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Web Programming Fundamentals

Activity: Problem Solving

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

**1)  Define the problem**

The problem is that there’s a man that want to cross the river, but he just can carry one item with him. He needs to take with him a cat, a parrot and a bag of seeds but he cannot leave them alone because they cat could eat the parrot and the parrot could eat the seed.

An insight is that the problem doesn’t show a limit number of trips that the man can make in his boat.

The overall goal is that the man has to take the cat, the parrot and the bag of seed to the other side of the river.

2)  **Break the problem apart**

The main constraint is that the boat has only space for the man and an extra item.

The sub-goal is that the man cannot leave the cat with the parrot alone and the parrot with the seeds alone.

3)  **Identify potential solutions**

First of all is that he will need to make four trips to transport all the items.

Then he will has to take first the parrot because it’s like the central object, then he has to return for the bag of seeds and take them to the other side, but he has to return with the parrot so it can’t eat the seeds. After that he leaves the parrot and take the cat to the other side and the he has to come back for the parrot.

Socks in the Dark:

**1)  Define the problem**

You have 20 socks of three different colors, but you don’t have any light to see and you need to match at least one pair and matching one pair of each color.

2)  **Break the problem apart**

The main constraint is that theirs is no light to see the socks. Another constraint is that there 3 different colors.

The sub goal is that you have to match one pair of each color at least.

3)  **Identify potential solutions**

A solution for matching one pair is to take three socks at the same time. And to match one pair of each color you must take 9 socks at the same time.

Predicting Fingers:

1. **Define the problem**

A girl counts to ten with each finger of his left hand. She starts with number one in her thumb and ends with her first finger as 10 and so on. We need to know if she continues counting this way which finger will she stop if she counts to 100 and 1000.

2)  **Break the problem apart**

The main constraint is that every 10 units the count stops in a different finger. The sub goals are which fingers will she stop counting when she stops at 100 and 1000.

3)  **Identify potential solutions**

I count from 1 to 100 stopping in 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, and realized that the count stops in the first finger twice every two times and the same with the ring finger. But every hundred units it will change the start of the finger for example for the 210 it will start with the ring finger and the 310 will start with the first finger and so on. So following that order you must extrapolate until 1000. So the results are for 100 the ring finger and for 1000 the ring finger too.

**4)  Evaluate each potential solution**

a) Does each solution meet the goals?

Yes, every problem has its own solution. I have realized that the three problem are different because they can be just logical or some of them need more than just counting, you have to evaluate every source and variable. It’s important to consider each variable.

 b) Will each solution work for ALL cases?

No, each case has a different solution. They are different problems with different variables that require another strategy from the others.

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

a) Explain the solution in full.

I count from 1 to 100 stopping in 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, and realized that the count stops in the first finger twice every two times and the same with the ring finger. But every hundred units it will change the start of the finger for example for the 210 it will start with the ring finger and the 310 will start with the first finger and so on. So following that order you must extrapolate until 1000. So the results are for 100 the ring finger and for 1000 the ring finger too.

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).