What is coding? Why learn about it through kinesthetic movement?

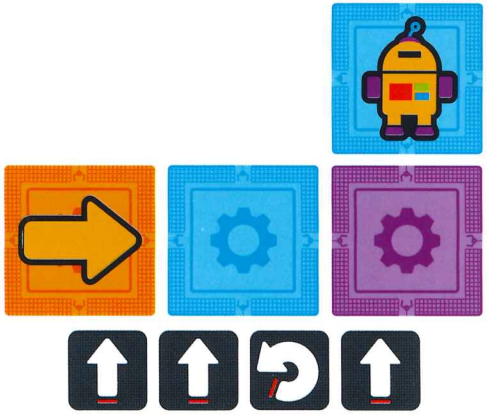
Coding is a specific language, a series of commands that tells a computer what to do. In short: coding programs a computer to act in ways predetermined by you, the user. But there are more ways of acquiring this knowledge than by sitting before a screen. In fact, the real building blocks of coding are found in critical thinking, sorting information, mapping routes between endpoints, and in helping children break down large problems into smaller mini-puzzles that they can think through logically.

Adding the element of movement brings this computational thinking into the kid-approved area of active play. Kinesthetic learning can help children at this age concentrate and retain information. Get kids up, moving, and working together to learn all about programming!

Introducing Mazes & Coding Cards

Begin by building a simple maze: Arrange four mats of any color in any configuration, as shown in the image below. Place a start arrow on the first mat, pointing the correct way into the maze. Place a robot to mark the end point—the goal is to get to the robot. Step by step, move through the maze, calling out the commands that correspond to your movements: "Forward (1), forward (2), turn left (3), forward (4)." Then, lay out the four matching coding cards (see image below) in proper sequence, explaining that they mirror the path you just made through the maze. Make sure children understand that to turn means to pivot in the direction shown, not to take a step.

Continue with another maze—this time, lay out the coding cards **before** moving through the maze. Let children call out each movement shown on the cards, in sequence, before you perform the corresponding command.



Play Options

Cooperative Play

- Pair up two children. One child builds and moves through the maze; the second child places the correct sequence of coding cards and directs the first child, step by step.
- For beginning builders, assign a number of mats to build with. Start with a small number, like 5 or 6. The child can build the maze in almost any configuration, as long as the path has a distinct start (arrow) and end (robot). **Note:** See *Sample Mazes* on the back for building ideas.
- Time to get moving! The *coder* calls out the commands shown on the coding cards, one by one, to get the *mover* to the end. Was it a successful collaboration?
- If the path was coded incorrectly, both children work to identify the error. They should then swap out incorrect coding cards for correct cards, and start over again, working to complete the maze from the beginning.

Cooperative Play with Special Objects

- Integrate gears, springs, and Xs into any maze to stretch critical thinking skills. Place these special objects over any mat:


—**Spring:** Pick up and bring to the robot for repairs.


—**Gear:** Pick up and bring to the robot for repairs.


—**X:** Blocked! You can't step on this mat.

- Place these *action* coding cards in correct sequence to give commands for when children encounter special objects:


—**Claw:** Pick up a spring or gear.


—**Jet Pack:** "Fly" (step) over the X, to the next mat on the maze. This is the only card that lets children go over an X. If two Xs are placed side by side, the Jet Pack coding card enables the child to "fly" over both as one move.


—**Wild:** Use your imagination! Represent any fun action (cluck like a chicken, stand on one foot, touch your nose...) by placing this card at any point along a coding string.

- Always remember to place an arrow at the start of a maze. Point the arrow in the direction you want the player to move first.

Team Play

- Make two teams. One team is the *mover*: Lay out the maze and designate a member to follow the moves. The other team is the *coder*: Look closely at the maze, place the coding cards in the correct sequence, and call out commands.
- Try doing this with two teams simultaneously! Each team gets a start arrow and a robot. This time, each team moves from a different starting point (arrow). If necessary, teams can write additional coding commands on paper. **Note:** If two children meet at the same mat, allow one team to finish the sequence, and then the other.