but I believe this problem was well structured. I only say this because I believe there is only one correct answer. I found myself depending on declarative knowledge of symmetry.

5. What strategy did you use to solve the problem?

I used symmetry and simple math.

6. How did you develop this strategy?

With only four grey dots available, and four red dots, I automatically knew I would have to double use the dots (simple math equation). As I stated above, I then found myself depending on declarative knowledge of symmetry. Where can I put the grey dots that could be used for two of the red dots? From there, it was fairly easy to solve after I

discovered diagonals could be used. I am confident I developed these strategies early in life through math instruction (and playing Tetris)!

7. What declarative knowledge was needed to solve this problem?

The declarative knowledge that I believe I used was simple math (multiplication, subtraction) and symmetry.

8. What procedural knowledge was needed to solve this problem?

The only procedural knowledge that I think of that I used to solve this problem was figuring out that I could use diagonal lines. This was procedural because it took trial-and-error on my part to understand that step in solving the problem.

9. Which problem was the most challenging for you to solve?

As embarrassing as it is, Wolf, Sheep, & Cabbage was very difficult for me to solve (and my husband as well)!

10. Why was it difficult to solve?

It was not until my third attempt that I realized I had to take something back in the boat to the other side in order to get all three across. I spent the first two attempts including lots of "think time" trying to get all three to the other side without bringing anything back which I now understand is impossible.

11. What type of problem was it (see Kirkley, 2003 article pg. 8)? Explain.

I believe this problem is moderately-structured. While there is only one answer, the problem solver has to create a mental model first, abstractly reason, and invent a strategy (while it may be the same one, it can very well be new to the problem solver) in order to solve the problem. I also believe there are at least two different ways to solve this problem which eliminates it being a well-structured problem.

12. What strategy did you use to solve the problem?

I used trial-and-error and process of elimination.

13. How did you develop this strategy?

I began using this strategy as soon as I read the instructions. It said the wolf will eat the sheep and the sheep will eat the cabbage when left alone. I automatically started to think about what could be left alone together and what could not. Because the wolf and cabbage were the only two that could be alone together, I started by moving the sheep. From there I used trial-and-error until I realized I could take things back in the boat with me. Once I figured that out, finishing the problem was much easier.

14. What declarative knowledge was needed to solve this problem?

I do not think I used an abundance of declarative knowledge. I did pair items up in my mind of what could not be left alone together which was similar to using patterns and odd/even numbers but outside of that, I believe it was all procedural for me. I'm sure other people may solve this problem solely on declarative knowledge, but I did not.

15. What procedural knowledge was needed to solve this problem?

For me, this problem was mostly procedural because I had to physical try it repeatedly to find out what worked and what did not work. When one trial did not work, I attempted it another way until I found a solution to each step. Every step I found a solution for, got me closer to finishing the task.