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Problem Solving

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

1. Define the problem- A man has a cat, a parrot and a bag of seed and he needs to get them across a river. He only has enough room for himself and one other item and the cat will eat the parrot if you leave them together as well as the parrot eating the seed. The problem is how does the man get all three items across the river without losing any of them.
2. Break the problem apart- The man can’t leave the Cat alone with the Parrot and he cannot leave the parrot alone with the seed but he only has room for one of them at a time on his ship. The sub-goals would be to make sure none of the items is lost due to the wrong decision.
3. Identify potential solutions- There is really only one solution to this problem as you can not leave the cat alone with the Parrot and the Parrot alone with the seed, so this means that you have to take the parrot across the river first as it is the only variable that is involved in both scenarios.
4. Evaluate each potential solution- The solution absolutely meets the goal when you take the parrot across the river first he can no longer be eaten by the cat and he is also not able to eat the seed if you take the cat across first. Any other solution only makes it so you can get two of the items across.
5. Implement plan – The man takes across the parrot first and the cat sits and looks at the bag of seed in disgust. The man then comes back to the other side and grabs the cat to bring over to the other side and then the seed.

Socks in the Dark:

1. Define the problem- you have 20 socks in a drawer 10 of them are black 6 of them are brown and 4 of them are white. You are not allowed to look but need to pick out at least one matching pair as well as at least one matching pair for each color.
2. Break the problem apart- You need to pick the pairs of socks but you are picking them in the dark and are also not allowed to look at the socks until after you have made your picks.
3. Identify Potential Solutions- referencing the worksheet I will separate these with part and part b. In part A you could do it a different couple of ways, one would be the way of picking the black socks as the pair you are looking for this gives you the greatest probability as it has the most socks. You could also choose brown as your pair or white but those both have smaller probabilities than the black pair. In part B you have to look at each of the percentages for the sox and you can individually figure out what the chance of drawing each different sock or for each pair. I think that the individual socks make the most sense as it sounds like each sock is in the drawer individually.
4. Evaluate each potential solution- Part A – By choosing to pick the black socks you make your chances of picking a pair of them the best because there are that many more black socks than any other. You could do either brown or white but you would have to choose more socks from the drawer than if you were going for black socks. Part B- For the second problem I would have to say that you have to look at each sock color so that you know what the percentages are then you look at each one individually to see how many socks you would need to pull for each pair then add those numbers together and you would have your number for amount of socks needed to be pulled.
5. Implement Solution- Part A – For the solution to part A I am looking to pull a pair of black socks. There are 20 total socks in the drawer and 10 of them are black so some simple math shows that 50 percent of the socks are black. So if you pull two socks at once one of them is going to be black, therefore you only need to pull 4 socks to be sure you have a black pair. Part B – To make sure you have a pair of each color you need to look at the percentage of each color of sock in the drawer so as we already saw we have the 50% black socks the brown sock is 30% and the white socks are 20%. So we would need to pull 4 to make sure we have a pair of black socks, to be sure we have a brown pair you need to pull 6 socks to be sure you have a pair so that puts our total at 10 socks overall. The white socks are the trickiest as there are only four in the pile and a 20% chance that you will grab one. But to make sure you have a pair you would need to pick up 10 socks, which would be all of the socks. If you were able to see them after you picked them it would be different.