EASE EuropeAn network of steam Educators

# Lesson Plan

## Title:
Micro:bit Dice Rolling Game

## Grade Level: 6th Grade to 8th Grade

## STEAM Areas: Mathematics, Technology, Engineering

## Materials Needed:
- Micro:bit device;
- Computer with internet access;
- USB cable for programming micro:bit;
- Battery pack for micro:bit;
- Dice for offline play.

## Objectives:
By the end of this lesson, students will be able to:
- Understand how to program a dice rolling game using a Micro:bit device;
- Apply random number generation and LED display to create a functional game;
- Collaborate with a partner to play the game and calculate points.

## Procedure:

**Step 1 (Introduction):** Start by introducing the Micro:bit dice rolling game tutorial to the students. Explain the learning outcomes and the significance of creating a digital dice rolling game using Micro:bit. Emphasize the key concepts to be covered, including random number generation, LED display, and game strategies.

**Step 2 (Setting up the Environment):** Divide the students into pairs and ensure each pair has access to a Micro:bit device, a computer with internet access, and a USB cable for programming the Micro:bit.

**Step 3 (Project Initialization):** Instruct the students to connect the Micro:bit device to the computer and open the makecode website to begin the programming process. Encourage them to explore the basic functions of the Micro:bit device before starting the project.

**Step 4 (Understanding the Code):** Provide an overview of the code structure used in the tutorial video. Explain the use of variables, random number generation, and conditionals for creating the dice rolling game.

**Step 5 (Step-by-Step Coding)**: Guide the students through the step-by-step instructions from the tutorial video. Assist them in understanding and implementing key programming concepts such as **creating a local variable** to represent the roll of the dice, using **gestures** to trigger the dice roll, and **displaying the corresponding LED patterns** for each number on the dice.

## Procedure:

**Step 6 (Partner Programming)**: Encourage collaborative learning by asking students to work with their partners to follow the coding instructions. Provide support and guidance as needed, ensuring that each pair successfully completes the programming tasks.

**Step 7 (Game Play Demonstration):** Demonstrate the game play using the programmed Micro:bit devices. Show students how to shake the Micro:bit to roll the virtual dice and display the result on the LED matrix. Explain the rules of the game, including the conditions for ending the game and calculating points.

**Step 8 (Collaborative Play):** Allow the students to play the dice rolling game with their partners. Observe the game play and provide assistance where necessary. Encourage fair play and good sportsmanship among the students.

**Step 9 (Modification and Experimentation):** Challenge the students to modify the code to add new features to the game, such as sound effects or additional game mechanics. Encourage them to experiment with different programming elements to enhance the gameplay experience.

**Step 10 (Reflection and Discussion)**: Engage the students in a reflective discussion about their experience in creating and playing the dice rolling game. Encourage them to share their insights, challenges faced, and potential improvements for the game.

**Step 11 (Conclusion)**: Summarize the key takeaways from the lesson and express encouragement for further exploration of Micro:bit programming. Highlight the importance of creativity and problem-solving in designing digital games using technology.

Wrap up the session by summarizing key takeaways, addressing any final questions, and encouraging students to explore advanced Micro:bit further. Provide additional resources for self-study and future projects.

**Have a great learning activity!**

## Assessment:

- Students may be assessed based on their ability to understand and replicate the dice rolling game using the Micro:bit device along with their capability to explain the process and strategies used in playing the game.

## References:


- Micro:bit TUTORIAL | easy game-Dice: https://www.youtube.com/watch?v=NeYtja1nr3c
- https://makecode.microbit.org/tutorials
- https://makecode.microbit.org/