A Cat, a Parrot, and a Bag of Seed:

1. Define the problem
   1. The problem is that you can’t leave two certain animals or objects together.
   2. Immediately looking at the problem I can see that the man is going to have to carry one of the animals or objects back to the main land area because two can’t be together.
   3. The overall goal is to have the Cat, the Parrot, and the Bag of Seed to other side of the river.
2. Break the problem apart:
   1. The constraints are that you can only carry one animal over at a time and that specific animals can’t be together or left with the bag of seed.
   2. The sub-goals are to get them over one at a time without problems.
3. Identify potential solutions:
   1. A possible solution is to carry something back so that no two bad things are put together.
4. Evaluate each potential solution:
   1. Yes, the solution presented meets the goals because all of the items will go across the river with none of them getting harmed.
   2. Yes, the solution will work for all cases (with variation).
5. Choose a solution and develop a plan to implement it:
   1. My solution is for the man to take the Parrot across the river first and then go back to pick up the Bag of Seeds. When dropping off the Bag of Seeds on the same side as the parrot, he needs to take the parrot with him back. When he gets to the other side he picks up the cat and drops off the parrot. He takes the cat to the same side as the Bag of Seeds. Then goes back to pick up the parrot and gets to the other side of the river with all of them together and at with no injuries.
   2. At first I thought of tying them to a tree so that they didn’t harm each other, but no rope was mentioned.

Socks in the Dark:

1. Define the problem:
   1. There are different amount of pairs of three different colors and I have to find out how many I have to pull out of my drawer to get matching socks (something I do everyday).
   2. Some insight? There’s going to be a lot of sock pulling.
   3. The overall goal is to get a pair of each of the colors of socks while not looking at the socks.
2. Break the problem apart:
   1. The constraints are that you can’t look at the socks and that you are pulling one sock at a time.
   2. The sub-goals are to be able to suddenly see the color of the sock even though you are picking them out in the dark, and to be able to pick out socks in pairs.
3. Identify potential solutions:
   1. Do about 5 trials of pulling socks out one by one until you get your desired outcome.
4. Evaluate each potential solutions:
   1. The solution will meet the goals as long as the results are documented and seem consistent and accurate.
   2. The solution presented will work for each case because it will have unbiased results.
5. Choose a solution and develop a plan to implement it:
   1. Pull one sock out by one until you get at least one matching pair and do about 5 trials of those. Then put all the socks back in and pull one sock out one by one until you get a matching pair of each color.
   2. If you do the mathematical way of getting results then you must pick out AT LEAST 4 socks to guarantee one matching pair of socks because worst case scenario is that you pull out one of each color (3), your next one HAS TO make a pair. In order to get a pair in each color you would have to pull out 18 socks (worst case scenario) because if you pull out all the 5 pairs of black socks (10 socks) and all the pairs of brown socks (6 socks), then your next two socks will HAVE TO be a pair of white socks.

Predicting Fingers:

1. Define the problem:
   1. I want to know on which finger the little girl will land on when she hits 10, 100, and 1,000.
   2. The insight that I can give is that along with a lot of finger counting, there may have to be some math included.
   3. The overall goal is to find a system that correlates with finding which finger she will end up on when counting.
2. Break the problem apart:
   1. The constraints are that I don’t have 1,000 fingers to count all of this out, but most importantly how the girl is counting her fingers.
   2. The sub-goal is to be able to maintain the consistency of the counting of her fingers.
3. Identify problem solutions:
   1. For the sub-goal I discussed it would be convenient to draw out a hand and label them with numbers.
4. Evaluate each potential solution:
   1. Yes, the solution to draw a hand and label it with numbers and figuring out a system helps in figuring out the rhythm of the counting.
   2. Yes, because the visual aid will help to figure out the system quickly.
5. Choose a solution and develop a plan to implement it:
   1. The solution in finding out which finger would be the lucky one is to draw out the hand. Once you draw out the hand you can label them 1-20 and you will be able to see a pattern. With this pattern you will be able to figure out on which finger 10, 100, and 1,000 will fall on.
   2. One form that will work, but is not convenient is to count out all of your fingers until you get to 1,000, but that is extra work. This method is a little time consuming, but if you understand it thoroughly then you can explain it the same.