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I.

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

A man finds himself on a riverbank with a cat, a parrot and a bag of seed. He needs to transport all three to the other side of the river in his boat. However, the boat has room for only the man himself and one other item (either the cat, parrot or seed). In his absence, the cat could eat the parrot, and the parrot would eat the seeds. Show how he can get all the passengers to the other side, without leaving the wrong ones alone.

1. Define the Problem
   * + - 1. The problem is that the man only has room for himself and one other on his boat. If he leaves one with the other, it could eat it.
         2. Some incite I would offer is that the man should not try to bring a cat, a bird, and a bag of seed onto a boat that only fits two without one trying to eat the other. At least bring a bigger boat to fit them all at once.
         3. The overall goal is for the man to transfer all three across the river without harm happening to each of the three.
2. Break the Problem Apart
   * + - 1. The constraints are that the man had to think about his situation because one will eat the other.
         2. The Sub goals the man has to endure are to get each one across the river to form a greater goal that they all arrive safe.
3. Identify Potential Solutions
   * + - 1. The possible solutions for the sub goals are that the man will have to bring the bird first. The cat will not eat the seed and seed cannot eat cats. Then he will bring the seed over, followed by the cat.
4. Evaluate each Potential Solution
5. If the bird is in a cage, then yes.
6. No.
7. Choose a Solution and Develop a Plan to Implement it.
8. The man would not be able to cross the river without taking the bird first, then the seed, lastly the cat. The only other way is the same result in reverse (cat first, then seed, followed by bird) because no matter what the situation is, the bird is always left with the seed. It is not explained if the bird is in a cage or not. So if the bird is in a cage, then the man’s solution is what I think is the only way possible. Bird, Seed, then cat.
9. My thoughts are you would never want the cat and bird left behind together so that limits your choices on who goes first. It would either have to be bird, seed, cat or cat, seed, bird or cat, seed, bird. Either way the bird is always felt with the seed.

II.

* Socks In The Dark

There are 20 socks in a drawer: 5 pairs of black socks, 3 pairs of brown and 2 pairs of white. You select the socks in the dark and can check them only after a selection has been made. What is the smallest number of socks you need to select to guarantee getting the following:

1. At least one matching pair
2. At least one matching pair of each color

1. Define the Problem

1. The problem is trying to get a pair of matching socks without seeing them.
2. You will have a greater chance getting a pair of black socks rather than brown or white.
3. The overall goal is to get one matching pair and then a matching pair of each color.
4. Break the Problem Apart
   * + - 1. The constraints are that there is a higher quantity of black socks so it is more difficult to get a matching pair of brown and white.
         2. The sub goals are to get a pair of socks in each color with as few attempts. To get only one pair you would only need to grab 4 socks. To get all three pairs you would grab 10 socks.
5. Identify Potential Solutions
   * + - 1. If you grab 4 socks for one pair you are most likely aiming for black because black consists of 50% of the sock. Then you grab 10 socks because your chances of gathering a pair in each color would be greater because 50% are black, 30% are brown, and 20% are white.
6. Evaluate each Potential Solution

(a) Yes.

(b) Yes.

1. Choose a Solution and Develop a Plan to Implement it.
   * + - 1. Grabbing 10 socks would give you a greater chance at getting a pair in each color on your first attempt because your chances are so low when it comes to getting a pair of white and brown.
         2. To test this I took 5 pairs times two, which equal 10. Then 3 pairs time two, this equals 6. Lastly, 2 pairs times two, which is 4. I looked at the percentage that would equal and got 50%, 30%, and 20%. Then looked at the fact you need 6 socks to get all 3 pairs then just added a couple socks on each pair, which gave me 10 socks. Since 50% are black I figured you would only need to attempt to grab 4 socks to get 1 pair.

III.

* Predicting Fingers

A little girl counts using the fingers of her left hand as follows: She starts by calling her thumb 1, the first finger 2, middle finder 3, ring finger 4, and little finger 5. Then she reverses direction, calling the ring finger 6, middle finger 7, first finger 8 and thumb 9, after which she calls her first finger 10 and so on. If she continues to count in this manner, on which finger will she stop?

a) What if the girl counts from 1 to 10?

b) What if the girl counts from 1 to 100?

c) What if the girl counts from 1 to 1000?

Define the Problem

(a) To figure out what finger she will stop at if she continues to count in the same pattern.

(b) You will always land on either your pointer finger or ring finger.

(c) The overall goal is to figure out which finger she will stop at.

Break the Problem Apart

1. I don’t see any constraints. Just to follow a pattern until you reach the numbers.
2. The sub goals are to keep the same pattern till she reaches the numbers 10, 100, 1000.

Identify Potential Solutions

(a) Since you will always land on either your index or ring finger, you count by tens to figure out which finder you will land on at 10, 100, 1000.

Evaluate each Potential Solution

(a) Yes.

(b) Yes.

Choose a Solution and Develop a Plan to Implement it.

1. The solution it to follow the pattern that she is currently undergoing then once you see where increments of ten land, you just times by ten.
2. I got 10 on your index finger, 100 on your ringer finger and 1000 on your ring finger. All increments of 10 will land on your index finger and all increments of 100 will land on your ring finger. I came up with this simply by counting by 10s on my index and ring until I reached 1000.