

Junior Batch

In our Maths Circle, we learnt that “**solving a problem**” did not mean just guessing the final answer. It meant figuring it out properly, step-by-step. We also learnt that “**presenting a solution**” was not just writing down the final answer. It meant explaining *how* we got there clearly and logically, showing all the important reasons and rough work.

In today’s session, we continued the theme from our last sessions and solved problems involving logical statements.

We learnt to decide whether a statement was true or false and to explain our answers using examples and counterexamples. For example, we saw that the sum of two odd numbers is always even, but a number greater than 5 need not be greater than 10. We also discussed statements about numbers, shapes and everyday situations. These problems helped us check whether a statement was always true or whether we could find a case where it failed.

We then learnt the difference between a **necessary condition** and a **sufficient condition**. A necessary condition is something that must be present for a particular result to be possible, but it may not be enough by itself. For example, having flour is necessary for baking a normal cake, but flour alone is not enough to bake one. A sufficient condition guarantees the result, even if it is not the only way to get that result. For example, being a square is sufficient for a shape to be a rectangle, but a rectangle need not be a square.

We used examples from everyday life to understand these ideas. Having power is necessary to watch a movie on a television, but power alone does not guarantee that a movie can be played. Similarly, having a Rs. 100 note is sufficient to pay for a Rs. 20 chocolate, but it is not necessary, as we can pay using other notes or coins. These examples helped us understand why a condition can be necessary without being sufficient, or sufficient without being necessary.

Finally, we looked at conditions that are both necessary and sufficient. For example, a number is a multiple of 10 if and only if it ends in 0. Similarly, a rectangle is a square if and only if its length and width are equal, and a triangle is equilateral if and only if all three sides are equal. In these cases, the condition works in both directions: it is necessary for the result, and it is also sufficient to guarantee the result.

The main idea of today’s session was to check exactly what a statement tells us, rather than assume that it works in every case. We practised giving clear reasons for our answers and using examples and counterexamples to support our thinking. We also learnt to check whether a condition is necessary, sufficient, or both. These ideas help us make correct statements and explain our mathematical reasoning clearly.