1) Define the problem

a) A man must get a cat, parrot and seed to the other side of the river carrying one item at a time without leaving the cat and parrot alone together.

b) The man will have to take multiple trips.

c) The goal is to get the cat, parrot, and seed to the other side of the river with the outlined constraints in 1a.

2) Break the problem apart.

a) I can only take one item across at a time.

b) I cannot leave the cat and parrot together alone.

c) I cannot leave the parrot and seed together alone.

3) Identify potential solutions

a) I will take a total of seven trips.

b) I take the parrot first and return to pick up the cat.

c) I drop off the cat and return with the parrot.

d) I drop off the parrot and return with the seed.

e) I return to get the parrot and arrive back at the other side with all three items.

4) Evaluate each potential solution

a) Each of the solutions meets the goals outlined in the problem.

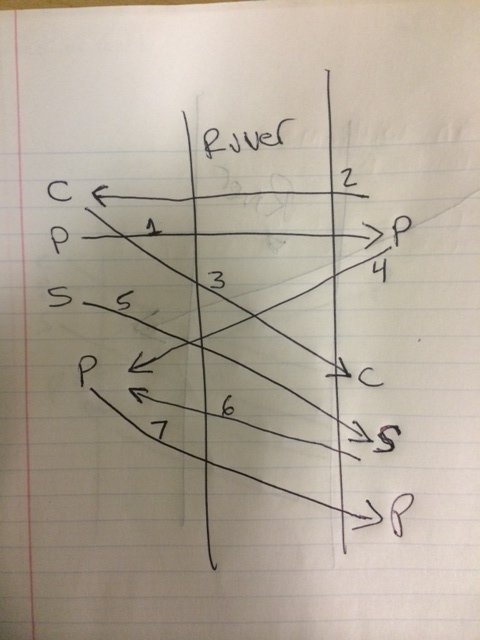
b) Each solution works in all case scenarios tested.

5) Choose a solution and develop a plan to implement it.

a) The solution described in 3 a – e, when tested meets the constraints outlined and meets the goal in as described in 1a.

b) This image shows the solution See Image 1

# Image 1



1) Define the problem

a) Given the following data: 20 socks total, 5 pair are black, 3 pair are brown and 2 pair are white. What is the least number of socks I can select blindly and have one of the following results?

At least one matching pair.

At least one matching pair of each color.

b) What insight can you offer into the problem that is not immediately visible from the word problem alone?

c) The goal is to find a way to calculate the odds of blindly selecting a matching pair and a matching pair of each color.

2) Break the problem apart

a) The constraints are that I have to randomly select the socks without seeing them.

b) Calculate the odds of selecting a pair from three different colors.

c) Calculate the odds of selecting a pair of each color from three different colors.

3) Identify potential solutions

a) The potential solution for both goals is the use of mathematics and the determining of odds.

a) If there are at least one pair of three different colors, the math tells us we would need to select four socks to guarantee one pair of matching color. I calculated this in my head.

b) In order to pick one pair of each color we would have to select enough socks to mathematically guarantee the odds. This time I drew a diagram to help me calculate the least number of socks I would have to select to guarantee a result of one pair of each color.

4) Evaluate each potential solution

a) The solutions both meet the goals.

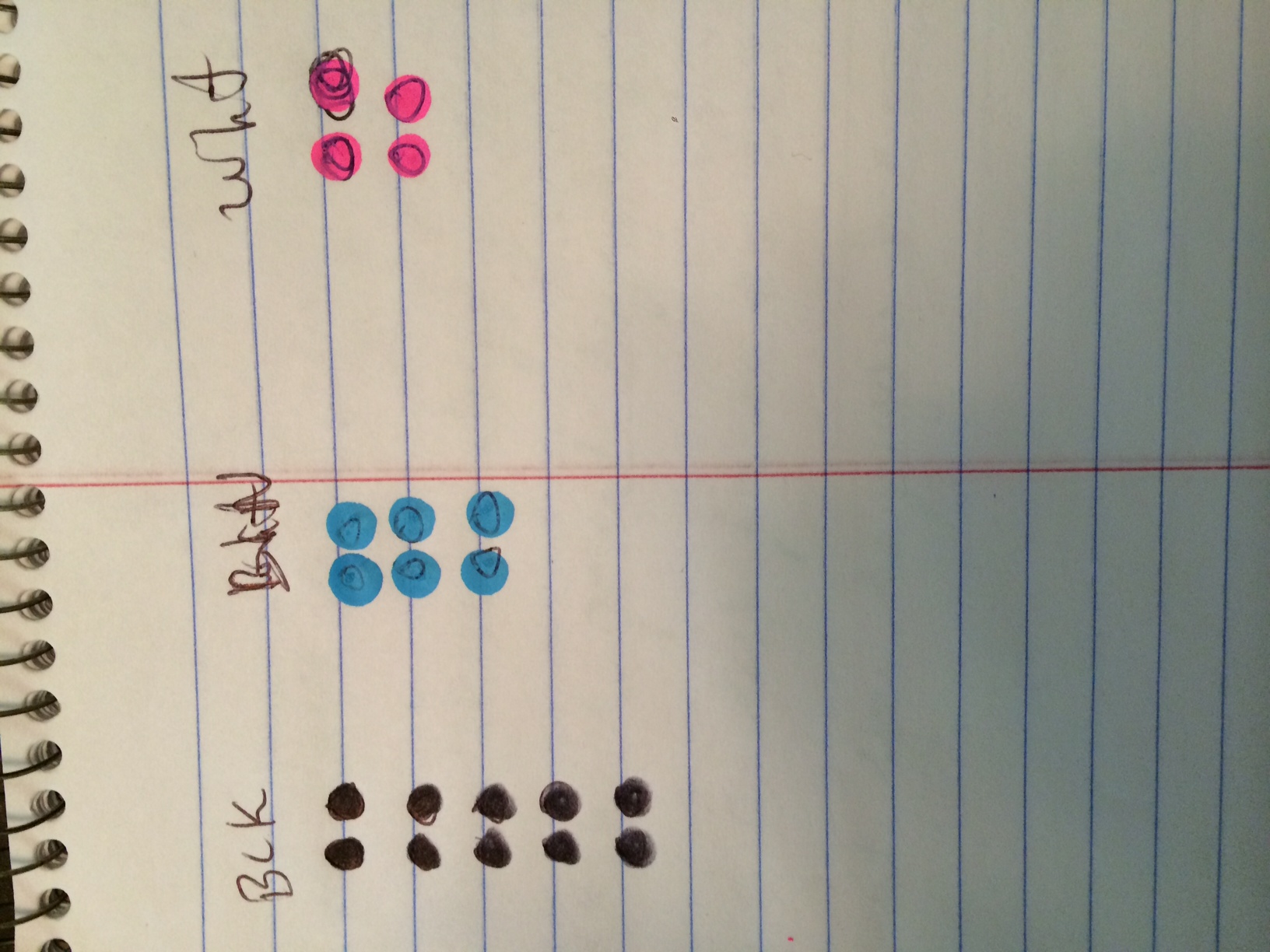
b) Each solution works in all cases and scenarios tested.

5) Choose a solution and develop a plan to implement it.

a) If you have a total of 20 socks in 3 colors and you select 3 socks, you could end up with 1 of each color. By selecting a 4th sock you are guaranteed to select a duplicate color. With a total of 20 socks that include 5 pair of black, 3 pair of brown and 2 pair of white socks, you would have to select a minimum of 18 socks to guarantee 1 pair of each color.

b) Using my hand drawn diagram, I counted the socks I would remove. I started at 2 and continued increasing the number until I had achieved the desired goal or solution. See Image 2

# Image 2



1) Define the problem

a) Counting the fingers on my left hand starting with my thumb as number 1, first finger as 2, middle finger as 3, ring finger as 4 and little finger as 5 and then reversing back to the ring finger as 6 and so on, figure out what finger will be 10, 100 and 1000.

b) Mathematics tells me that there is a pattern or formula I could use to figure this out.

c) My goal is to identify what finger will be the 10th, 100th and 1000th count.

2) Break the problem apart

a) I have 5 fingers; however with this counting method after the first count of 5, I only gain 4 counts in each additional direction.

b) My sub-goal is to identify a pattern and or a formula.

3) Identify potential solutions

a) Finding a pattern for this problem seems to be the most efficient solution. I could figure out a formula but I want to apply the K.I.S.S theory to this. Through trying this out several times, I have noticed that all multiples of 10 stop on the first or ring finger. The first 10 stops on the first finger, 20 and 30 stop on the ring finger and then 40 and 50 on the first finger. This pattern repeats therefore, multiples of 50 stop on the first finger.

4) Evaluate each potential solution

a) While developing a formula is a viable solution, identifying a pattern will meet the goals for this problem.

b) Using this pattern works in each case of counting for 10, 100 and 1000.

5) Choose a solution and develop a plan to implement it.

a) Using the pattern I identified in 3a, I have determined that counts of the first 10 stop on the first finger and counts in multitudes of 50 and 100 stop on the first finger. This will tell us that counts of 10, 100 and 1000 will all stop on the first finger.

b) My hand was the best test tool for this problem. I counted out 10, then 20, then 30, then 40, then 50 and so on up to 100. I took note of what finger I stopped on at each plateau. This enabled me to verify a consistent repetitive pattern.