Blockly

Take on coding challenges and make your own programs using Blockly's block-based coding interface. Programming lets you turn your silliest or most ambitious ideas into reality.

Access Blockly on the web at code.makewonder.com

Teachers can track student progress through the Blockly puzzles by logging on at portal.makewonder.com

How programs work in Blockly

Start with the puzzles to learn about how Blockly works!

Start - connect your first block to the start state. If nothing is attached, nothing happens when you run your program.

Loops - you can put blocks inside of a control block to make a loop! In this case, the blocks inside repeat until there is an obstacle in front.

Block Drawer - select your category and then drag out the blocks you want to use in your code.

Start - tap here to run your program!

Visual input interfaces help guide children in concepts like angles, time, speed, and distance.

Blocks in Blockly

Start

When [Dash] [Button 2]

Go to Start

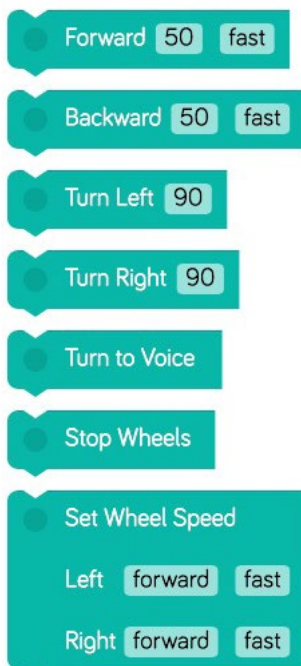Function [Function1]

Call [Function1]

Control how your program will start. Use a block from the Start section to indicate the **event** that will start executing your program. Drag and stack additional blocks below a When block to write your program.

Go to Start. This block makes your program go back to the Start block! Usually it will make your program run from the beginning again.

Functions. A function is a mini-program that you can call from anywhere else in your program. Drag a function out, put blocks into it, and then you'll be able to use that program any time you use the "call function" block.

Try making a rainbow color pattern in a function. You can add that entire set of blocks into your program by just using the "call function" block. Functions are friends that make your life easier!

Drive

Forward [50] [fast]

Backward [50] [fast]

Turn Left [90]

Turn Right [90]

Turn to Voice

Stop Wheels

Set Wheel Speed
Left [forward] [fast]
Right [forward] [fast]

Drive blocks control where and how Dash moves! Forward and Backward blocks use **centimeters** as units, and turns refer to **degrees** as the unit of the turn angle.

Turn to Voice allows you to program Dash to turn towards the sound of your voice. This works best in a quiet room with minimal background noise.

Set Wheel Speed gives you individual control of Dash's wheels. Forward and backward at the same speed makes Dash **spin**. Forward at different speeds makes Dash go in an **arc**. Try different combinations out! Note: to stop Dash's wheels add the **Stop Wheels** block.

Look

Make Dash's head move up, down, left, or right. Units refer to **degrees**. Degree units are absolute, meaning **Left 30** sets the head at 30 degrees left from a neutral straight position.

Look left 90

Look up 22

Look towards Voice

Look towards Voice allows you to program Dash's head to look towards the direction of the sound of a voice. This works best in a quiet room with minimal background noise.

Light

Control Dash & Dot's lights to give your program some color and effects!

All Lights

Left Ear

Right Ear

Front

Tail on

Eye Pattern All on

All Lights light up Dash's ears and chest with the color you pick. It lights up Dot's ears and backlight.

Left Ear / Right Ear light up Dash or Dot's left or right ear with a color.

Front lights up Dash's chest or Dot's backlight.

Eye Pattern indicates the pattern of the 12 LED eye lights. Tap each light to turn it on in Dash or Dot's eye!

Sound

Dash loves to play sounds—go into each category and pick a sound to add some fun effects to your programs!

Say Hi

Animal Horse

Transport Fire Siren

Weird Beeps

My sounds #1

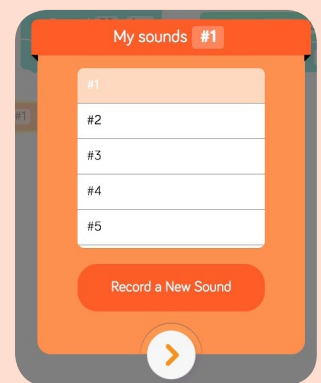## Recording a custom sound in Blockly

Select A Slot

1 2 3 4 5 6

1) Pick a slot for the sound you're about to record. Robots can store 10 custom sounds at a time.
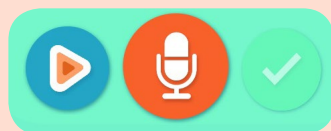
2) Press the **record** button. Press the **play** to test. Then press **check** to transfer to the robot!

My sounds #1

#1
#2
#3
#4
#5

Record a New Sound

3) The # you pick must match the slot for the sound you recorded.

Animations

Greet Dash Hi

Dance Dash Confident

Expression Dash Laugh

Race Dash Take Off

Answer Dot Maybe

Play Dot Hold
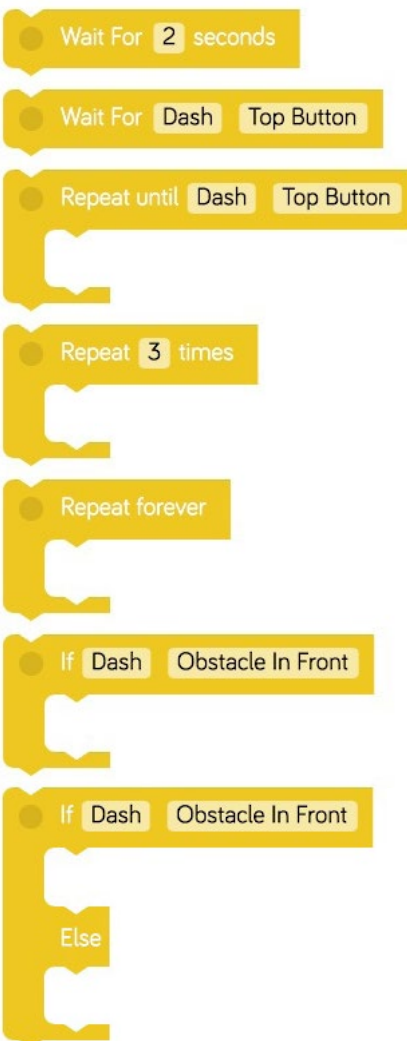
Use **Animations** to make Dash do fun dances, greetings, expressions, and more! Try it out!

Control

Control how Dash robots interact with each other and their environment!

Wait For 2 seconds

Wait For Dash Top Button

Repeat until Dash Top Button

Repeat 3 times

Repeat forever

If Dash Obstacle In Front

If Dash Obstacle In Front
Else

Wait for # seconds - Have Dash wait for a set period of time before continuing your program.

Wait for [event] - Dash will wait for an event to be triggered before moving to execute the rest of the program.

Repeat until - Dash will run the blocks inside the brackets until the event you pick is triggered.

Repeat # times - Dash runs the blocks inside the bracket for a set number of loops!

Repeat forever - it's like the song that never ends. Beware!

If - Dash will run the blocks inside the bracket if the condition is present. This block only checks when your program is passing through it.

If / else - Dash will run the blocks inside the first bracket if the condition is present. If the condition is not present, it will run the blocks inside the second bracket.

Variables
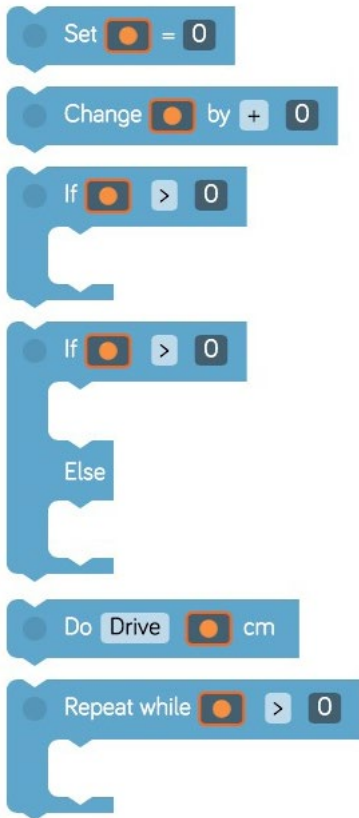
In programming, **variables** act like boxes to hold values. They're called "variables" because what's in them can "vary" or change.

Why would you want to use a variable?
1. They make code shorter.
2. They make code easier to read.
3. They make code easier to change.

For a detailed explanation of how variables work in Blockly, go to this handy PDF!

There are also several puzzles towards the end of the map that teach you how to use variables!

Saving and Creating Projects

Blockly allows you to save, create, and load sample projects. This allows students to name their projects and save them to their tablets. If you need to look at their programs for any reason, just tell them what to save it as, and you can easily find it on their tablet.
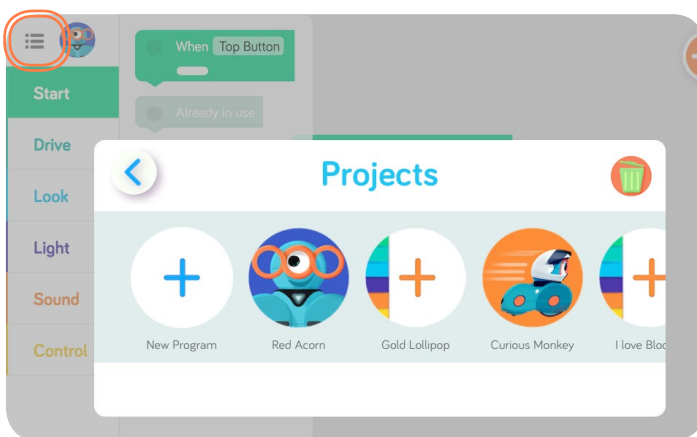
Tap the hamburger menu on the **top left hand side** of the app go to the menu. From here, you can create a new program, load an existing program, or do puzzles!
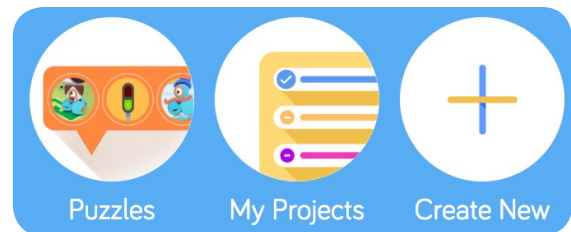
Curriculum

Check out our teacher portal to find lessons for Blockly:
portal.makewonder.com