1) Define the problem

a) The man must get the 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 man, cat, parrot, and seed to the other side of the river with the outlined constraints.

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.

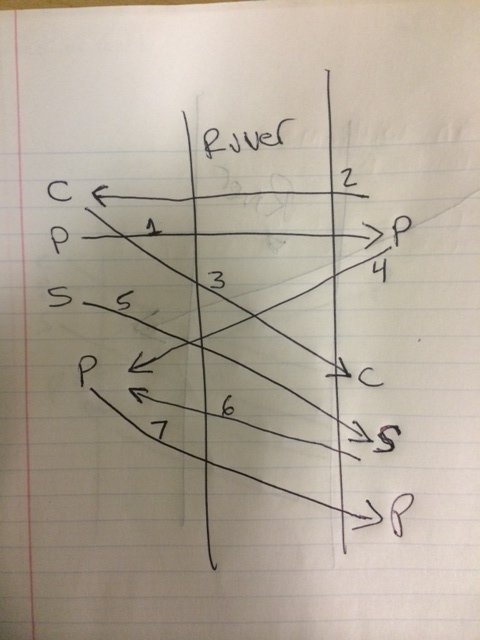
b) Each solution works in all case scenarios tested.

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 in a drawer, 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.

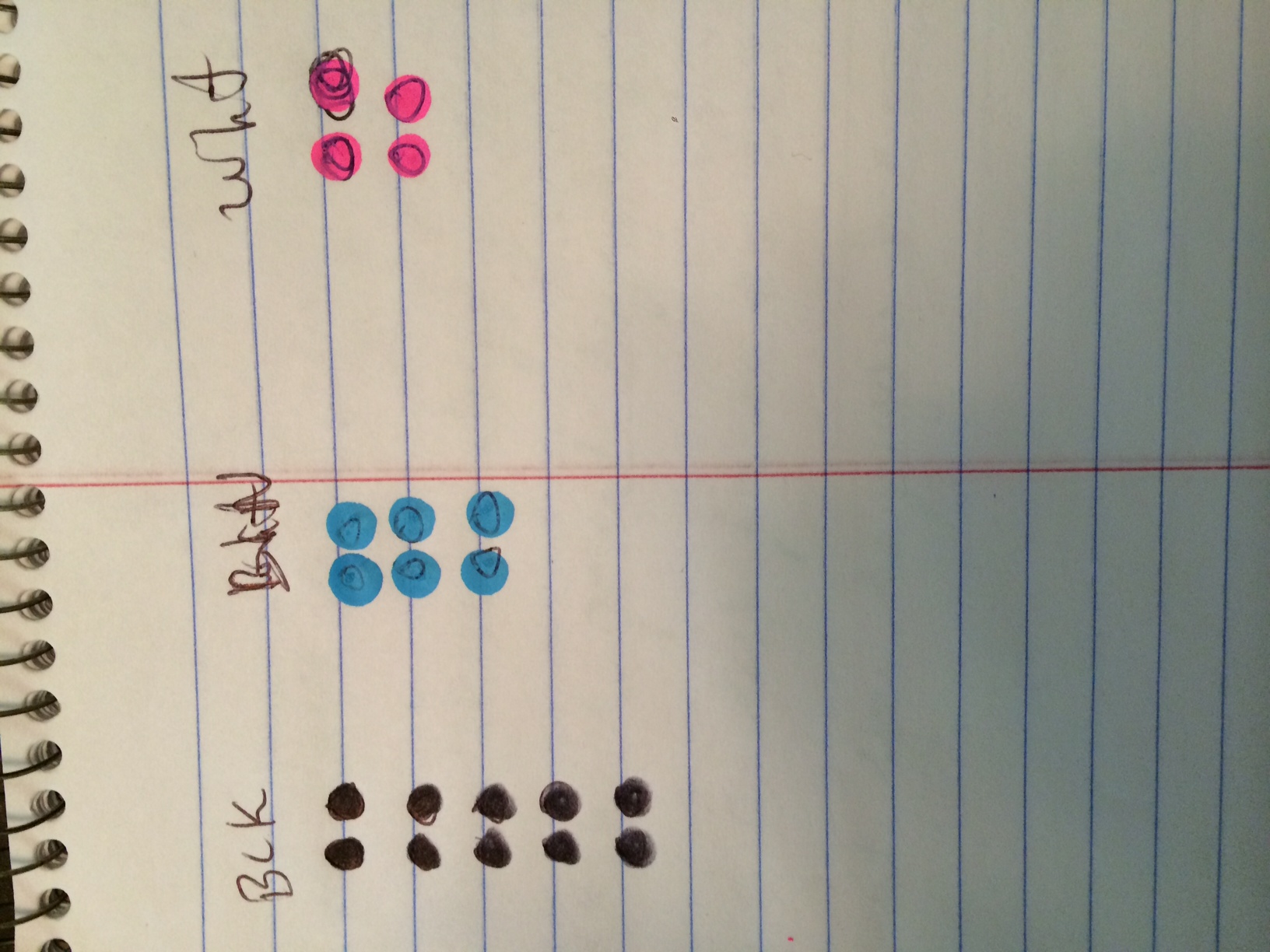
b) Each solution works in all cases and scenarios tested.

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) Do this in your own words.

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

the word problem alone?

c) What is the overall goal?

2) Break the problem apart

a) What are the constraints?

b) What are the sub-goals?

3) Identify potential solutions

a) For each of the sub-problems you’ve discussed in #2, what is a possible solution?

4) Evaluate each potential solution

a) Does each solution meet the goals?

b) Will each solution work for ALL cases?

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

a) Explain the solution in full.

b) Describe some test cases you tried out to make sure it works. (You can include

drawings and diagrams as part of your explanation as long as they are clearly

communicating the solution).