Lesson Plan 1

Outline

* Brief introduction to what programming is.
* Introduction to flow-control statements.
* Learn about variables and functions
* Create a small flow control animation and understand event driven programming.

Start with introducing yourselves and everyone. Talk about where you are from, what got you into computer science. Ask around to kids why they like IT. Talk about the first program that you made.

What is programming?

Creating an organized list of instructions that, when executed, causes the computer to behave in a specific manner. Without programs, computers are useless. Every program must be translated into machine language that the computer can understand. This translation is performed by compilers, interpreters, and assemblers. Most code is typed, but we will be using visual blocks. Each block corresponds to a line of "real" code. A program is a set of instructions for your computer to follow. We write the instructions for a computer to do something. It’s a bit like giving directions from your school to your home. You have to be specific and get each direction in the right order.

Explain binary briefly

Computers understand binary. Straightforward implementation in digital electronic circuitry using logic gates. Binary is base 2 system with 0 and 1. Also explain math operators briefly and how math is used in programming. Explain that for computers to understand we have to use specific keywords, which they then translate into 0’s and 1’s for them to work. Luckily, all we have to know are the words and instructions that computers can understand. We don’t have to talk to them in 0’s and 1s!

Why learn programming

* You can create your own programs or games.
* Lots of jobs computing and engineering use programming.
* Ability to read and write a machine language, it is just like learning another language.
* New and strictly logical way of thinking about problem-solving. It’s called computational thinking, and it's about understanding the difference between human and artificial intelligence. Computers are everywhere today, and a huge part of our life; it’s time we learnt their language.

**Direction exercise**: Teacher is a robot and needs to get to the other side of the classroom

Or bot logic exercise: <http://botlogic.us/play>

Or code.org 1-5 exercises

Scratch Introduction

Start by explaining scratch

Scratch is an interactive IDE where you can make animations and mini games. Scratch allows users to use event driven programming with multiple active objects called "sprites". Sprites can be drawn either as vector or bitmap graphics — from scratch in a simple editor that is part of the Scratch, or can be imported from external sources, including webcam.

* Open up scratch, demonstrate how to pick and create a new sprite and a new background

Explain about how to pick costumes and backgrounds and sound

Explain variables

Variables are things you use to create a program. Variables play an important role in computer programming because they enable programmers to write flexible programs. Rather than entering data directly into a program, a programmer can use variables to represent the data. Then, when the program is executed, the variables are replaced with real data. This makes it possible for the same program to process different sets of data.

* Image when you bake a cake, what do you need? (Ask the audience) These are variables; the actions you do to them are control statements. What would the variables in scratch be?

Some variables come with the program and some variables can be created. More on this later

* Goal - Make the sprite move straight/ walk 10 to 20 steps. (Animation)

Give out the animation tutorial sheet 1(cat walking)

Explain event driven programming and how a program works when a trigger is pulled. Event driven programming is when a program does something based on what is clicked or what is given. E.g. ATM machine, Microwave oven etc.

Give out tutorial sheet 2(How to glide)

Explain the idea of functions in programming, how different functions come together to create a program. Perhaps go back to the example of the cake depending on how well the students are grasping the topic. First function (mix sugar and butter), another function (add eggs and flour to sugar and butter) last function (bake in the oven). Each function is a separate logical step in the instructions/recipe. The functions on their own are each useful (and often reusable in other programs) but this specific set of functions in this order is creates the whole program.

If this is completed give out tutorial sheet 3(changing colour)

If this is completed give out tutorial sheet 4(Image effects, voices)

If this is completed give out tutorial sheet 5(create story moon tutorial)

Mini quiz on what they have learnt. Give out chocolates to the winners.

Next lesson we will learn different types of loops.