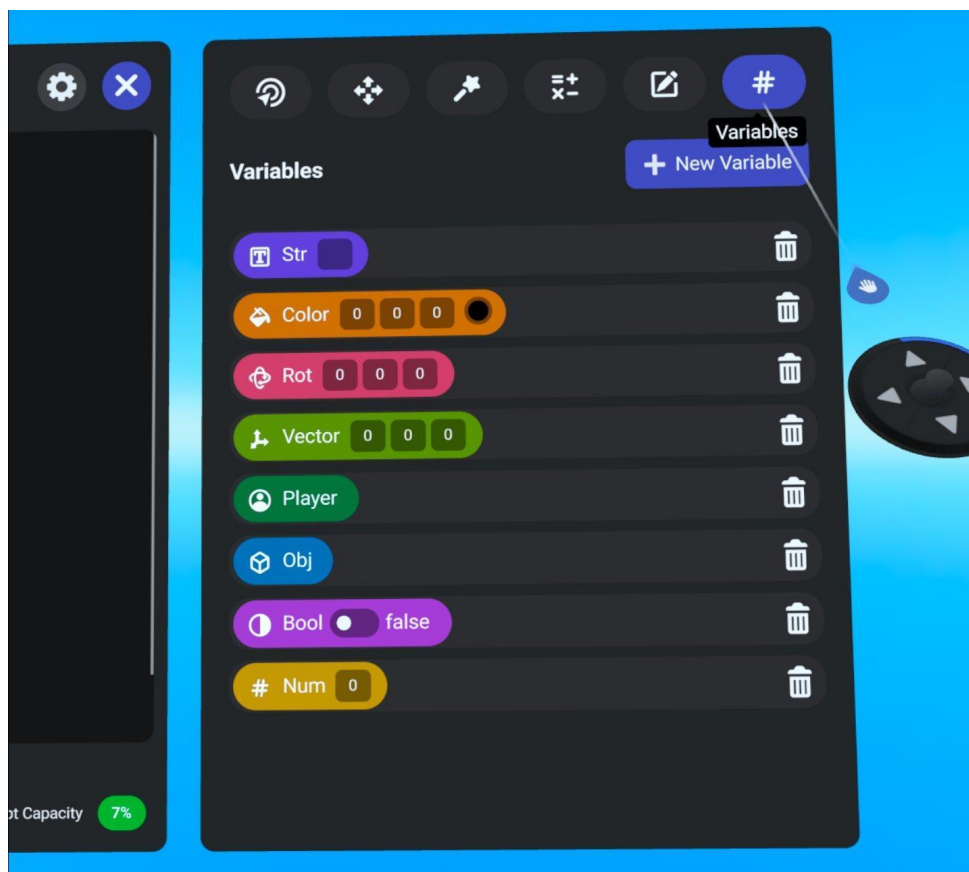# Variables

Variables

Variables > Variables

Variables can be created for use throughout your script, you can set defaults for some of the value types inside the scripting panel. On the object that the script is attached to's property panel, you can override these defaults by filling the variables out. They can be set back to script default by clicking on the "x" next to the variable in the object's property panel.

There are many uses for variables, consider the following use cases:

1. When a value changes throughout the duration of a world.
2. When a value is used multiple times in a script.
3. When an object needs to be referenced.

Number

Variables > Variables > Number

A number variable.

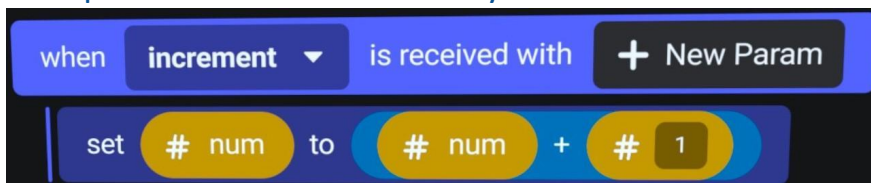## Appearance in Composition Pane

Description

Numbers variables are used for calculations, counting, measurements, and a whole lot more. Input a value into the number variable block in the Variables tab to set its initial value. Its value can change using the **set to** block found on the Values tab.

You can create a number variable to use throughout your script, preventing unnecessary changes down the line, or even allowing for unique attributes on individual objects. Now when you change its value on the Variables tab, this is much faster than changing its value multiple times throughout the script. And you can even set a unique initial value from the properties panel on objects the script has been attached to.

If a calculation is used multiple times, consider setting a number variable to the calculation, then replace the repetitive calculations with the variable. This can save space in the script window and uses less scripting capacity.

If a number value doesn't change and isn't used multiple times in a script, remember there are single use number inputs found on the Values tab.
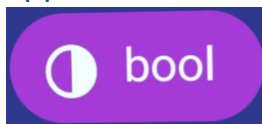
Example 1: Increase a number by one.

When the increment event is received, number is set to number + 1. This increases the current value of the number by one.

Boolean

Variables > Variables > Boolean

A boolean variable.

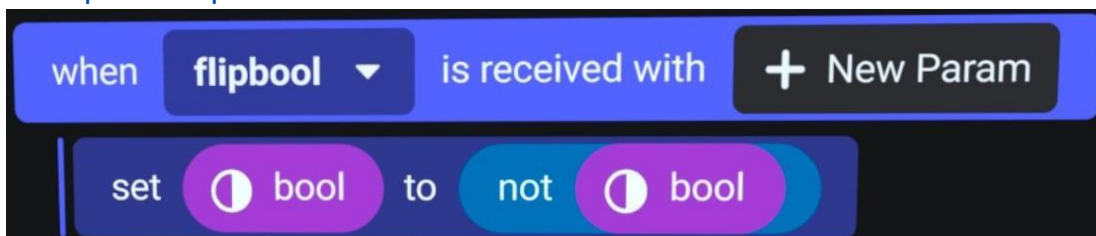## Appearance in Composition Pane

Description

Boolean variables are either true or false. Consider using them when a thing can only be either, or. For example, someone can either be left handed or right handed, wearing an attachable or not wearing an attachable, playing a game or not playing a game.

To set the initial value of a boolean click the toggle on the boolean variable.

Booleans can be used in If and While codeblocks. Logic operators will also return a boolean value.

To flip a boolean variable from true to false or from false to true, Set the boolean to not(boolean).

Example 1: Flip the value of a boolean

When the flipbool event is received, bool is set to not(bool). This sets bool to true if it is false, or false if it is true.

Object

Variables > Variables > Object

An object variable.

Appearance in Composition Pane

Description

Objects are anything in the world with a property panel, including grouped objects, gizmos, sounds, and more.

To reference an object in the world with a script, create an object variable. Then, drag the blue pill from the object's property panel and drop it into the empty variable slot on the property panel of the object that the script is attached to.

You can also set an object variable by receiving an object parameter in an event, and then setting the value to the object parameter. You can then reference the object in other events.

Example 1: Move an object up
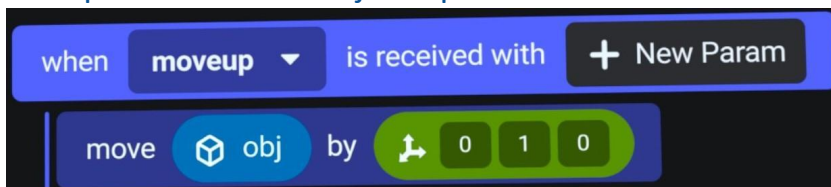
When the moveup event is received, obj moves upwards by one meter. This is because the vector (0,1,0) has a 1 in the Y slot, which is the up and down direction of the world.

Player

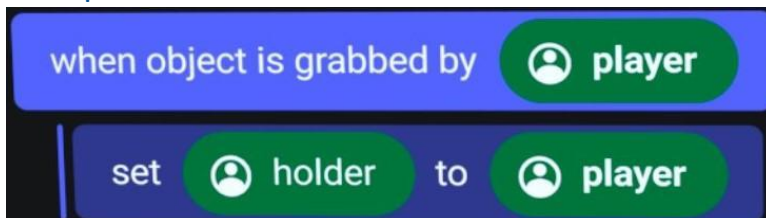**Variables > Variables > Player**

A Player ID variable.

Appearance in Composition Pane

Description

Player variables identify a player so that they can be referenced in a script. When a player is a parameter in an event, such as **when object is grabbed by player**, set a player variable to the player parameter to reference the player in another event.

Example 1:

When the object is grabbed by a player, the script sets the player that grabbed the object to a player variable named holder. This allows the script to reference the player in other events.

Vector

Variables > Variables > Vector

A vector variable.

Appearance in Composition Pane

Description

Vectors are three numbers: X, Y, and Z. Their use depends on the context in which it is used. Some common vector types are:

> **Position:** the coordinates of a position relative to the world origin.
> **Direction:** A direction in space with the values representing its length in each direction.
> **Scale:** The size of an object in each direction relative to a different size, typically a meter.
> **Velocity:** The change in position of an object over a second.
> **Angular velocity:** the change in rotation of an object over a second.

To set the initial value of a vector variable, type in the X, Y, and Z values on the Variables tab. To change its value, use the **set to** codeblock found on the Values tab.

If a calculation that returns a vector value is used multiple times in an event, set a vector variable to the calculation, then replace the calculations with the variable. This can save space in the script window and use less script capacity.

Remember you can always get a single use vector input from the Values tab.

Example 1: Save the objects original position
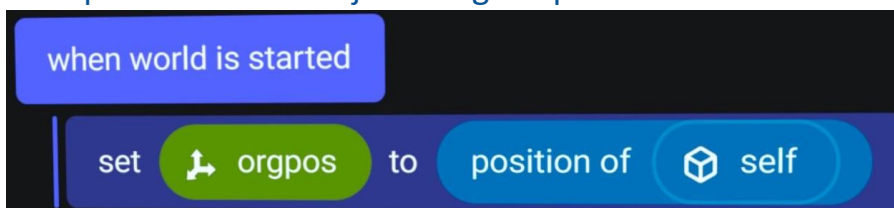
When world is started, we set the OrgPos vector variable to the position of self.

Rotation

Variables > Variables > Rotation
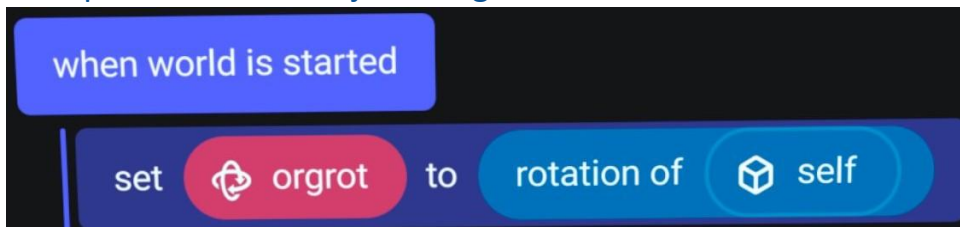
A rotation variable.

Appearance in Composition Pane

Description

Rotations are based on the direction each axis is facing. The values represent the pitch, yaw, and roll of an object. Rotating the x-axis of an object changes its pitch, rotating the y-axis changes its yaw, and rotating its z-axis changes its roll. Rotation is measured in degrees, from 0 to 360. Any negative value input automatically changes to a positive value that is 360 minus the absolute value.

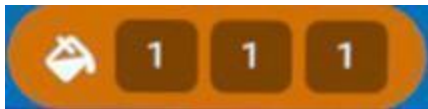## Example 1: Save the objects original rotation

When world is started, we set the OrgRot rotation variable to the rotation of self.

Color

Variables > Variables > Color

A color variable.

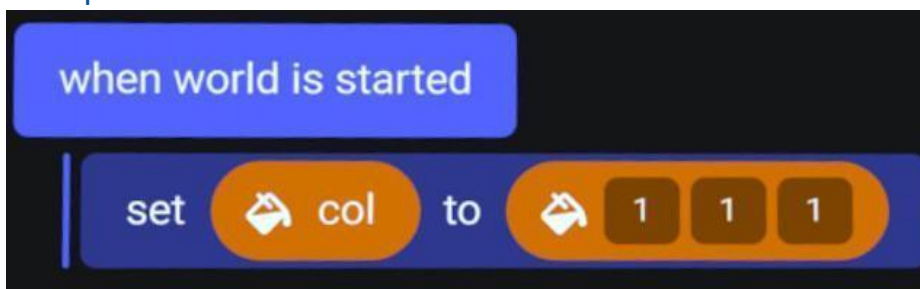## Appearance in Composition Pane

Description

The values in a color variable represent how much red, green, and blue (RGB) are in a color. Values are between 0 and 1, with (0,0,0) being black and (1,1,1) being white. Different combinations of red, green, and blue can create many possible colors.

Color variables are useful when the color of an object changes. Use the **set to** codeblock to change the variable, and you can use the **paint object** codeblock to paint an object that color.
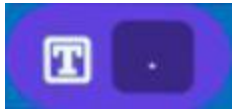
Example 1: Set a variable to a color value

When world is started, we set color variable *col to white or (1,1,1).*

String

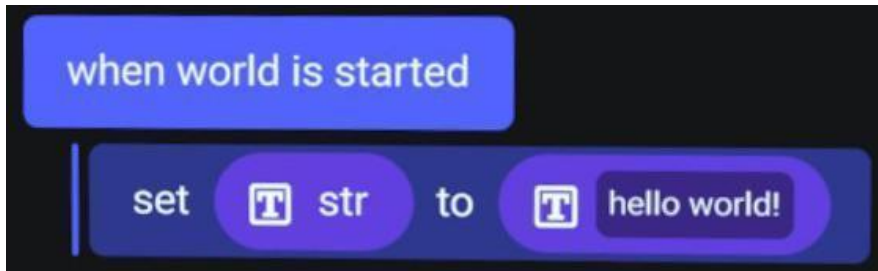**Variables > Variables > String**

A string variable.

Appearance in Composition Pane

Description

Strings are characters. They are used to display text or as identifiers. You can use a string variable if the string changes throughout the duration of the world or if it is used multiple times in a script. Remember you can find single use string inputs on the Values tab.
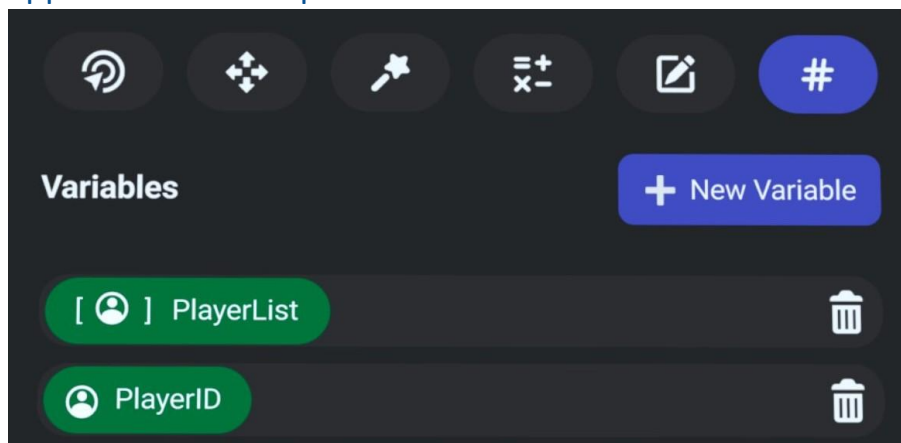
Example 1: Set a variable to a string value

When world is started, we to set the string variable *str* to "hello world!"

List

Variables > Variables > List

A list of a variable type.

## Appearance in Composition Pane

Description

Lists are useful for storing multiple variables, and each variable can be referenced by the index of the variable in the list.

To create a list, click on New Variable in the Variables tab, write the name of the list, click on its variable type in the drop down box, and toggle the list option. Lists can be identified in the Variables tab by the brackets around the variable symbol.

There are many codeblocks for lists found on the Operators tab.

Example 1: when a player enters a trigger, add them to the list
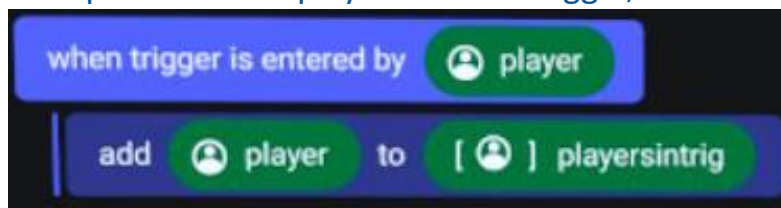
When trigger is entered by player, we add the Player to the playersintrig list.