

Lekcija 3:

Uvod v blokovno programiranje

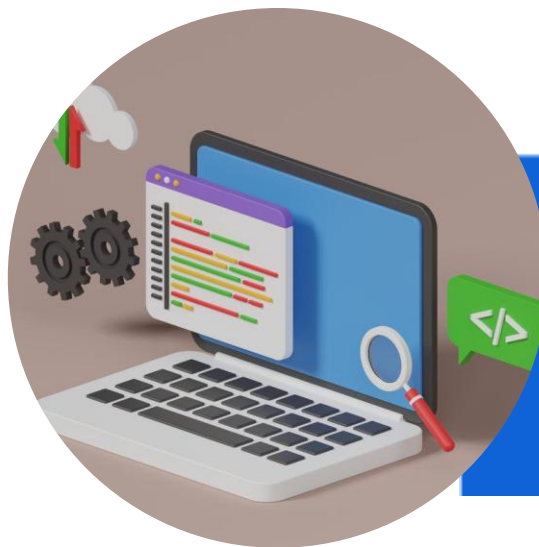
Pametno kmetovanje z droni



Cilji lekcije

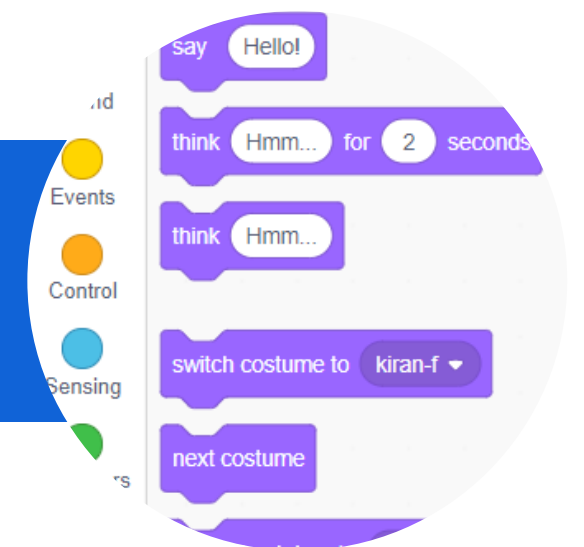
Razumevanje osnov blokovnega računalništva
programiranje.

What is Block C



Naučite se uporabljati orodja, kot sta Scratch ali
Mind+ za

Oblikujte preproste primere kodiranja



TEME

Uvod v blokovno programiranje

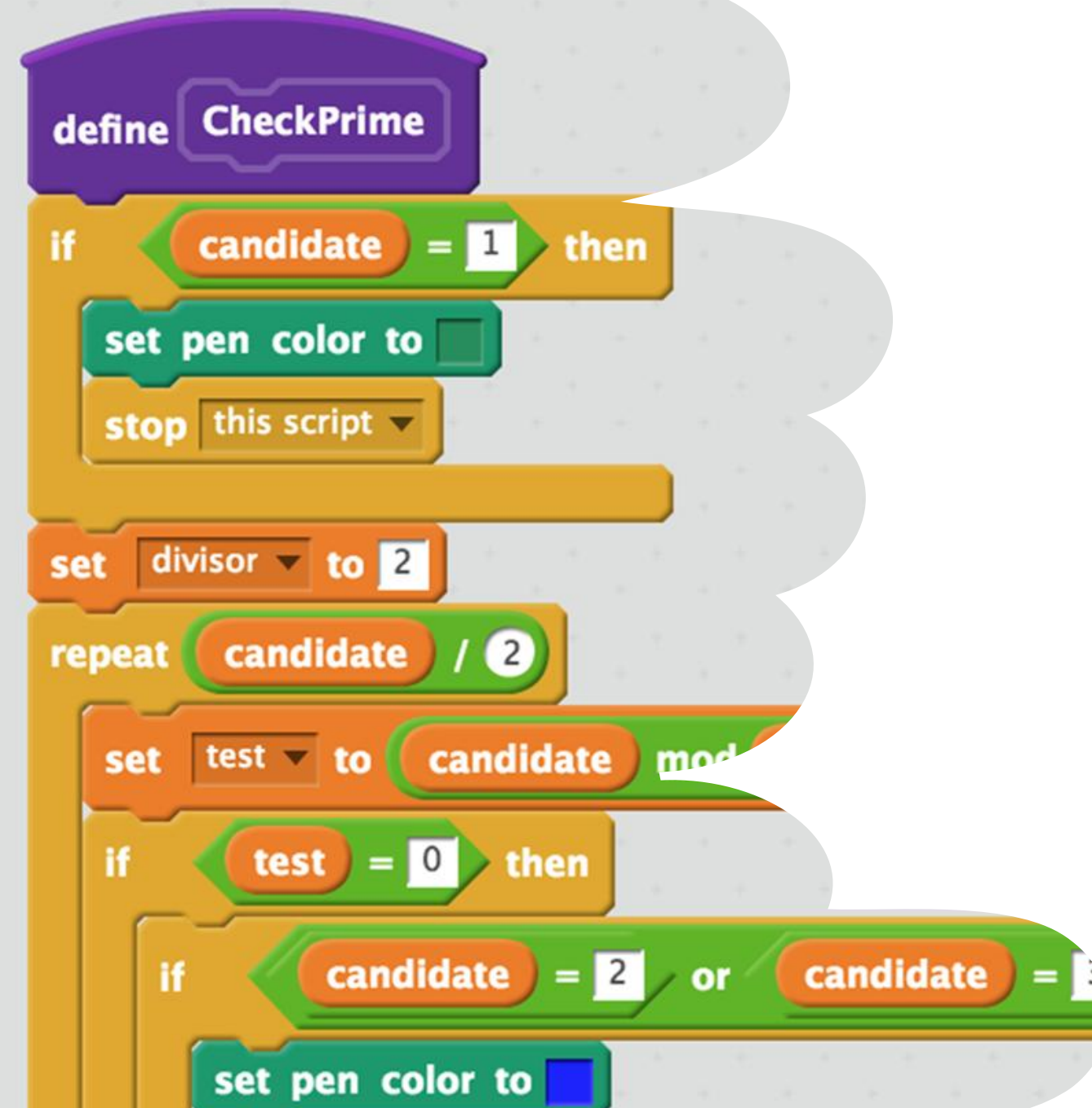
Mind+ in specifični Drone Blocks

Razprava in vprašanja in odgovori

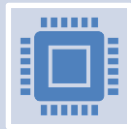
Preprosti primeri kodiranja

Uvod v blokovno programiranje

```
test_prime(n)
    if(n == 1)
    {
        return false;
    }
    if(n == 2)
    {
        return true;
    }
    else
    {
        for(var x = 2; x < n; x++)
        {
            if(n % x == 0)
            {
                return false;
            }
        }
    }
}
```



Kaj je blokovno programiranje?



Blokovno programiranje je vizualni način kodiranja, pri katerem uporabniki ustvarjajo programe s povezovanjem blokov, ki predstavljajo kodo. navodila.



Zasnovan tako, da je intuitiven in enostaven za začetnike, še posebej za mlajše učence.



Blokovno kodiranje velja za "brez sintakse"



Osredotočanje na ključne koncepte, strukturno logiko in reševanje problemov, ne da bi se dolgočasili ali frustrirali zaradi kompleksnosti kodiranja na osnovi besedila.



Gradi prednosti na področju STEM z matematiko, evalvacijo in analizo



Vrsta blokov

GIBANJE

Omogoča vam pozicioniranje in premikanje sprite znotraj delovnega območja.

IZGLED

Omogoča vam, da spremenite videz in pustite, da sprite govori.

ZVOK

Omogoča vam uvedbo zvočnih učinkov.

DOGODKI

Omogoča vam zagon programa glede na različne dogodke in upravljanje sporočila.

NADZOR

Omogoča vam ustvarjanje zank in vstavljanje pogojnih blokov.

ZAZNAVANJE

Omogoča vam upravljanje interakcij.

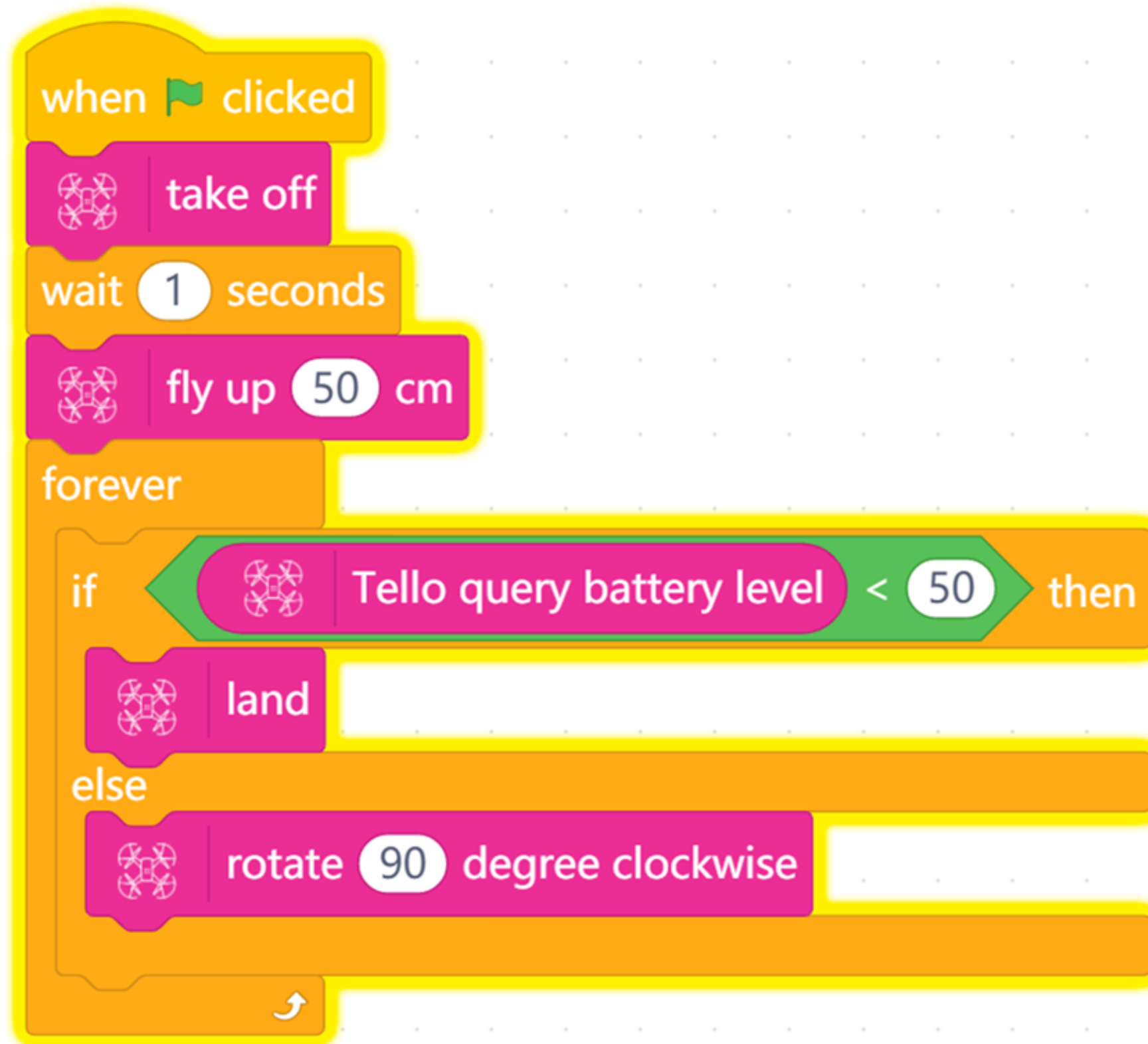
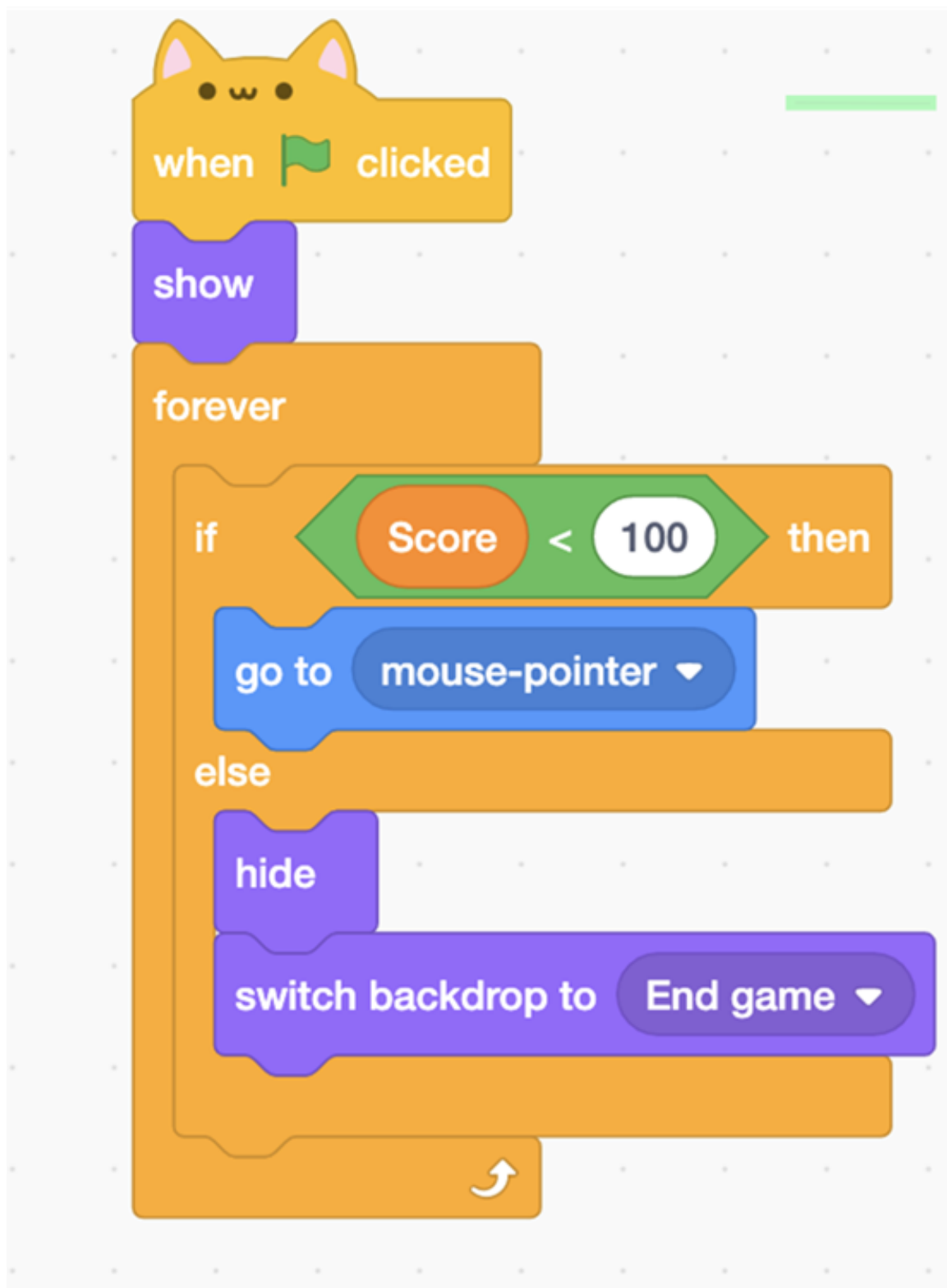
OPERATERJI

Omogoča vam izvajanje matematičnih in primerjalnih operacij.

SPREMENLJIVKE

Omogoča vam ustvarjanje in upravljanje spremenljivk.

Bloki so oblike, ki jih je mogoče kombinirati



Bloki gibanja

Motion

move 10 steps

go to x: -8 y: -156

go to random position ▼

glide 1 secs to x: -8 y: -156

glide 1 secs to random position ▼

turn ↻ 15 degrees

turn ↺ 15 degrees

point in direction 90

point towards mouse-pointer ▼

change x by 10

set x to 104

Barvno kodirana svetlo modra

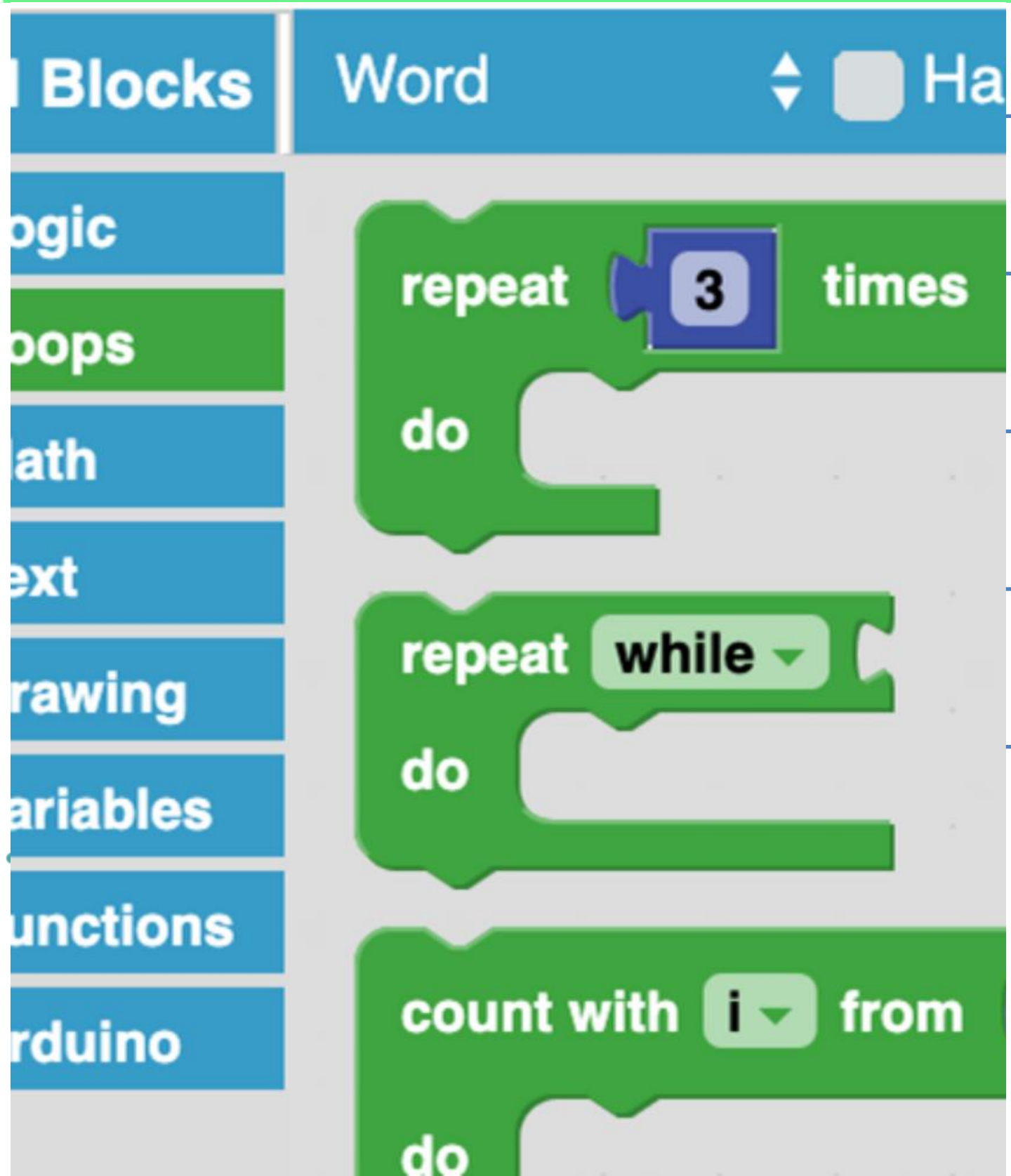
Gibalni bloki so gradniki, ki premikajo dron

TVzlet / Pristanek

Premik naprej / nazaj

Vrtenje v smeri urinega kazalca/nasprotni smeri urinega kazalca

Bloki zanke



Barvno kodirana zelena

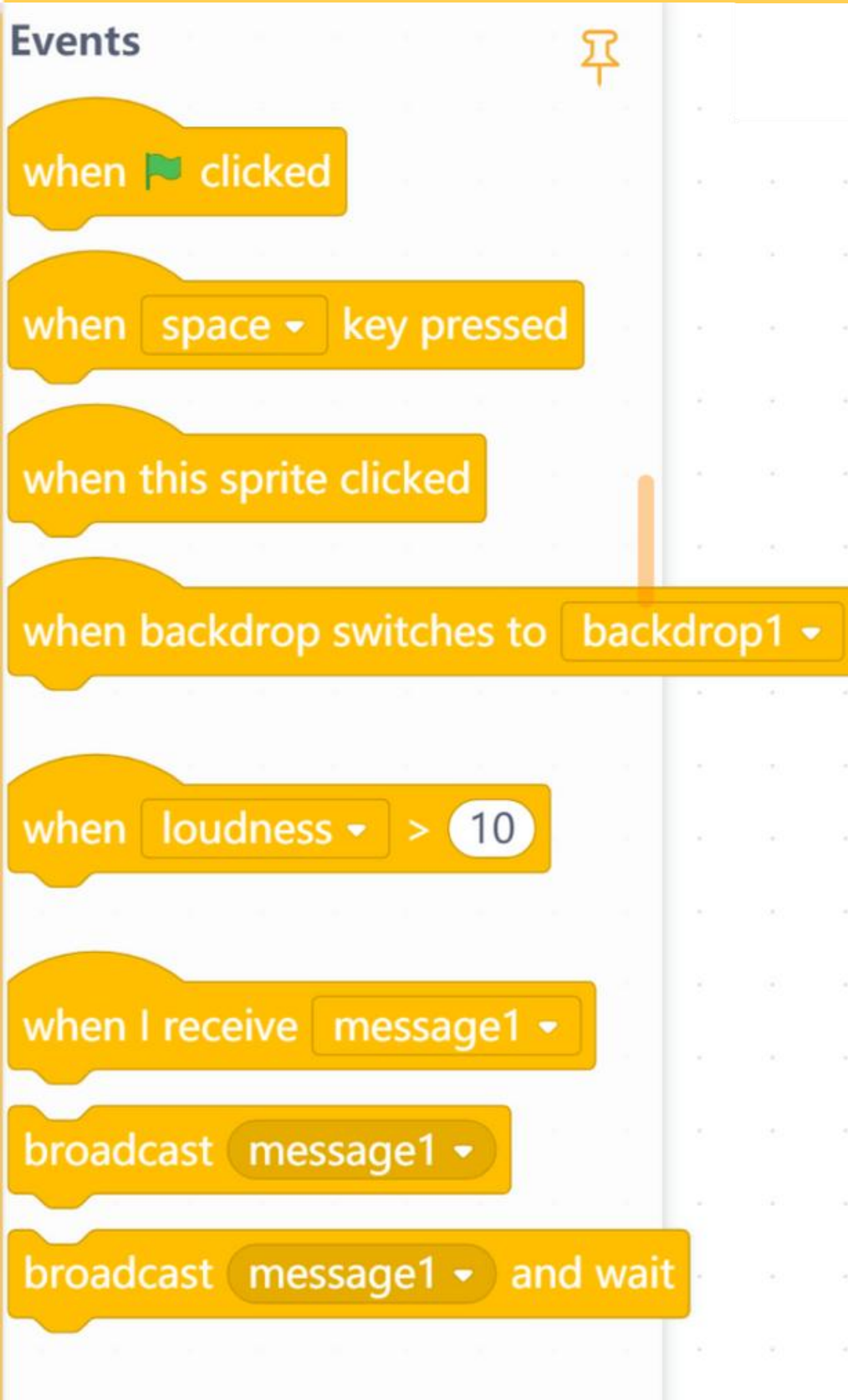
Zanke so temelj programiranja in omogočajo izvajanje nalog da se lahko večkrat učinkovito ponovi. Pri **blokovnem kodiranju**,

Ponovi DOGODKE

Premaknite se naprej, **DOKLER** ne naletite na oviro

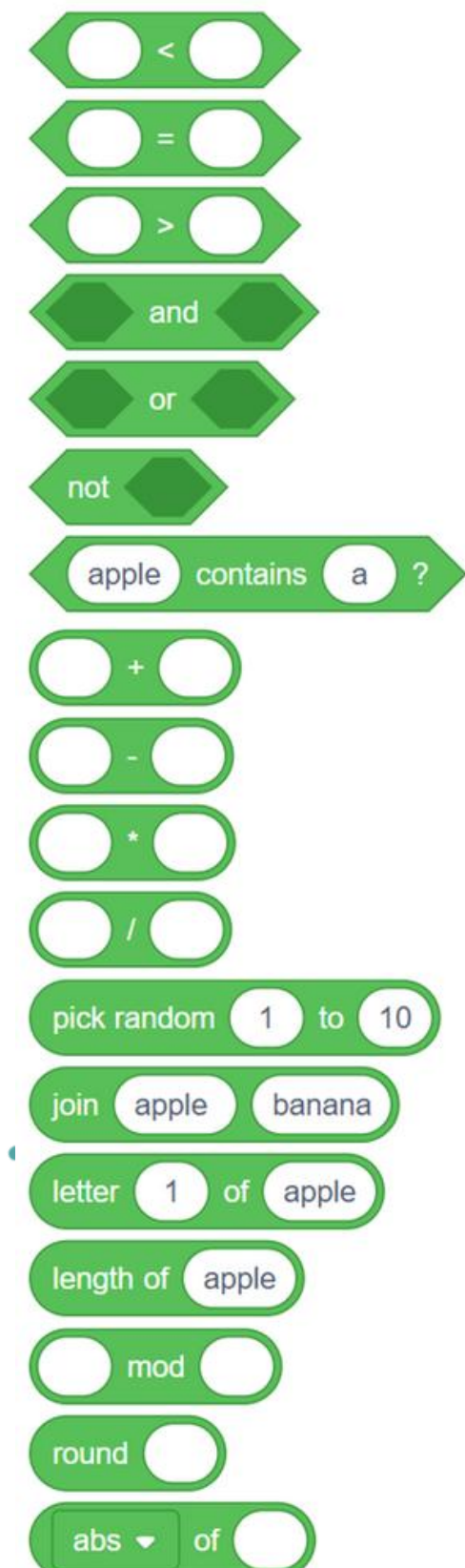
Leti **DOKLER** spremenljiva baterija ne preide na **> 20 %**

Bloki dogodkov



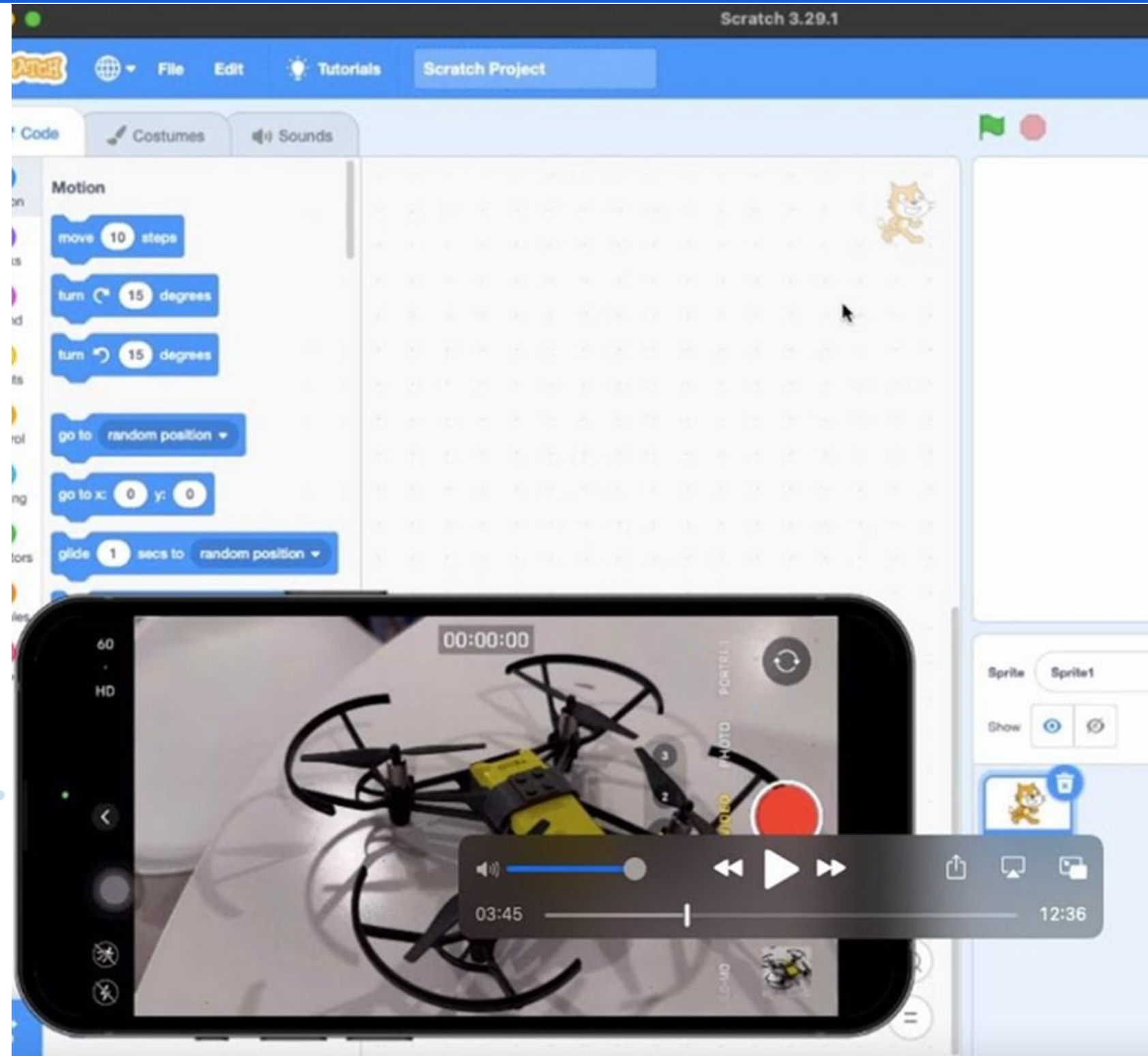
- **Barvno kodirana svetlo rumena**
- **Dogodki so sprožilci, ki sprožijo dejanja v programu, kot je pritisk tipke, klik na miško ali celo prejemanje sporočila od drugega del programa.**
- **Ti bloki se uporabljajo za določanje, kdaj naj se skript biti voden.**

Operatorski bloki



- So barvno kodirane svetlo zeleno,
- Uporabljajo se za skiptiranje matematičnih enačb in obdelavo nizov
- Če je baterija $< 20 \%$
- Če je infrardeča vrednost $= 10$

Več informacij



<https://en.scratch-wiki.info/>

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

Mind+ in Drone bloki

The image displays the Mind+ software interface for programming a drone. On the left is a block palette with the following categories and blocks:

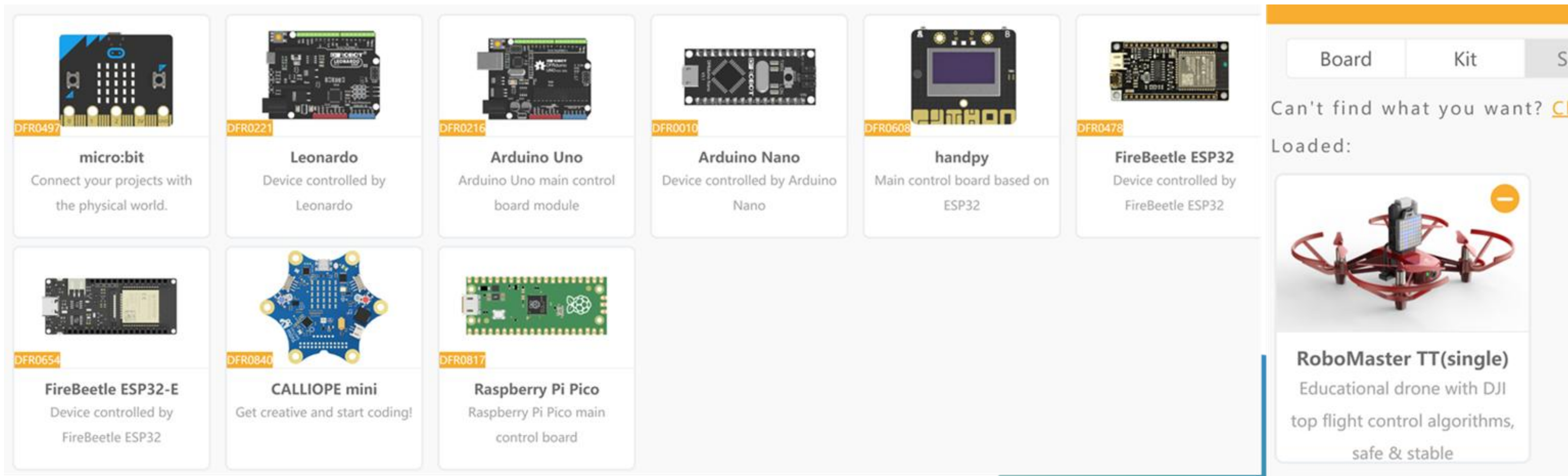
- Sound:** turn Tello's video open ▾
- Events:** Enter propeller mode
- Control:** Exit the propeller mode, take off
- Sensing:** Throw away in 5 seconds
- Operators:** land
- Variables:** fly up 50 cm, fly down 50 cm, fly left 50 cm
- My Blocks:** (empty)
- Functions:** (empty)

On the right, a script is being built on a grid background:

- when clicked** (yellow block)
- take off** (pink block)
- wait 1 seconds** (yellow block)
- fly up 50 cm** (pink block)
- forever** loop (orange block) containing:
 - if** **Tello query battery level < 50** **then** (green block) containing:
 - land** (pink block)
 - else** (orange block) containing:
 - rotate 90 degree clockwise** (pink block)

Kaj je MIND+

- Mind+ je programska oprema, ki temelji na jeziku Scratch 3.0 in podpira različne odprtokodna strojna oprema, kot so Arduino, micro:bit, mPython-esp32 in vse vrste krmilne plošče.
- Mind + že podpira na desetine pogosto uporabljene knjižnice razširitvenih modulov.



Funkcije drona Robomaster TT

RoboMaster TT(single)

turn Tello's video open ▾

Enter propeller mode

Exit the propeller mode

take off

Throw away in 5 seconds

land

fly up 50 cm

fly down 50 cm

fly left 50 cm

fly right 50 cm

fly forward 50 cm

fly backward 50 cm

rotate 90 degree clockwise

rotate 90 degree clockwise

rotate 90 degree counter clockwise

flip forward(f) ▾

set speed to 50 cm/s

Fly (relative to the aircraft) x 50 cm y 50 cm z 0 cm speed 100 cm/s

Flying curve warp x1 20 cm y1 20 cm z1 0 cm and x2 40 cm y2 60

Emergency Stop

Stop motion and hover

☐ Relative Height (cm)

☐ Barometer Height (m)

☐ TOF Height (cm)

☐ Motherboard minimum temperature (°C)

☐ Motherboard maximum temperature (°C)

☐ Pitch axis attitude angle (°)

☐ Roll axis attitude angle (°)

☐ Roll axis attitude angle (°)

☐ Pan axis attitude angle (°)

☐ X-axis acceleration (0.001g)

☐ Y-axis acceleration (0.001g)

☐ Z-axis acceleration (0.001g)

☐ X-axis speed (cm/s)

☐ Y-axis speed (cm/s)

☐ Z-axis speed (cm/s)

☐ power?

Turn on ▾ Challenge Card Detection

Set the detection position Down View ▾

fly to MissionPad x 50 cm y 50 cm z 80 cm with 50 cm/s Mid m-1 ▾

Flying arc line under challenge card x1 20 cm y1 20 cm z1 80 cm and x2

Jump along challenge card x 100 cm y 0 cm z 80 cm speed 50 cm/s ya

The aircraft rotates to the 0 angle relative to the challenge card m-1 ▾

Funkcije drona Robomaster TT

The aircraft rotates to the angle relative to the challenge card

☐ Challenge Card Number

☐ Challenge Cardx(cm)

☐ Challenge Cardy(cm)

☐ Challenge Cardz(cm)

☐ Reply to Command

☐ Current Speed

☐ Motor running time(s)

☐ Wi-Fi SNR

☐ Tello SDK Version

☐ Tello SN Code

☐ Get Hardware Version

☐ Tello firmware version

☐ Tello query battery level

☐ Display pattern

☐ Rolling display pattern direction frequency pattern

☐ Display a single character color

☐ Scroll display text direction frequency text color

☐ Set the boot pattern

☐ Restore the default boot pattern

☐ Set screen brightness

☐ Read TOF(mm)

☐ Send custom command

☐ Received string message

☐ Customized response value received

☐ Send a clear message

☐ LED color

☐ LED color R: G: B:

☐ LED breathing light color frequency (Hz)

☐ LED breathing light R: G: B: frequency: (Hz)

☐ LED flashes color 1 and color 2 frequency (Hz)

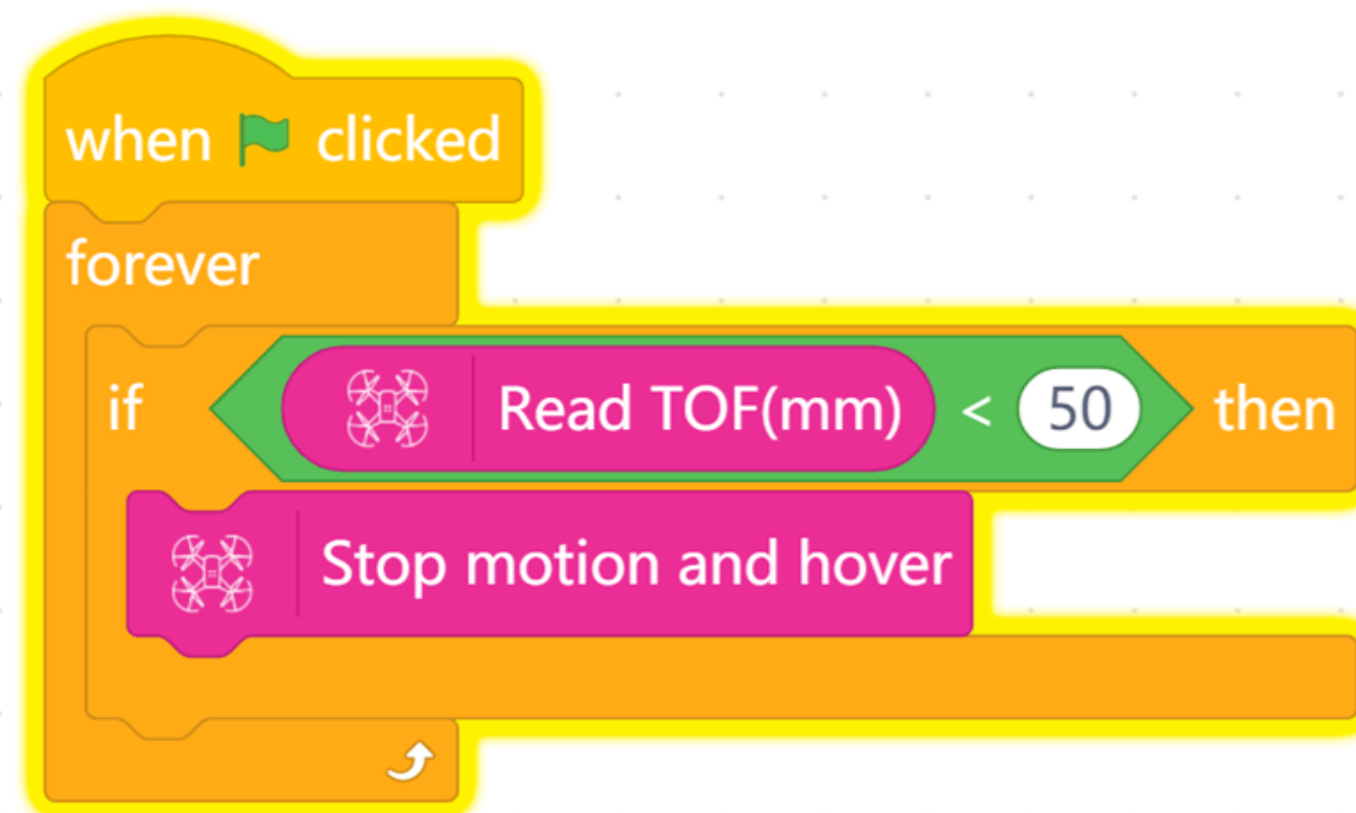
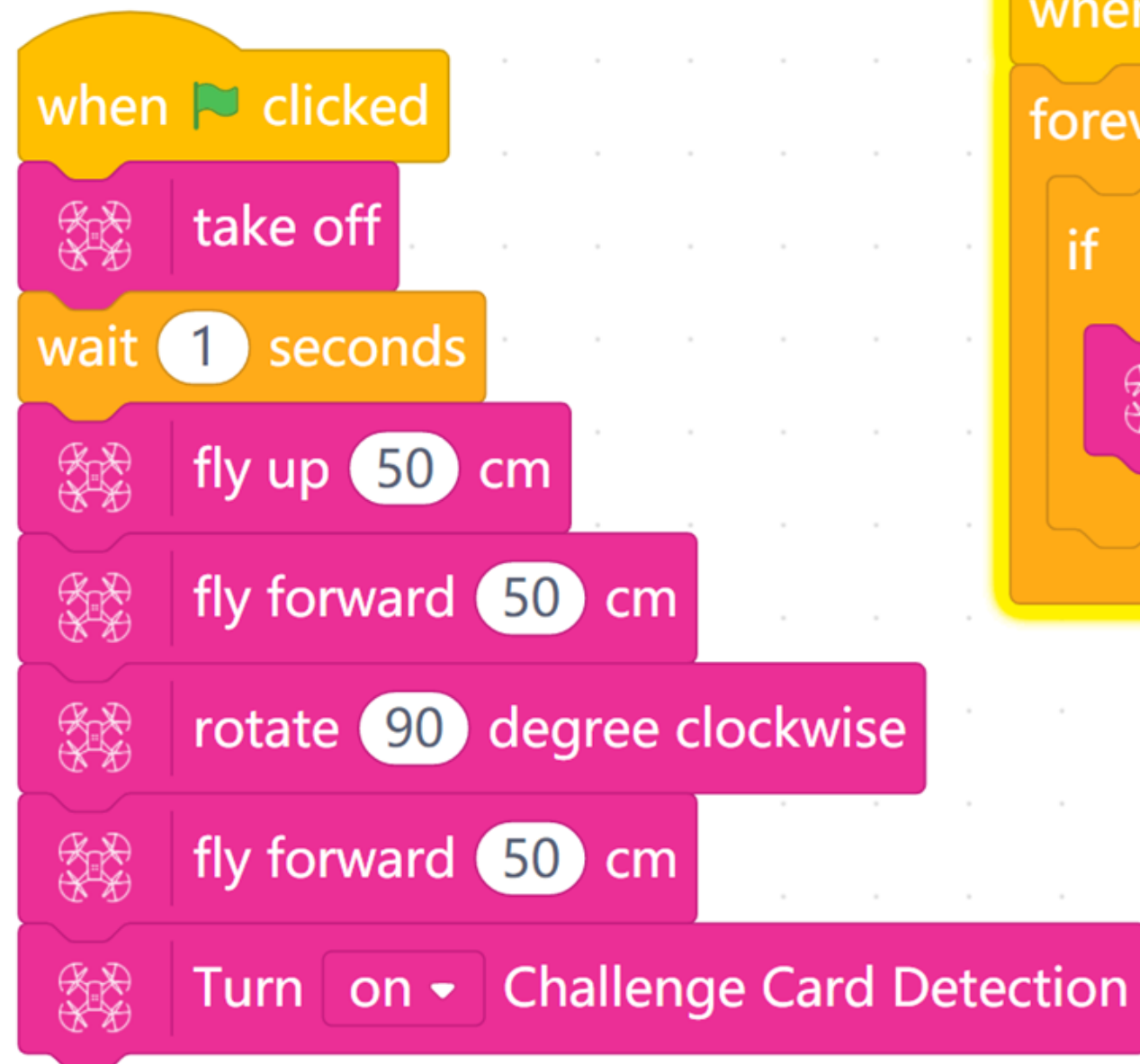
☐ LED flashing R1: G1: B1: - R2: G2: B2: frequency: (Hz)

Preprosti primeri



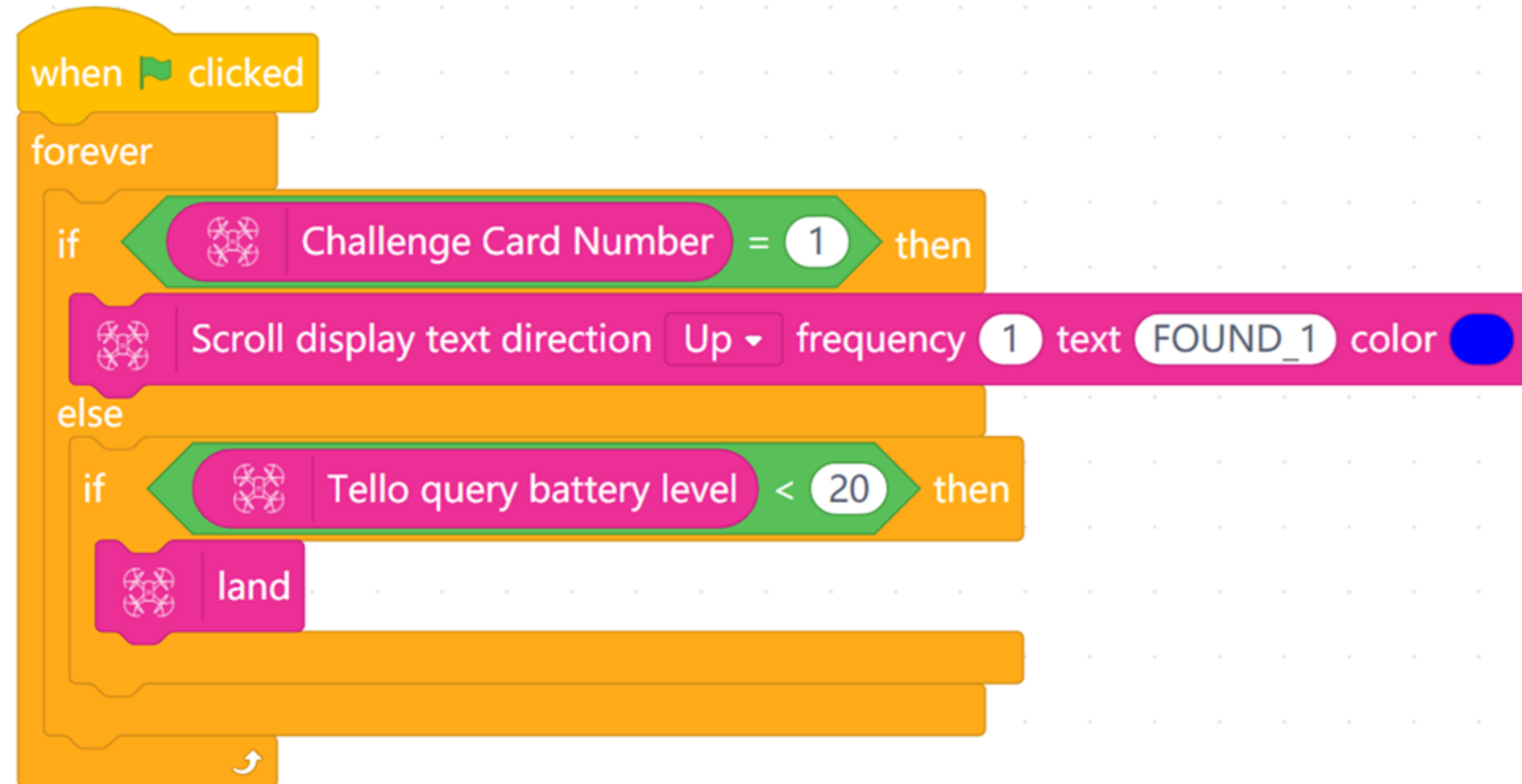
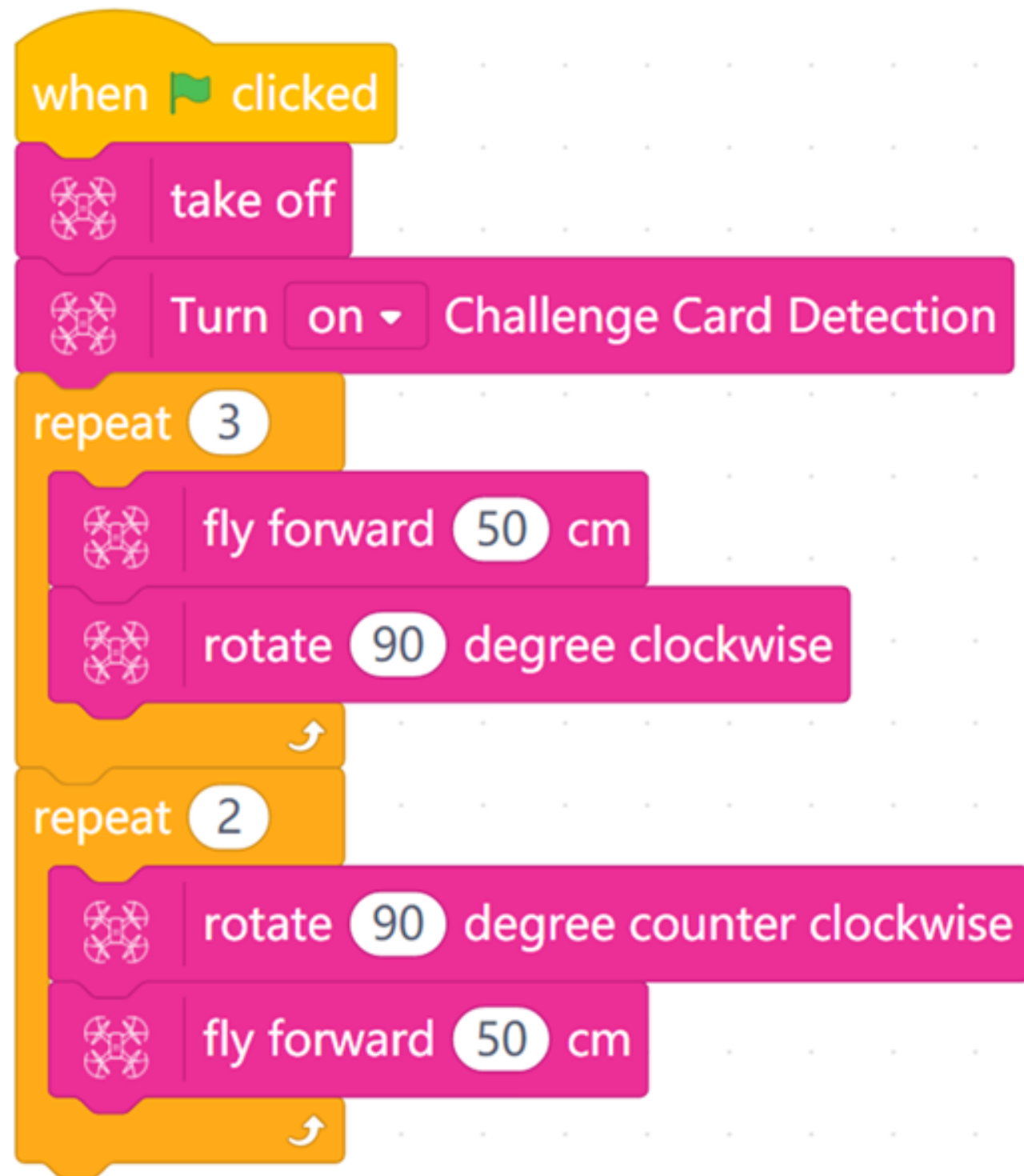
Vzletite in naredite
čarovnijo

Preprosti primeri



Preprosti vzorci

Preprosti primeri



Preberi QR

Vprašanje in odgovor

Kaj je "skripta" v Scratchu?

Zakaj uporabljamo zanke?

Za kaj se v Scratchu uporablja "zelena zastava"

Kaj so "dogodki" v Scratchu?

Zakaj uporabljamo MIND+

Dodatni viri

Nadaljnje branje

Mindplus Wiki <https://mindplus.dfrobot.com/RMTT>

Introducing Mind+ : A Sctrach 3.0 Programming Software

www.youtube.com/watch?v=_C32KQD3JZw



Hvala za vašo pozornost!



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