Dreidel Game

Teacher's Workbook

Jewish Interactive

Your students will make:
An interactive dreidel using the micro:bit

Equipment you will need:
- Laptop
- micro:bit

Time needed:
1 - 2 lessons

Your students will learn:
In this lesson, your students will use **variables** and **conditionals** to code their dreidel. They will use the shake **input** on the micro:bit to control the actions that it takes. More advanced students will also learn about **radio signals** and how micro:bits can communicate with each other.
Students will learn to **debug** their **algorithm** and will use **logical reasoning** to explain their code.
Here is a video of a student using logical reasoning to explain how their code works having completed this project.

Coding concepts and computational thinking:
Input: The inputs on a micro:bit include the buttons A and B, the shake feature as well as the pins 0, 1 and 2 along the bottom of the device
Variable: A variable is a placeholder for information which has the ability to change. In this lesson the variable is **Dreidel** which chooses one of the four sides to display
Conditionals: Using a conditional means that the code will only run under certain conditions. Such as **if the variable = 2** it will show a certain image on the micro:bit. The part of the statement in bold is the conditional.
Algorithm: A list of steps to follow in order to complete a task
Debug: Finding and fixing problems in the algorithm

Technology links:
Radio Signals: micro:bits using the same radio signal are able to communicate with each other. In the **Student Challenge Workbook** students will be using two micro:bits to communicate to each other. When one micro:bit is shaken, both will come up with a letter from the dreidel.

Lesson:
Introduction:
Start by showing your students a micro:bit with the code already downloaded. Explain the new coding concepts that they will be using in this lesson such as **variables** and **conditionals** (if/else statements).

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For this activity, students should know the four letters on the dreidel and should know how to play the dreidel game.

Nun - nothing
Gimel - everything
Hay - half
Shin - put one back

By the end of this unit, students should be able to use logical reasoning to explain how their algorithm (code) works. They should also be able to debug any issues within their code. The students should have a basic understanding of variables and how they work.

Part One:
Students should work in pairs to follow the **Student Workbook** to create their dreidel testing them on the micro:bit emulator as they go along. This should take 1 lesson to complete depending on the coding level of the students.
Students should be able to work through this independently and the teacher should be available for support and guidance.

Once the students have finished their code, plug the micro:bit into the USB port of the computer and click the download button on the MakeCode website. Drag the downloaded file into the micro:bit external drive and wait for the program to load.

While the program is loading, the light at the back of the micro:bit will flash. When this light is solid yellow, then students can test the program on their micro:bits.

Students may now need to debug some of their algorithm so that the code works.

Extension: If the students finish coding their dreidel games, can they compete against each other?

Part Two:
Show the students two micro:bits that are communicating using the radio signals. Explain that one is sending a message that the other is receiving. When we shake micro:bit 1, the other micro:bit receives the signal and shows a letter of the dreidel. This is like playing games against the computer where only one (the person playing the game) is sending the input (in this case, shaking the micro:bit).

Students work through **Student Challenge Workbook** where one person codes micro:bit 1 and their partner is on micro:bit 2.

Each group should be on a different radio signal. This might be best assigned by a teacher but depends on the number of students in the room.

Once the students have finished their code, plug the micro:bit into the USB port of the computer and click the download button on the MakeCode website. Drag the downloaded file into the micro:bit external drive and wait for the program to load.

While the program is loading, the light at the back of the micro:bit will flash. When this light is solid yellow, then students can test the program on their micro:bits.

Students may now need to debug some of their algorithm so that the code works.