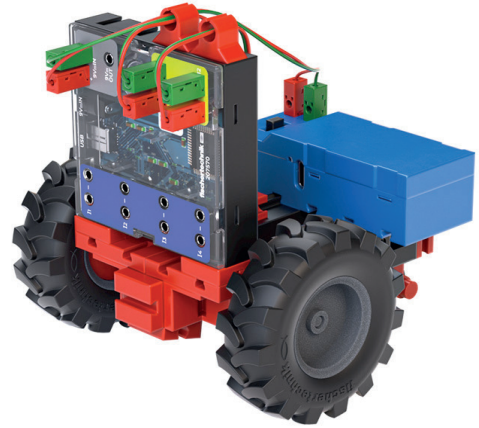


# Model 10: Buggy

## Objectives and classification

### Overview

The buggy is a three-wheeled driving robot that is controlled remotely via the keyboard. Logical connections („and“, „or“) are introduced. In the experimental task, the buggy receives a voice output.



### Topics

How does a remote control work? What are „logical operators“? How can you evaluate the sound strength level?

### Learning objectives

- Evaluate keystrokes and use them as remote control
- Use of variables to store status values (motor speed)
- Use of logical operators („and“, „or“)
- Evaluation of the volume level

### Competition

The buggy model is particularly suitable for a playful competition, such as a race. If several STEM Coding Pro kits are available, the students build one buggy per team and then compete against each other. The students can come up with their own rules or the teacher can provide them.

If programming skills are already available, e.g. a backpack race can serve as a motivating introduction to the world of robotics.

### Time required

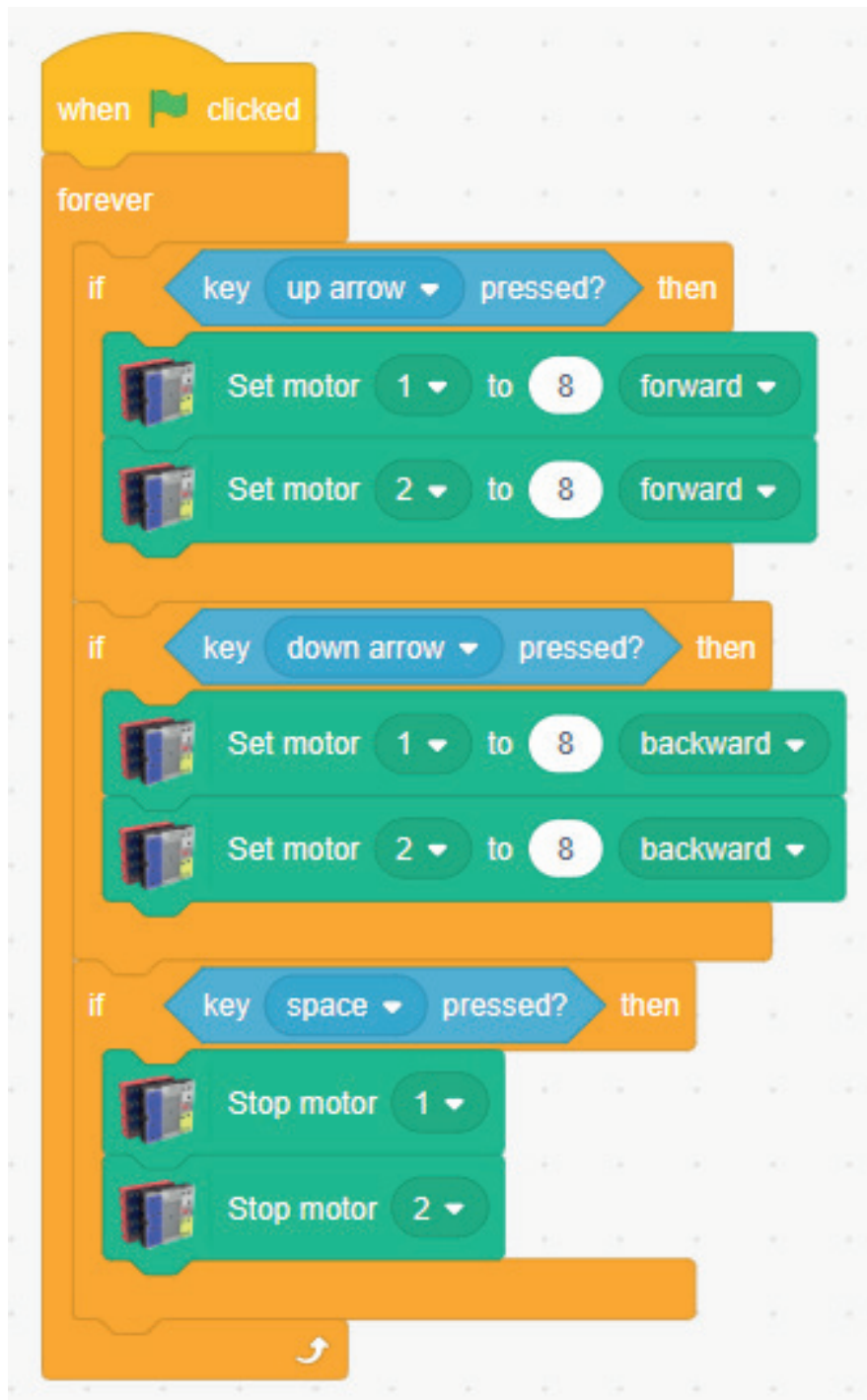
The buggy can be constructed in around 20 minutes. The first tasks „Remote control 1“, „Remote control 2“ and „Remote control 3“ can be solved by the students in the same lesson. The topic of the experimental task (emergency stop) is taken up again in model 11. Experiment task 5 adds a voice output to the buggy. The tasks are independent of each other and can be used as a supplementary task for particularly fast students.

Note: Bluetooth transmission delays the commands slightly; with a USB connection, the buggy responds more immediately to the remote control.

## Solutions and notes

# Programming tasks Model 10: Buggy

Solution Remote control:



remote control 1.sb3

## Solutions and notes

# Programming tasks Model 10: Buggy

Solution Remote control 2:



remote control 2.sb3

## Solutions and notes

# Programming tasks Model 10: Buggy

### Solution Remote control 3:

```

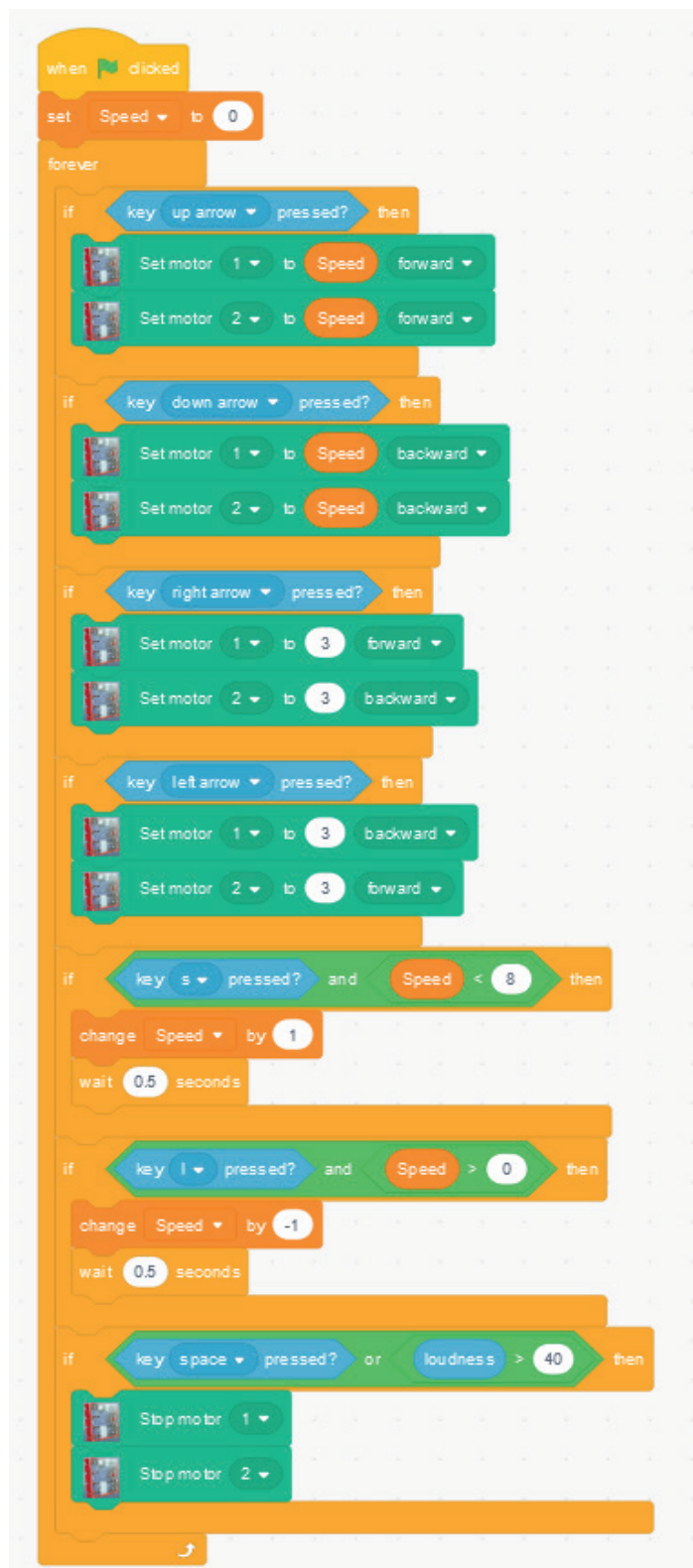
when clicked
  set Tempo to 0
  forever
    if key up arrow pressed? then
      Set motor 1 to Tempo forward
      Set motor 2 to Tempo forward
    if key down arrow pressed? then
      Set motor 1 to Tempo backward
      Set motor 2 to Tempo backward
    if key right arrow pressed? then
      Set motor 1 to 3 backward
      Set motor 2 to 3 forward
    if key left arrow pressed? then
      Set motor 1 to 3 forward
      Set motor 2 to 3 backward
    if key s pressed? and Tempo < 8 then
      change Tempo by 1
      wait 0.5 seconds
    if key l pressed? and Tempo > 0 then
      change Tempo by -1
      wait 0.5 seconds
    if key space pressed? then
      Stop motor 1
      Stop motor 2
  
```

remote control 3.sb3

## Solutions and notes

# Programming tasks Model 10: Buggy

Solution Emergency stop:



```

when clicked
  set Speed to 0
  forever
    if key up arrow pressed? then
      Set motor 1 to Speed forward
      Set motor 2 to Speed forward
    if key down arrow pressed? then
      Set motor 1 to Speed backward
      Set motor 2 to Speed backward
    if key right arrow pressed? then
      Set motor 1 to Speed 3 forward
      Set motor 2 to Speed 3 backward
    if key left arrow pressed? then
      Set motor 1 to Speed 3 backward
      Set motor 2 to Speed 3 forward
    if key s pressed? and Speed < 8 then
      change Speed by 1
      wait 0.5 seconds
    if key l pressed? and Speed > 0 then
      change Speed by -1
      wait 0.5 seconds
    if key space pressed? or loudness > 40 then
      Stop motor 1
      Stop motor 2
  
```

Emergency stop.sb3

## Solutions and notes

# Programming tasks Model 10: Buggy

```

when clicked
  set Tempo to 0
  forever
    if key up arrow pressed? then
      Set motor 1 to Tempo forward
      Set motor 2 to Tempo forward
      speak forward
    if key down arrow pressed? then
      Set motor 1 to Tempo backward
      Set motor 2 to Tempo backward
      speak backward
    if key right arrow pressed? then
      Set motor 1 to 3 backward
      Set motor 2 to 3 forward
      speak turn right
    if key left arrow pressed? then
      Set motor 1 to 3 forward
      Set motor 2 to 3 backward
      speak turn left
    if key s pressed? and Tempo < 8 then
      change Tempo by 1
      speak faster
      wait 0.5 seconds
    if key l pressed? and Tempo > 0 then
      change Tempo by -1
      speak slower
      wait 0.5 seconds
    if key space pressed? or loudness > 40 then
      Stop motor 1
      Stop motor 2
      speak stop
  
```

remote control with voice output.sb3