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Web Programing Fundamentals – S2

Problem Solving Activity

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

**Problem**: Can’t leave the cat and parrot together, cat will eat the parrot. If you leave the parrot and bag of seed, it will eat the seed. How can we get everything across the river safely?

**Possible Solution**: Going to have to take multiple trips with the boat driver.

* Can’t leave cat and parrot, or parrot and seed. Have to take parrot first so its only cat and seed.
* Have to bring parrot over, and then bring it back. Parrot is always a variable.

**First solution**: Leave the cat and bag of seed. Cant leave the parrot and seed, or cat and parrot.

**First**, take the parrot over and leave it on the side. Go back and get the cat. Bring it to the other side and bring the parrot back with you. Leave the parrot, and bring the bag of seed to the other side and leave it with the cat. Go back and pick up the parrot.

It took me a minute to figure out he has to take multiple trips, and then I also realized that the parrot was key in this.

**Socks in the Dark:**

**Problem**: with 20 pairs of socks, we need to select at least one matching pair, and one matching pair of each color, all while selecting them in the dark.

1. **Possible Solution for one matching pair**: You need to pull 4 socks. Say on the first 3 pulls you get one black, one brown, and one white. Your next pick will have to be one of the 3 colors, giving you one matching pair of socks.

**Constraints**: Need to figure out how to get one matching pair, and also one matching pair of each color. Potentially you could get one pair of each color in 6 picks, but you still might not. If you grab 12, you have a higher chance and will get 3 pairs of the same color.

B. **At least one matching pair of each color:** You would need to pull at least 12 socks. Since it takes 4 socks to have one matching colored pair, you would have to pull 12 in order to guarantee 3 pairs of each color.

Predicting Fingers

Problem: What finger will the girl land on if she counts from 1 to 10. Then 1 to 100? 1 to 1000?

Thumb is 1, first finger 2, middle finger 3, ring finger 4 and pinky 5. Then reverse, the numbers going backwards.

1. If she counts from 1 to 10 = stop on first finger – finger 2
2. If she counts from 1 to 100 = stop on ring finger – finger 4
3. If she counts from 1 to 100 = stop on ring finger again.

**Why?** Counting from to 10 lands on first finger. In order to figure out what she would land on from 1 to 100, you have to multiply 10 x 10 = 100. Count ten fingers more from where you left on 10 and you will land where you should be for 100 instead of actually counting it all out.

**How to get to 1000 without actually counting**: If you land on your ring finger on number 100, you just multiply 100 x 10=1000. Just count ten fingers more and you will land where you should be if you were to actually count to 1000.