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Lesson 4 - Working with code blocks

Expected Time: 45 - 60 minutes.

Aspect of National Curriculum Programme of Study covered:

KS2 objective a - Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

KS2 objective b- Use sequence, selection and repetition in programs; work with variables and various input and output

KS2 objective c - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

Objectives
Student will be able to;
- design a programme where a particular outcome will happen based upon an action inputted by the user
- create programs which contain variables

Ongoing objectives
- Use technology respectfully and safely
- Understand that communication online can be seen by others
- Evaluate and select digital online content responsibly and discerningly

<u>Activity</u>

Step 1. In this lesson we are going to work through some different types of code blocks. Code blocks are used to make coding more simple and control the flow of a computer programme. We are going to look at code blocks in if statements and also a code block within a function. Start by opening up a new whiteboard session Click here to open in a new tab

Step 2. Click on the left hand box on the whiteboard page and type in the following commands.

```
ask mypassword Please enter a password
if mypassword equals qwerty123
  type Access Granted
else
  type Access Denied
end if
```

Step 3. Notice how there are two spaces before each type command. This brings each code block out from the main code and makes the programme look more neat and tidy. Reload the code and you should get a pop up box asking for a password. If you enter qwerty123 the page will say access granted and if you put in a wrong password it will say access denied. You have effectively written two blocks of code and one will be run when the if condition is met, the other (after the else command) will run if the condition is not met.

ask mypassword Please enter a password

if mypassword equals qwerty123

Yes | No

type Access Granted | type Access Denied

These Are Code Blocks
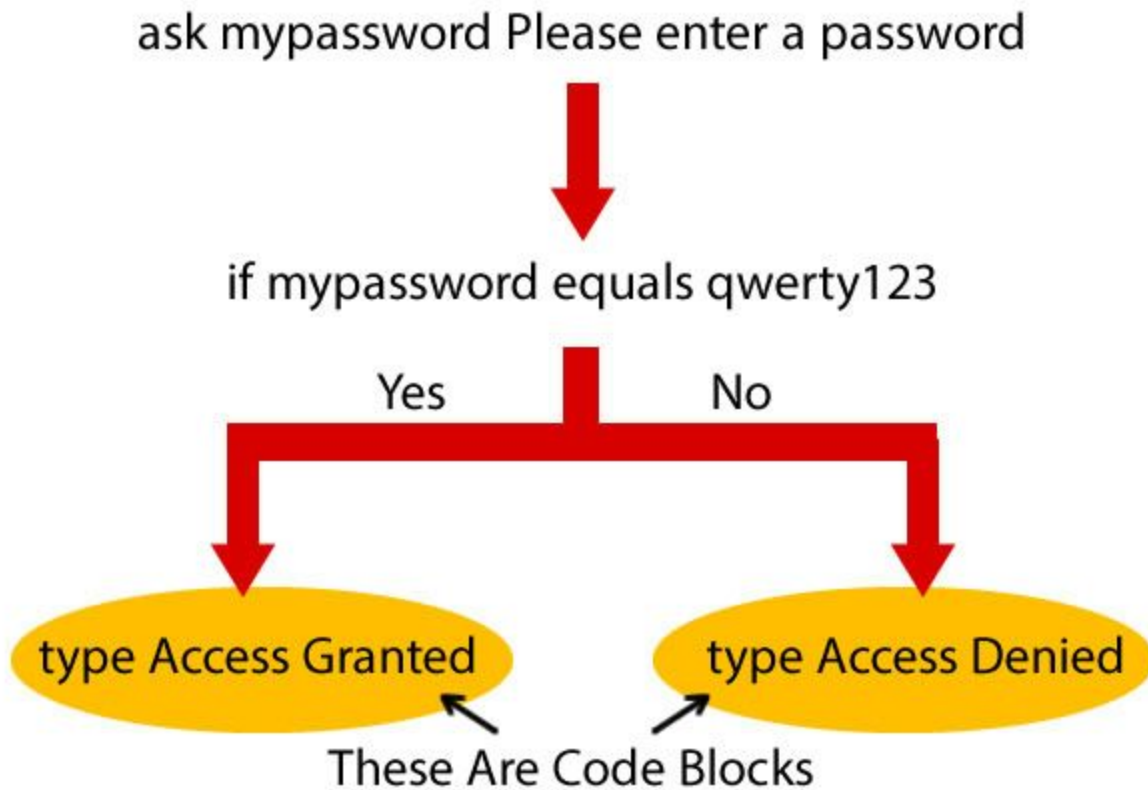
A code block is a set of instructions telling the computer what to do, literally it is a block of code. In this example we place a conditional if statement. If the condition is met the first block of code will run. If the condition is not met the second block of code will run (after the else command).

Step 4. OK now we have a password protected code block lets create a function to do something cool only if the password is correct. A function is a block of code that is stored in the computers memory until you start it. A function will not run straight away but can be called multiple times from anywhere else in the programme. Lets build an example to demonstrate this. Add the following code to the top of your programme (we have to add it to the top because we need to tell the computer about the function before we run it):

```
function secret
  type this is my secret function
  draw treasure
end function
```

Step 5. If you reload the code now you will notice that nothing new happens. What we need to do is call the new function or make it run. We will do this only if the password is correct. So lets call the function by typing the following command after the 3rd line "type Access Granted"

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Step 6. Reload the code and you should now be asked for a password. If you get the password right it will say Access Granted and then run the function we just created typing some text and drawing a little picture of some treasure like below:

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Lesson 4 - Working with code blocks

> *This lesson allows the children to create a programme which contains a variable*
> *.*
> *By the end of the lesson the children should have created a programme which contains two possible outcomes, each one dependent upon the input from the user.*

Code Blocks

A code block is a block of code that the computer will follow depending on what the user inputs. Within this lesson, the code blocks the children will be looking at are dependent on what the user inputs and will follow either an if or else statement.
See the diagram below for a pictorial explanation.
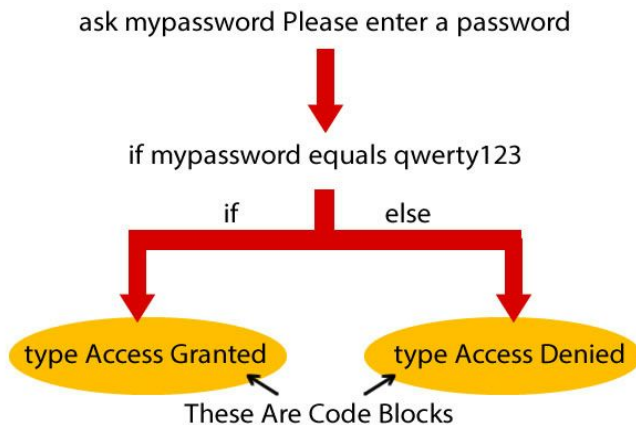
Functions

A function is a set of code that will never run straight away. It will only run when you start it later on in the code block. A function always begins with the word function. It must be written before the code block it is to appear in, to let the computer know what you want it to do before you run it.

Challenge
- Challenge 1.

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The children could write their own function which will appear for Access Denied. The children need to choose the name of their function, what image is to appear and where in the code block they wish for it to happen.
Their function could be in the form of a cross appearing. See below for an example of code.

```
function secret
  draw treasure
end function

function denied
  draw cross
end function

ask mypassword Please enter a password
if mypassword equals Qwerty123
  type Access Granted
newline
start secret
else
  type Access Denied
start denied
end if
```

● Challenge 2

An additional challenge could be to change the background colour for Access Granted and Access denied. see below for an example of code

```
function secret
  draw treasure
end function

function denied
  draw cross
end function

ask mypassword Please enter a password
if mypassword equals Qwerty123
background blue
  Title Access Granted
newline
start secret
else
background red
Title Access Denied
newline
  start denied
end if
```