

WS 03 – Micro:bit/Calliope Einsteiger

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Gliederung

Rahmenplan

Hardware

Programmierungsumgebung

Programmieraufgaben

Vergleich Micro:bit und Calliope

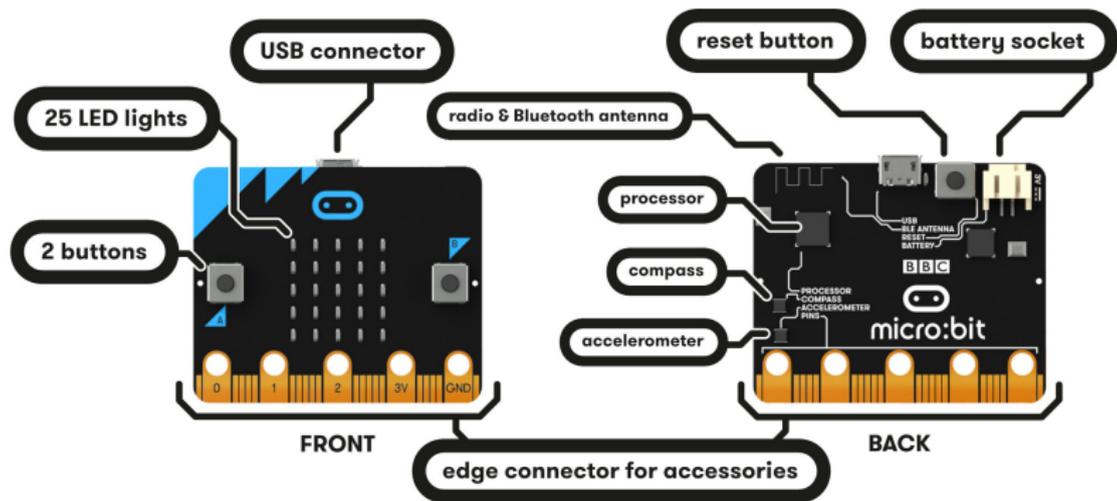
Fazit



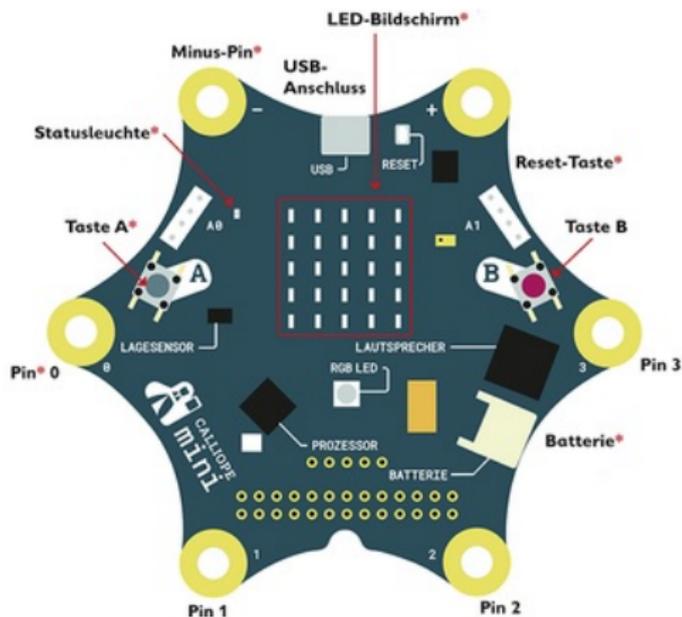
Rahmenplan

Verbindliche Ziele und Inhalte	Hinweise und Anregungen
<p>Daten verarbeiten</p> <ul style="list-style-type: none"> • Sensorwerte abfragen und verarbeiten • das Prinzip der Analog-Digital-Wandlung erläutern <p>Software für ein Informatiksystem entwickeln</p> <ul style="list-style-type: none"> • eine Spezifikation prüfen und erweitern • eine Anwendung realisieren und dokumentieren • eine Anwendung systematisch testen 	<p>Die Schülerinnen und Schüler identifizieren Sensoren in einem Informatiksystem und ermitteln den Wertebereich eines Sensors.</p> <p>Eine Spezifikation ist die exakte Beschreibung der gewünschten Funktionalität eines Informatiksystems. Die Dokumentation kann als Kommentarfunktion in der Implementation, als Prozessdokumentation oder als Bedienungsanleitung realisiert werden. Anhand der Testergebnisse sind Schlussfolgerungen für die Entwicklung der Anwendung zu ziehen.</p>

Micro:bit – Hardware

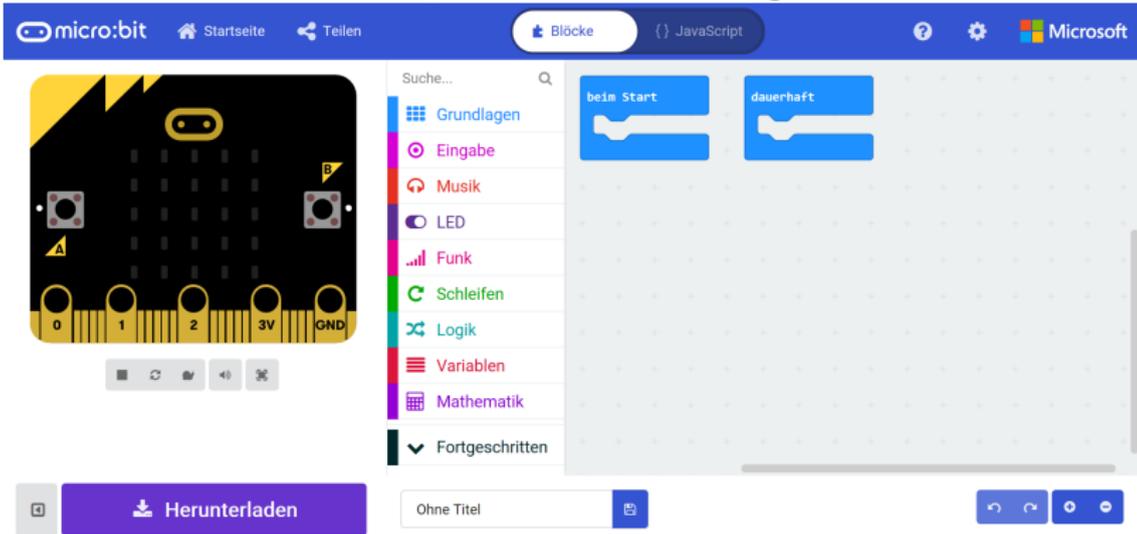


Calliope – Hardware



Micro:bit – Programmieren

<https://microbit.org>



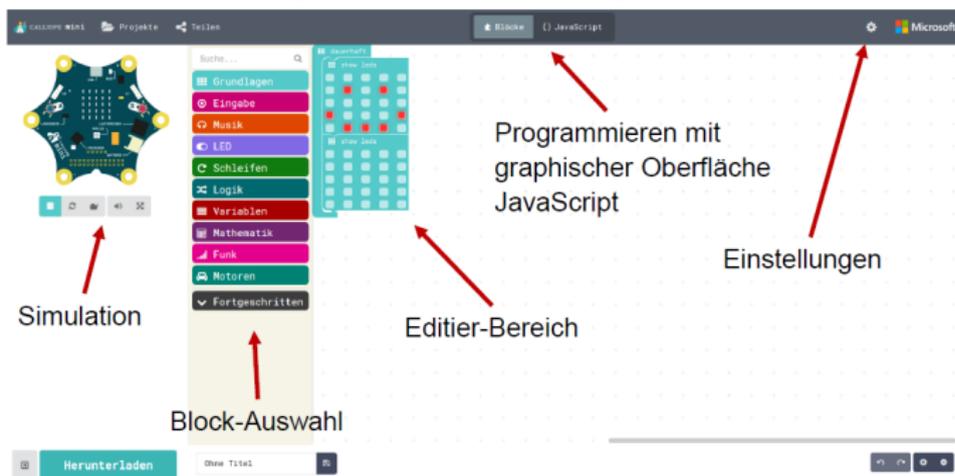
The screenshot shows the Micro:bit programming website interface. At the top, there is a navigation bar with the Micro:bit logo, a home icon labeled 'Startseite', a share icon labeled 'Teilen', a search bar containing 'Blöcke', and a dropdown menu showing 'JavaScript'. On the right side of the navigation bar are icons for help, settings, and the Microsoft logo.

The main content area is divided into two sections. On the left, there is a large image of a Micro:bit board with a yellow and black background. Below the board are several small icons: a square, a refresh icon, a share icon, a play icon, and a stop icon. At the bottom left of this section is a large purple button labeled 'Herunterladen' (Download).

On the right side, there is a search bar labeled 'Suche...'. Below it is a vertical list of categories with colored icons: Grundlagen (blue), Eingabe (pink), Musik (red), LED (purple), Funk (orange), Schleifen (green), Logik (teal), Variablen (red), Mathematik (purple), and Fortgeschritten (dark green). To the right of this list is a large grid area for programming blocks. Two blue blocks are visible: 'beim Start' (when started) and 'dauerhaft' (forever). At the bottom right of the grid are three navigation icons: back, forward, and a circular refresh icon.

Calliope – Programmieren

<https://www.calliope.cc/>



The screenshot shows the Calliope web interface. On the left is a simulation of a Calliope mini board. In the center is a block selection menu with categories like Grundlagen, Eingabe, Musik, LED, Schleifen, Logik, Variablen, Mathematik, Funk, Motoren, and Fortgeschritten. On the right is an editor area with a grid of blocks. At the bottom left is a 'Herunterladen' button, and at the bottom center is a text input field for naming and saving. Red arrows point from text labels to these specific UI elements.

Simulation

Block-Auswahl

Download des Programms

Editier-Bereich

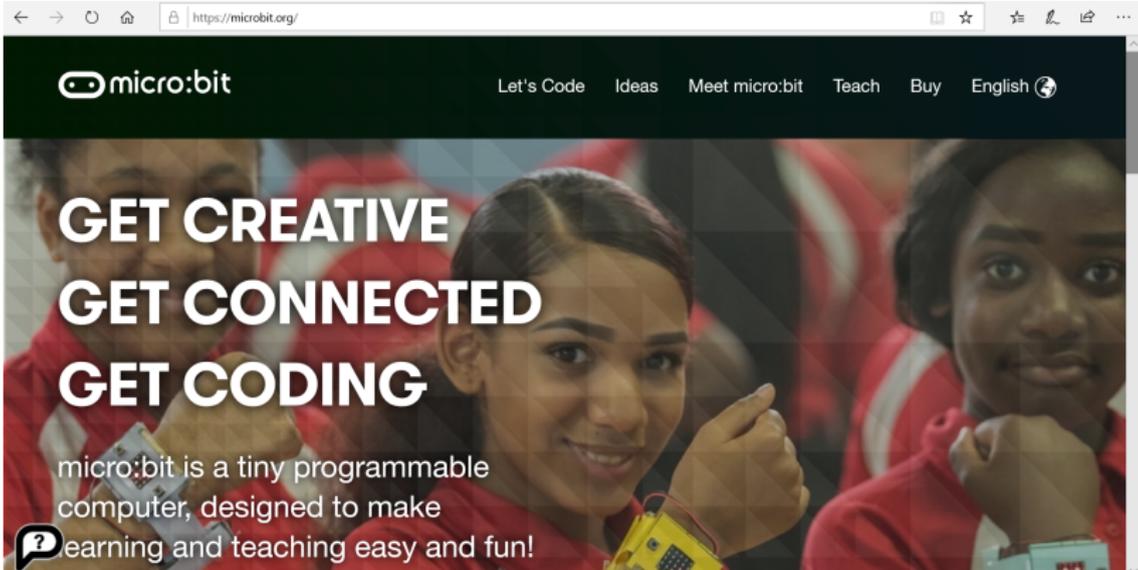
Programmieren mit graphischer Oberfläche JavaScript

Einstellungen

Namenvergabe und Speichern

Erste Programmierungen mit Micro:bit und Calliope

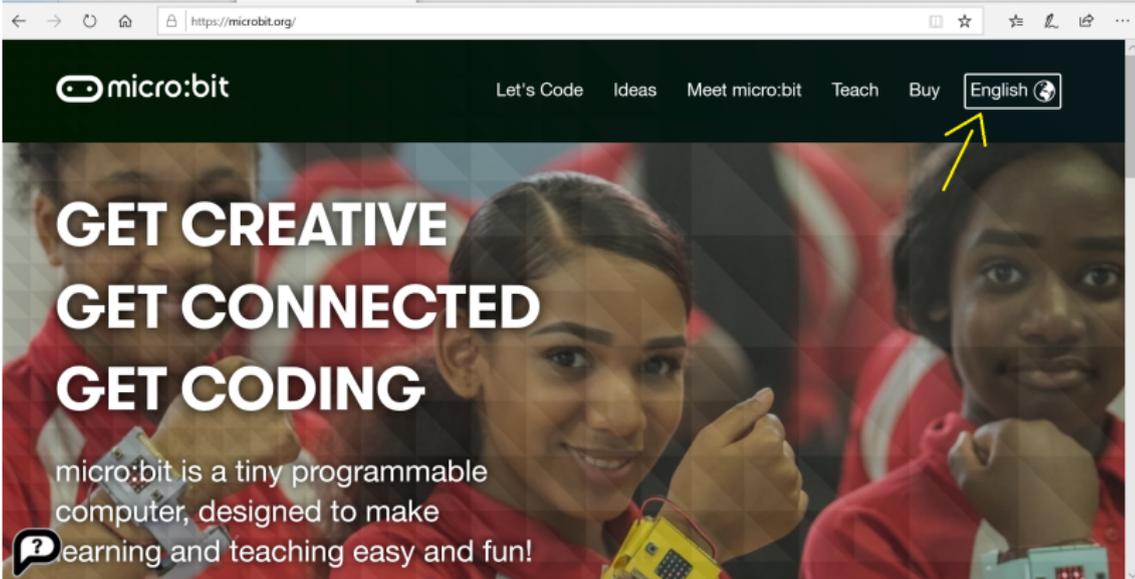
Schritt 1



The screenshot shows the homepage of the micro:bit website. At the top, there is a navigation bar with the micro:bit logo on the left and links for "Let's Code", "Ideas", "Meet micro:bit", "Teach", "Buy", and "English" on the right. The main content area features a large image of three children in red jackets, with a young girl in the center pointing towards the camera. Overlaid on the image is the text "GET CREATIVE", "GET CONNECTED", and "GET CODING" in large, bold, white letters. Below this, a smaller text block reads: "micro:bit is a tiny programmable computer, designed to make learning and teaching easy and fun!" with a speech bubble icon.

Erste Programmierungen mit Micro:bit und Calliope

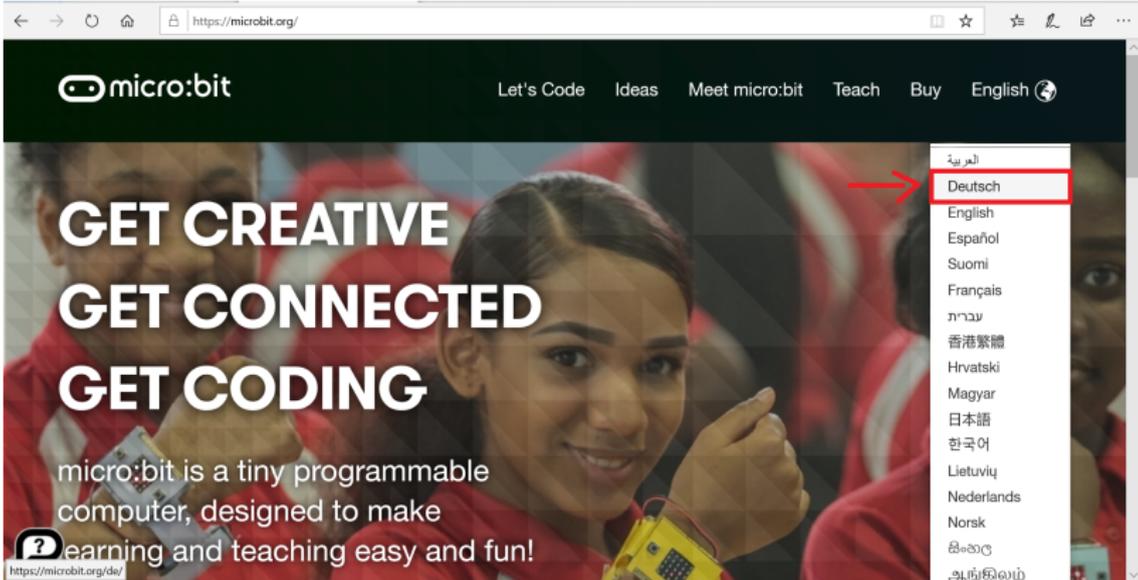
Schritt 2



The screenshot shows the homepage of the micro:bit website. The browser address bar displays "https://microbit.org/". The navigation bar includes the "micro:bit" logo, and links for "Let's Code", "Ideas", "Meet micro:bit", "Teach", "Buy", and "English" (with a globe icon). A yellow arrow points to the "English" button. The main content area features a large image of three children in red shirts, with the text "GET CREATIVE", "GET CONNECTED", and "GET CODING" overlaid. Below this, a paragraph reads: "micro:bit is a tiny programmable computer, designed to make learning and teaching easy and fun!" with a question mark icon.

Erste Programmierungen mit Micro:bit und Calliope

Schritt 3



The screenshot shows the micro:bit website in a browser. The main navigation bar includes 'micro:bit', 'Let's Code', 'Ideas', 'Meet micro:bit', 'Teach', 'Buy', and 'English'. A language selection dropdown menu is open, listing various languages. 'Deutsch' is highlighted with a red box and a red arrow pointing to it. The main content area features the text 'GET CREATIVE', 'GET CONNECTED', and 'GET CODING' over a background image of children. Below this, it says 'micro:bit is a tiny programmable computer, designed to make learning and teaching easy and fun!'.

← → ↻ 🏠 <https://microbit.org/> 📄 ☆ 🌐 🗑️ ⋮

micro:bit Let's Code Ideas Meet micro:bit Teach Buy English 🌐

العربية
Deutsch
English
Español
Suomi
Français
עברית
香港繁體
Hrvatski
Magyar
日本語
한국어
Lietuvių
Nederlands
Norsk
မြန်မာ
အင်္ဂလိပ်

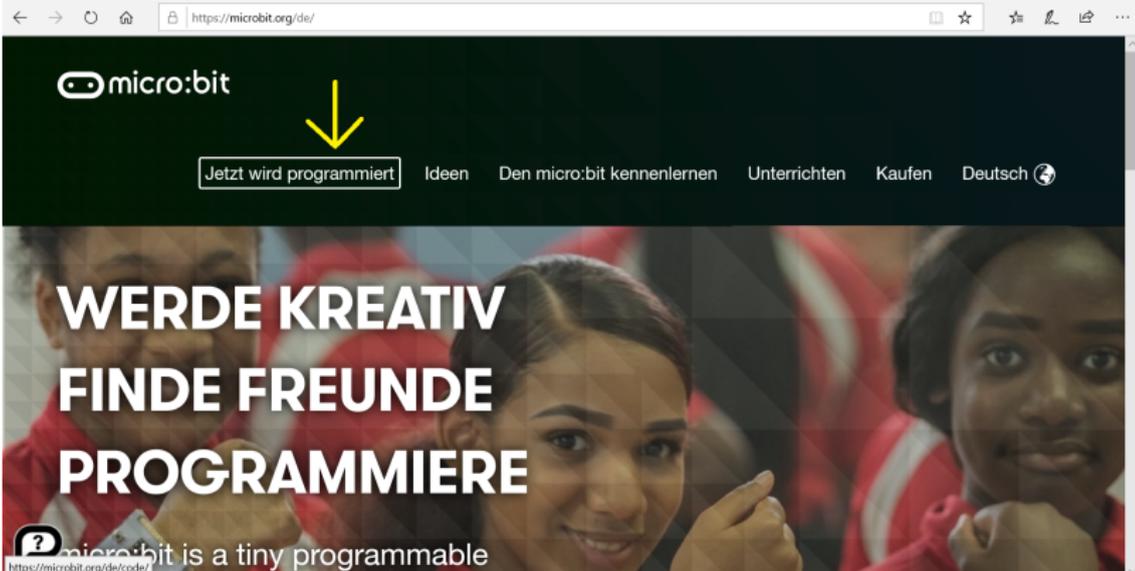
GET CREATIVE
GET CONNECTED
GET CODING

micro:bit is a tiny programmable computer, designed to make learning and teaching easy and fun!

<https://microbit.org/de/>

Erste Programmierungen mit Micro:bit und Calliope

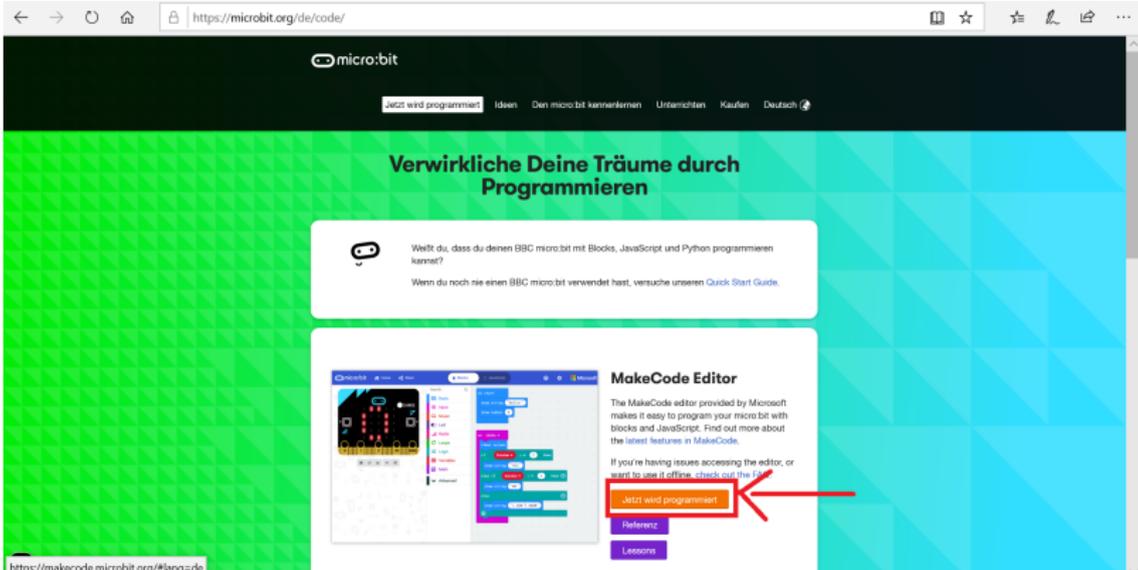
Schritt 4



The screenshot shows the German homepage of the Micro:bit website. The browser address bar displays `https://microbit.org/de/`. The main navigation bar is dark with the Micro:bit logo on the left. A yellow arrow points to the button labeled "Jetzt wird programmiert". Other navigation items include "Ideen", "Den micro:bit kennenlernen", "Unterrichten", "Kaufen", and "Deutsch" with a globe icon. Below the navigation bar is a large banner image of three children in red and white uniforms. Overlaid on the image is the text "WERDE KREATIV", "FINDE FREUNDE", and "PROGRAMMIERE" in large white letters. At the bottom left of the banner is a small icon of a question mark and the text "micro:bit is a tiny programmable".

Erste Programmierungen mit Micro:bit und Calliope

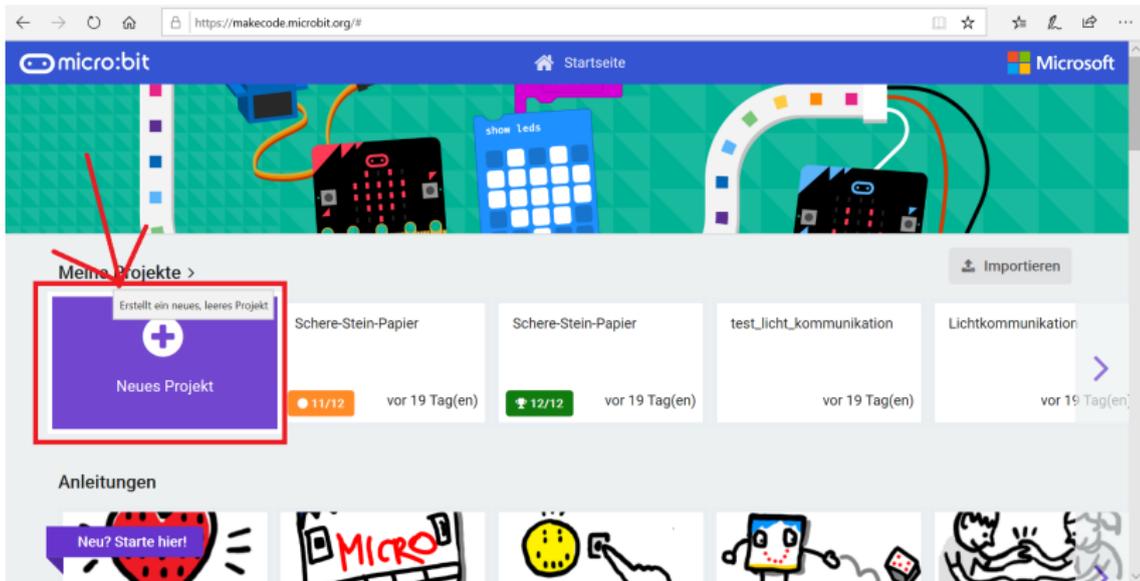
Schritt 5



The screenshot shows the German version of the micro:bit website. The URL in the browser is <https://microbit.org/de/code/>. The page features a green and blue geometric background. The main heading is "Verwirkliche Deine Träume durch Programmieren". Below this, there is a white box with a speech bubble icon and the text: "Weißt du, dass du deinen BBC micro:bit mit Blocks, JavaScript und Python programmieren kannst? Wenn du noch nie einen BBC micro:bit verwendet hast, versuche unseren Quick Start Guide." Below this is another white box titled "MakeCode Editor" which contains a screenshot of the MakeCode editor interface and the text: "The MakeCode editor provided by Microsoft makes it easy to program your micro:bit with blocks and JavaScript. Find out more about the latest features in MakeCode. If you're having issues accessing the editor, or want to use it offline, check out the FAQ." At the bottom of this box are three buttons: "Jetzt wird programmiert" (highlighted with a red box and a red arrow), "Referenz", and "Lektionen". A small URL <https://makecode.microbit.org/#lang=de> is visible in the bottom left corner of the page content.

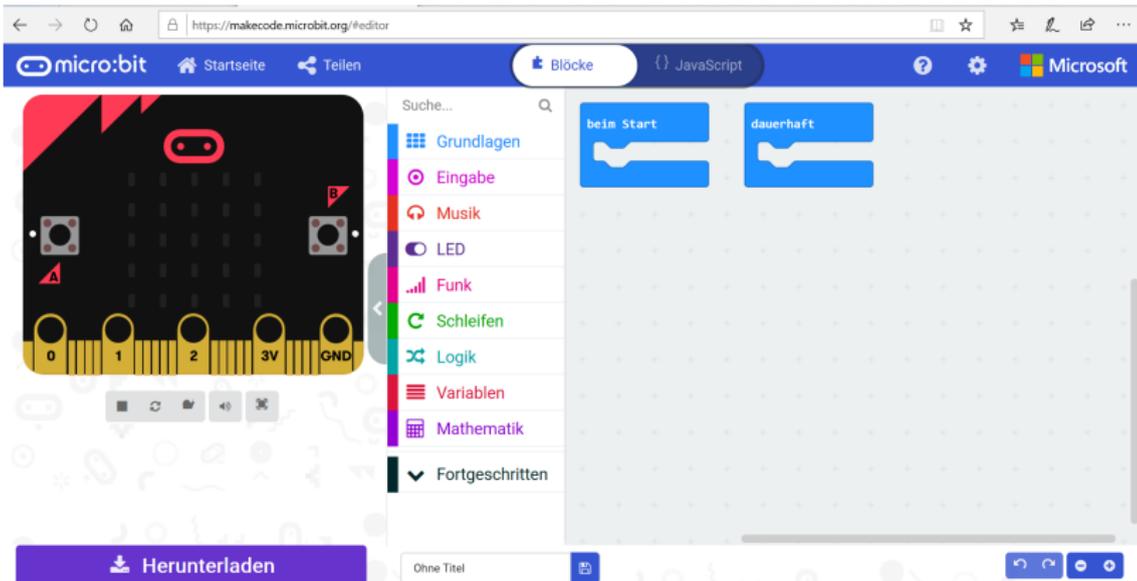
Erste Programmierungen mit Micro:bit und Calliope

Schritt 6



Erste Programmierungen mit Micro:bit und Calliope

Schritt 7



Suche...

- Grundlagen
- Eingabe
- Musik
- LED
- Funk
- Schleifen
- Logik
- Variablen
- Mathematik
- Fortgeschritten

beim Start

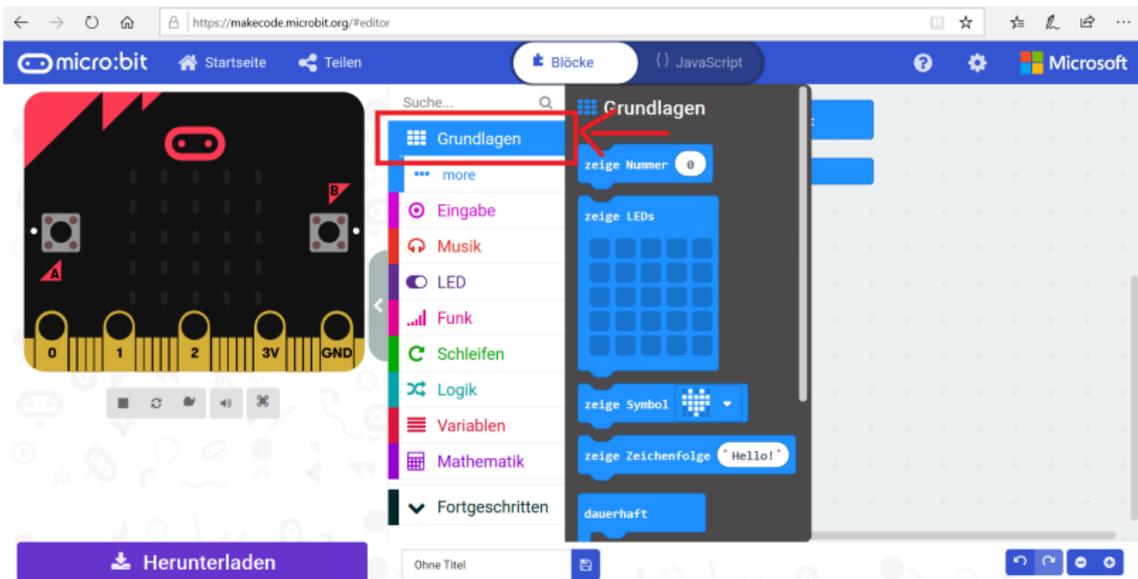
dauerhaft

Herunterladen

Ohne Titel

Erste Programmierungen mit Micro:bit und Calliope

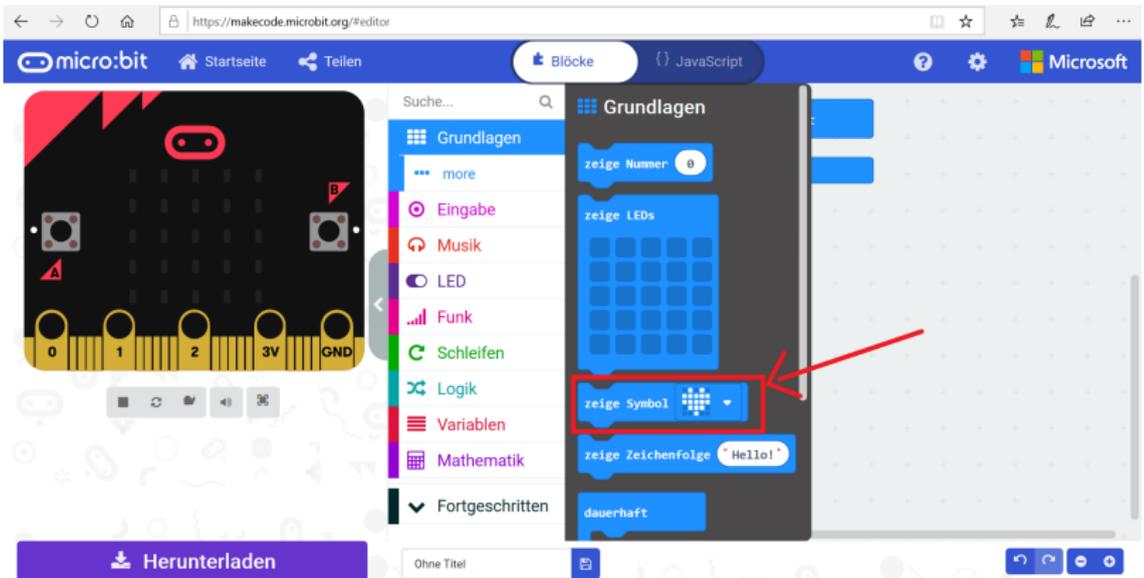
Schritt 8



The screenshot displays the MakeCode Micro:bit editor interface. The browser address bar shows the URL <https://makecode.microbit.org/#editor>. The top navigation bar includes the 'micro:bit' logo, 'Startseite', 'Teilen', 'Blöcke', and 'JavaScript'. On the left is a virtual Micro:bit board. A central sidebar menu lists categories: 'Grundlagen' (highlighted with a red box and arrow), 'more', 'Eingabe', 'Musik', 'LED', 'Funk', 'Schleifen', 'Logik', 'Variablen', 'Mathematik', and 'Fortgeschritten'. The 'Grundlagen' category is expanded, showing blocks like 'zeige Nummer', 'zeige LEDs', 'zeige Symbol', 'zeige Zeichenfolge', and 'dauerhaft'. A 'Herunterladen' button is at the bottom left.

Erste Programmierungen mit Micro:bit und Calliope

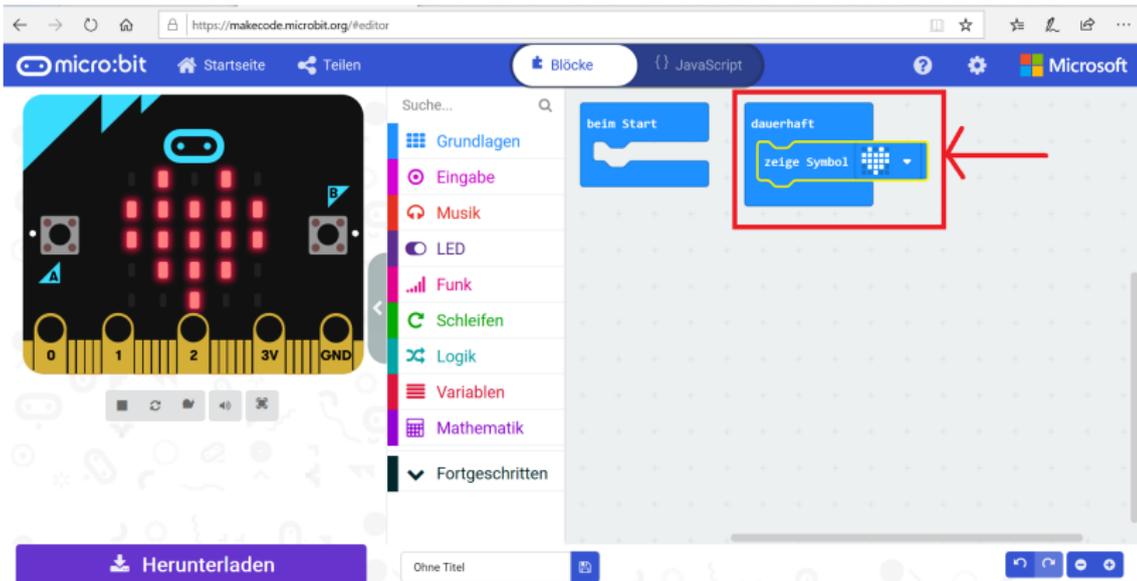
Schritt 9



The screenshot shows the MakeCode Micro:bit editor interface. The left sidebar displays a Micro:bit board. The main workspace shows a block-based program with the following blocks: 'zeige Nummer 0', 'zeige LEDs', 'zeige Symbol' (highlighted with a red box and a red arrow), 'zeige Zeichenfolge "Hello!"', and 'dauerhaft'. The 'Grundlagen' menu is open, showing various block categories: 'Grundlagen', 'Eingabe', 'Musik', 'LED', 'Funk', 'Schleifen', 'Logik', 'Variablen', 'Mathematik', and 'Fortgeschritten'. The URL in the browser is <https://makecode.microbit.org/#editor>. The Microsoft logo is visible in the top right corner of the browser interface.

Erste Programmierungen mit Micro:bit und Calliope

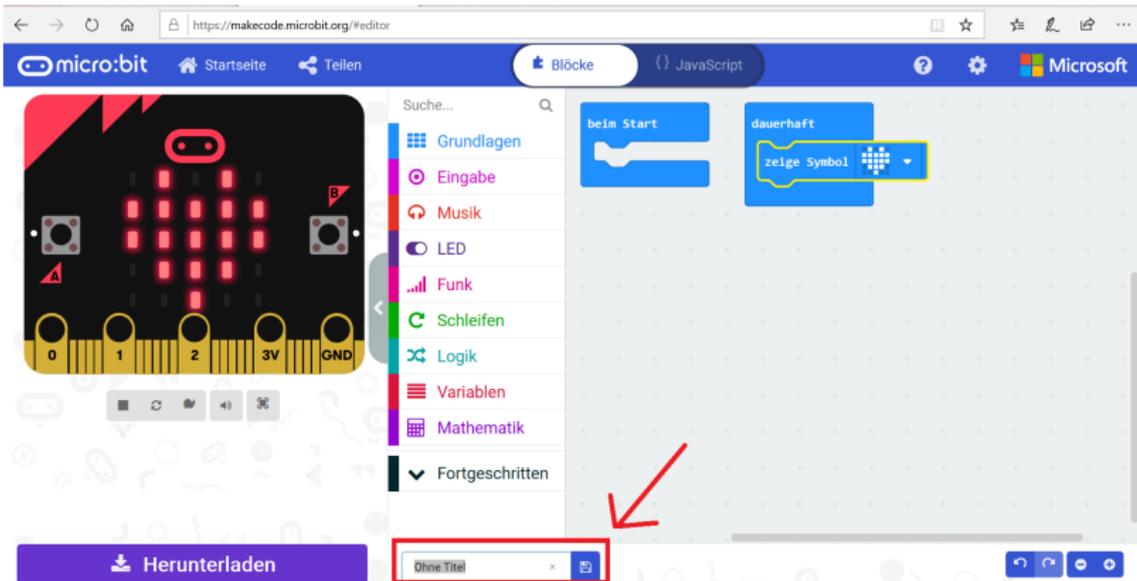
Schritt 10



The screenshot shows the Micro:bit MakeCode editor interface. On the left is a virtual Micro:bit board with a grid of red LEDs. The main workspace contains a 'beim Start' block followed by a 'dauerhaft' block. Inside the 'dauerhaft' block, a 'zeige Symbol' block is highlighted with a yellow border and a red arrow points to it from the right. The left sidebar shows a search bar and a list of block categories: Grundlagen, Eingabe, Musik, LED, Funk, Schleifen, Logik, Variablen, Mathematik, and Fortgeschritten. The bottom of the editor has a 'Herunterladen' button and a title field containing 'Ohne Titel'.

Erste Programmierungen mit Micro:bit und Calliope

Schritt 11



Suche...

- Grundlagen
- Eingabe
- Musik
- LED
- Funk
- Schleifen
- Logik
- Variablen
- Mathematik
- Fortgeschritten

beim Start

dauerhaft

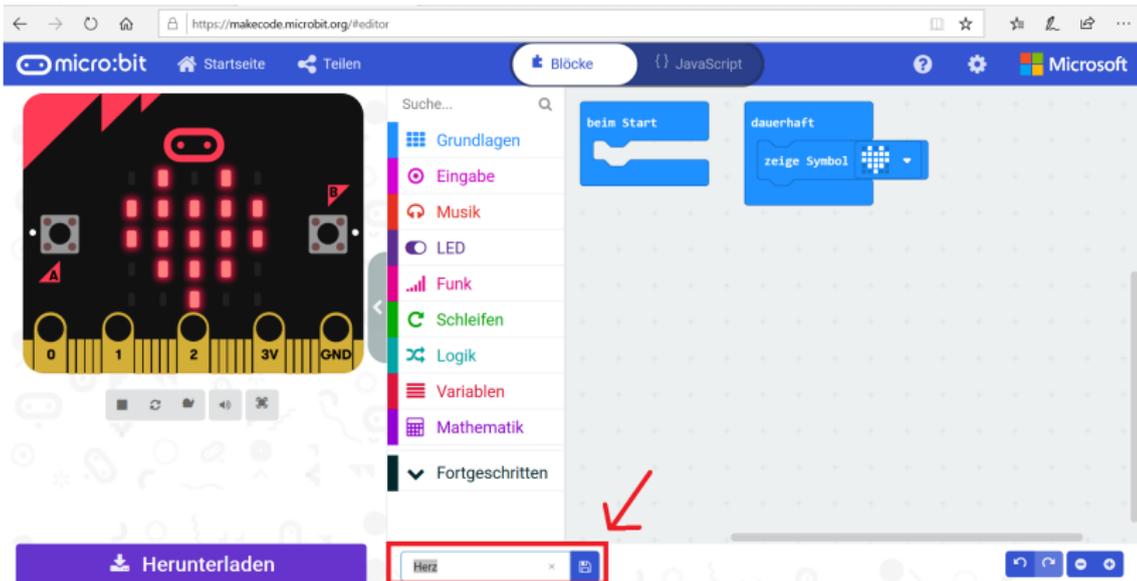
zeige Symbol

Herunterladen

Datei Name

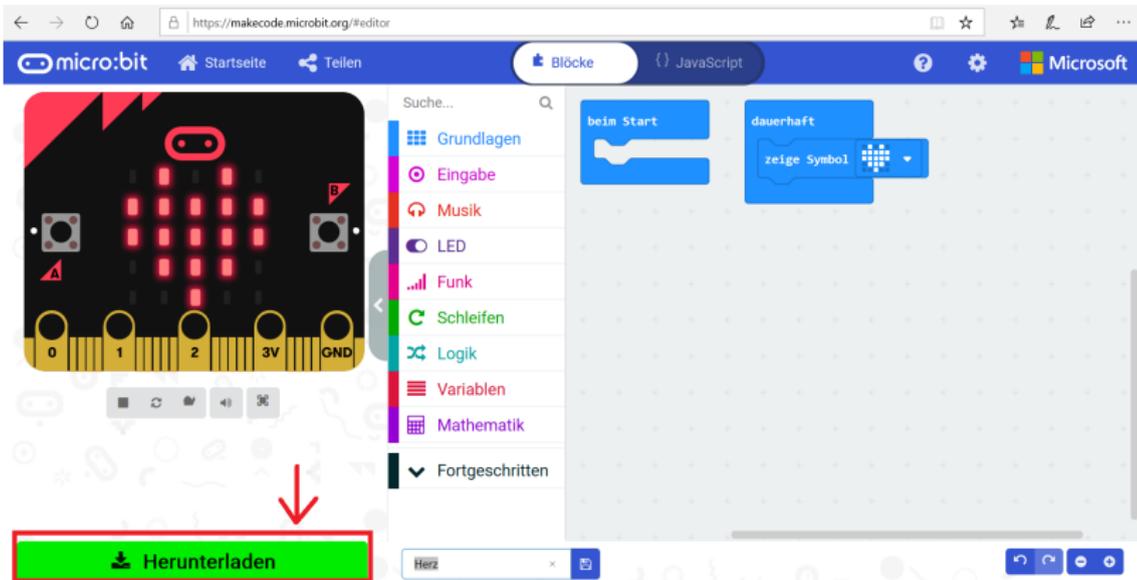
Erste Programmierungen mit Micro:bit und Calliope

Schritt 12



Erste Programmierungen mit Micro:bit und Calliope

Schritt 13



Suche...

- Grundlagen
- Eingabe
- Musik
- LED
- Funk
- Schleifen
- Logik
- Variablen
- Mathematik
- Fortgeschritten

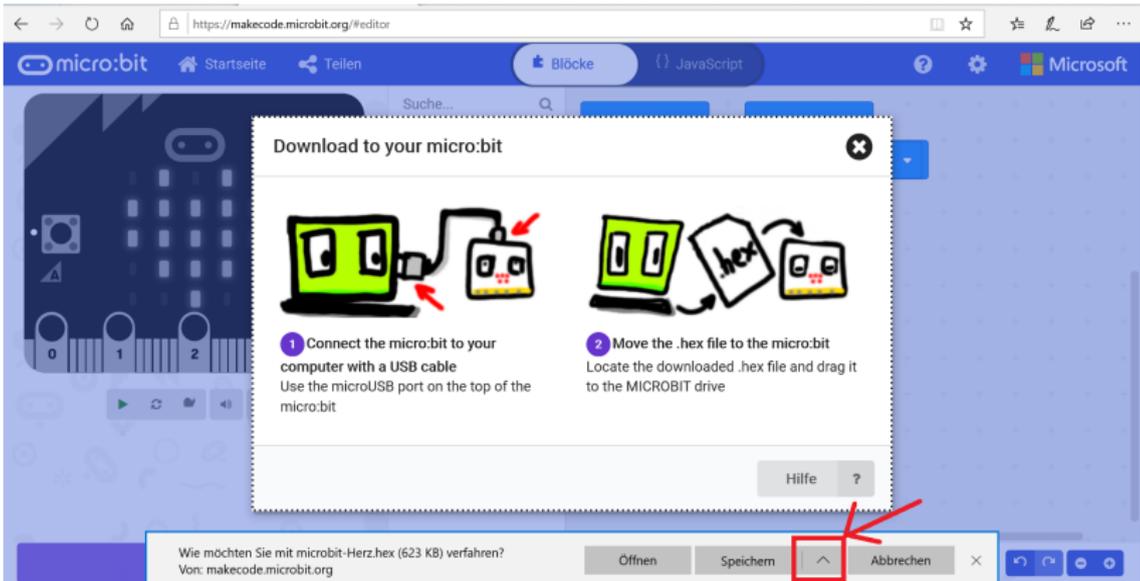
beim Start

dauerhaft zeige Symbol

Herunterladen

Erste Programmierungen mit Micro:bit und Calliope

Schritt 14



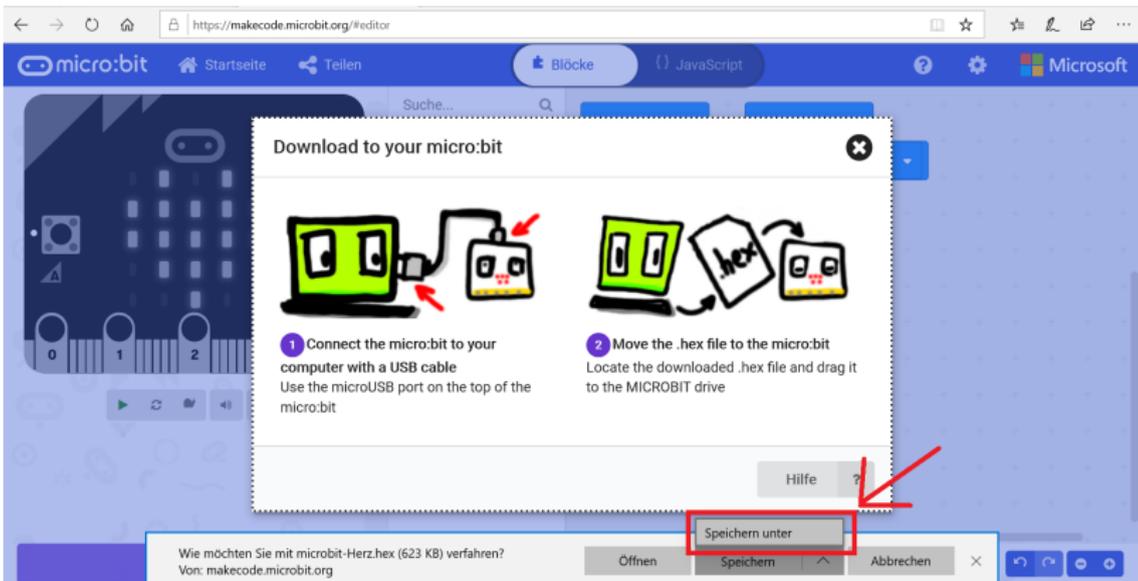
The screenshot shows the MakeCode Micro:bit editor interface. A dialog box titled "Download to your micro:bit" is displayed in the center, containing two steps:

- 1** Connect the micro:bit to your computer with a USB cable
Use the microUSB port on the top of the micro:bit
- 2** Move the .hex file to the micro:bit
Locate the downloaded .hex file and drag it to the MICROBIT drive

Below the dialog box, a file dialog is open, showing the question: "Wie möchten Sie mit microbit-Herz.hex (623 KB) verfahren?" and the source: "Von: makecode.microbit.org". The "Abbrechen" button is highlighted with a red box and a red arrow pointing to it.

Erste Programmierungen mit Micro:bit und Calliope

Schritt 15



https://makecode.microbit.org/#editor

micro:bit Startseite Teilen Blöcke JavaScript

Suche...

Download to your micro:bit

- 1 Connect the micro:bit to your computer with a USB cable
Use the microUSB port on the top of the micro:bit
- 2 Move the .hex file to the micro:bit
Locate the downloaded .hex file and drag it to the MICROBIT drive

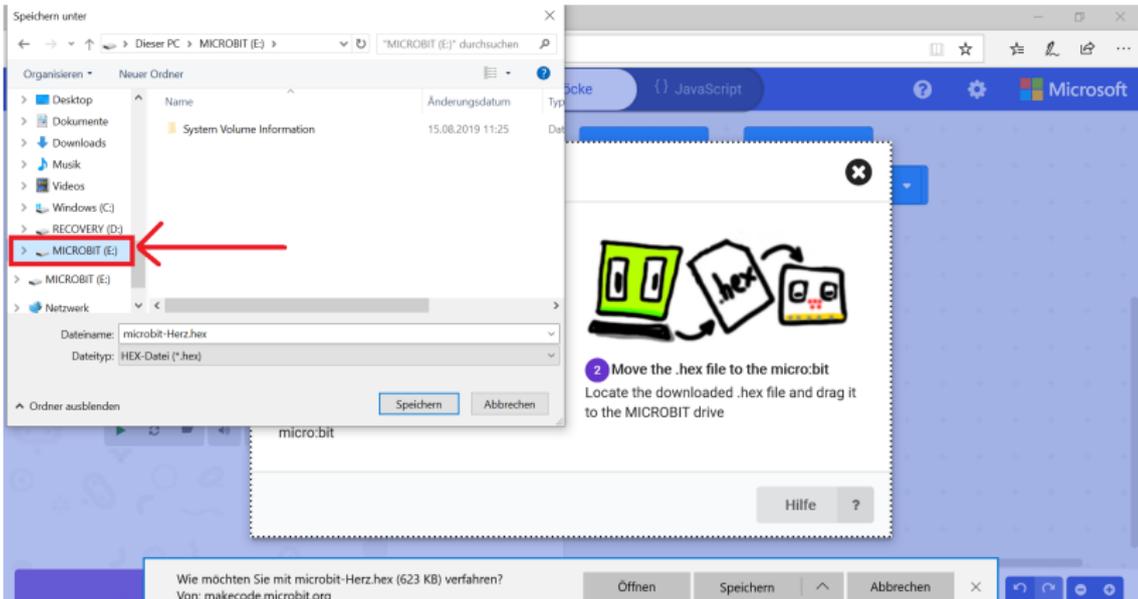
Hilfe ?

Wie möchten Sie mit microbit-Herz.hex (623 KB) verfahren?
Von: makecode.microbit.org

Öffnen Speichern unter Speichern Abbrechen

Erste Programmierungen mit Micro:bit und Calliope

Schritt 16



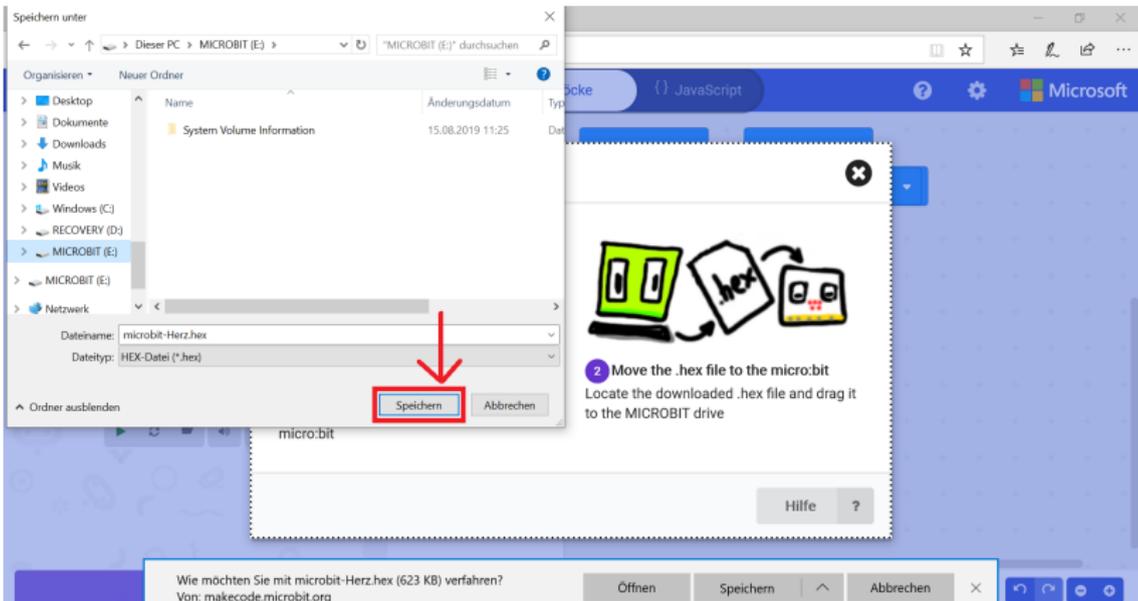
The screenshot shows a Windows File Explorer window titled "Speichern unter" (Save as) with the address bar set to "Dieser PC > MICROBIT (E:)". The left sidebar shows the navigation pane with "MICROBIT (E:)" highlighted by a red box and a red arrow pointing to it. The main pane shows a file named "microbit-Herz.hex" with a date of "15.08.2019 11:25". The file type is "HEX-Datei (*.hex)". The "Dateiname" field contains "microbit-Herz.hex" and the "Dateityp" is "HEX-Datei (*.hex)". The "Speichern" (Save) button is visible.

In the background, a web browser window is open to a page titled "JavaScript". A white callout box with a dashed border contains an illustration of a green Micro:bit, a white card with ".hex" written on it, and a yellow Calliope mini robot. Below the illustration, the text reads: "2 Move the .hex file to the micro:bit. Locate the downloaded .hex file and drag it to the MICROBIT drive". A "Hilfe ?" (Help) button is at the bottom of the callout.

At the bottom of the browser window, a small dialog box asks: "Wie möchten Sie mit microbit-Herz.hex (623 KB) verfahren? Von: makecode.microbit.org". It has buttons for "Öffnen", "Speichern", "Abbrechen", and a close button.

Erste Programmierungen mit Micro:bit und Calliope

Schritt 17



Speichern unter

Dieser PC > MICROBIT (E:) > "MICROBIT (E:)" durchsuchen

Organisieren - Neuer Ordner

Name	Änderungsdatum	Typ
System Volume Information	15.08.2019 11:25	Datensystem

Dateiname: microbit-Herz.hex
Dateityp: HEX-Datei (*.hex)

Speichern Abbrechen

micro:bit

JavaScript

2 Move the .hex file to the micro:bit
Locate the downloaded .hex file and drag it to the MICROBIT drive

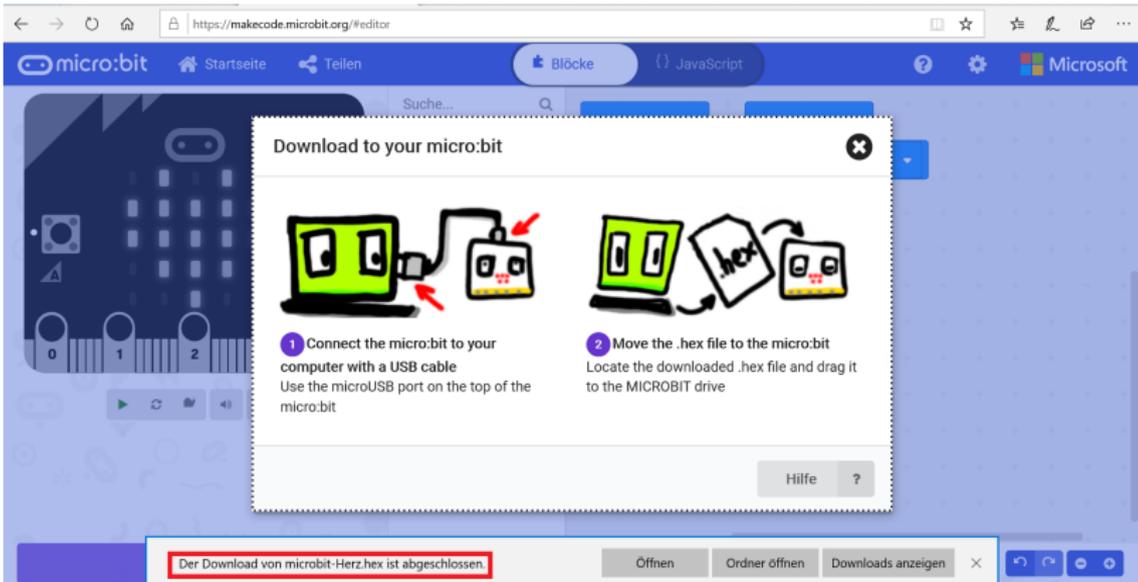
Hilfe ?

Wie möchten Sie mit microbit-Herz.hex (623 KB) verfahren?
Von: makecode.microbit.org

Öffnen Speichern ^ Abbrechen x

Erste Programmierungen mit Micro:bit und Calliope

Schritt 18



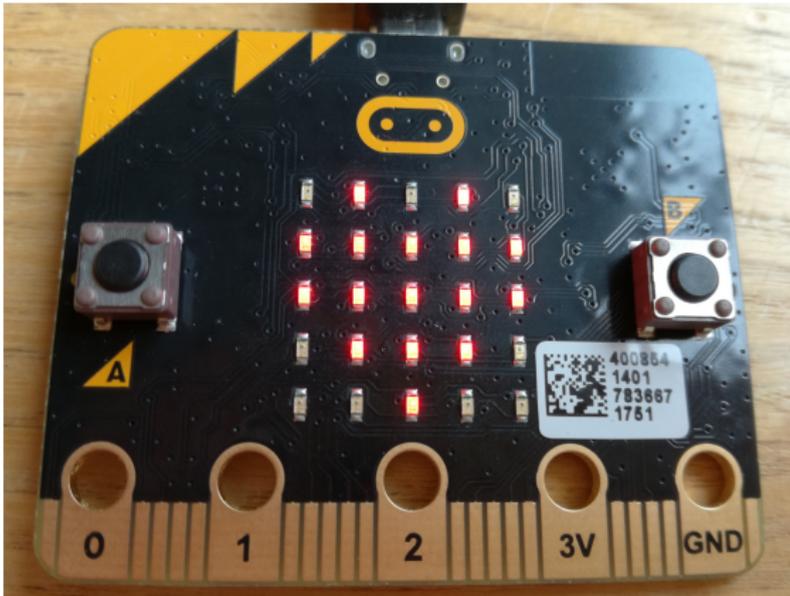
The screenshot shows the MakeCode Micro:bit editor interface. A dialog box titled "Download to your micro:bit" is displayed in the center. The dialog contains two steps:

- 1** Connect the micro:bit to your computer with a USB cable
Use the microUSB port on the top of the micro:bit
- 2** Move the .hex file to the micro:bit
Locate the downloaded .hex file and drag it to the MICROBIT drive

Below the steps, there is a "Hilfe ?" button. At the bottom of the browser window, a status bar shows a red-bordered box with the text: "Der Download von microbit-Herz.hex ist abgeschlossen." To the right of this box are buttons for "Öffnen", "Ordner öffnen", and "Downloads anzeigen".

Erste Programmierungen mit Micro:bit und Calliope

Schritt 19

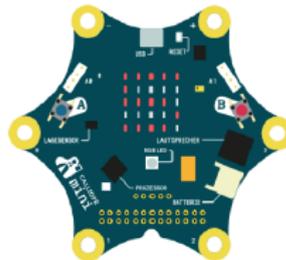
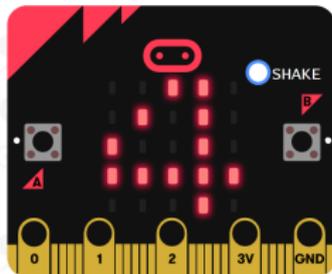


Erstes eigenes Programm für den Micro:bit und Calliope

Modellieren Sie mit dem Micro:bit **und** Calliope einen Würfel mit den folgenden Anforderungen:

- durch schütteln wird eine Zahl auf dem Display ausgegeben.
- die Augenzahlen sind zwischen 1 und 6 zu wählen.

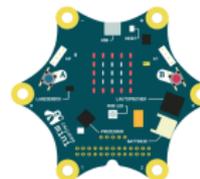
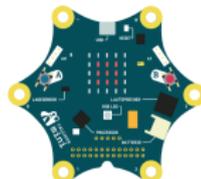
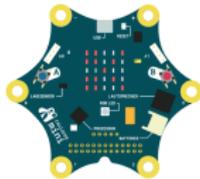
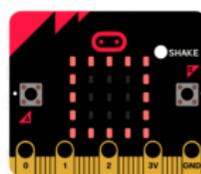
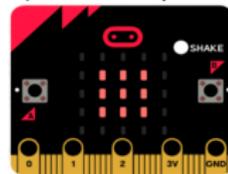
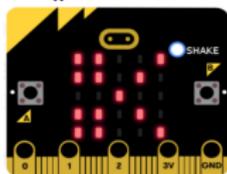
Vergleichen Sie das Programm des Micro:bits mit dem des Calliopes.



Zweites Programm für den Micro:bit und Calliope

Micro:bit/Calliope Schere-Stein-Papier

Schritt 1: Designe die Bilder für Schere, Stein und Papier



Schritt 2: Wenn der Micro:bit/Calliope geschüttelt wird, so wird zufällig ein Bild ausgegeben.

Schritt 3: Spiele mit deinem Nachbarn dieses Spiel.

Zusatz: Zähle deine Spielgewinne. Tipp: Du spielst gegen deinen Nachbarn.
Wenn du gewinnst, drücke auf deinem Micro:bit/Calliope eine Taste.



Mögliche Aufgaben für Schüler

Wählen Sie einen Einplattinencomputer aus, um die folgenden Stationen zu bearbeiten.

Station 1 Schere, Stein, Papier

Station 2 Micro:bit/Calliope als Nachtlicht verwenden

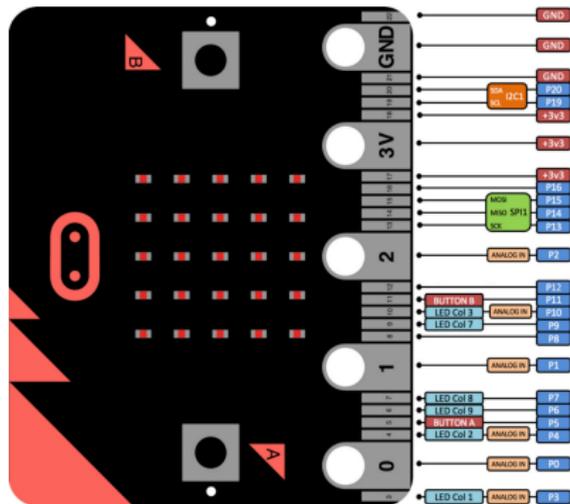
Station 3 Micro:bit/Calliope als Funkgerät verwenden



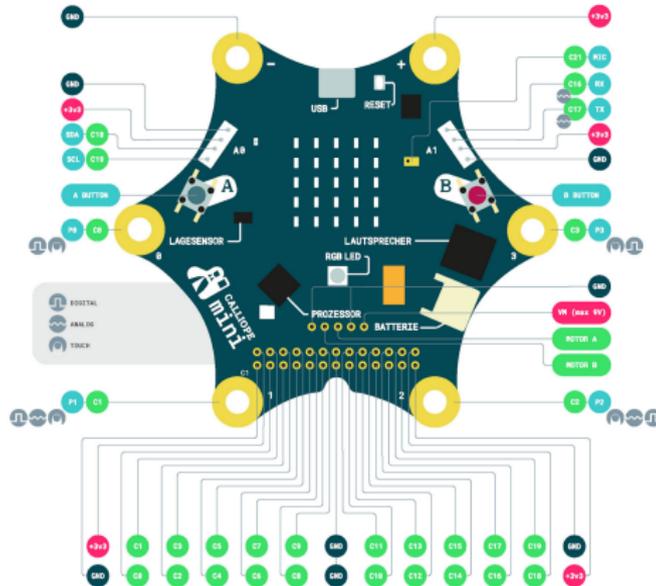
Vergleich Micro:bit und Calliope

Eigenschaft	Micro:bit	Calliope
Entwickelt	2014 von BBC	2017 vom Cornelsen Verlag; auf Grundlage des micro:bits
Lampen	25 LEDs	25 LEDs 1 RGB-LED
Knöpfe	A, B, Reset	A, B, Reset
Sensoren	Kompass, Helligkeit, Bewegungssensoren, Temperatur, Beschleunigungssensor	Kompass, Helligkeit, Bewegungssensoren, Temperatur, Beschleunigungssensor

Micro:bit – Pins



Calliope – Pins



Vergleich Micro:bit und Calliope

Eigenschaft	Micro:bit	Calliope
Pins	25 Pins	+, -, P0, P1, P2, P3; Pins sind berührungsempfindlich
USB	Micro-USB	Micro-USB
Bluetooth	ja	ja
Lautsprecher	nein	ja
Mikrofon	nein	ja
Prozessor	ja	ja
Grove-Konnektorem	nein	ja
Motor-Anschluss	jein	ja

Zusammenfassung und Fazit

