Unofficial SPIKE Prime 3 Block Guide by PrimeLessons.org

- Text descriptions based on SPIKE Help Menu
- To download additional programming blocks, click on the icon with blocks and a plus sign at the bottom left of the SPIKE Prime App and add the Extensions.
- There are some additional Weather, Display, and Datalogging blocks not included in this guide. Please refer to the Help Menu in the software.

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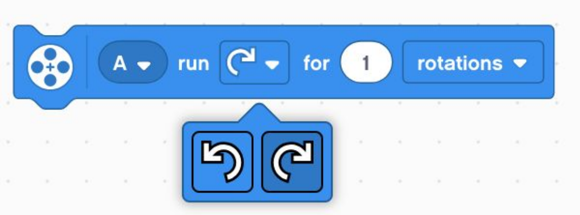
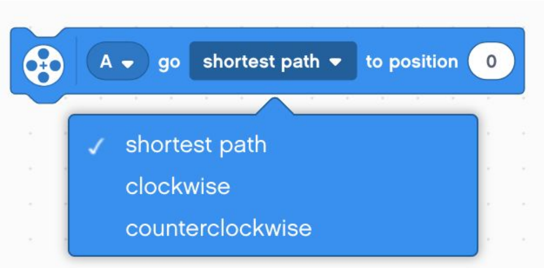
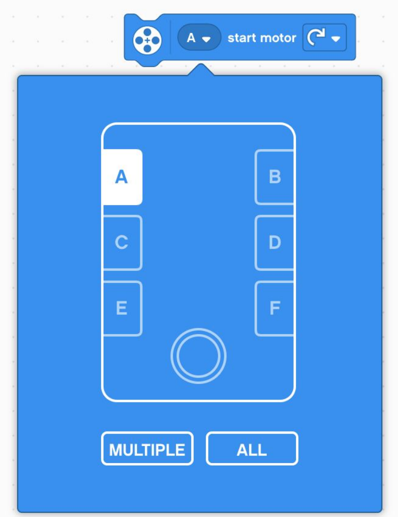
MOTOR BLOCKS



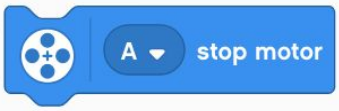
Run Motor for Duration: Tells the motor(s) to run in a clockwise or counterclockwise direction for a number of rotations, seconds or degrees. (Default speed: 75%, and Stall Detection enabled).



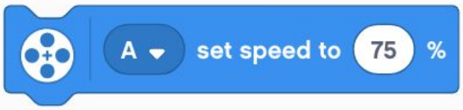
Motor Go to Position: Tells the motor(s) to travel the shortest path, clockwise or counterclockwise to the position selected (0-360). (Default speed: 75%, and Stall Detection enabled).



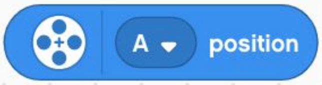
Start Motor: Starts the motor(s) turning in a clockwise or counterclockwise direction. (Default speed: 75%, and Stall Detection enabled).



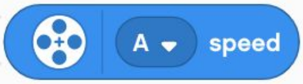
Stop Motor: Stops the motor(s) selected. The motor will brake, and will not post the position



Set Motor Speed: Sets the speed of the motor(s) to the maximum percentage (-100 to 100). Negative value reverses direction.



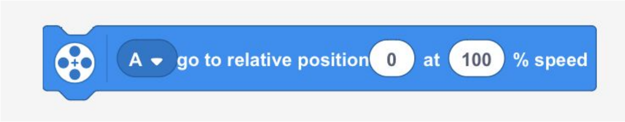
Motor Position: Reports the current position of the selected motor (0-359).



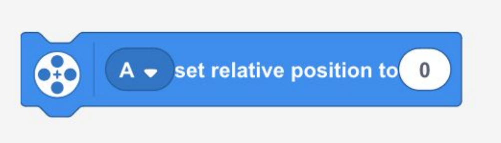
Motor Speed: Reports the actual current speed of the motor (-100-100).

MORE MOTOR BLOCKS

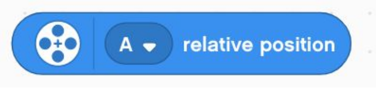
You will need to add these blocks using Extensions.



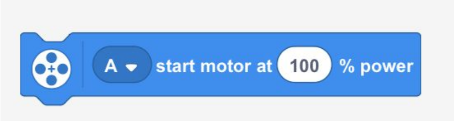
Go to Relative Position at Speed: Runs one or more motors to a relative position at a specified speed. Unlike the absolute position that's used in the Go to Position Block, the relative position has no range limit and can be preset with the Set Relative Motor Position to 0 Block.



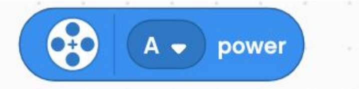
Set Relative Position to 0: Sets the relative position of one or more motors to a specified value. Use a value of "0" to reset the relative position.



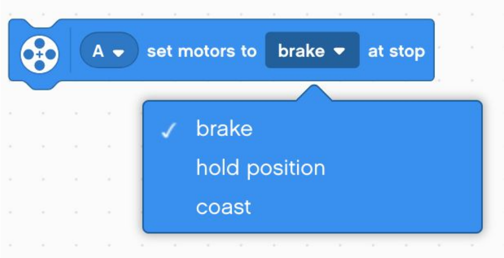
Relative Position: Returns the number of degrees that the specified motor has turned since the program started or was reset by the Set Relative Motor Position to 0 Block.



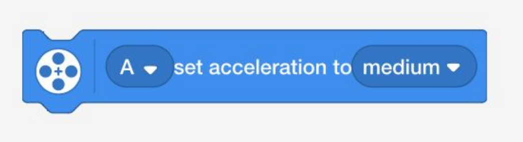
Start Motor with Power: Run one or more motors at a specified percentage of power forever. When running a motor according to speed, the power of the motor is regulated in order to maintain the specified speed.



Motor Power: Returns, as a percentage, the power level currently being used on the specified motor.



Stop and Coast: specifies how the motor will stop when using a Motor Block with a specified duration, or the Stop Motor Block. The motor can stop in three different ways: *Brake*: the default method in which the motor uses power to brake when stopping and applies friction to the motor afterward. *Hold position*: the motor uses power to brake and actively moves the motor back to the position in which it stopped, if it is forced away from it.*Coast*: the power to the motor is cut when stopping



Set Motor Acceleration This block sets the acceleration and deceleration of one or more motors. The acceleration can be set to fast, medium or slow. The default acceleration is medium. A customs acceleration can be set by inputting a variable with two numbers separated by a space. The first number sets the acceleration, the second number sets the deceleration. The range is 1-10000 with higher numbers giving a faster acceleration.

The default values are: Fast =10000; Medium = 2000 for the Small Motor, 4000 for the Medium and Larger Motor; Slow = 1000

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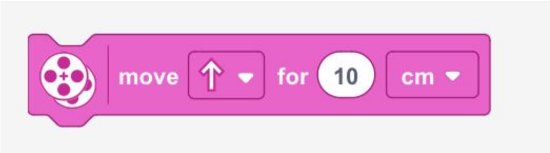
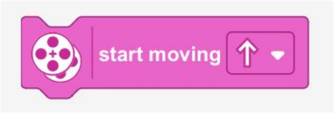
MOVEMENT BLOCKS

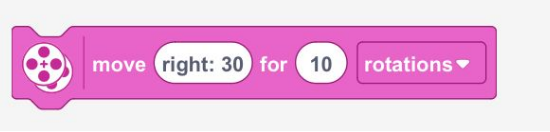
Movement Block motors are synchronized. They must be two of the same type.



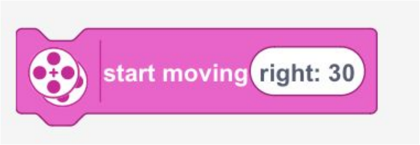
Move for Duration: Moves a Driving Base either forward or backward for a specified number of centimeters, inches, seconds, degrees, or rotations. The distance that's moved in centimeters and inches depends on how the Driving Base has been built. Use the Set 1 Motor Rotation to Distance Moved Block to calibrate your Driving Base.



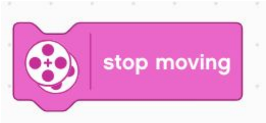
Start Moving: Starts moving a Driving Base either forward or backward.



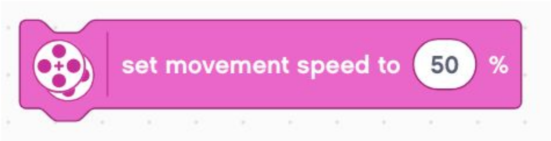
Move with Steering for Duration: Moves a Driving Base forward for a certain duration with the possibility of steering. Higher steering values (i.e., +99 and -99) will make the arc path of the Driving Base sharper. Use a value of “0” to drive in a straight line. Using the values 100 and -100 will make the Driving Base pivot on itself.



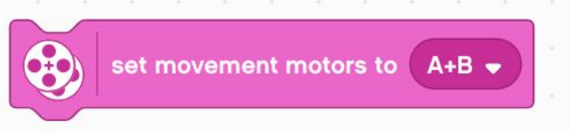
Start Moving with Steering: This block starts moving a Driving Base forward with the possibility of steering forever. Higher steering values (i.e., +99 and -99) will make the arc path of the Driving Base sharper. Use a value of “0” to drive in a straight line. Using the values 100 and -100 will make the Driving Base pivot on itself.



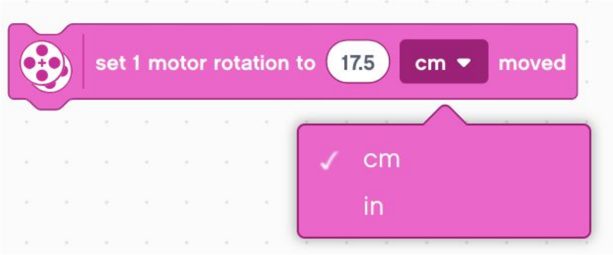
Stop Moving: Stops the motor(s) moving



Set Movement Speed: Sets the motors to move at a percentage of their maximum speed by default(-100 to 100).



Set Movement Motors: Defines which two motors are used for movement for your driving base



Set 1 Rotation to Distance Moved: Defines how many cm or inches one motor rotation equals.

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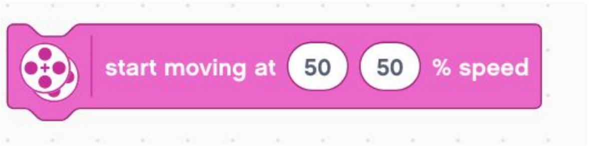
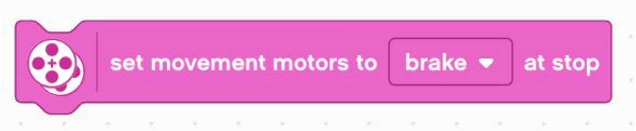
MORE MOVEMENT BLOCKS

You will need to add these blocks using Extensions.



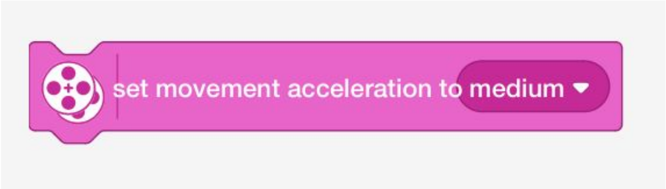
start moving at 50 50 % speed

Start Moving at Speed: Moves the driving base forever at a specified speed for left and right motors.



set movement motors to brake at stop

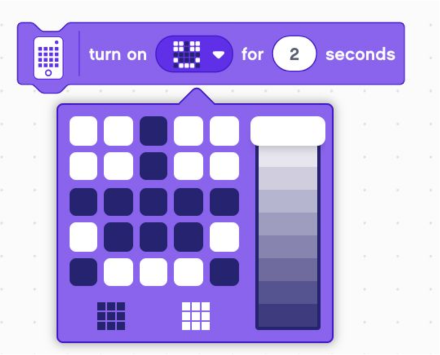
Set Movement Motors to Brake at Stop Determines how the motors will stop when using a Movement Block for a specified duration. Brake (Power to brake), Hold (Power to break and motor moves back to the position when it stopped), Coast (Power to the motor is cut)



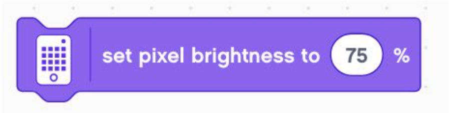
set movement acceleration to medium

Set Movement Acceleration: Sets the acceleration and deceleration of a Driving Base. The acceleration can be set to fast, medium or slow. The default acceleration is medium. A customs acceleration can be set by inputting a variable with two numbers separated by a space. The first number sets the acceleration, the second number sets the deceleration. The range is 1-10000 with higher numbers giving a faster acceleration. The default values are:
Fast =10000
Medium = 1800
Slow = 1000

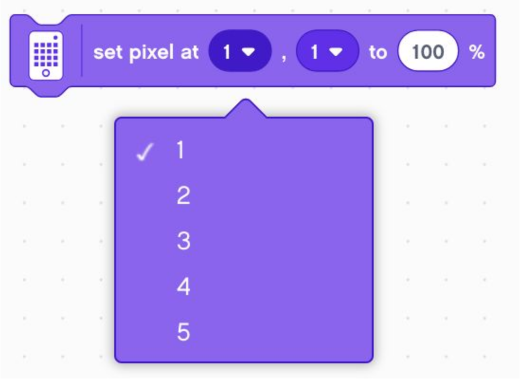
LIGHT BLOCKS



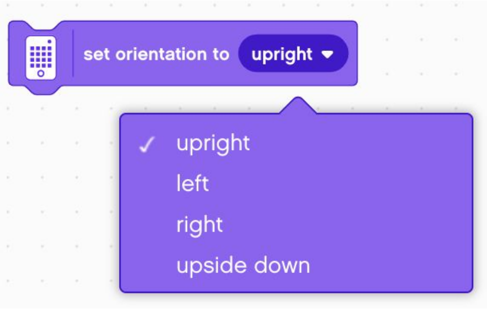
Turn on 5X5 Light matrix for Seconds: Create a pattern that lights up for a specific amount of time. Move the lever to change the intensity of the light.



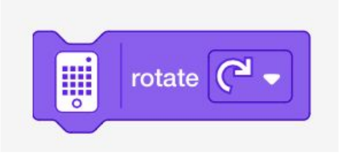
Set Pixel Brightness: Set the brightness of the 5X5 Light Matrix for the next block using the 5X5 Light Matrix. Default: 100%



Set Pixel: Set the brightness of individual pixels on the 5X5 Light Matrix.



Set Orientation to (Upright): Set the orientation of what is being shown on the Light Matrix. Choose between upright, upside down, left or right. Default: Upright.



Rotate Orientation (Clockwise): Rotate the orientation of what is being shown on the 5X5 Light Matrix to clockwise or counterclockwise.

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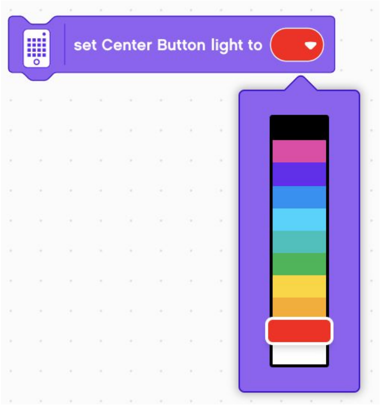
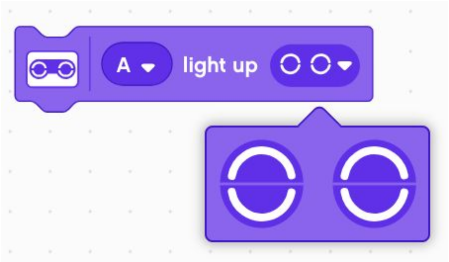
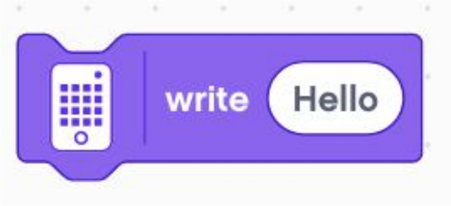
LIGHT BLOCKS



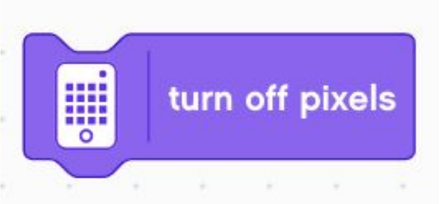
Set Center Button Light: Set the color of the Center Button light



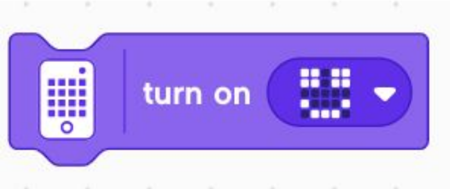
Light up Distance Sensor: Turn on the lights on the four segments of the Distance Senor



Write on 5X5 Matrix: Display a text string on the 5X5 Light Matrix that scrolls by

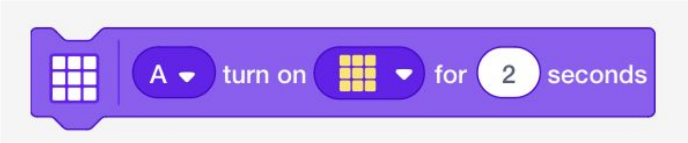


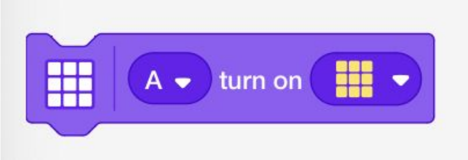
Turn off Pixels: Turn off the all the lights on the 5X5 Light Matrix.

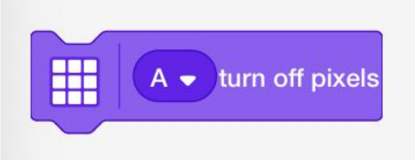


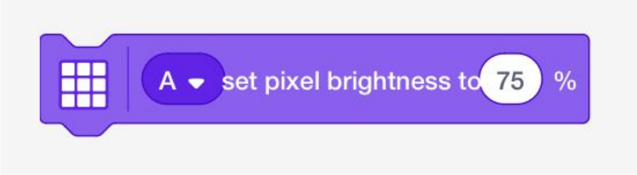
Turn on 5X5 Light Matrix: Create a pattern to light up on the Light Matrix. Pattern stays light until the Light Matrix is told to do something else or the program is stopped.

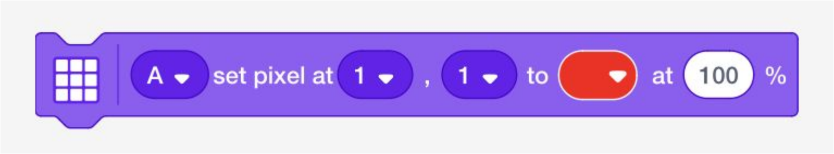
LIGHT BLOCKS

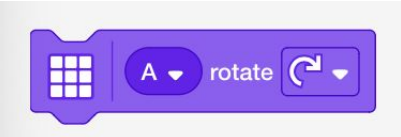

A ▾ turn on ▾ for 2 seconds

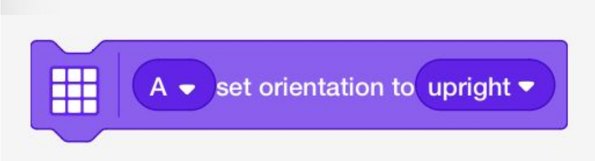

A ▾ turn on ▾


A ▾ turn off pixels


A ▾ set pixel brightness to 75 %


A ▾ set pixel at 1 ▾ , 1 ▾ to 🟥 ▾ at 100 %

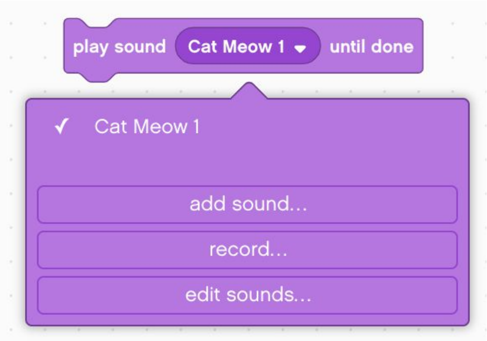

A ▾ rotate ↻ ▾


A ▾ set orientation to upright ▾

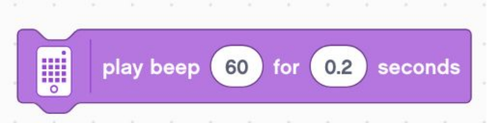
These blocks are for the 3X3 Light Matrix that comes in the Essentials set and function in a similar way to the blocks described on the previous pages.

SOUND BLOCKS

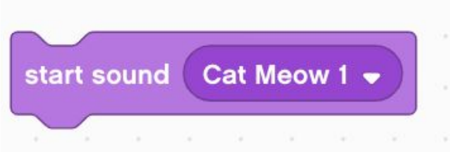
Most sounds (other than beeps) play on your device and not the Hub.



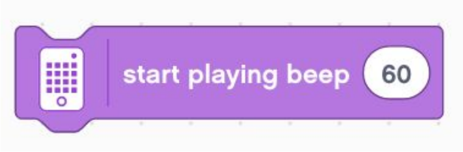
Play Sound until Done: Plays a selected sound on your device and pauses the programing stack until the sound is finished. You can add sounds, record sounds and edit sounds.



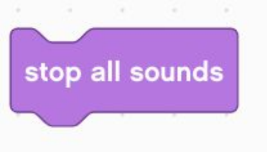
Play Beep for Seconds: Plays a beep tone on the Hub for the specified number of seconds.



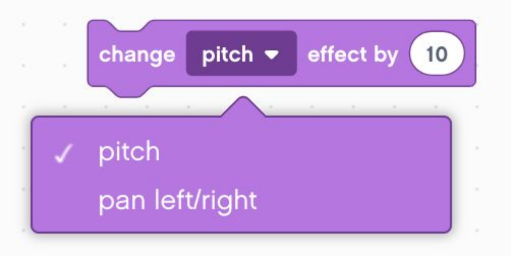
Start Sound: Start playing a selected sound on your device and immediately plays the next block in the programming stack. You can add sounds, record sounds and edit sounds.



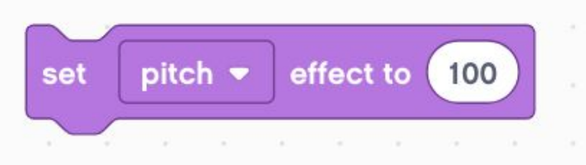
Start Playing Beep: Plays a beep tone on the Hub until something in the program stops it.



Stop All Sounds: Stops all sounds currently being played.

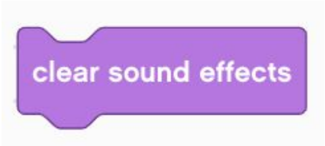


Change Pitch Effect By: Changes the pitch or pan left/right effect of the sounds played on the device Pan effect: which speaker is emitting the sound. Left Speaker (-100), Normal (0), and Right Speaker (100)



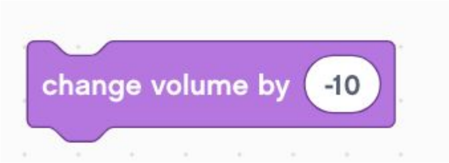
Set Pitch Effect By: Changes the pitch or pan left right/left effect of sounds that are being played on the device.

SOUND BLOCKS



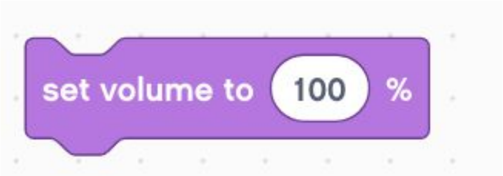
clear sound effects

Clear Sound Effects: Sets both the pitch and pan left/right sound effect back to normal



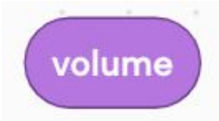
change volume by -10

Change Volume: Changes the volume of the sound currently being played by a specified increment from the volume at which it’s currently playing. Default (100%)



set volume to 100 %

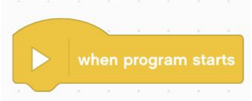
Set Volume: Sets the volume of the sound. Default (100%)



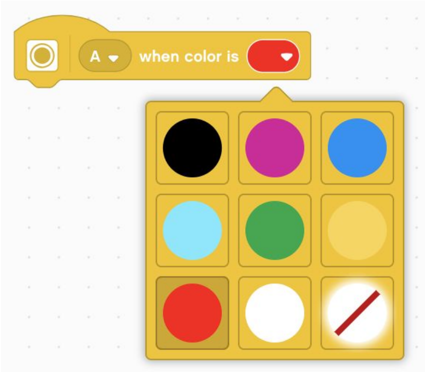
volume

Volume: Reports the current volume

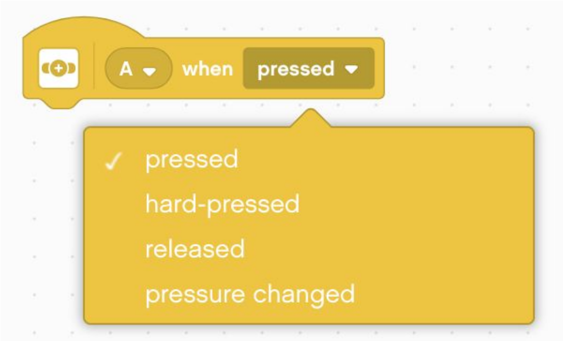
EVENT BLOCKS



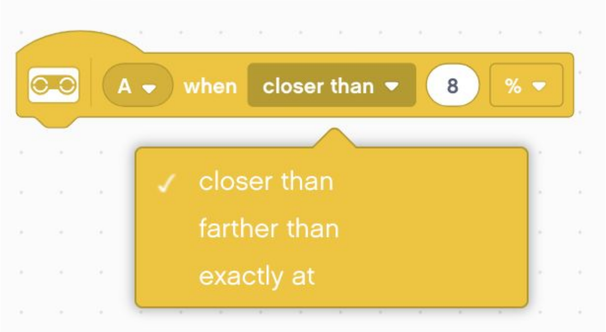
When Program Starts: Plays all the blocks attached to it in sequence



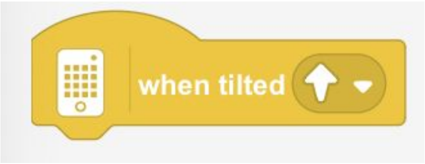
When Color Is: Plays all the blocks attached to it when the Color Sensor detects a specified color



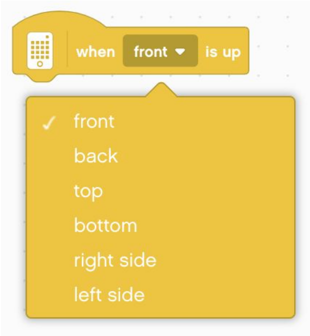
When Pressure Is: Plays all the blocks attached to it when the Force Sensor is pressed, hard-pressed, released, or when a change in pressure is detected.



When Closer Than: Plays all the blocks attached to it when the Distance Sensor detects that an object is closer than or further than the specified distance.

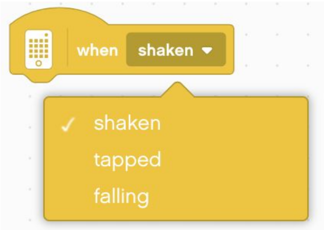


When Tilted: Plays all of the blocks attached to it when the Hub is tilted in the specified direction starting from a flat, button(s) up position. It won't trigger again as long as the Hub isn't tilted in a new direction.

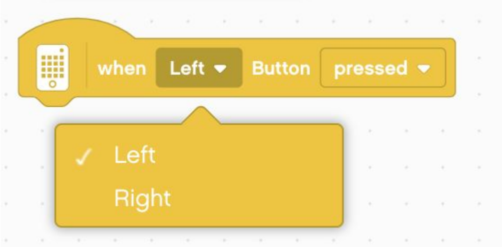


When Hub Orientation is Up: Plays all the blocks attached to it when the Hub is placed in the specified orientation (front, back, top, bottom, left side, or right side)

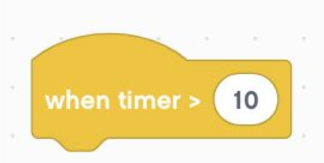
EVENT BLOCKS



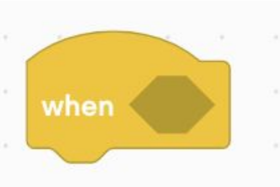
When Hub Shaken: Plays all of the blocks attached to it when the hub is shaken, tapped, or falling.



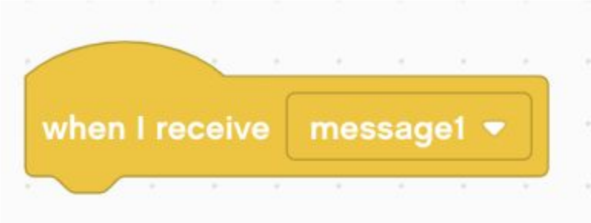
When Hub Button Pressed: Plays all the blocks attached to it when the Left or Right Buttons are pressed or released.



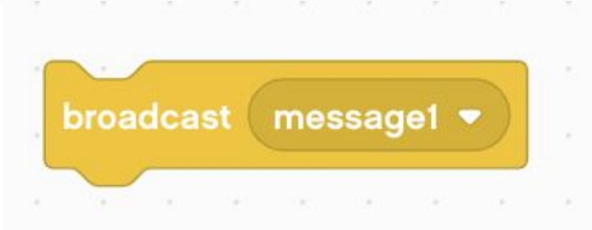
When Timer: Plays all the blocks attached to it when the time exceeds the specified value.



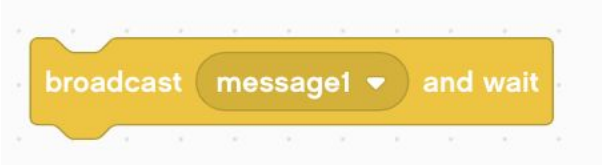
When: Plays all the blocks attached to it when a certain condition is true



When I receive Message: Plays all the blocks attached to it when a specified message is broadcasted by the Broadcast Message Block or the Broadcast Message and Wait Block.



Broadcast Message: Broadcasts a specified message. All When I Receive Message Hat Blocks for that specified message will play. After the message has been sent, the next block in the programming stack with play.



Broadcast Message and Wait: Broadcasts a specified message. All When I Receive Message Hat Blocks for that specified message will play. After the message has been sent, the block waits until all the programming stacks with the specified message finish before moving to the next block.

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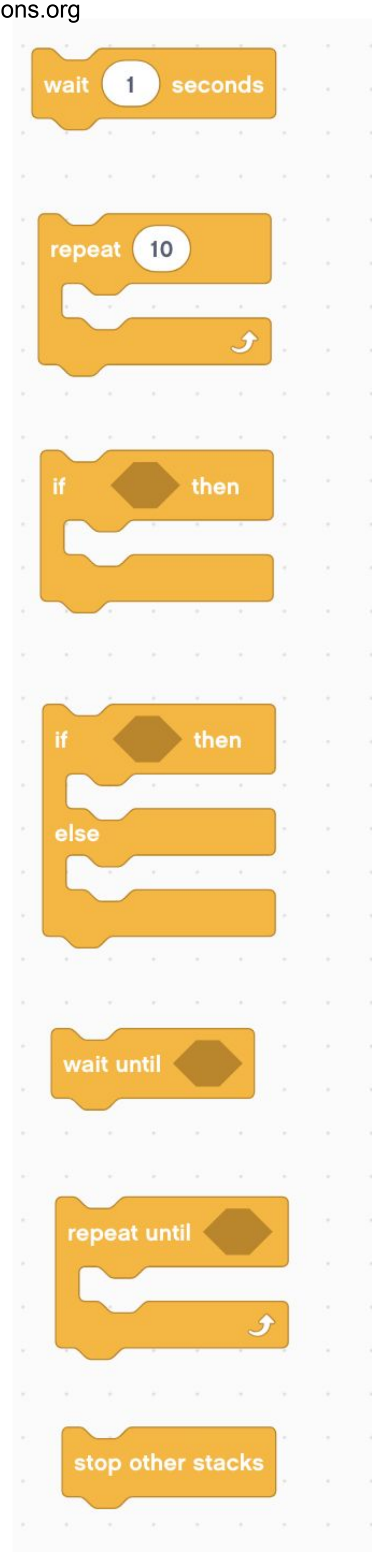
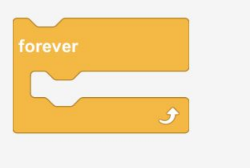
CONTROL BLOCKS



Wait for Seconds: Pauses the stack for the specified number of seconds (whole numbers and decimals)

Repeat Loop: All blocks in the loop will repeat for the specified number of times or use the **Forever Loop** to repeat forever



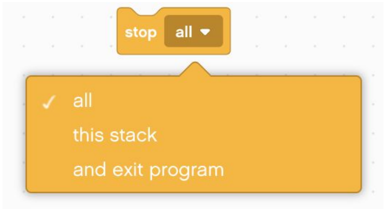
If Then: The block checks whether a condition is true. If true, everything inside will play.

If Then Else: The Block checks whether a specific condition is true. If true then the the blocks in the first space will play and then the code continues down the stack. If false, the blocks in the second space play.

Wait Until: Pauses the stack until the condition is true

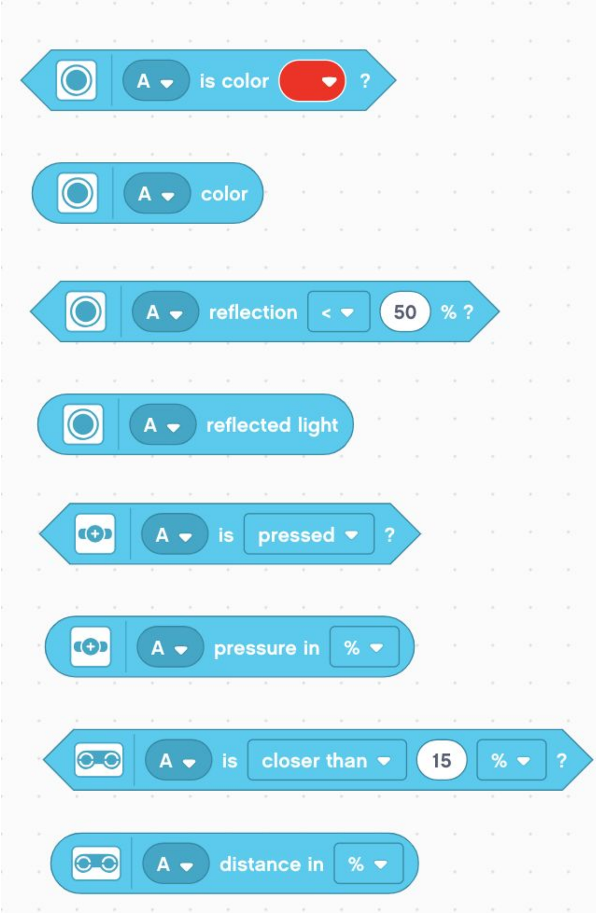
Repeat Until Loop: All blocks inside the loop will repeat until the condition is true

Stop other Stacks: The block stops all other programming stacks in the project expect its own



Stop: Block stops all programming stacks currently running, it’s own programming stack, or exits the program.

SENSOR BLOCKS



Is Color?: Returns “true” when the Color Sensor detects the specified color.

Color: Reports the color of the Color Sensor as a number code.

Is reflected light: Returns “true” when the light reflected back to the Color Sensor is greater than, equal to, or less than the specified percentage.

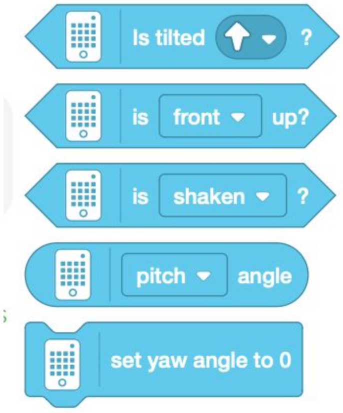
Reflected Light: Reports the value of the light that is being reflected back to the Color Sensor

Is Pressed? Returns “true” when the Force Sensor is pressed (> 0 newton), hard pressed (> 5 newton), or released (= 0 newton)

Pressure: Reports the current pressure being applied to the Force Sensor in newtons (2-10 newtons) or as a percentage.

Is distance? Returns “true” when the Distance Sensor detects something is closer than, exactly or greater than a specified distance.

Distance: Reports current distance the Distance Sensor is detecting (cm, in, percentage).



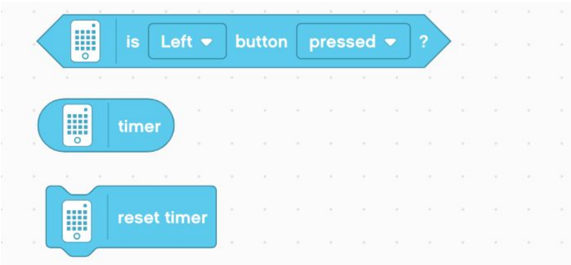
Tilted: Returns "true" when the Hub is tilted in the specified direction starting from a flat, button(s) up position.

Is Hub orientation? Returns “true” if Hub is placed at angle specified (front, back, top, bottom, left side, right side)

Is Shaking? Returns “true” when the Hub is shaken, tapped, or falling.

Hub Pits Roll Yaw Angle: Reports the Hub’s pitch, roll or yaw angle.

Set Hub Yaw Angle to 0: Sets the yaw = 0



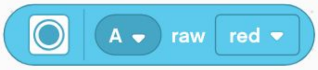
Is Hub Button pressed? Returns “true” if Left or Right button is pressed or released

Time: Reports time (sec) since the program started.

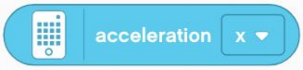
Reset Timer: Resets the timer

MORE SENSOR BLOCKS

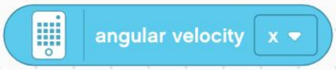
You will need to add these blocks using Extensions.



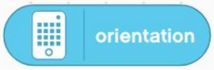
Raw Color: Returns the raw red, green, or blue color reading from the Color Sensor (0-255)



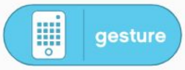
Hub Acceleration: Returns the Hub's acceleration on the X, Y or Z axis



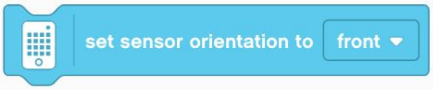
Hub Angular Velocity: Returns the Hub's angular velocity (Gyro Rate) on the X, Y, or Z axis



Orientation: Returns the current orientation of the hub (front, back, top, bottom, left side, or right side)

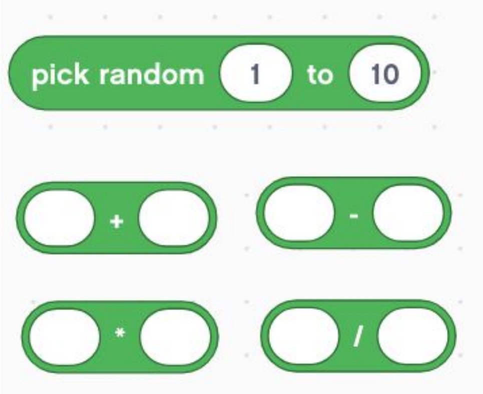


Gesture: Returns the current gesture (shaken, tapped, or falling)



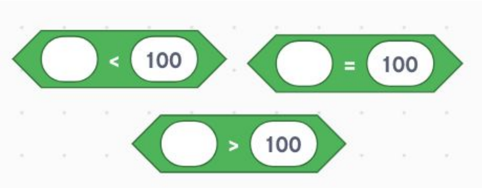
Set Hub Sensor Orientation: Set the orientation of the 6-axis Gyro Sensor to front, back, top, down, left side, or right side.

OPERATOR BLOCKS

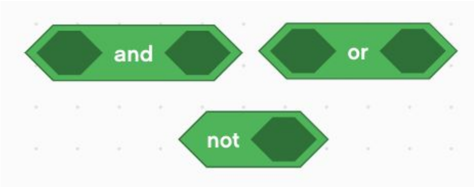


Pick Random Number: Picks a random number within the specified range (including endpoints). Whole numbers or decimals can be selected if the endpoints are decimals. If endpoints are whole numbers, only whole numbers can be selected

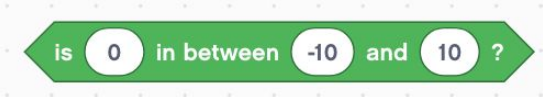
Plus/Minus/Multiply/Divide: Add, subtract, multiply or divide two values and return the results



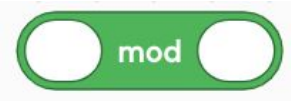
Greater Than/Less Than/Equal To: Returns true if value is greater than, less than or equal to.



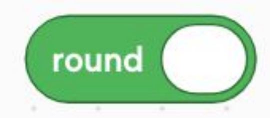
And/Or/Not: Joins two Boolean Blocks with “and”, “or” condition. Not inverts the boolean value of the condition inside.



Is Between: Checks whether the specified value falls between the next two specified values (including endpoints)

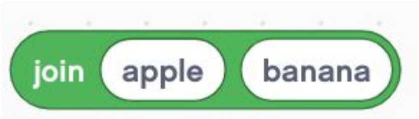


Mod: Returns the remainder when the first value is divided by the second. E.g. 10 mod 3 returns 1.

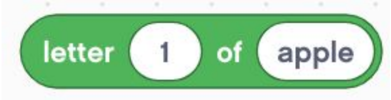


Round: Rounds the given number to the nearest integer. (.5 and higher round up)

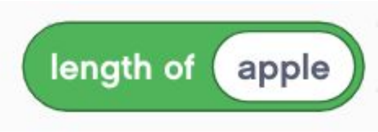
OPERATOR BLOCKS



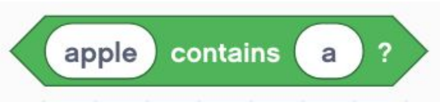
Join Strings: Join two text values and returns the results. E.g. “apple” “banana” would return “applebanana”



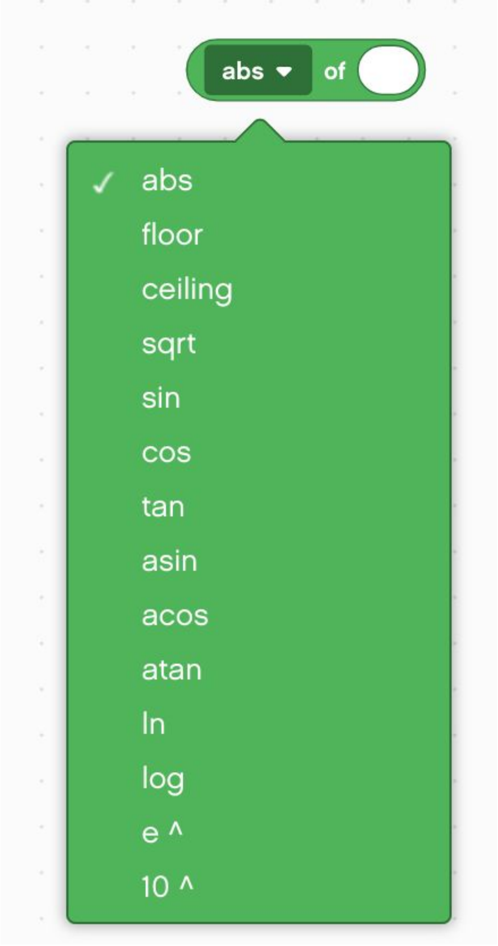
Letter of String: Returns the character that occupied the specified position. E.g. letter 1 of apple is “a”



Length of String: Returns the number of characters in the string. E.g If you enter “apple”, the block returns “5”

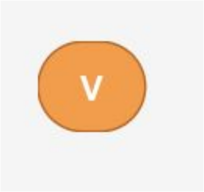


String Contains: Returns “true” if the specified character is contained in the string.



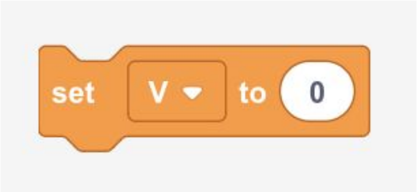
Math Functions: Performs the specified math function on a given number and reports the results.

VARIABLE BLOCKS



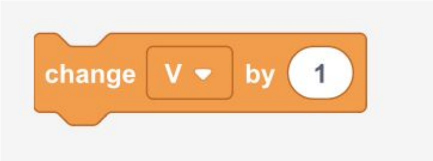
V

Variable: Reports the value of a variable. Whenever a variable is created, a version of this block appears with the variable's given name on it.



set V ▾ to 0

Set Variable To: Sets the specified variable to the given value. The variable can be either a string or a number.



change V ▾ by 1

Change Variable By: Changes the specified variable by a given value. The change is from the specified amount from the value currently stored in the variable. For example, if my variable contains the value *4*, using the Change Variable By 3 Block would make the value change to *7*. Also, if the variable is a text string (not a number), the value of the variable is set to the quantity the variable was to be changed by. For example, if “my variable” contains “LEGO,” using the block shown above will change the value to “1.”

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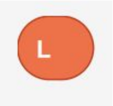
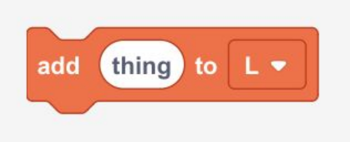
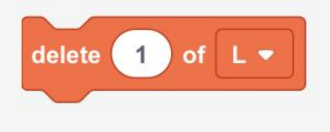
LIST BLOCKS



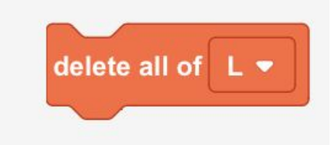
List: Reports, as a string, the items contained in a list. Whenever a list is created, a version of this block appears with the list's name on it.



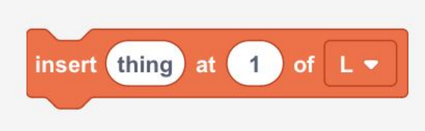
Add item to List: Adds the specified item to the end of the specified list.



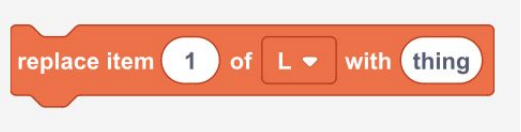
Delete Item in List: Deletes the item that's currently occupying the specified position in the specified list.



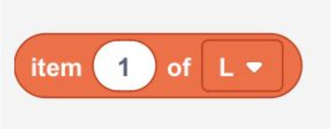
Delete All Items in List: Deletes all of the items in the specified list.



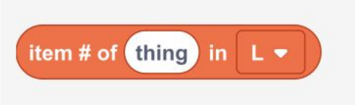
Insert Item at Index in List: Inserts a specified item at a specific position in the specified list.



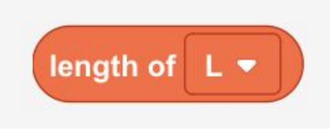
Replace Item at Index in List with Another Item: Replaces the item at the specified position with a specified value.



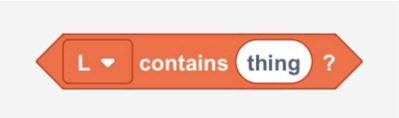
Value of Item at Index in List: Returns the value that occupies the specified position in a specified list.



Index Value of Item in List: Returns the number of the position in a list where an item first appears. If the item isn't contained in the specified list, it reports “0.”



Length of List: Returns the number of items contained in the specified list.



List Contains?: Returns “true” if the list contains the specified value in any position. The specified value must be an exact match for the value contained in the list. If none of the values in the list are equal to the specified value, it returns “false.”