

UW Math Circle

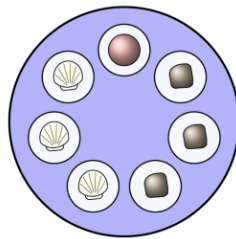
Week 3 – Talking About Math

Presentation Tips

1. Start by stating the problem in your own words, and summarize the solution you're about to present.
2. Explain each step clearly and justify everything you say. We should be able to follow your solution even if we haven't worked on the problem ourselves.
3. If something's important, write it down! Write full equations (eg. " $x = 10$ ", not just "10"). Label your diagrams clearly.
4. Talk to your audience! Face the room, and speak up so everyone can hear you.

Worksheet A

1. You have a drawer of ten red socks and ten blue socks. You take socks out of the drawer without looking. How many socks must you take to guarantee you grab a matching pair?
2. Three rocks, three seashells, and one pearl are placed in identical boxes on a circular plate in the order shown. The lids of the boxes are then closed, and the plate is secretly rotated. You can open one box at a time. What is the smallest number of boxes you need to open to know where the pearl is, no matter how the plate was rotated?



3. Sherlock and Mycroft are playing Battleship on a four-by-four grid. Mycroft hides a single three-by-one cruiser somewhere on the board. Sherlock can pick squares on the grid and fire upon them. What is the smallest number of shots Sherlock has to fire to guarantee at least one hit on the cruiser?
4. A complete set of the Encyclopedia of Mathematics has 10 volumes. There are ten mathematicians in Mathemagic Land, and each of them owns two volumes of the Encyclopedia. Together they own two complete sets. Show that there is a way for each mathematician to donate one book to the library such that the library receives a complete set.