Last Mark Strategy

HOST GUIDE - includes solutions | A4 | v1.0.0

2-6 players, with an adult host | Suggested ages 9-12 | Plan 20-30 minutes

Keep this guide with the adult host. Let the group try before offering hint 1, then hint 2. Read the explanation only when the group is ready to check its work.

Support your group

With 3-6 people, form two teams and rotate the person holding the pencil. First practise with one mark in each of two piles. Keep the final-mark-loses rule written beside the board.

Warm-up: two single marks

Hint 1: Do not take from both piles.

Hint 2: Leave exactly one mark.

Answer: Empty either one pile, leaving one mark for the other player.

The opponent has only one legal move: take the last mark and lose. The two choices are equally good.

Round 1: a useful losing position

Hint 1: Try leaving only one mark in total.

Hint 2: Taking both marks from one pile is legal.

Answer: Remove both marks from the second pile, leaving (1, 0).

Leaving one mark forces the opponent to take the last. Removing only one from the second pile leaves two single marks, a winning position for the opponent.

Round 2: two piles of different sizes

Hint 1: Try making the piles equal.

Hint 2: Equal piles of 2 behave differently from equal piles of 1.

Answer: Remove one mark from the pile of 3, leaving (2, 2).

If the opponent leaves (1,2), empty the pile of 2 and leave one mark. If the opponent leaves (0,2), remove one of those two. Both replies leave the opponent the last mark.

Final: three piles

Hint 1: There is one winning opening move.

Hint 2: Change only the largest pile, and leave it with 3.

Answer: Remove one mark from the pile of 4, leaving (1, 2, 3).

The six replies leave (0,2,3), (1,1,3), (1,0,3), (1,2,2), (1,2,1), or (1,2,0). Reply respectively to reach (0,2,2), (1,1,1), (1,0,0), (0,2,2), (1,1,1), or (1,0,0). Each leaves the opponent a losing position.

How to close the session

Finish by playing the final position twice with the teams swapping who moves first. Explain the winning reply rule; winning against a mistaken move alone is not a proof.

If a result differs, return to the stated rule and compare the written steps. An answer revealed by the host is help, not an independently solved puzzle.

Mechanism reference: Project Gutenberg 16599, Last Match. New session instructions and examples.

Age and time are planning estimates. No child playtest or physical print trial is claimed.