

Annette Phillips
 The “E” in STEM
 Online Problem Solving assignment

1. Which problems did you work through?

I worked through a couple of rounds of the Tower of Hanoi, 3 Glasses Puzzle and 4 rounds of Plastelina Logic Games. I solved 3, 4, 5 of the Tower of Hanoi; I solved the Wolf, Sheep & Cabbage fairly easily then moved on to solve a few more.

2. Which problem was the easiest to solve?

I found the Tower Hanoi to be the easiest to solve; it of course got more difficult as you add more rings. Also, keeping close to the minimum number of moves is also a challenge. I also found the Wolf, Sheep and Cabbage to be pretty easy to solve.

3. Why was it easy to solve?

I think it was easier for me because it was easily visualized. I can move the pieces around and really see how to organize the columns.

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

It is a well structured problem with kind of a step-by-step solution of moving the rings (by sizes) until they are on the correct column. There are clear instructions to keep the rings on columns with the largest on the bottom. After you solve the first one, it is easy to use the same strategy for the challenges with more rings.

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

I would dismantle the tower until the bottom ring was free then move the smaller rings over to make room to move the larger ring to the far right column. I knew it was a process of moving them until I could get the larger one free and over. It was a step-by-step process.

6. How did you develop this strategy?

It is just a matter of perseverance in working through the steps. I developed this through years of working through problems.

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

There isn't a lot of content knowledge for this one, but just the willingness to work through the problem while following the stipulations.

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

How to work through well structured problems.

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

The most challenging problems were the Three Glasses puzzle and I went on to solve the Family in Crisis logic problem.

10. Why was it difficult to solve?

The 3 (Jugs or Glasses) problem just took a little more thinking about how to accomplish the task with the stipulations. It was harder to visualize the solution. For the Family Crisis problem, it was more difficult because the solution involved time constraints as well. I actually had to write out the solutions I was trying and it wasn't until I did this that I solved it.

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

I would say the 3 Jugs problem is a moderately structured problem. I think there may have been more than one strategy to get to the solution. It took more abstract reasoning and evaluation. It does help to have a math context in which to think about the solution. I feel the same for the Family Crisis problem; it was moderately structured and takes more mental modeling and problem representation.

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

I didn't have the strong math context to solve it through mathematical reasoning. I talked myself through the problem and solved it through trial and error; I all of a sudden visualized the solution after several attempts. The Family Crisis problem took more time and I actually wrote out a few scenarios. It wasn't until I wrote out these possible solutions that I finally was able to solve it.

13. How did you develop this strategy?

I am a visual learner, so I learned over the years to draw or write out problems and possible solutions to problems. You also have to learn how to develop perseverance when trying to work through logic problems.

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

I think with both problems it is helpful to have some mental modeling or experiences with math problems or logic problems; a more expert problem solver would have had more experiences with solving these types of problems and would have had less errors.

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

The problem solver needs to have past experiences to be able to draw on strategies to solve these problems. The learner should have skills in mental modeling, problem representation and abstract reasoning.