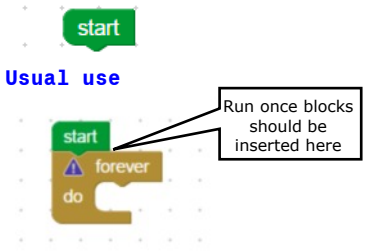
KS2 Cards

CODE
Blockly Code layout

Snippet:

PICAXE



Location:

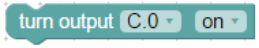
Function:
This is the starting block, which is created when a new Blockly program is opened. The start block is the program start, any variables or actions that need to be done first should be placed after this block and before the main program loop.

CODE
Operate a Digital Output

Snippet:

PICAXE

Block



Parameters

- Port pin: the pin number
- value: off or on

Return

- None

Location: Output

Function:
This will set a pin to output 0 or 1, on or off, click on the down arrow to show the options.

CODE
Reading a digital input

Snippet:

PICAXE

Block

Parameters

- pin: the number of the digital pin you want to read

Return

- 0 or 1

Location: Input

Function:
Reads the value from a specified digital pin, either **0** or **1**. You can select any pin from the drop-down menu, only those pins that can be used as inputs will be shown.

CODE
Operate an Analog Output

Snippet:

PICAXE

Block

Parameters

- Period: 0 to 255, fast to slow
- Duty: the duty cycle: between 0 (always off, 0%) and 1023 (always on, 100%)
- pin: the pin to write to

Return

- None

Location: Output

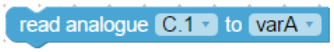
Function:
Writes an analog value (**PWM wave)** to a pin. Can be used to light a LED at varying brightnesses or drive a motor at various speeds. The block make the pin will generate a steady square wave of the specified duty cycle until the next command on the same pin.

CODE
Reading an analog input

Snippet:

PICAXE

Block



Parameters

- Value: the value from the analog pin

Return

- 0 to 255

Example

Location: Input

Function:
Reads the analog voltage on a pin and returns a value 0 to 255.

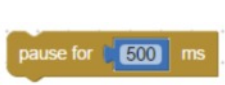
Only applies to pins that have analog functions.

CODE
How to delay for a set time

Snippet:

PICAXE

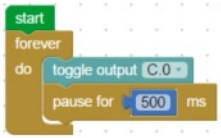
Block



Parameters

- Time: 0 to 32767ms

Example



Location: Delays

Function:
This block pauses the code for x milliseconds (ms), 1000ms = 1s.

CODE
Looping for a **While**

Snippet:

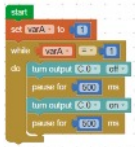
PICAXE

Syntax

Parameters

- expression: a statement that evaluates to true or false

Example



Location: Loops

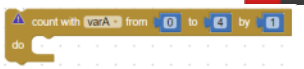
Function:
while loops will loop continuously, and infinitely, until the expression becomes false. Something must change the tested variable, or the while loop will never exit. This could be in your code, such as an incremented variable, or an external condition, such as testing a sensor.

CODE
Looping **Count** a number times

Snippet:

PICAXE

Block



Parameters

- VarA: name of counter variable
- From: start value
- To: end value
- By: increment value

Example

Location: Loops

Function:
The **count with** statement is used to repeat a block of statements inside the loop. Each time through the loop, the variable is increased by 1 from the starting value until the maximum value is reached, then loop then ends.

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CODE

Repeat a number of times

Snippet:

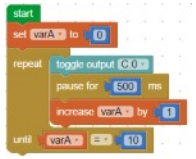
PICAXE

Block

Parameters

- Expression: a statement that evaluates to true or false

Example



Location:

Loops

Function:

The **repeat** loop simply repeats the code within the loop the until the comparison becomes true. Remember to update the variable in the loop or it won't end.

CODE

If decision making

Snippet:

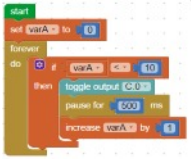
PICAXE

Block

Parameters

- Comparisons: =, <>, >, <, <=, >=

Example



Location:

Variables

Function:

if, is used in conjunction with a comparison to tests whether a certain condition has been reached, such as an input being above a certain number. if the comparison is true, the statements inside the brackets are run. If not, the program skips over the code.

CODE

If ... Else decision making

Snippet:

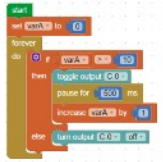
PICAXE

Block

Parameters

- Comparisons: =, <>, >, <, <=, >=

Example



Location:

Variables

Function:

if/else allows greater control over the flow of code than the basic **if** statement, by allowing multiple tests to be grouped together. For example, an analog input could be tested and one action taken if the input was less than 500, and another action taken if the input was 500 or greater.

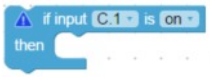
CODE

If input decision making

Snippet:

PICAXE

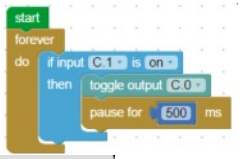
Block



Parameters

- Input: which pin to use

Example



Location:

Input

Function:

This if block is specifically for use with inputs, the input pin needs to be selected, and the off or on needs to be selected as well.

Note: the inputs you can select are those available on the Picaxe type you are using.

CODE

Basic maths

Snippet:

PICAXE

Arithmetic Operators

The basic maths operations:

- Addition
- Subtraction
- Multiplication
- Division

Example

Location:

Maths

Function:

The maths operations follow standard maths operations, they need to be placed into a set variable block. You select the required maths operation from the drop down menu. There are some additional advanced operations in the list.

CODE

Create a variable

Snippet:

PICAXE

Block

Parameters

- Name: the name of your variable

Return

- None

Location:

Variables

Function:

This is the method use to set up numerical variables, they may need to be initialised at the start of your code - see the Blocky code layout card. Select the down arrow on the New variable and enter the name of your new numerical variable.

CODE

Choosing a **Random** number

Snippet:

PICAXE

Block

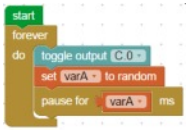
Parameters

- None

Returns

- A random number between 0 and 65535

Example



Location:

Variables

Function:

This block stores a random number into the given variable. Use the down arrow to select other variables if needed. To use a new new, you need to create a new variable - see the Create a variable card.

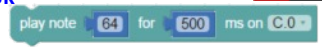
CODE

Play a musical note

Snippet:

PICAXE

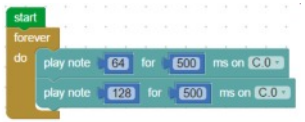
Block



Parameters

- Frequency
- Time: how long to play for in ms
- Pin: which pin to use

Example



Location:

Output

Function:

This block generates an audio tone of set frequency, for a specified duration in ms, the pin to use is selected using the down arrow.

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CODE

Play a tune (built-in)

Snippet:

PICAXE

Block

Parameters

- Select on of 4 built-in tunes

Example

Location:

Output

Function:

This block plays one of four built-in tunes, with this block only certain pins can be used depending upon the Picaxe chip type.

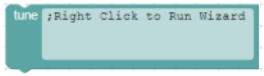
CODE

Play a tune RTTTL type

Snippet:

PICAXE

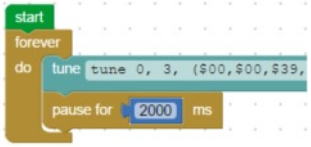
Block



Parameters

- RTTTL tune loaded via the Tune Wizard

Example



Location:

Output

Function:

This block plays any RTTTL tunes (Nokia ring tones), these files are loaded via the Tune Wizard, the IDE comes with a wide range of examples. More are available from the Picaxe website.

CODE

Set **servo** position

Snippet:

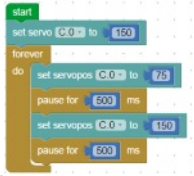
PICAXE

Block

Parameters

- Pin: which pin to use
- Angle: what angle to set motor to

Example



Location:

Output

Function:

This block controls the position of an attached servo motor. For a standard servo the angle is 0 to 180, using values 75 to 225.

A continuous rotation version, 75 = rotate in one direction, 150 = stop and 225 rotates in the other direction. The set servo block initialises the servo.

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