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

1. **Define the problem**
   1. A man needs to get a cat, a parrot and a bag of seed to the other side of the river, but he only has room for himself and one other passenger.

* 1. The overall goal is to get all of the passengers to the other side without losing any of them.

1. **Break the problem apart**
   1. None of the animals can be left alone together because they will devour each other and the parrot can’t be left with the seed because he will devour it.
   2. Sub-goals
      1. Getting to the other side efficiently
2. **Identify potential solutions**
   1. Putting the parrot on top of the mans shoulder, taking the cat across, then going back for the seed.
   2. Buy a raft with a rope to bring the items across and put only the cat and the seed on the raft and the parrot in the boat
3. **Evaluate each potential solution**
   1. This solution works for most cases but may not be the best fit. i.e. the parrot might fly away.
   2. This solution seems to be the best fit for ALL cases. It is more practical and doesn’t run the risk of anything flying away or escaping.
4. **Choose a solution and develop a plan to implement it**
   1. The man should buy a small raft and place the cat and seed in the raft, and place the parrot in the boat. He can either tie the raft to the boat or hold onto the rope and pull the raft along.

**Socks in the Dark:**

1. **Define the problem**
   1. What is the smallest amount of socks you need to select to guarantee getting
      1. At least one matching pair
      2. At least one matching pair *of each color*
   2. Probability plays a big part in this situation.

1. **Break the problem apart**
   1. Selecting the socks in the dark, can only check them after a selection has been made, what is the *minimum amount* of socks that can be selected
      1. 20 pairs of socks
      2. 5 pair of socks (10 socks)
      3. 3 pair of socks (6 socks)
      4. 2 pair of socks (4 socks)
   2. Minimum amount of socks that can be selected to get at least one matching pair and at least on matching pair of each color
2. **Identify potential solutions**
   1. Use probability: the minimum amount of socks that can be selected to find a matching pair is 4.
   2. The minimum for 1 of each color, is 6 socks
3. **Evaluate each potential solution**
   1. Probability seems to be the best solution in this case, that meets the goals.
4. **Choose a solution and develop a plan to implement it**
   1. Probability is the best solution, selecting 4 socks to get one matching pair and 6 socks to get at least 1 matching pair of each color. I didn’t draw this one out but I did write it out.
      1. 20 pairs
      2. 5 pr (10 socks) Black
      3. 3 pr (6 socks) Brown
      4. 2 pr (4 socks) White

**Predicting Fingers:**

1. **Define the problem**
   1. If the girl continues to count in this manner, on which finger will she stop?
      1. What if the girl counts from 1 to 10
      2. What if the girl counts from 1 to 100
      3. What if the girl counts from 1 to 1000
   2. Probability will play a big part in this situation also
2. **Break the problem apart**
   1. The girl continues to count in an uneven manner
      1. The girl counts 1 to 10
      2. The girl counts 1 to 100
      3. The girl counts 1 to 1000
   2. To find which finger she will stop on at 10 100 and 1000
3. **Identify potential solutions**
   1. Use probability to solve each one
4. **Evaluate each potential solution**
   1. Probability is the best solution to solve for this
5. **Choose a solution and develop a plan to implement it**
   1. Probability is the best solution to find which finger she will stop on. I actually did this, although I had to do it several times because I lost count, but the predictability was close to the actual.