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| Video Title | **Prisoners and Candies** | |  |
| Topic | Logic | |  |
| Aim(s) | Train the ability to extrapolate information from a problem, work by exclusion. | |  |
| Length | 20min | |  |
| Camp Location |  | |  |
| Facilitators |  | |  |
| N. of students |  | |  |
| Date |  | |  |
| Resources  needed | Pen, paper, 11 candies (or surrogate) for each group of 4 learners | |  |
| Preparations | Division in groups of 4 is optional: groups should not be competing but rather help to check each other solution | |  |
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| **Video time** | **What facilitator does** | **What learners do** | |
| 00:00 - 00:26 | General VMC Video Introduction | |  |
| 00:26 - 00:53 | Title and drawings | |  |
| 00:53 – 02:10 | Stating the riddle | |  |
| 02:10 – 02:28 | Introduction of the first experiment | |  |
| After watching the video | * Assist the process, provoke thoughts * When a possible solution is suggested, ask the learners to enact the series of questions in the case of the suggested solution and check that each answer can be explained. | * Discuss what information they can get from the statement of the riddle * Figure out which cases can be excluded * Enact possible solutions | |

**ERRATA CORRIGE:** The video says that each mathematician has a number of candies “greater” than one. It should be “greater or equal than one” instead!

**Possible questions to help the learners:**

* **Question**: Would a prisoner ask the question: 'do you know if you have more candies than me?' if he had the minimum possible amount of candies?  
  **Answer**: Yes
* **Question:** If a prisoner is certain that he cannot have more candies than the previous prisoner, would he answer 'I don't know' to the question 'do you know if you have more candies than me'?  
  **Answer**: No, he would reply: 'I know that I don't'.

**Solution:**

If each prisoner has at least one candy (the video says “greater than one”, but it should actually be “greater than or equal to one”), that means that they all have 1 + some number such that the sum is 11.

From now on we can forget about the one candy that each one must have, and focus on the other seven candies (11 - 4 = 7). Therefore every prisoner can have from 0 to 7 candies, and the sum of all candies must be seven.

* When Prisoner 2 tells Prisoner 1 that he does not know whether he has more candies than him, everyone knows that Prisoner 2 has at least one candy. In fact, if Prisoner 2 had no candies, he would have answered “I know that I do not have more candies than you”.
* When Prisoner 3 tells Prisoner 2 that he does not know whether he has more candies than him, everyone knows that Prisoner 3 has at least two candies. In fact, if Prisoner 3 had one or two candies, he would have answered “I know that I do not have more candies than you”, as Prisoner 3 known but the previous point that Prisoner 2 has at least one candy.
* Now we know that Prisoner 2 has at least one candy and Prisoner 3 has at least two candies, and the remaining four can be distributed in all possible ways. When Prisoner 4 tells the others that he knows how many candies each prisoner has, we know that Prisoner 4 must have all four remaining candies, as this is the only way he could possibly have all the informations.
* So the answer is that the candies of the four prisoners are (0,1,2,4).