This miniproject asks you prove a conjecture of something that I would view as a puzzle (and something that is one that would be cool to solve in Math Club).

Write the numbers $1, 2, 3, \ldots, 2n$ on a blackboard, where n is an odd integer. Pick any two of the numbers, say j and k. Write $|j - k|$ on the blackboard and erase both j and k. Continue in this manner until only one integer is written on the board. Prove that this number must be odd.