

PENSIERO COMPUTAZIONALE

Giorno 2

ott 2017

Hands on

Key note



Prof. C. Demartini

mBot



Mamma: «Luca, vai al mercato e compra 1 bottiglia di latte. Se hanno delle uova, comprane 6».

Luca va al mercato e torna con 6 bottiglie di latte.

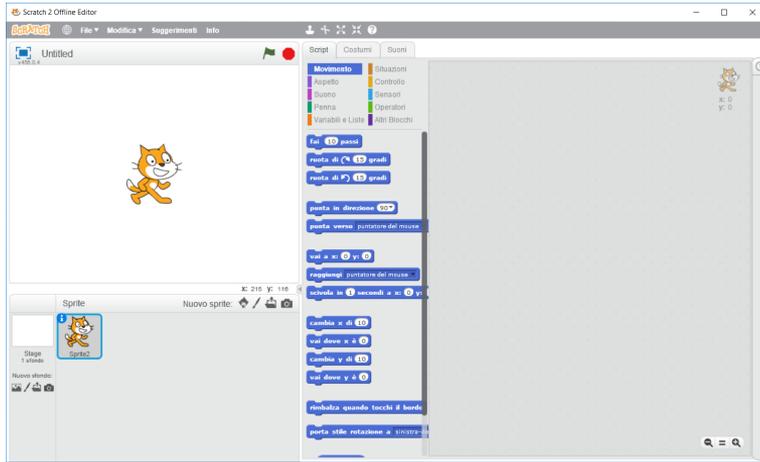
Mamma: «Ma perché hai comprato 6 bottiglie di latte?!»

Luca: «Perché avevano le uova!»

Scratch e mBlock

Sottotitolo

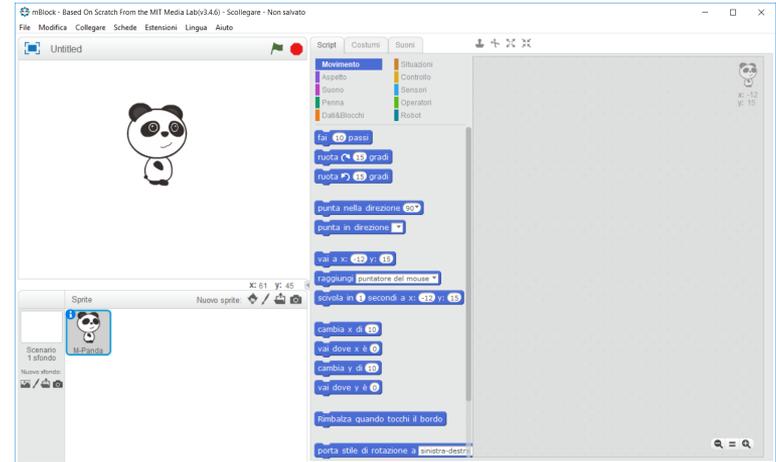
SCRATCH



Scratch is a project of the Lifelong Kindergarten Group at the MIT Media Lab

<https://scratch.mit.edu/>

mBlock



mBlock build by Makeblock is the World's very first Scratch 2.0 branch that can upload a program into Arduino based boards

<http://www.mblock.cc/>

mBot

mBot

ONE ROBOT PER KID

Makeblock



<http://store.makeblock.com/>

mBlock

Interfaccia di programmazione

The screenshot displays the mBlock software interface, which is based on Scratch. The main workspace shows a panda character on a white background. The script area on the right contains the following code blocks:

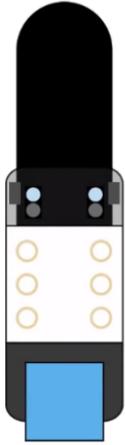
- dire **Ciao!** per 2 secondi
- dire **Ciao!**
- pensa **Hmm...** per 2 secondi
- pensa **Hmm...**
- mostrati
- nascondi
- passa al costume **Panda-b**
- passa al prossimo costume
- passa allo sfondo **sfondo1**
- cambia effetto colore di **25**
- porta effetto colore a **0**
- rimuovi effetti grafici
- cambia dimensione di **10**
- porta dimensione al **100 %**
- vai in primo piano
- vai indietro di **1** livelli

The interface also shows a menu bar with options like File, Modifica, Collegare, Schede, Estensioni, Lingua, and Aiuto. The top-left corner indicates the project is titled 'Untitled' and is based on Scratch. The bottom-left corner shows the Sprite area with a 'Nuovo sprite' button and a 'Scenario 1 sfondo' button.

Line Follower

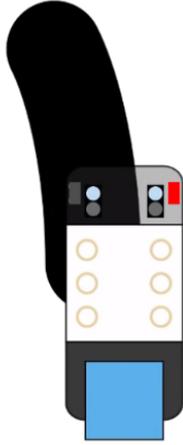
mBot

Line follower



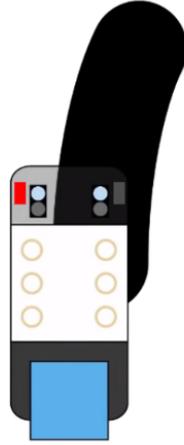
0

00



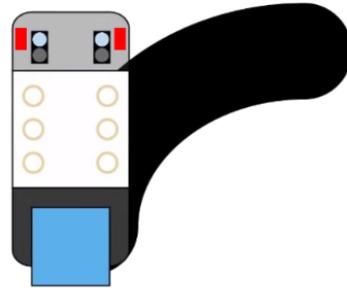
1

01



2

10

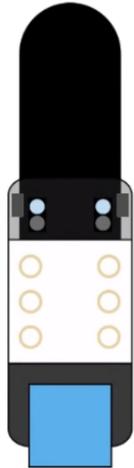


3

11

mBot

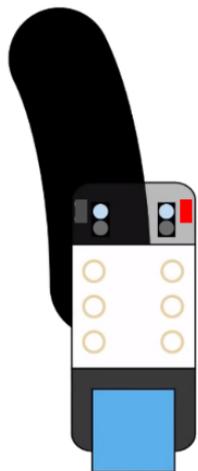
Line follower



```
definisci MuoviAvanti  
setta la velocità del motore M1 a 100  
setta la velocità del motore M2 a 100
```

mBot

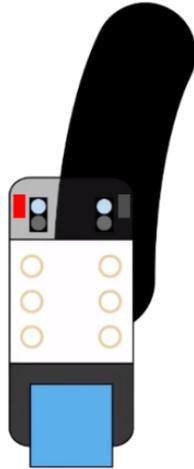
Line follower



```
definisci GiraSinistra  
setta la velocità del motore M1 a 0  
setta la velocità del motore M2 a 100
```

mBot

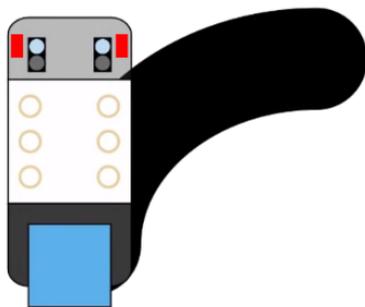
Line follower



```
definisci GiraDestra  
setta la velocità del motore M1 a 100  
setta la velocità del motore M2 a 0
```

mBot

Line follower

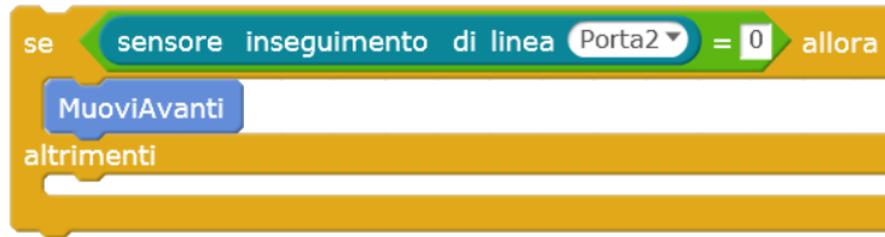


```
definisci MuoviIndietro  
setta la velocità del motore M1 a -100  
setta la velocità del motore M2 a -100
```



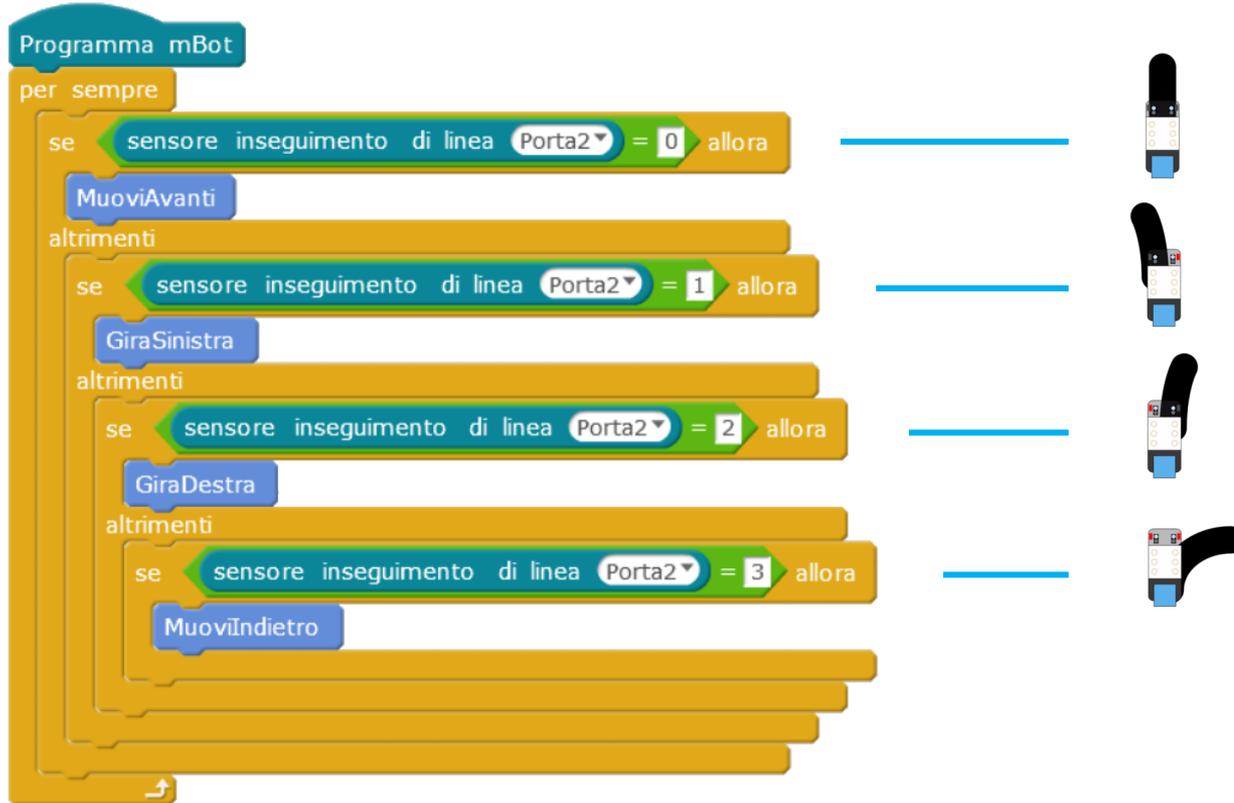
mBot

Line follower



mBot

Line follower

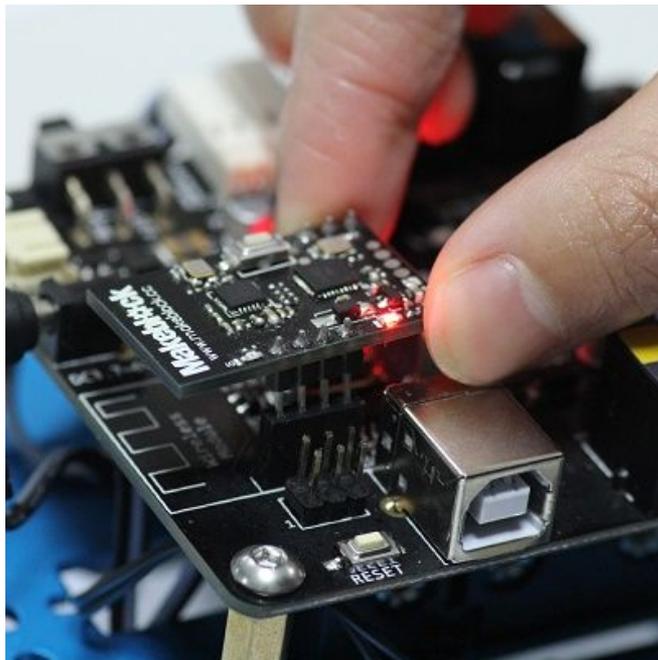


Esercizi 1.0

muoviamo i primi passi

Setup iniziale

Collegare mBot al PC



LED	Stato
Lampeggia velocemente	Dispositivo in attesa di associazione
Lampeggia lentamente	Dispositivo in attesa di connessione
Acceso	Dispositivo connesso



Setup iniziale

Collegare mBot al PC

- 1 Collegare** mBot al computer tramite cavo USB
Menu: Collegare => Porta Seriale => ...
- 2 Accendere** mBot
- 3 Aggiornare** il FW
Menu: Collegare => Aggiorna Firmware
- 4 Inserire** il modulo WiFi nello slot di mBot
- 5 Associare il** modulo WiFi e chiavetta:
 - Premere il pulsante sul modulo WiFi (il LED Blu inizia a lampeggiare)
 - Inserire nella porta USB del PC la pennetta USB WiFi
 - Ad associazione avvenuta il LED Blu smette di lampeggiare resta acceso
- 6 Connettere** tramite IDE mBlock
Menu: Collegare => 2.4G Seriale => Collegare
- 7** Se si presentano problemi di connessione, chiudere l'applicativo e riaprirlo

Nota

Non è necessario eseguire ogni volta le operazioni di aggiornamento software e di accoppiamento del modulo WiFi.

Se il modulo WiFi a bordo di mBot è già accoppiato con la penna USB WiFi, il LED resta acceso senza lampeggiare. In questo caso procedere direttamente con lo step 6.

Esercitazioni

Esercitazione

Segui la linea



Testo dell'esercizio

mBot deve seguire una linea tracciata a terra utilizzando una velocità di crociera variabile.

E' possibile modificare la velocità di mBot utilizzando i tasti numerici del telecomando.

(0 = fermo, 9 = massima velocità).

mBot **non** deve essere connesso al PC tramite chiavetta WiFi.

Alcuni blocchi che potrebbero esserti utili

Segui la linea



Esercitazione

Evita l'ostacolo



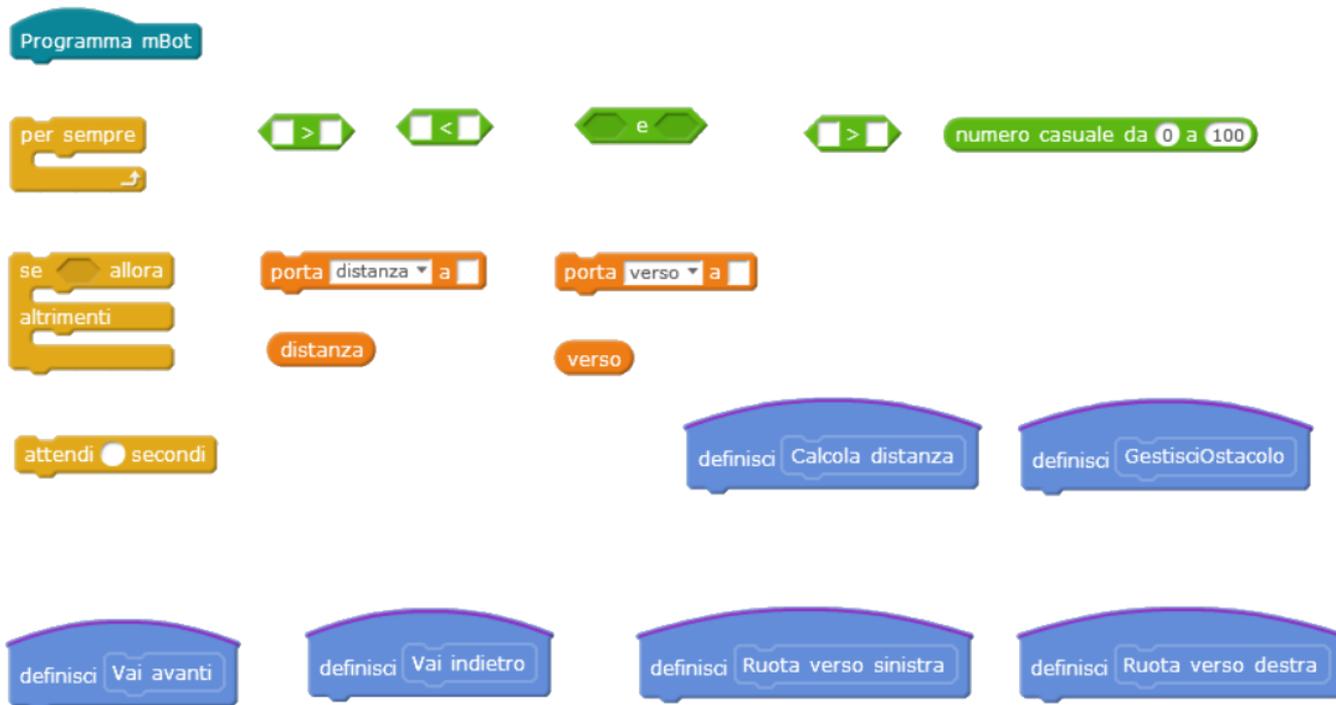
Testo dell'esercizio

mBot deve procedere in linea retta finché non incontra un ostacolo a una distanza inferiore a 10. Nel caso venga rilevato un ostacolo, mBot si ferma, attende 1 secondo, fa retromarcia, sceglie una direzione a caso (destra o sinistra), ruota su se stesso nella direzione scelta, procede il suo viaggio.

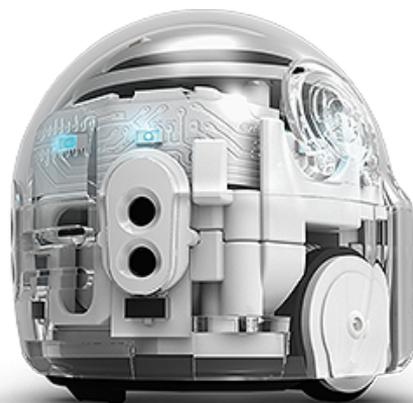
mBot **non** deve essere connesso al PC tramite chiavetta WiFi.

Alcuni blocchi che potrebbero esserti utili

Evita l'ostacolo

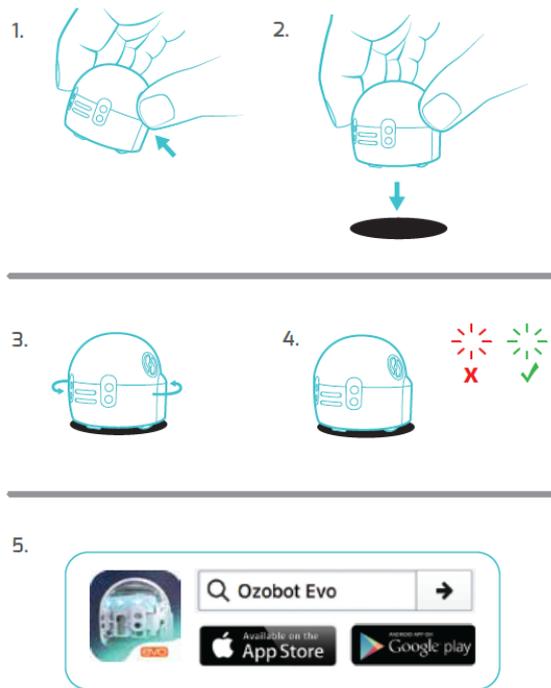


Ozobot



bit evo

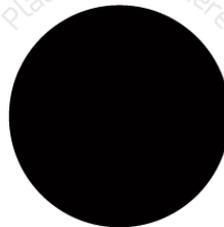
<https://ozobot.com/>



1 Get Started

Calibrate Evo and download the app.

Place Ozobot Here



1. Press and hold power button for 2 sec. until top light flashes white.
2. Release power button and Evo's wheels will quickly calibrate. Place Evo on the black circle.
3. Evo will spin, move forward, then flash **green** if calibrated. If Evo flashes **red**, start over from Step 1.
4. Evo turns off after calibrating. Press the power button to start playing.
5. For the full Evo Experience, download the Ozobot Evo app. Collect stars as you go.

Tips: Drawing Lines



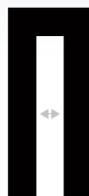
X
Too Thin!



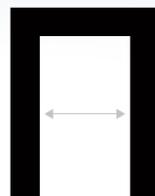
X
Inconsistent!



✓
Just Right



X
Too Close!



✓
Just Right



X
Too Sharp!



✓
Just Right



✓
Just Right

Tips: Code Reference Sheet

SPEED



SNAIL
DOSE



SLOW



CRUISE



FAST



TURBO



NITRO
BOOST

DIRECTION



GO
LEFT



GO
STRAIGHT



GO
RIGHT



LINE JUMP
LEFT



LINE JUMP
STRAIGHT



LINE JUMP
RIGHT



U-TURN



U-TURN
(LINE END)

SPECIAL MOVES



TORNADO



ZIGZAG



SPIN



BACKWALK

TIMERS



PAUSE (3 SEC.)



TIMER ON
(30 SEC. TO STOP)



TIMER OFF

WIN/EXITS



WIN/EXIT (PLAY AGAIN)



WIN/EXIT (GAME OVER)

Tips: Drawing Codes



X
Codes On
Colored Lines



X
Different
Sizes



X
White
Spaces



X
Overlapping
Colors



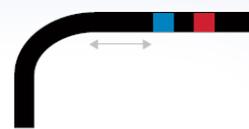
X
Too Dark



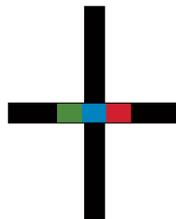
✓
Codes On Black
Lines



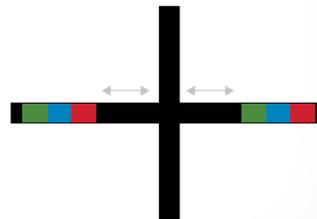
X
No Codes on
Corners!



✓
Keep Codes on Straight
Lines Away from Corners



X
Too Close!

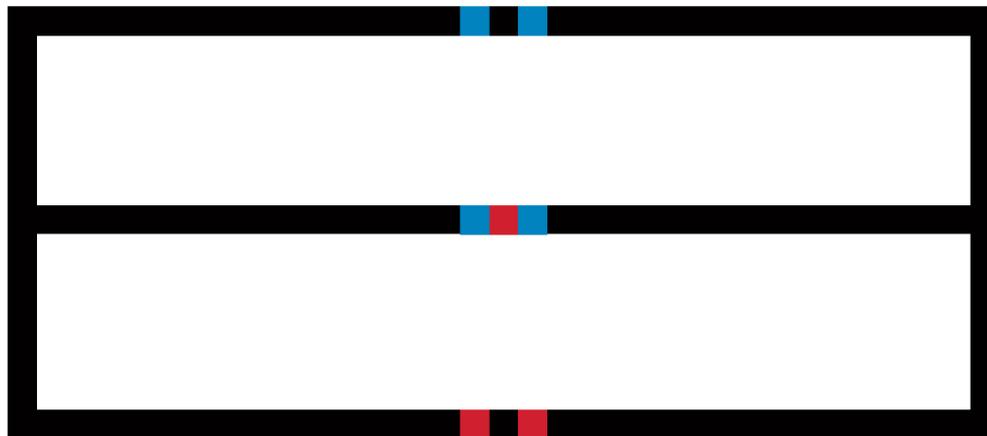


✓
Place Codes Away from
Intersections

5

OzoCodes

Evo reads and responds to color patterns, called OzoCodes. Can you tell which OzoCodes mean Slow, Fast, and U-Turn?



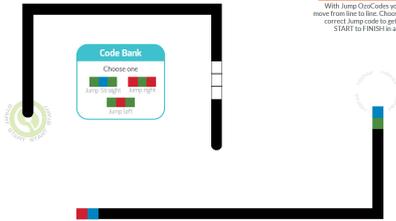
6 Code Creator

Use markers to practice creating the cool Ozobots below.



9 Jump Codes

With Jump Ozobots you can move from line to line. Choose the correct Jump code to get from START to FINISH in a flash.

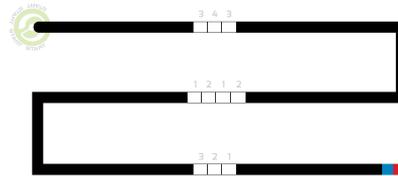


Color Key

1 2 3 4

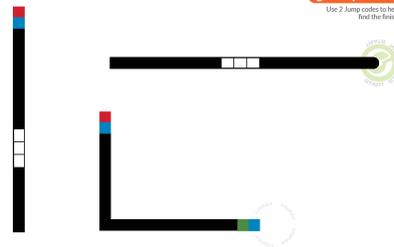
7 Code By Numbers

Some codes mean the same thing no matter which way Evo reads them. Other codes have two meanings. Use the color key to color the codes, then see what Evo does in both directions.



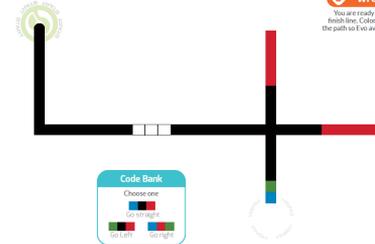
10 Jump Challenge

Use 2 Jump codes to help Evo find the finish line!



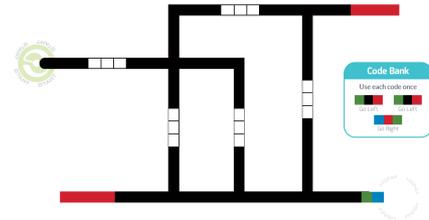
8 Wrong Way!

You are ready to help Evo find the finish line. Color the correct code in the path so Evo avoids the dead ends!



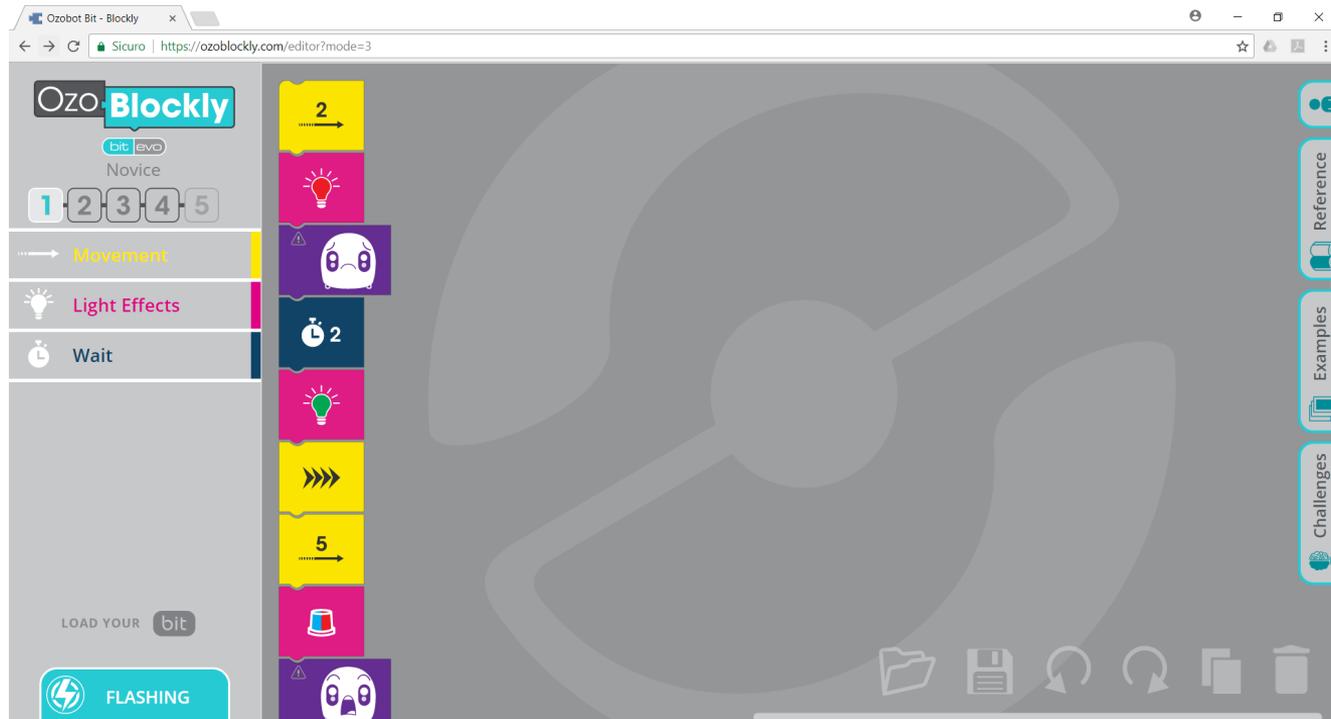
11 Brain Teaser

Use each Ozobot in the Code Bank to get Evo to the finish.





<https://ozoblockly.com/>



The screenshot displays the OzoBlockly web editor interface. The browser address bar shows the URL <https://ozoblockly.com/editor?mode=3>. The interface includes a sidebar on the left with the OzoBlockly logo, a 'Beginner' level indicator, and a navigation menu with categories: Movement, Light Effects, Timing, and Loops. A 'LOAD YOUR bit' button is visible at the bottom of the sidebar. The main workspace contains a code block with the following structure:

```
repeat 4 times
do
  set top light color green
  move forward distance 4 steps speed medium
  set top light color red
  rotate right
```

The code block is visually represented with a blue 'repeat' block containing a 'do' block. The 'do' block contains four sub-blocks: a pink 'set top light color' block with 'green' selected, a yellow 'move forward' block with '4 steps' and 'medium' selected, another pink 'set top light color' block with 'red' selected, and a yellow 'rotate right' block. The background of the workspace features a large, faint watermark of the OzoBlockly logo. A toolbar on the right side of the workspace contains various icons for user management, navigation, and editing. At the bottom of the workspace, there are icons for file management, including a folder, a save icon, and undo/redo arrows.

The screenshot displays the OzoBlockly web editor interface. The browser address bar shows the URL <https://ozoblockly.com/editor?mode=3>. The interface includes a sidebar on the left with the OzoBlockly logo, a 'bit' selector, and a difficulty level of 'Intermediate'. Below this are navigation buttons for '1', '2', '3', '4', and '5', and a 'FLASHING' button. The main workspace contains a 'repeat forever' loop with the following code blocks:

- if** block with conditions: **object behind** and **object in front**
- do** block containing:
 - say color** red
 - set top light color** red
 - set light color** red, red, red, red, red
 - 1 second(s)** delay
 - firework**
 - break out of loop**
- else if** block with condition: **object behind**
- do** block containing:
 - set light color** red, orange, yellow, green, blue
 - say direction** forward
 - move** forward, distance 3 steps, speed fast
- else if** block with condition: **object in front**
- do** block containing:
 - set light color** blue, green, yellow, orange, red
 - say direction** back
 - move** backward, distance 3 steps, speed fast
- turn front lights off**

The screenshot displays the OzoBlockly web editor interface. On the left, a sidebar contains a menu with categories: Movement, Line Navigation, Light Effects, Timing, Terminate, Logic, and Loops. The 'Light Effects' category is currently selected. Below the menu, there is a 'LOAD YOUR bit' button and a 'FLASHING' indicator. The main workspace shows a Scratch-style code editor with the following blocks:

- A 'repeat while' block with 'while' set to 'true'.
- A 'do' block containing a 'repeat 3 times' block with three 'set top light color' blocks: yellow (0.2s), green (0.4s), and blue (0.4s).
- A 'do' block containing a 'repeat 5 times' block with three 'set top light color' blocks: red (0.3s), purple (0.5s), and blue (0.5s).
- A 'do' block containing a 'repeat 4 times' block with three blocks: 'set top light color' (white, 0.1s), 'turn top light off', and 'set top light color' (white, 0.5s).

The interface also includes a top navigation bar with a browser address bar showing 'https://ozoblockly.com/editor?mode=3' and a right sidebar with various utility icons.