

Prison Break

60 minutes

Game Design Studio

WHAT THIS LESSON DOES

Get ready to create an exciting maze game with MakeCode Arcade! You'll design a character, build a challenging maze, set a goal to reach, and add a timer to increase the difficulty. Let's start building!

WHAT STUDENTS SHOULD BE ABLE TO DO

- Develop skills in creating and controlling a character sprite in MakeCode Arcade.
- Understand and apply the concept of designing a maze in a game environment.
- Learn to set and implement game goals, such as reaching a specific location.
- Gain knowledge on how to add and use a timer to increase game difficulty.
- Enhance problem-solving skills through the creation and navigation of a maze game.

BEFORE THE LESSON

- Open arcade.makecode.com yourself first and confirm it loads and is not blocked by the school filter. It runs in the browser with no login needed.
- One device per pupil, or per pair if you are short. Projector on so you can model creating a project and using the tile map editor.
- Have your own worked example ready to show: a small maze with walls set and a goal tile, so pupils can see the finished target.

Prison Break

HOW THE LESSON RUNS

Introduction to Prison Break Game

Create a new Arcade project

Create a sprite

Move with the buttons

Draw your maze

Set the walls of your map

Camera follow the sprite

Add a goal tile

Win the game

Set a timer

Wrap up

TEACHING MOVES

- 2. Create a new Arcade project. Model creating the new project on the board and point out the code area versus the simulator on the right, so pupils know where their game will run.
- 3. Create a sprite. Show the sprite editor once. Let pupils design any character they like, but keep it small and solid so it is easy to see against the maze.
- 4. Move with the buttons. Have pupils test movement in the simulator straight away using the arrow controls before moving on, so a broken control block is caught here.
- 5. Draw your maze. Encourage a simple, solvable maze first. A path with a couple of turns is plenty; they can complicate it once the win logic works.
- 6. Set the walls of your map. Demonstrate the Draw Walls tool on the board. Stress that drawing a tile and setting it as a wall are two separate actions, then have pupils test they cannot walk through.
- 7. Camera follow the sprite. Explain why the sprite vanished at the edge, then add the camera-follow block so pupils connect the fix to the problem they just saw.
- 8. Add a goal tile. Insist on exactly one goal tile, using a clearly different colour so it stands out from the walls and path.
- 9. Win the game. The overlap block must reference the same tile chosen as the goal. Walk the room checking pupils have matched the tile in the code to the tile in the maze.
- 10. Set a timer. Add the countdown together and let pupils play once against the 30 seconds. Ask whether their maze is beatable in the time and whether it should be.

WHAT TO WATCH FOR

- Pupils draw the wall tiles but never mark them as walls, so the player still walks straight through the maze. Show that a tile's appearance and its wall property are separate. Have them re-open the tile map editor, use Draw Walls, and test movement against a wall before continuing.
- The win screen never appears because the tile named in the overlap code is not the same tile placed as the goal. Sit beside the pupil and compare the tile in the onOverlapTile block with the tile they placed in the maze. Set both to the same tile and retest.
- Pupils think 'You Win!' failing to show means their whole game is broken. Reassure them the movement and maze are fine. The issue is one link, the goal detection. Isolate that step and check it on its own.

DIFFERENTIATION

- Emerging: Pair the pupil who is slow to get started with a partner who has a project open, so they can copy the setup steps and catch up. Give them a very short straight-line maze so they reach the win step and feel the game working before adding difficulty.
- Developing: Let them build the code steps but ask them to explain back to you what the wall tiles and the goal tile each do. Prompt them to test in the simulator after every step rather than at the end, so mistakes surface early.
- Proficient: Challenge them to design a longer or branching maze that is genuinely hard to beat inside the 30 second timer. Ask them to change the timer length and explain how it changes the difficulty, then justify the value they settled on.