**Coding is Fun**

**Session 5 : Take Your PIC**

**A Simple Computer**

1. **A VERY Simple Computer**

It’s called a **PIC**

No printer . . . no mouse . . . no keyboard . . . no screen . . .

Switches and LEDs (Light Emitting Diodes) – build it yourself!

1. **Hardware**

**Switches** for **INPUT** – send electrical signal **TO** pin on Computer

**LEDs** for **OUTPUT** – take electrical signal **FROM** pin on Computer

**3** **Boxes** – 2 Players (Red and Green – LEDs) + Controller

Look inside the Boxes – everything’s wired up for you

1. **Connect it up**

**Breadboard** – a very easy way to connect everything up

Look at the **DIAGRAM**

Connect the wires from the Boxes / Computer to the Breadboard

Make sure you get the right wires in the right places

1. **Software**

Write a program on a PC – needs special software on the PC

Written in the **“C”** language

**“Compile”** it – convert the program to code the Computer understands

1. **Prepare the Computer**

**Programmer** – links PC to the PIC Computer

Copy compiled program from the PC to the Computer

1. **Play the Game!**

Scissors . . . Paper . . . Stone

**Was that FUN?**

**Want to try this yourself?**

**This is for the real BRIGHT sparks!**

1. **Get GOOD at Code Academy**

**REALLY GOOD**
You’ll need plenty of practice before trying to program a PIC

**Don’t try to RUN before you can WALK!**

1. **Get someone to HELP**

If you know anyone who’s done some programming
Ask them if they’d be willing to help you

1. **Buy the Kit**

You’d need a “PICDEM Lab Development Kit with PICkit 3”

This has everything you need to make some simple projects

**But isn’t cheap!**
<http://uk.rs-online.com/web/p/microcontroller-processor/7395932>

1. **Download and Install the Software**

You’ll need the MPLAB IDE from <http://www.microchip.com>
Go to **Design Support** / **Development Tools**
Get basic **MPLAB IDE** **v8** – **NOT** the MPLAB X IDE
Both work . . . but the tutorials are based on v8

For **MPLab 8**, download / install the **HI-TECH C Compiler** for PIC10/12/16 MCUs Lite

For **MPLab X**, download and install the **XC8 C Compiler**

1. **Work through the Tutorials**

There are quite a few . . . and they’re quite fiddly
**Don’t** try doing anything else until you are comfortable with these!

In your .c file, you may need to add a line
#define \_LEGACY\_HEADERS

Before
#include <pic.h>

Follow ALL the instructions very carefully
There is quite a bit of detail to get right and it can take a while to get the first tutorial working
If you’re really stuck, come and ask!

1. **NOW try Scissors . . . Paper . . . Stone**

You **DON’T** need boxes or any soldering – just use the breadboard

You may need a few more switches (kit only comes with 4)
Or just touch pairs of wires together!

Use the diagrams
Get the LEDs the right way round

Copy the program from:
For MPLab 8 :
[http://www.codingisfun.co.uk/CIFResources/5/Coding is Fun - Resources – 5 – PIC – Scissors Paper Stone.c](http://www.codingisfun.co.uk/CIFResources/5/Coding%C2%A0is%C2%A0Fun%C2%A0-%C2%A0Resources%C2%A0%E2%80%93%C2%A05%C2%A0%E2%80%93%C2%A0PIC%C2%A0%E2%80%93%C2%A0Scissors%C2%A0Paper%C2%A0Stone.c)

OR

For MPLab X :
[http://www.codingisfun.co.uk/CIFResources/5/Coding is Fun - Resources – 5 – PIC – Scissors Paper Stone.X.zip](http://www.codingisfun.co.uk/CIFResources/5/Coding%C2%A0is%C2%A0Fun%C2%A0-%C2%A0Resources%C2%A0%E2%80%93%C2%A05%C2%A0%E2%80%93%C2%A0PIC%C2%A0%E2%80%93%C2%A0Scissors%C2%A0Paper%C2%A0Stone.X.zip)