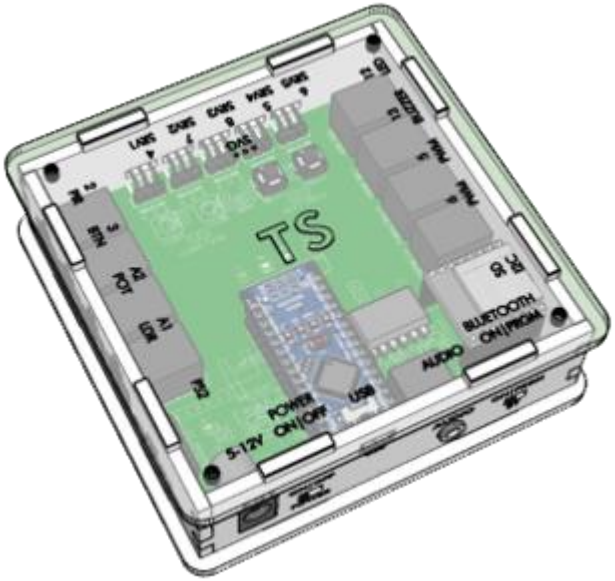


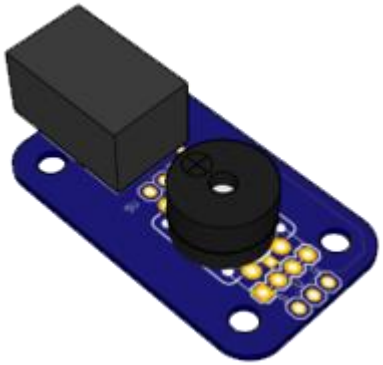
mBlock

TScratch Basics

Coding with mBlock (Software)

Learning Objective

In this lesson you will learn:

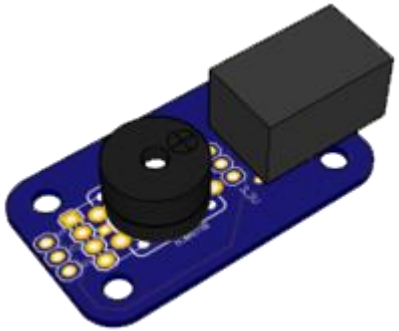


TScratch
(TSense Buzzer)

- Include a Buzzing output into your project!
- Coding another digital output with mBlock

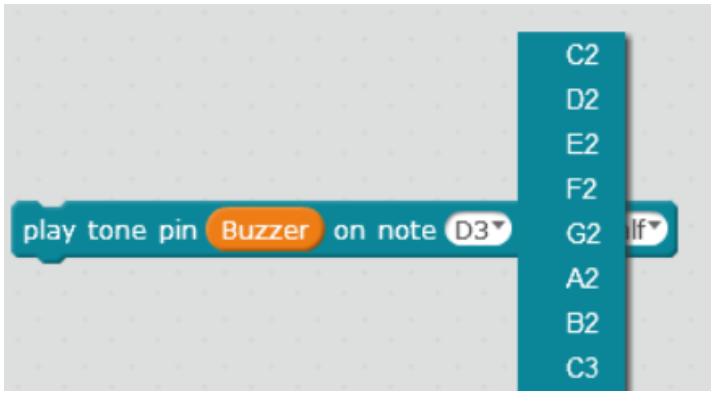
What is a Buzzer?

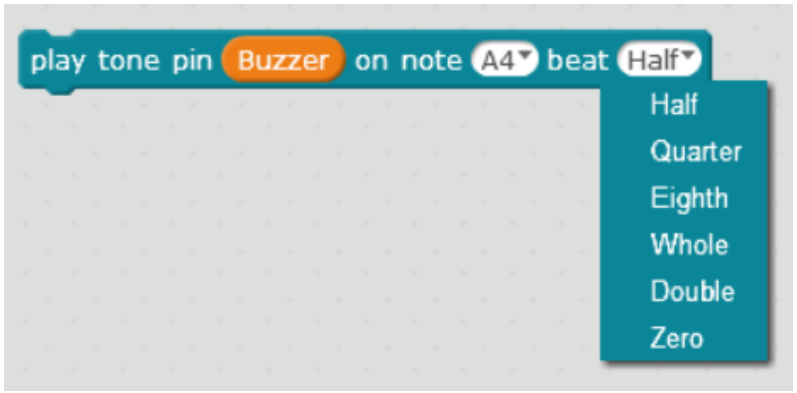
- A buzzer consists of a metal disc around a ceramic disc.
- Applied voltage causes the ceramic disc inside to contract and expand against the metal disc, causing the sound.
- Normally used as alarms eg. doorbells, car alarms.



What is a Buzzer?

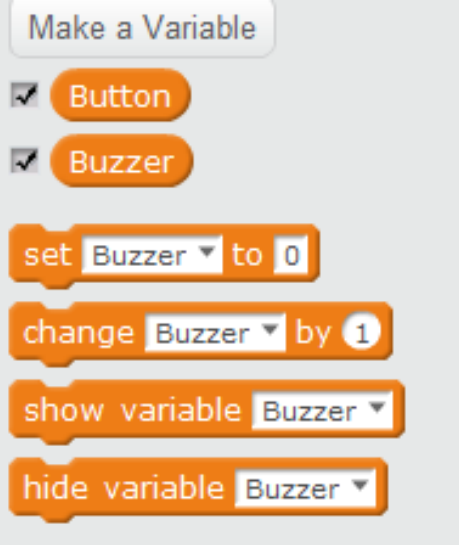
- The buzzer is a DIGITAL OUTPUT.
- The frequency of the sounds produced can be controlled, making them into tones.
- Covers 6 octaves from C2 to D8.
- The length of the note can also be controlled.





Write your buzzer control program

- In this program, we will have a button **digital input (port 3)** and buzzer **digital output (port 13).**
- Create the respective variables in the Data&Blocks tab, then define them in the scripting area:



Write your buzzer control program

- Within a forever loop, set your conditions. In this case, we want the buzzer to play **C4** for a **half** note when the button is **pressed**. The buzzer will play **A6** for a **half** note when the button is **NOT pressed**.
- If button input is HIGH → play tone pin C4 for half note
- If button input is LOW → play tone pin A6 for half note
- Button input is HIGH when button is pressed, meaning button = 1
- Button input is LOW when button is NOT pressed, meaning button = 0

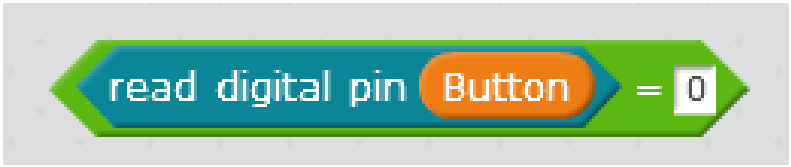
Write your buzzer control program

- From the Operators tab, drag the  :

Double-click and type the number 0 in the box

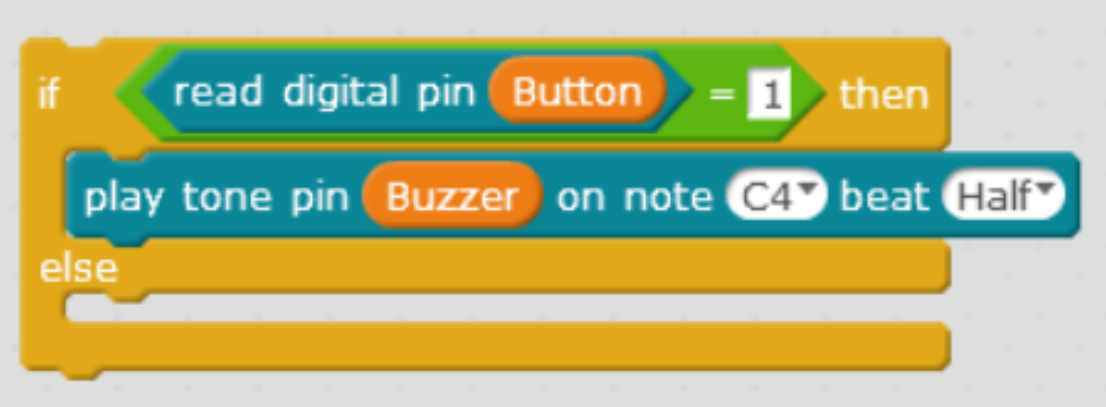
Note: Remember to drag the Button variable inside!

- Click and drag the block over the white square you want it to go until it lights up to insert it.



Write your buzzer control program

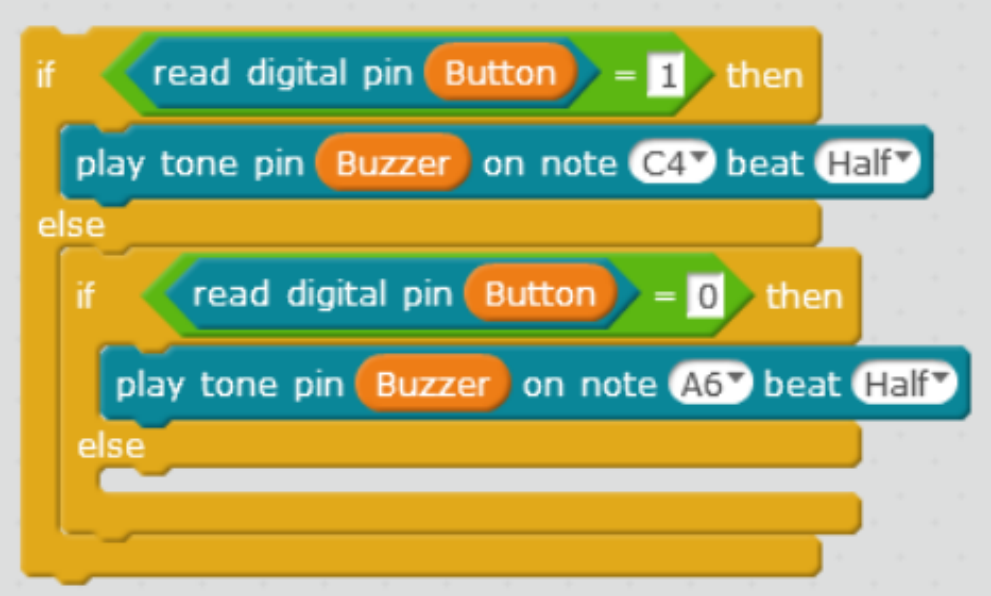
- First condition: if the Button input is HIGH (1), play tone pin C4 for half note.
- Drag out an **if… else** control block and insert the condition:



Make sure the correct variables are in the correct places, and you are using **digital** pins with the correct designation (input or output)!

Write your buzzer control program

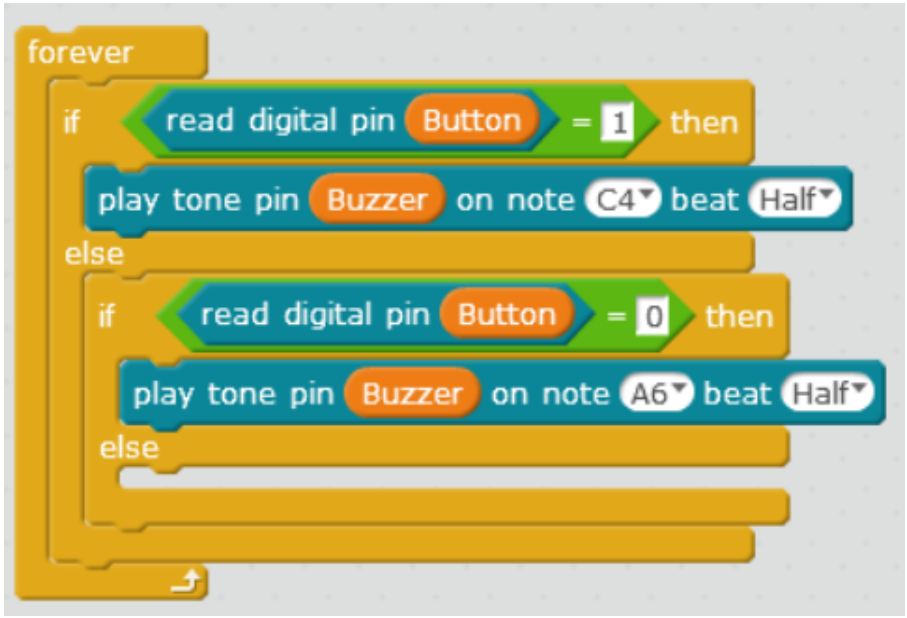
- Second condition: if the Button input is LOW (0), play tone pin A6 for half note.
- Insert the condition in a **NEW if** block, then into the first **else** part:



Note: There are **TWO** if conditions!
In the case that the first condition is not fulfilled, ONLY THEN will the program check for the second condition!

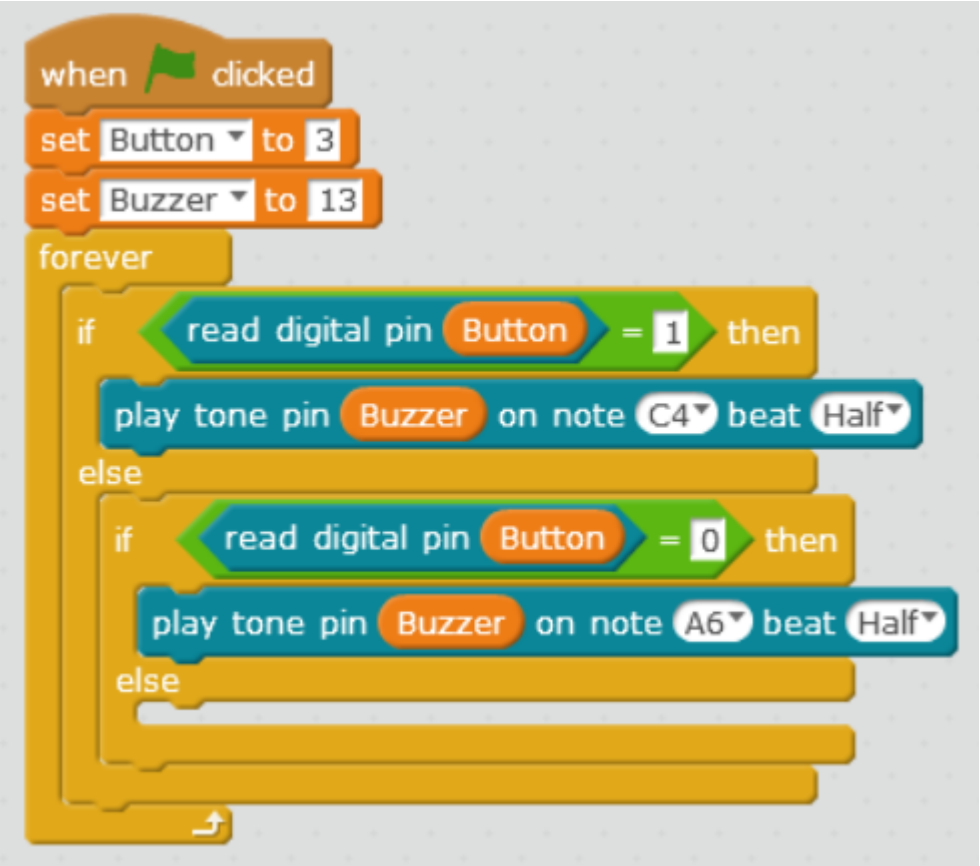
Write your buzzer control program

- We want the program to continuously check if the conditions are fulfilled, in case there is a change of state.
- Insert your conditions into a forever loop:



Write your buzzer control program

- Complete program:



Write your buzzer control program

- Additional scripting:
- mBlock comes with a default panda sprite when the software is loaded. To make the program more interesting, we can program the panda to state the note being played.
- Buzzer plays C4 → “C4”
- Buzzer plays A6 → “A6”

Write your buzzer control program

- Drag the text block from the Looks tab and add the desired text: