

RAM Math Circle - IMSc Chennai
Synopsis for September 27, 2026

This Math Circle session is divided into three main segments:

- How to Think (and Argue!) Like a Mathematician
 - Hands-on Toothpick Puzzles and • Origami
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How to Think (and Argue!) Like a Mathematician

The session began by exploring what it truly means to solve and present a mathematical problem. The class established that simply guessing a final answer is insufficient; true problem-solving requires explaining steps clearly and showcasing logical reasoning. Students collaborated to practice arguing and writing like actual mathematicians.

- **Worst-Case Scenarios:** Students tackled logic problems, such as determining the minimum number of picks needed to guarantee a matching pair of marbles from a dark bowl. By testing their initial guesses against the absolute “worst luck” scenario (e.g., picking one black and one white marble first), they proved that just three picks guarantee a pair. They practiced several problems around this theme to learn how to establish mathematical certainty.
- **Cause and Effect:** Students examined logical rules, learning that they often function as “one-way streets.” By drawing cause-and-effect diagrams, they visualized how a single result (like a great mood or dirty shoes) can stem from several different alternative causes.
- **Counterexamples:** Using the analogy of finding a single sour mango, students learned that disproving a universal mathematical rule requires only one valid counterexample.

The first half of the session concluded with a few advanced challenge problems.

Note: For full details of the specific problems and puzzles discussed during this session, please refer to the worksheet dated September 27, 2026.

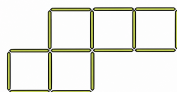
Hands-on Toothpick Puzzles

Next, the students enjoyed the following toothpick puzzles. The main idea is to understand the right temperament and focus on how to sustain perseverance for a little more time.

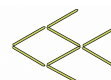
Move 2 toothpicks so that it faces the left.



Move only 2 matchsticks so that you get 4 (identical) squares. There should not be any spare matchsticks left.



Moving only three matches, make the fish in the figure swim to the right.



Origami

We learned how to make isosceles tetrahedron from 2 square sheet of paper.