

CodyColor KIT

Teacher trainer resource

Unplugged

Cross-disciplinary

Cross-age

**To foster computational
thinking skills**



3. Discover the lesson plan: Pas-de-deux

The challenge in brief:

Pas-de-deux is a competitive challenge between two teams (A and B) on a 5x5 chessboard. The teams place the pawns (robots) at opposite corners of the board (A1 and E5) and, taking turns, place CodyColor tiles one by one to build the longest possible paths.

The team that composes the longest path for its robot before it leaves the board wins.

Target:

From primary school onwards

Learning objectives:

- Develop computational thinking
- Strengthen spatial orientation and rotations
- Experiment with strategies, compare hypotheses, and make group decisions

- Train collaboration, communication, and respect for rules.

Initial setup:

The game begins with the 5x5 board empty, with only two grey tiles at A1 and E5. Team A places its robot at A1 facing South, and Team B places its robot at E5 facing North. Thus, at the start, both robots face empty squares and wait for their teams to choose which colored tile to place there; they then move onto it and execute the corresponding instruction according to CodyColor's rules.

- Teams take turns alternately: A, then B, then A again, and so on.

Execution:

On their turn, the team chooses a colored tile (yellow/red/grey) to place on the square in front of their robot.

After placing the tile, the robot automatically moves forward, reads and interprets the color, and, if necessary, performs the rotation (in case of a yellow or red tile).

Special cases:

1. If, after executing the instruction just placed by its team, the robot has in front of it a square that already contains a colored tile (placed either by its own team or by the opposing team in previous turns), it must also move onto that tile and execute it according to CodyColor's rules. The turn ends only when the robot stops in front of an empty square.
2. If, at the start of a turn, the robot of the team to move has in front of it a colored tile placed by the opposing team in the previous turn, it proceeds by moving onto that tile and any others it encounters along the way, respecting CodyColor's rules. Only when the robot arrives in front of an empty square does it stop, waiting for its team to make its move by placing a tile.
3. In cases 1 and 2, the robot travels across multiple squares in the same turn. Note that cases 1 and 2 can also occur together if the board is already very full; this typically happens in the final phases of the game.

When, after executing the instruction associated with the color of the square it is on, the robot is facing outside the board, it exits without waiting for the next turn and ends its team's game.

End of the challenge and scoring

The challenge ends when the robots of both teams leave the board. This means the game continues even when only one of the two teams is still in play, because the victory is decided

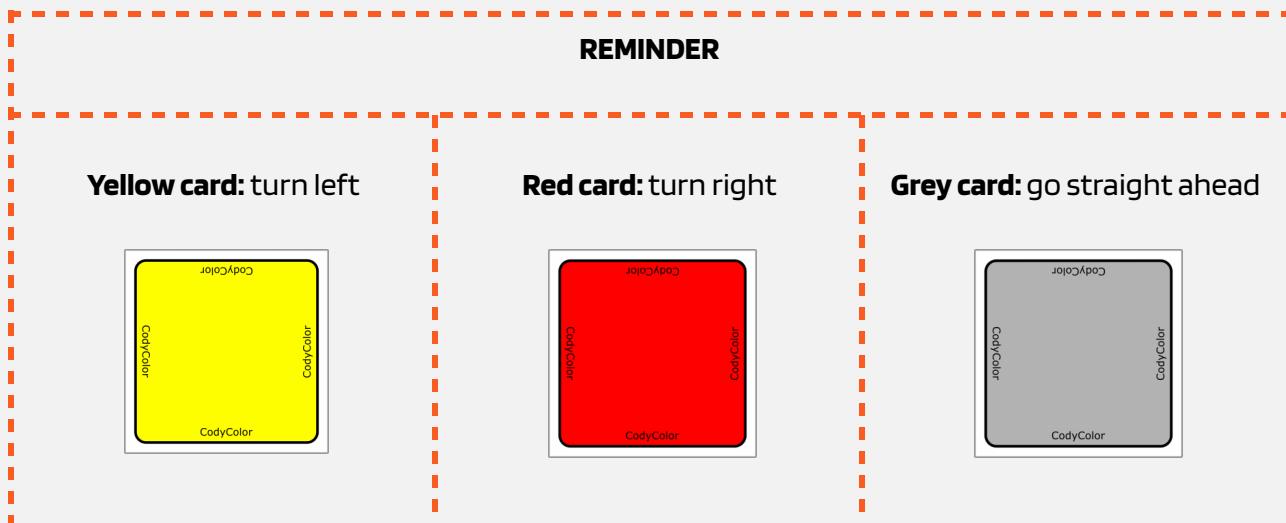
only at the end by checking which team has built the longest path (not necessarily the team that stayed in play for more turns).

At the end of the challenge, both teams reposition their robots at the starting positions, without removing the colored tiles from the board, to compare the length of the programmed paths. The comparison is carried out by moving the two robots simultaneously, one step at a time, to the rhythm set by everyone clapping.

On the clap, both robots move to the square in front of them, look at the color of the tile they are on, execute the corresponding instruction, and wait for the next clap. The two teams count the steps out loud as long as their robots are in play. Each team stops counting only when its robot leaves the board.

Each team earns as many points as the steps taken by its robot before leaving the board.

The challenge consists of three rounds whose scores are summed. In the event of a tie, additional tie-breaker rounds are played.



How to play in two separate rooms

The “Pas de deux” challenge can also be played remotely, for example, between two classes in different schools (even in different cities or countries) and communicating via an instant messaging chat (e.g., WhatsApp).

In both classrooms, the 5x5 grid must be set up by strictly following the arrangement of row and column labels, as well as the notation of the cardinal points used as directions. This is essential so that positions can be communicated unambiguously by specifying their coordinates.

In each of the two classrooms, both the team’s own robot (played by a student) and the opponent’s robot, called the “avatar,” will move on the grid. It may be useful to have students wear distinctive vests or other markers to differentiate their own robot from the opponent’s avatar and to make the experience more engaging and intuitive.

Initially, according to the rules of *Passo a Due*, both grids will be empty, with grey tiles placed in A1 and E5. During the game, the grids in the two classrooms will always be kept consistently updated, both in terms of the positions of the two robots and the colored tiles placed on the floor.

Game dynamics:

1. Before starting, the teachers agree on who starts from square A1 and who from E5, and on which team makes the first move.
2. The teacher of the team whose turn it is communicates their move via chat to the teacher of the other team with a text message specifying the tile color and the position (e.g. *yellow A2*). In the meantime, the local team places the tile and the robot moves according to the *Pas-de-deux* rules.
3. The team that receives the message via chat announces the instruction chosen by the opposing team, places the communicated tile on their own grid, and moves accordingly to the person acting as the opponent’s robot avatar. At this point, the teacher of the team not taking the turn sends a text message specifying the final position reached by the avatar (for example, *A2 EAST*).

The teacher of the team whose turn it is checks that the avatar position communicated by the opposing team matches the position of their own robot and confirms this to the other teacher. Only at this point does the turn pass to the other team.

For greater clarity, please refer to the figure illustrating the exchange between the two teachers. Let us imagine that the two teachers have already decided which team starts first (Team 1) and the respective starting positions: Team 1 in A1 facing South, Team 2 in E5 facing North. This is a possible example of a chat exchange.

