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

**1) Define the problem**

*a) Do this in your own words*.

You need to get The Cat, The Bird, and The Seed across the river bank without leaving one in the others bad company.

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

Maybe after reading the problem ask yourself questions about the problem and think about the possibilities these questions hold.

*c) What is the overall goal?*

The overall goal is to get the cat, the bird, and the bag of seed across the river without leaving the bird with the cat and without leaving the bag of seed with the bird.

**2) Break the problem apart**

*a) What are the constraints?*

Limited boat space, the amount of times having to cross the river, Can’t leave the cat with the bird and can’t leave the bird with the seed.

*b) What are the sub-goals?*

Getting the Cat across, getting the Bird across, and getting the Seed across.

**3) Identify possible solutions**

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

Take the cat across alone, take the bird across alone, and take the seed across alone. Take all three at one time.

**4) Evaluate each potential solution**

*a) Does each solution meet the goals?*

Each solution meets the goal that was stated.

*b) Will each solution work for all cases?*

It seems that in these cases it would work properly.

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

*a) Explain the solution in full.*

I would take a more practical approach, by putting the cat in the boat, putting the bird on my shoulder, and the seed in my lap.

*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).*

In the solution I would say the only problem I would have to be the ability to keep the cat from attacking the bird and the bird from getting the seed in my practical solution.

**Socks in the Dark**

**1) Define the problem**

*a) Do this in your own words.*

You have 20 socks in your drawer, with several pairs of 3 different colors. With these the challenging part comes when you are in the dark. That being said the goal is you have to figure out the smallest number of socks necessary to accomplish 2 tasks of at least one matching pair, and at least one matching pair of color.

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

Completely get rid of the words and think of them as just numbers and create a probability equation to determine the answers.

*c) What is the overall goal?*

The overall goal of this problem to figure out the smallest amount of socks needed to complete the sub-problems.

**2) Break the problem apart**

*a) What are the constraints?*

The constraints for this problem would definitely doing it in the dark because it not being in the dark you could just collect the socks you desire. Another constraint would definitely be the odd number of socks indicating that there is going to be an extra black and brown sock.

*b) What are the sub-goals?*

Sub goals for this would be to get 1 matching pair with the smallest amount of socks possible, and at least one matching pair of each color.

**3) Identify potential solutions**

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

For a possible solution, you could turn the light on and choose what you are looking for.

**4) Evaluate each potential solution**

*a) Does each solution meet the goals?*

It does meet set goals.

*b) Will each solution work for ALL cases?*

It will work for all solutions.

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

*a) Explain the solution in full.*

The solution for this would be to turn on the light choose the ones you want and for this too work you would want to take around half of the socks and you would need around 10 socks for the smallest amount.

*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).*

**Predicting Fingers**

**1) Define the problem**

*a) Do this in your own words.*

Girl counts by 1’s on her hand by ones starting on her thumb and counting towards her pinky finger.

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

Don’t think too hard on this problem, think simple.

*c) What is the overall goal?*

To figure out which finger she will stop on at designated numbers.

**2) Break the problem apart**

*a) What are the constraints?*

She has a limited number of fingers on her hand, the possibility of losing track by counting that way. The large number in the questions.

*b) What are the sub-goals?*

The sub-goals are to figure out which finger she will stop on by counting from 1-10, 1-100, 1-1000.

**3) Identify potential solutions**

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

Well if you read carefully it gives you the answer to all 3 questions. They are the same due to the 3 numbers chosen to stop on.

**4) Evaluate each potential solution**

*a) Does each solution meet the goals?*

The solution does meet the goals stated in this problem.

*b) Will each solution work for ALL cases?*

The solution will work for each case because they are all connected because of the number chosen.

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

*a) Explain the solution in full.*

If she stops at 10 on her first finger, essentially they would all end on that same finger because the are all products of 10.

*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)*

What you could do would be to count to 10 regularly, and knowing the next 10 would end up on the same finger you could count by tens then by hundreds.