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

1. Define the problem
2. The man needs to get a cat, parrot and bag of seed to the other side of the river without any of the animals eating each other or the bag of seed.
3. N/A
4. Get everything to the other side of the river.

1. Break the problem apart
2. The constraints are not leaving the cat alone with the parrot or leaving the parrot alone with the cat.
3. The sub-goals of this are to get the cat across, the parrot across, and the seed across.
4. Identify potential solutions
5. There is only one solution to this problem. The seed needs to go first followed by the cat and then the parrot.
6. Evaluate each potential solution
7. Yes the solution meets the goals.
8. Yes the solution will work for ALL cases

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

a. The man would first transport the seed to the other side of the river. He would then transport the cat over to the other side, eliminating any of the two to eaten. Lastly the man will transport the parrot so he will be over there with all his animals and seed.

**Socks in the Dark:**

1. Define the problem

A) At least one matching pair

1. Getting at least one matching pair of sock from random selection in the dark.
2. The black socks would be the easiest pair to match in this situation.
3. Matching one pair of socks in the dark

B) At least one matching pair of each color

1. Getting at least one matching pair of each color sock from random selection in the dark.
2. The black socks would be the easiest pair to match in this situation.
3. Matching atleast one matching pair of each color sock in the dark.

1. Break the problem apart
2. The constraints of this problem are the dark and not being able to see the socks.
3. The sub-goals of this problem are getting a match with the least number of socks.
4. Identify potential solutions

A)

1. The solution to this problem is pretty simple with black having the most pair the smallest number of sock before getting a matching pair is 2.

B)

a. The smallest number of socks you could use to do this would be 6 because you need 3 pairs of matching sock of each color.

1. Evaluate each potential solution
2. Yes the solution meets the goals.
3. Yes the solution will work for ALL cases

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

a. You would have to randomly draw socks until you get a matching pair and a matching pair of each color.

**Predicting Fingers**

1. Define the problem
2. Predicting what finger a set number will land on.
3. Each 10 will only land on a certain finger
4. Figuring out what fingers each 10 lands on.

1. Break the problem apart
2. The constraints are having to remember what number is on what finger the higher you go in count.
3. The sub-goals of this are keeping up with the 10s and what finger they land on.
4. Identify potential solutions
5. Possible solution is to count to 40 and remember what finger 10, 20, 30, and 40 are and after that evaluate it and just use multiplication to determine the rest of the solutions
6. Evaluate each potential solution
7. Yes the solution meets the goals.
8. Yes the solution will work for ALL cases

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

a. Start by counting from and figure out what fingers land on 10, 20, 30, and 40. When you figure this out 10 and 30 land on the first finger and 20 and 40 land on the ring finger you can infer that the odd numbers will land on first finger and even will land on ring finger so being that 10 is on the first finger and 100 will land on ring finger and 1000 on the first finger.