

Upper Key Stage 2 - Session 5

Writing basic code directly in Python (forwards, turn, print, repetition)



Objectives

- Write code in Python without the support of Blockly
- Write simple programs in Python using code for simple movement e.g. `v.move_forwards()`
- Use the `print ()` function in Python (not available in Blockly)
- Debug Python programs, demonstrating an understanding of the appropriate syntax
- Use indents correctly in Python
- Use the `Repeat` loop ... for `count` in range (`n`):

Resources

- Interactive White Board (IWB)
- Levels 92 to 97 in Rapid Router
- Resource sheet UKS2-S3-2, UKS2-S5-1, UKS2-S5-2 , UKS2-S5-3
- UKS2 Levels Guide
- UKS2 Program Solutions Table

Vocabulary

- `v.move_forwards()`
- `v.turn_right()`
- `v.turn_left()`
- `for ... in range (...):`
- Print

Let's get started

Show Level 92 on the IWB. *[fig S5.1]*

Your challenge in this session is to become real Python programmers, without the help of Blockly

Ask the children to express the algorithm in English (e.g. **go forward, turn right, turn left, go forward**). They could write this on their mini whiteboards.

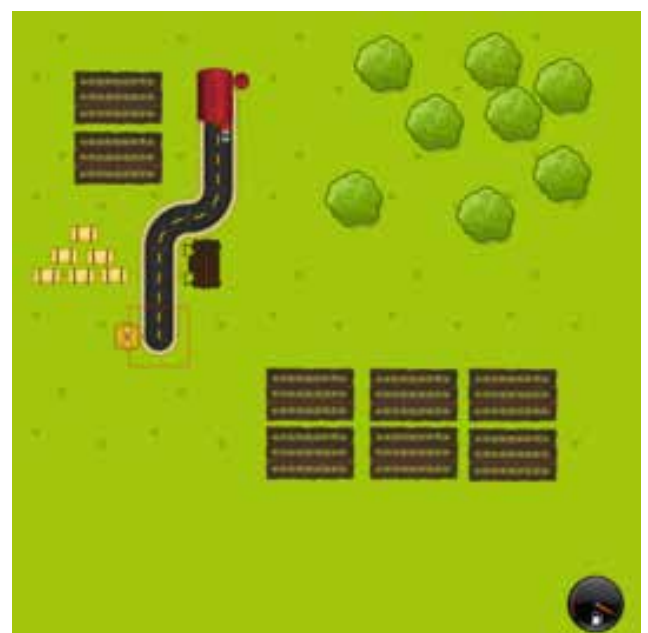


fig S5.1

How do we write this in Python?

Give out the Blockly - Python Matching Code Cards for forwards, right and left found on Resource Sheet UKS2-S3-2. Ask the children to match them up. [fig S5.2]

Use these to help type in the Python code (remember the 'import van' line of code appear automatically.)

```
1 import van
2
3 v = van.Van()
4
5 v.move_forwards()
6 v.turn_right()
7 v.turn_left()
8 v.move_forwards()
9 |
```



fig S5.2

Introduce the **print** function which is not available in Blockly.

print() will print whatever you put inside the brackets. They must be separated by a comma and bits of text (strings) must be put in inverted commas “”.

Try adding this as a final line of code:

print ('The van has arrived!')

What happens?

Main activity

In pairs, give the children time to complete Levels 92 to 94.

Encourage them to add their own message at the end, by using the **print** function.

Mini review

Bring the children together and ask if they have any questions or comments about what they have done.

Now we are going to look at repetition in Python. Can anyone remember how the repeat loop works in Python?

The children should remember much of this from Session 3, [**for count in range of (n)**].

Handout Resource Sheet UKS2-S5-1, asking the children to join the **repeat loop** in Blockly with the corresponding code in Python. [fig S5.3]

What do we know about the repeat loop in Python?

Go through the words and syntax that must stay the same, and the values that can change – ie the number of loops and the name of the ‘counter’.

Show Level 95 on the IWB, and work out the code together: [fig S5.4]

Give the children a chance to complete Levels 95 and 96 independently, with Level 97 as an extension, as this contains a nested **repeat** loop as a challenge.

Ask them to record one level solution on their Resource Sheet UKS2-S5-2. [fig S5.5]

[code] for {life} UKS2-S5-1

Match the code in Python to the correct Blockly blocks

Python	Blockly
<pre>for i in range(3): number = 1000000000 count = count + 1 n = 1000000000</pre>	
<pre>1 repeat: van 2 v = van.Van() 3 for i in range(3): 4 v.turn_left() 5 v.turn_right() 6 v.move_forwards()</pre>	
<pre>1 repeat: van 2 v = van.Van() 3 for count in range(3): 4 v.turn_left() 5 v.move_forwards() 6 v.turn_right()</pre>	
<pre>1 repeat: van 2 v = van.Van() 3 for count in range(3): 4 v.turn_left() 5 v.move_forwards() 6 v.turn_right() 7 v.move_forwards()</pre>	

Now check the code inside the repeat loop

fig S5.3

```

1 import van
2 v = van.Van()
3
4 for i in range(3):
5     v.turn_left()
6     v.turn_right()
7     v.move_forwards()
8
9

```

fig S5.4

[code] for {life} UKS2-S5-2

Python Planner Sheet

Remember to use indents where needed.

Movement commands:

```

v.move_forwards()
v.turn_left()
v.turn_right()

```

To create a repeat loop:

```

for count in range(n):

```

Use any name for count, and the correct number for n.

To print text in the output console:

```

print("your text")

```

My Code in Python for Level

```

import van
v = van.Van()

```

fig S5.5

Share and review

Create a 'Tips for Debugging Python' sheet using Resource Sheet UKS2-S5-3 as a template.

