Problem 1: A Cat, a Parrot, and a Bag of Seeds

1. Define the problem

The Man has to get a Cat, a Parrot, and a Bag of Seeds across a river without them eating each other.

The Cat and Parrot can’t be left alone or the Cat will eat the Parrot.

The Parrot and Seeds can’t be left alone or the Parrot will eat the Seeds.

The Man can only take one thing at a time across the river.

1. Break the problem apart

1. You can’t leave the Cat and Parrot, or the Parrot and Seeds.

2. You can only take 1 item at a time.

1. Identify potential solutions

1. You can leave the Cat and Seeds.

2. You could bring one of the items back with you.

1. Evaluate each potential solution

The Man can only leave the Cat and Seeds alone together, so he has to take the Parrot across first.

If the Man always has the Parrot with him, nothing will ever get eaten because the Parrot is needed in both scenarios where something gets eaten.

1. Choose a solution and develop a plan to implement it.

Take the Parrot across first. (Leaving the Cat and Seeds together, which is fine)

Then take the seeds across.

The Man can’t leave the seeds with the Parrot so he brings the Parrot back with him.

Then take the Cat across (Now that seeds and cat are across and the Parrot is back at the start)

Finally bring the Parrot back across to complete the task.

Problem 2: Socks in the Dark

1. Define the problem

You can’t see the socks and have 5 pairs of black, 3 pairs of brown and 2 pairs of white.

You want at least 1. One Matching pair

2. One matching pair from each color

1. Break the problem apart

You want to make sure you have what you need and not have to go back in for more socks.

1. Identify potential solutions

The minimum you need to have for one matching pair is one of each color and then one more for the match.

If you want a pair of every color you need every sock from the bigger sets and then a pair from the smallest.

1. Evaluate each potential solution

Both of these solutions will meet the goal for any number of socks weather it is these 20 socks and 3 colors, or if it’s 80 socks and 6 colors

1. Choose a solution and develop a plan to implement it.

For the first problem getting 1 matching pair, you would have to pick out a 4 socks to be guaranteed that you have a match. That would give you 1 black, 1 brown, 1 white and the forth one will make a pair for one of the colors.

For the second problem getting a match in all the colors, you will need all of the two biggest colors then two more socks. The two biggest are a pair of 5 and a pair of 3. This means you need all 16 black and brown socks and then the final pair of white socks. This means you must pull out a total of 18 socks.

Problem 3: Predicting Fingers

1. Define the problem

A little girl is counting on her fingers by eights, starting with her thumb and going to her pinky then back. I want to know what finger she will end on if she counts to 10, 100 and 1000.

1. Break the problem apart

The girls is counting by eights, every other time she gets to her pointer finger it is eight more. First time it is 2 then **8** then 10 then **16**, 18, **24** and so on

1. Identify potential solutions

Find the closest multiple of 8 that is less then the number she is looking for. That will be the pointer finger. Then you can count it out to her final number.

1. Evaluate each potential solution

This will work no matter what number is chosen, unless the number is less then 8 (because then she should just count it out).

1. Choose a solution and develop a plan to implement it.

If the number that she is looking for is 10 then the first multiple of 8 is 8 and that would be the pointer finger. Then count thumb 9 and then back to the pointer finger as 10. So 10 would end on the Pointer finger.

If the number is 100 then the closest multiple of 8 is 96. That would be the pointer finger, then 97 for the thumb, 98 for the pointer, 99 for the middle, and 100 for the ring finger. So 100 would end on the ring finger.

If the number is 1000, 1000 happens to be a multiple of 8 so the finger would end on the pointer finger.