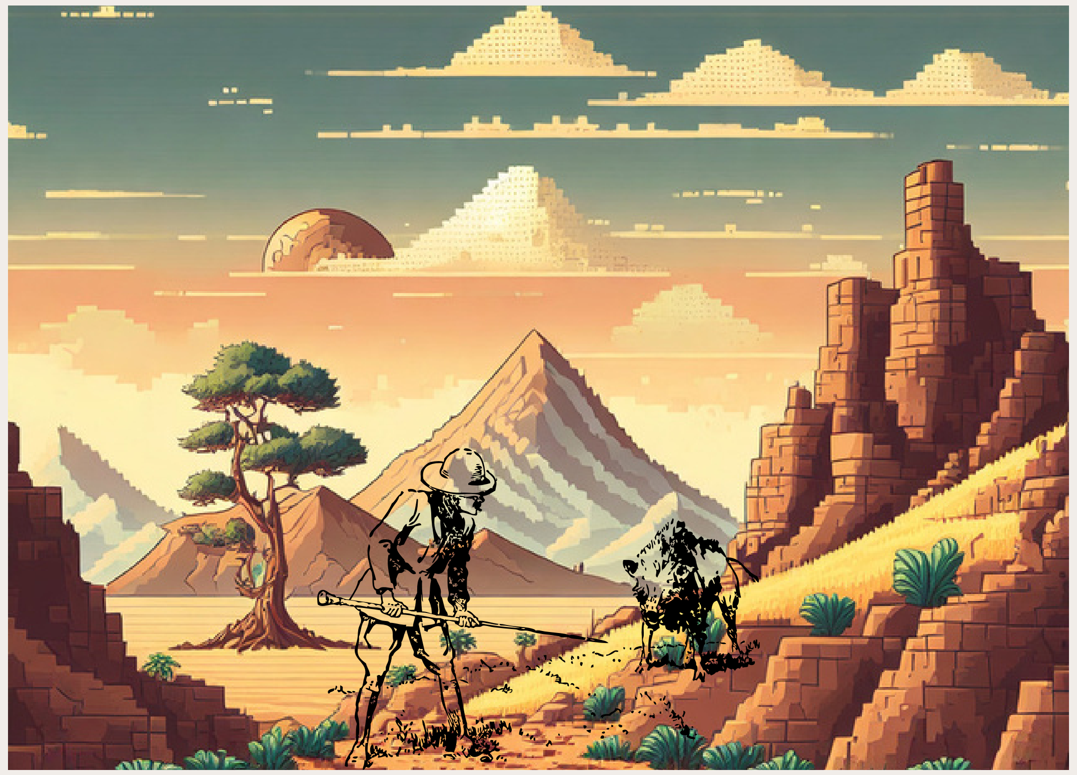
Designed by DaVinci Devs



TIME LABYRINTH

"A HISTORICAL MAZE GAME"

Team: DaVinci Devs

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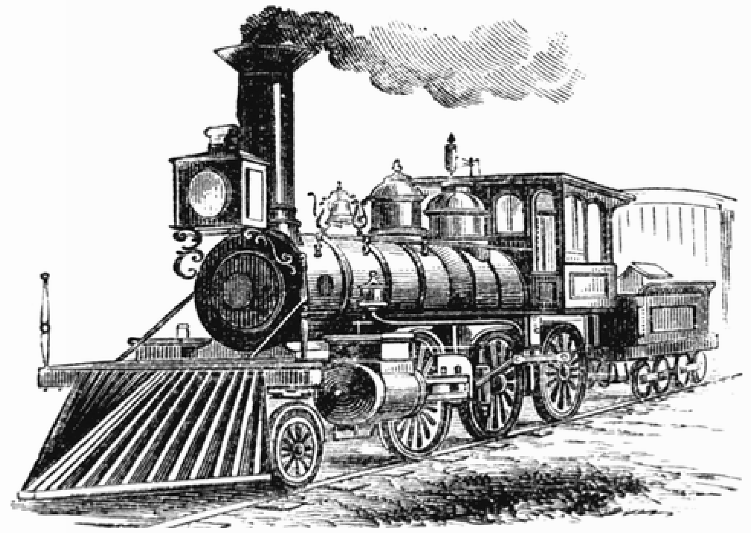


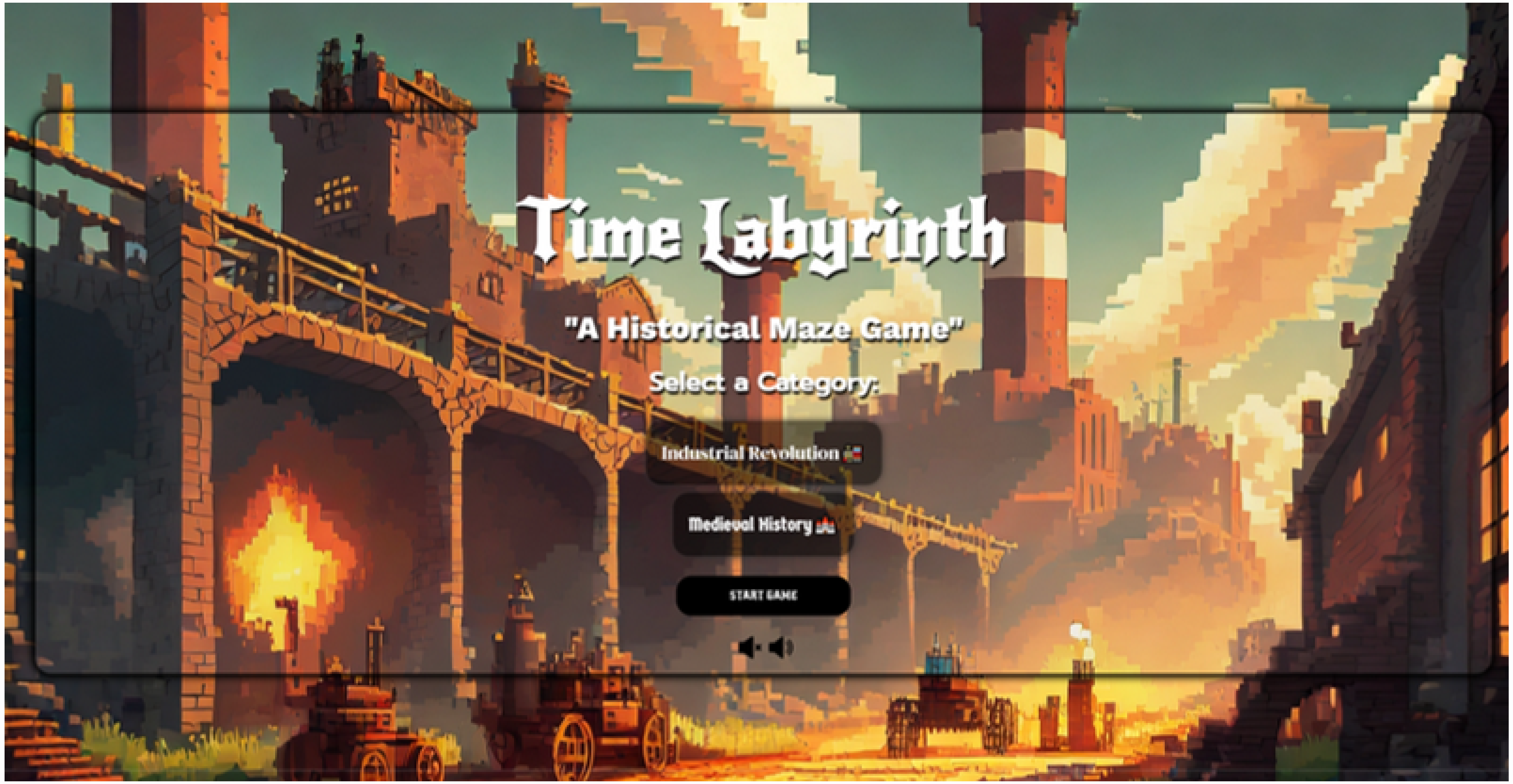
BRIEF

Develop an educational game to boost engagement in non-STEM subjects for the Hive group of secondary schools.

The game should make learning non-STEM subjects enjoyable, addressing recent declines in student interest.

To finally produce a functional MVP, wireframes, and a live demonstration of game.

LIVE DEMO


Time Labyrinth
"A Historical Maze Game"
Select a Category:
Industrial Revolution
Medieval History
START GAME

BACKGROUND RESEARCH

Chosen theme:
History:
Medieval era and Industrial Revolution

User Research:

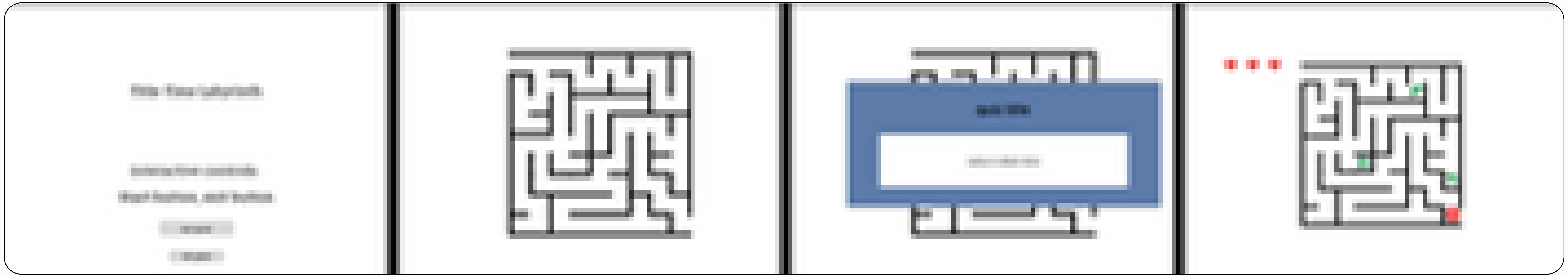
- Express a desire for more engaging and varied learning methods beyond textbook reliance.
- Feel a pressure from the vast curriculum, making it hard to deeply engage with and remember the material.
- Experience a lack of diversity in lesson activities, leading to a monotonous learning environment.

Why the Maze?

A maze-themed game was influenced heavily by the classic allure of the original ‘Scary Maze Game’.

We recognised in the maze a straightforward yet versatile platform that lends itself naturally to the integration of educational content.

FIGMA-DESIGN



TECHNOLOGIES

HTML, CSS, and JavaScript

- Core web technologies for a responsive, cross-platform game experience.
- HTML for structure
- CSS for visual layout and design
- JavaScript for interactive gameplay

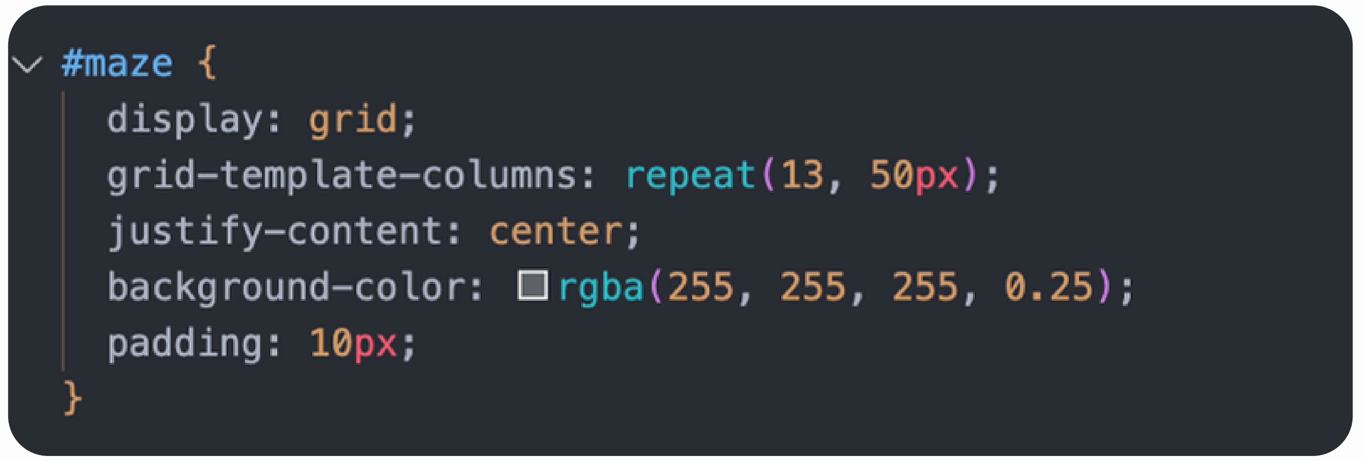
ExpressJS and NodeJS:

- Backend powered by NodeJS for scalable network applications
- ExpressJS for efficient API handling and data management
- Ensures reliable data storage and API interactions

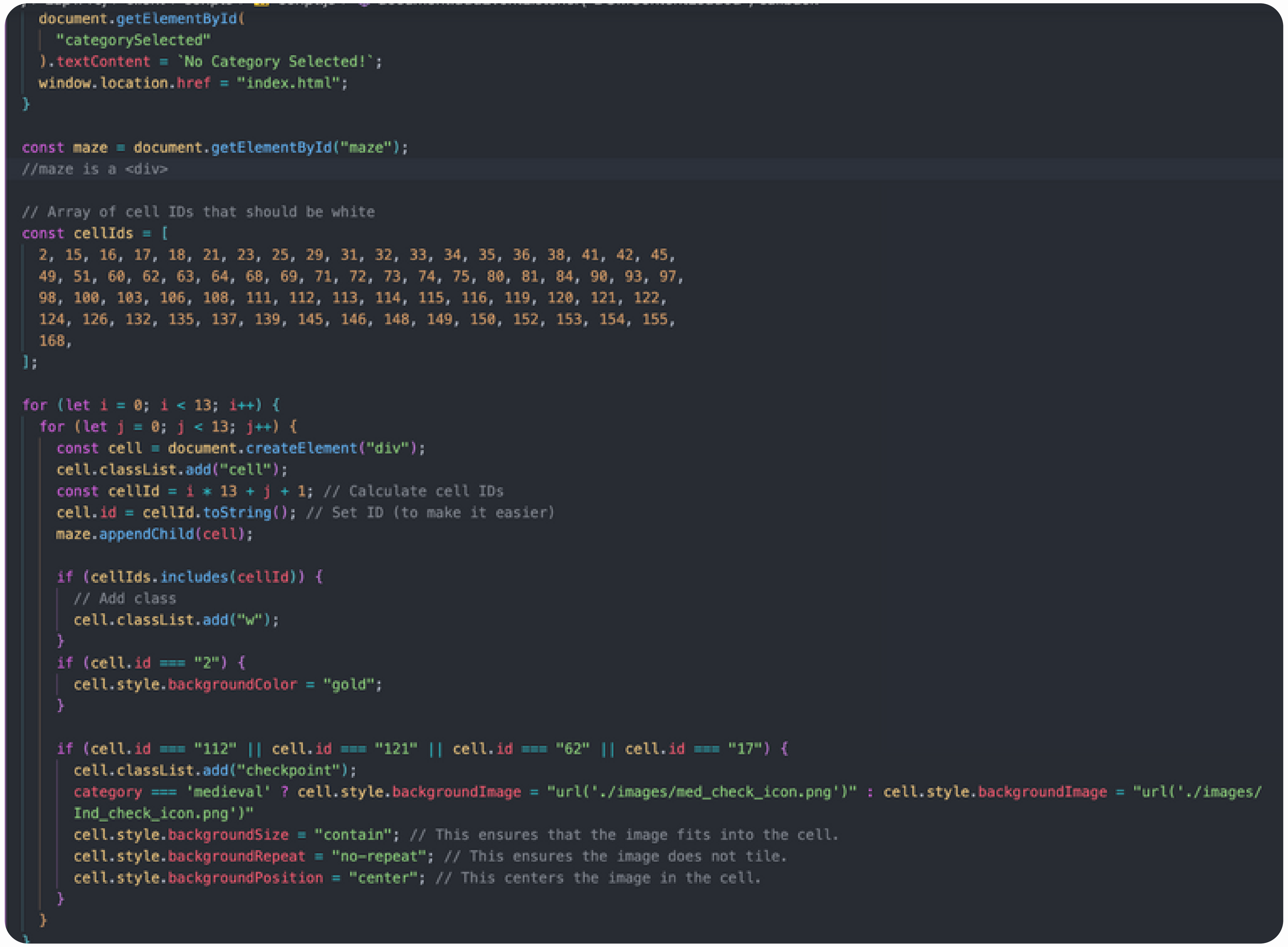
SIGNIFICANT CODE

For our maze game, the most significant code strongly relates to the two core elements of the application: the maze and multiple choice questions which pop up. The following code snippets are essential:

SNIPPET ONE: CREATING A MAZE WHICH INCLUDES CHECKPOINTS



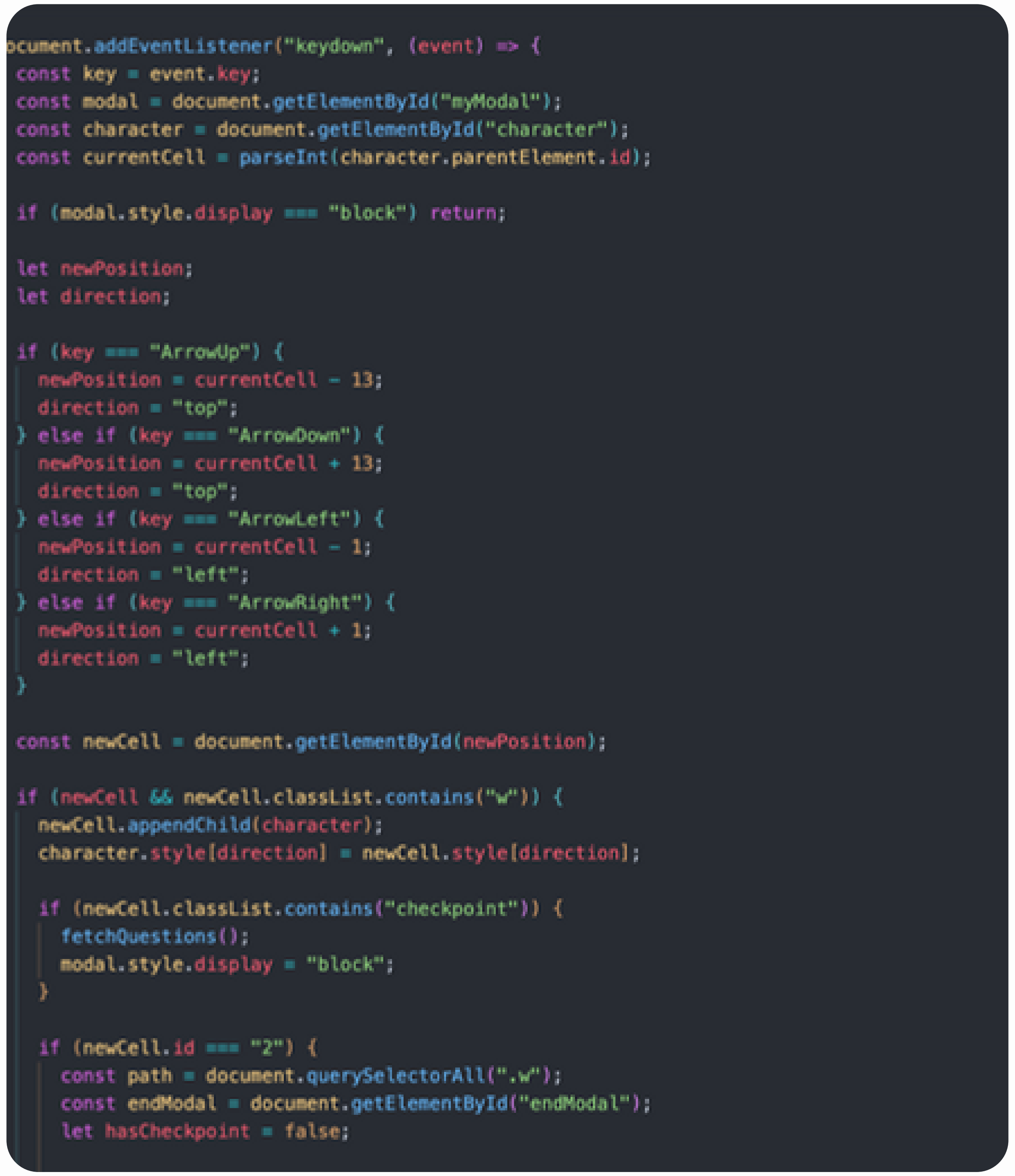
```css
#maze {
  display: grid;
  grid-template-columns: repeat(13, 50px);
  justify-content: center;
  background-color: rgba(255, 255, 255, 0.25);
  padding: 10px;
}
```



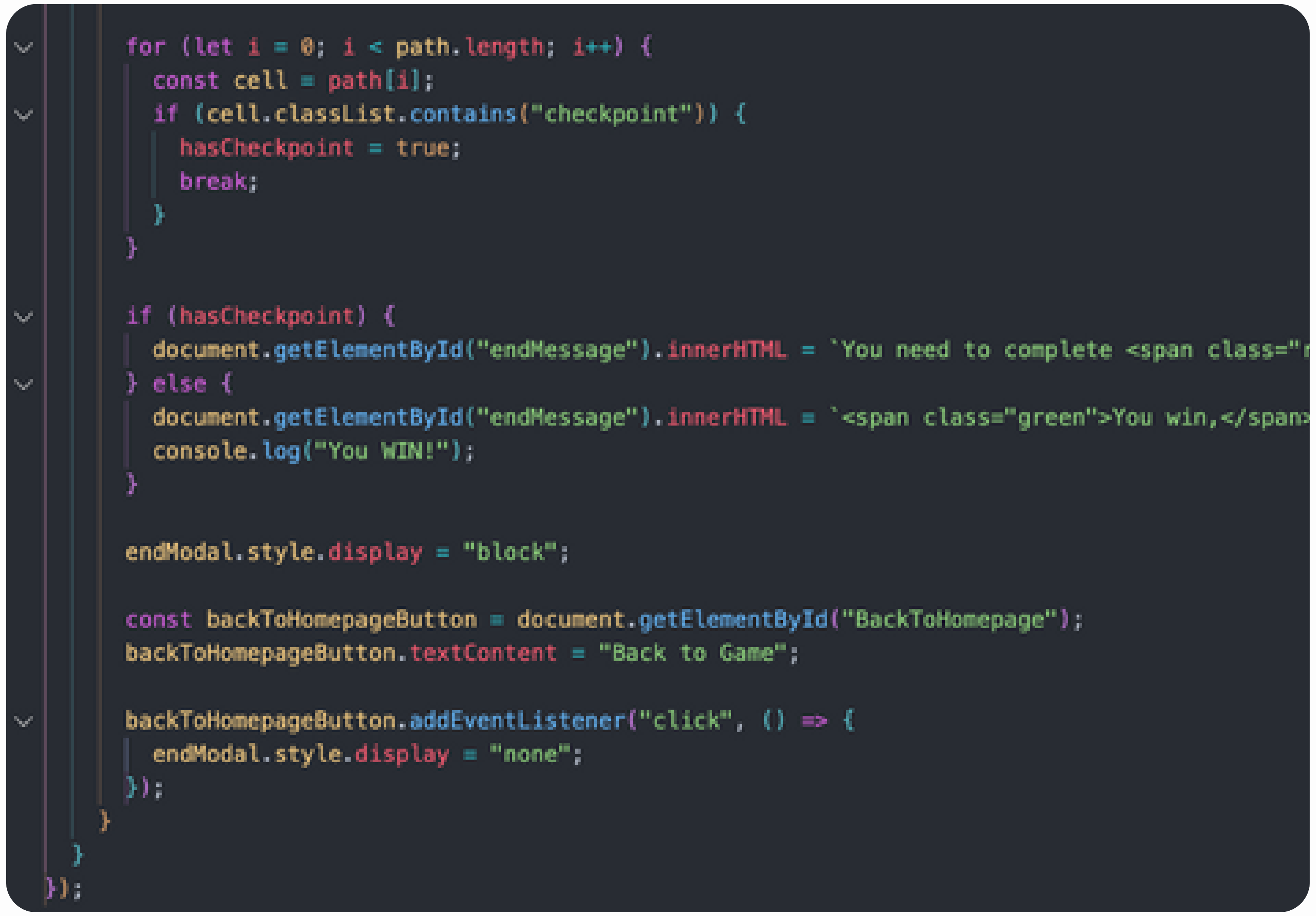
```javascript
  document.getElementById(
    "categorySelected"
  ).textContent = `No Category Selected!`;
  window.location.href = "index.html";
}

const maze = document.getElementById("maze");
//maze is a <div>

// Array of cell IDs that should be white
const cellIds = [
  2, 15, 16, 17, 18, 21, 23, 25, 29, 31, 32, 33, 34, 35, 36, 38, 41, 42, 45,
  49, 51, 60, 62, 63, 64, 68, 69, 71, 72, 73, 74, 75, 80, 81, 84, 90, 93, 97,
  98, 100, 103, 106, 108, 111, 112, 113, 114, 115, 116, 119, 120, 121, 122,
  124, 126, 132, 135, 137, 139, 145, 146, 148, 149, 150, 152, 153, 154, 155,
  168,
];

for (let i = 0; i < 13; i++) {
  for (let j = 0; j < 13; j++) {
    const cell = document.createElement("div");
    cell.classList.add("cell");
    const cellId = i * 13 + j + 1; // Calculate cell IDs
    cell.id = cellId.toString(); // Set ID (to make it easier)
    maze.appendChild(cell);

    if (cellIds.includes(cellId)) {
      // Add class
      cell.classList.add("w");
    }
    if (cell.id === "2") {
      cell.style.backgroundColor = "gold";
    }

    if (cell.id === "112" || cell.id === "121" || cell.id === "62" || cell.id === "17") {
      cell.classList.add("checkpoint");
      category === 'medieval' ? cell.style.backgroundImage = "url('./images/med_check_icon.png')" : cell.style.backgroundImage = "url('./images/
      Ind_check_icon.png')"
      cell.style.backgroundSize = "contain"; // This ensures that the image fits into the cell.
      cell.style.backgroundRepeat = "no-repeat"; // This ensures the image does not tile.
      cell.style.backgroundPosition = "center"; // This centers the image in the cell.
    }
  }
}
```

SIGNIFICANT CODE

SNIPPET TWO: IMPLEMENTING CHARACTER ICON MOVEMENT AND TRIGGERING A POP-UP QUIZ WHEN OUR CHARACTER HITS A CHECKPOINT



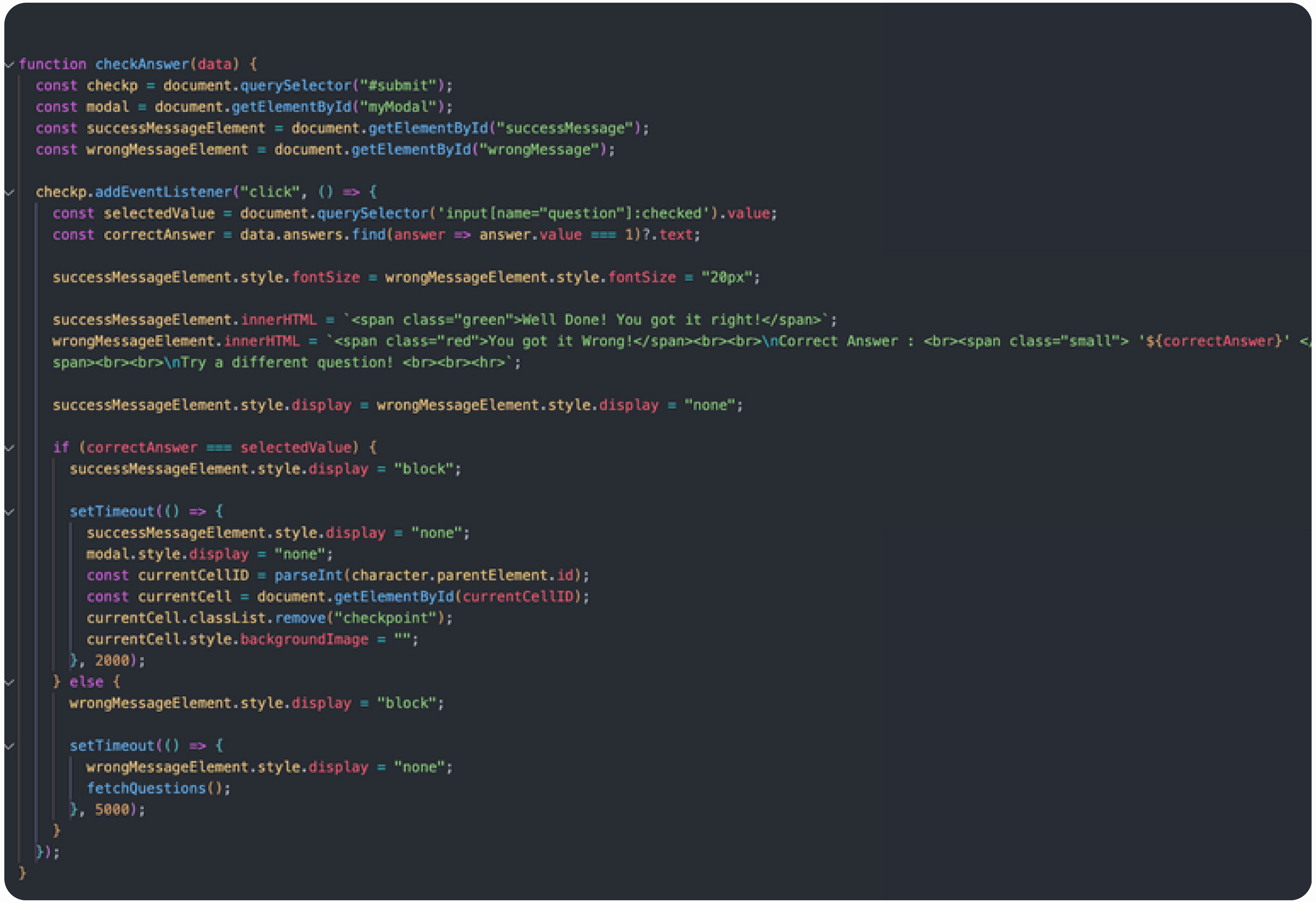
```
ocument.addEventListener("keydown", (event) => {
 const key = event.key;
 const modal = document.getElementById("myModal");
 const character = document.getElementById("character");
 const currentCell = parseInt(character.parentElement.id);

 if (modal.style.display === "block") return;

 let newPosition;
 let direction;

 if (key === "ArrowUp") {
   newPosition = currentCell - 13;
   direction = "top";
 } else if (key === "ArrowDown") {
   newPosition = currentCell + 13;
   direction = "top";
 } else if (key === "ArrowLeft") {
   newPosition = currentCell - 1;
   direction = "left";
 } else if (key === "ArrowRight") {
   newPosition = currentCell + 1;
   direction = "left";
 }

 const newCell = document.getElementById(newPosition);

 if (newCell && newCell.classList.contains("w")) {
   newCell.appendChild(character);
   character.style[direction] = newCell.style[direction];

   if (newCell.classList.contains("checkpoint")) {
     fetchQuestions();
     modal.style.display = "block";
   }

   if (newCell.id === "2") {
     const path = document.querySelectorAll(".w");
     const endModal = document.getElementById("endModal");
     let hasCheckpoint = false;
```



```
      for (let i = 0; i < path.length; i++) {
        const cell = path[i];
        if (cell.classList.contains("checkpoint")) {
          hasCheckpoint = true;
          break;
        }
      }

      if (hasCheckpoint) {
        document.getElementById("endMessage").innerHTML = `You need to complete <span class="r
      } else {
        document.getElementById("endMessage").innerHTML = `<span class="green">You win,</span>
        console.log("You WIN!");
      }

      endModal.style.display = "block";

      const backToHomepageButton = document.getElementById("BackToHomepage");
      backToHomepageButton.textContent = "Back to Game";

      backToHomepageButton.addEventListener("click", () => {
        endModal.style.display = "none";
      });
    }
  }
});
```

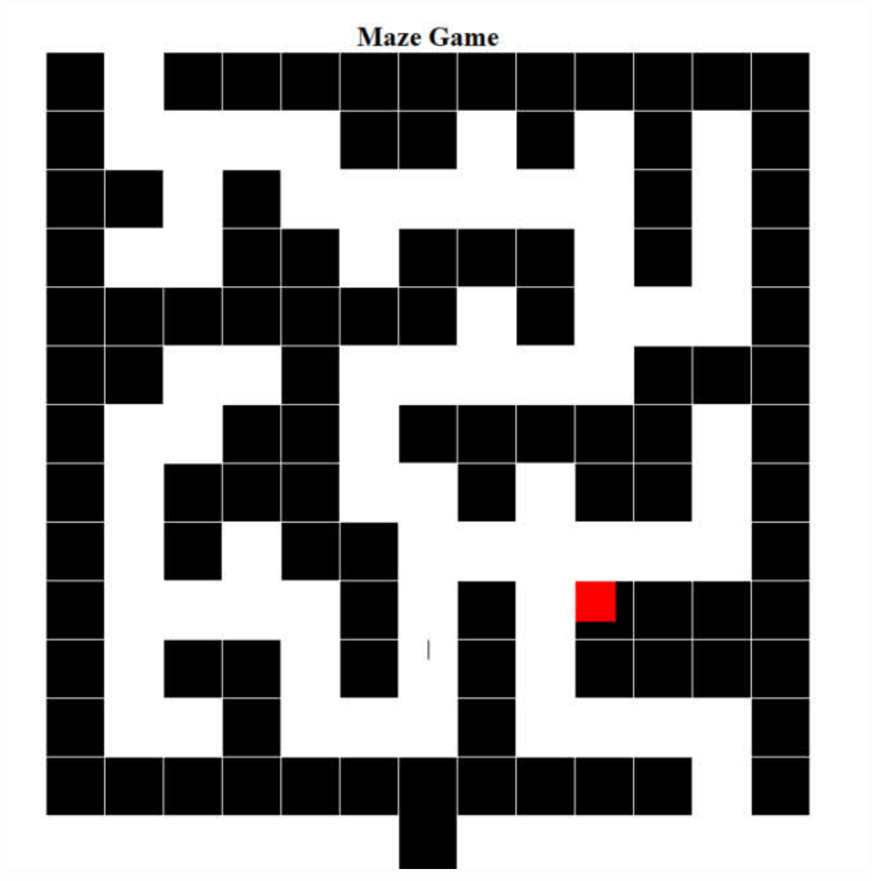
SIGNIFICANT CODE

SNIPPET THREE: CHECKING THE ANSWER TO THE QUESTION AGAINST THE ANSWERS IN OUR API



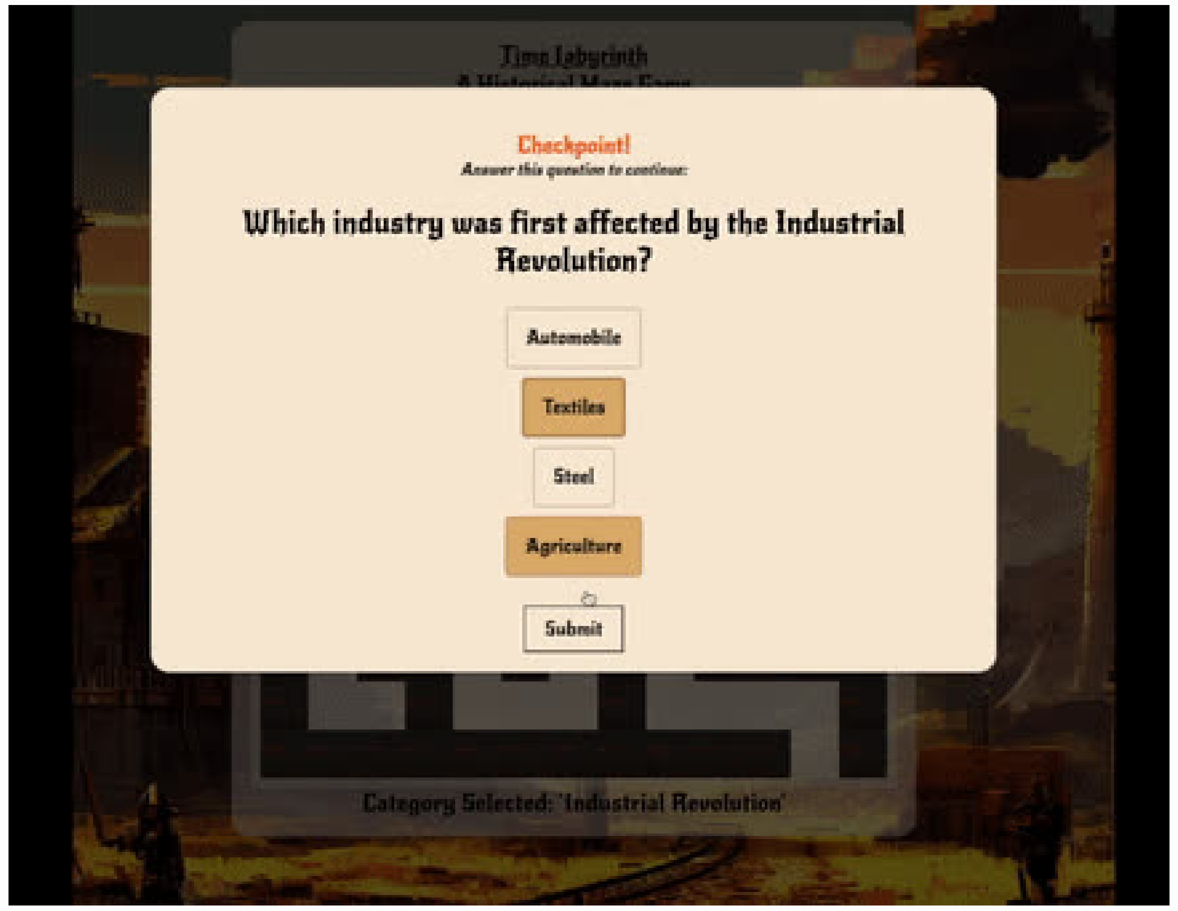
```
function checkAnswer(data) {
  const checkp = document.querySelector("#submit");
  const modal = document.getElementById("myModal");
  const successMessageElement = document.getElementById("successMessage");
  const wrongMessageElement = document.getElementById("wrongMessage");

  checkp.addEventListener("click", () => {
    const selectedValue = document.querySelector('input[name="question"]:checked').value;
    const correctAnswer = data.answers.find(answer => answer.value === 1)?.text;

    successMessageElement.style.fontSize = wrongMessageElement.style.fontSize = "20px";

    successMessageElement.innerHTML = `<span class="green">Well Done! You got it right!</span>`;
    wrongMessageElement.innerHTML = `<span class="red">You got it Wrong!</span><br><br>\nCorrect Answer : <br><span class="small"> '${correctAnswer}' <
    span><br><br>\nTry a different question! <br><br><hr>`;

    successMessageElement.style.display = wrongMessageElement.style.display = "none";

    if (correctAnswer === selectedValue) {
      successMessageElement.style.display = "block";

      setTimeout(() => {
        successMessageElement.style.display = "none";
        modal.style.display = "none";
        const currentCellID = parseInt(character.parentElement.id);
        const currentCell = document.getElementById(currentCellID);
        currentCell.classList.remove("checkpoint");
        currentCell.style.backgroundImage = "";
      }, 2000);
    } else {
      wrongMessageElement.style.display = "block";

      setTimeout(() => {
        wrongMessageElement.style.display = "none";
        fetchQuestions();
      }, 5000);
    }
  });
}
```

CHALLENGE AND SOLUTIONS



Challenge 1：

Writing code for a maze game and enabling and character movement within paths.


Time Labyrinth

Checkpoint!

Answer this question to continue:

Which industry was first affected by the Industrial Revolution?

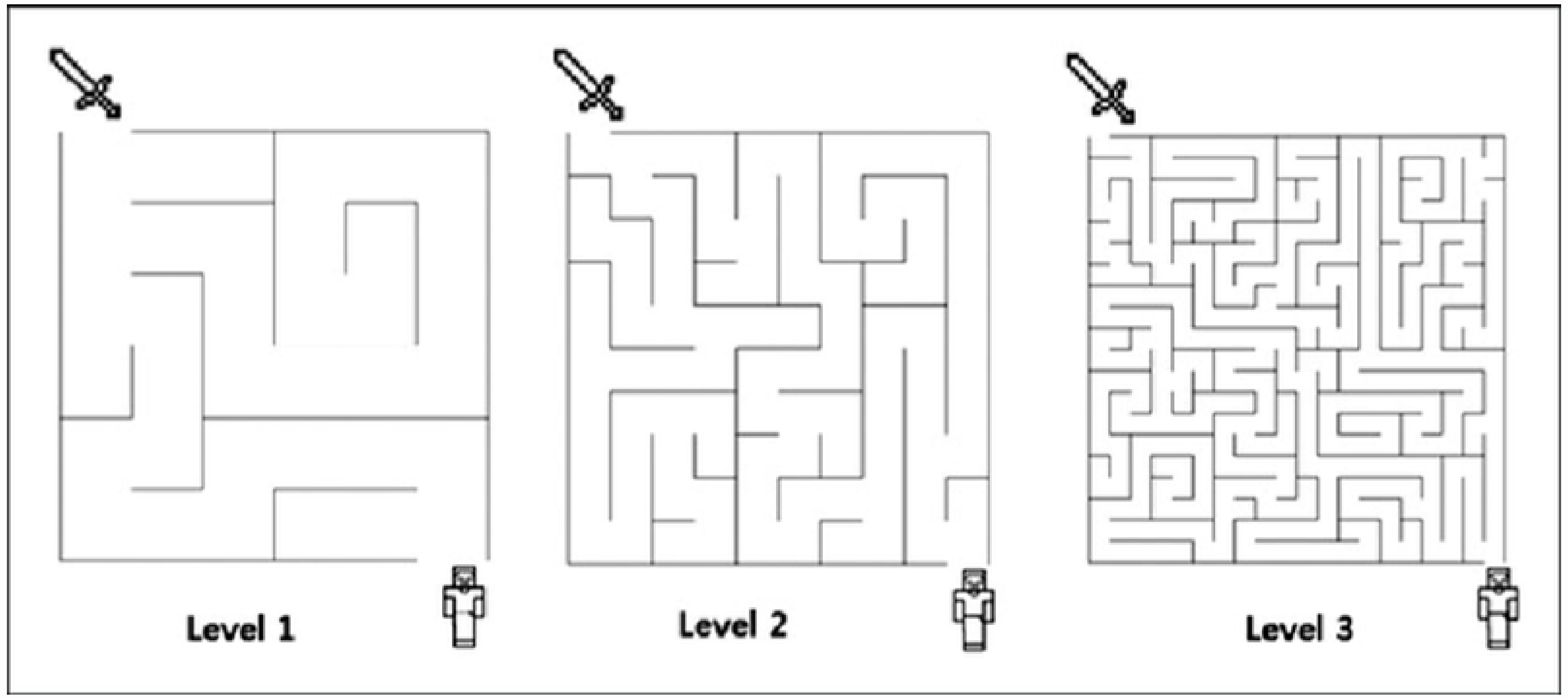
Category Selected: 'Industrial Revolution'

Challenge 2：

- Implementing a color change function for radio buttons in question pop-ups.
- The issue of the previously selected radio button's color persisting when moving to the next question.

FURTHER DEVELOPMENT AND FUTURE FEATURES

- Choose character icon
- Multiple maze levels, increasing difficulty
- 3 lives system for incorrect answers
- Teachers create custom categories/questions



WHAT WE'VE LEARNED

Technological Skills

Googling

ExpressJS

Collaboration

Teamwork

Interpersonal skills

CSS Styling

Deploying the Server

THANK YOU

Questions?