Upper Key Stage 2
Activity Set Summary

Activity set summary

In this set, children will revise their skills in the Blockly visual programming language and learn the basics of the text-based language: Python. Throughout, they will be designing, creating and debugging their own programs. They will develop their understanding of the concept of selection, to include **repeat while** in both Blockly and Python. Children who make rapid progress will gain confidence in writing Python programs independently, using **repeat loops**, **if** and **while** statements, defining **procedures** and creating **variables**. At the end of each activity set, children will create challenging routes for each other to solve by writing programs in Python. The activity will involve self-evaluation and provide an ideal opportunity for teachers to assess progress and achievement.

Session 1 – What do we already know? (recap the Blockly commands worked through previously)

Session 2 – Breaking down the problem into chunks (understanding procedures)

Session 3 – Switching from Blockly to Python

Session 4 – Understanding more Python commands (**while**, **if**.. **elif**..**else**)

Session 5 – Writing basic code directly in Python (forwards, turn, print, repetition)

Session 6 – Flying solo with Python! (programming independently using **repetition**, **selection** with extension to using **procedures** and **variables**)

Session 7: Increase the challenge – (creating new Python **variables**, incrementing **variables**)

Session 8 – Assessment session–(applying your coding knowledge to create a game challenge for a partner).

Resources

- Rapid Router app: www.codeforlife.education
- UKS2 Session plans 1-8
- Resource Sheets UKS2-S1-1 to UKS2-S8-2 and Assessment sheets
- Code Wall Cards
- Asset Cards
- Rapid Router UKS2 Levels Guide (Levels 51-109)
- UKS2 Program Solutions Table
- Rapid Router Blockly-Python Phrasebook
- Glossary

Key

Vocabulary: Programming terms appear in **blue**

Assessment: Key questions appear in **red**

Children's previous experience

Children should be able to use and understand the core programming concepts using Blockly, which they will have covered in Rapid Router Levels 1 to 50:

Forward and turn movements

Repeat loops

Repeat until

If … do statements

If … else if … else

Teacher preparation

Create accounts for yourself and the children in Rapid Router (www.codeforlife.eduction)

This way, the children can save their created challenges and you can track their progress.

If you have not used the LKS2 levels, look through the corresponding materials to select some bridging activities.

Familiarise yourself with the contents of UKS2 session plans, and the related app levels.

Read the Introduction to Python in Rapid Router and the Rapid Router Blockly-Python phrasebook.

Key points to note:

You may often need to spend more than one lesson covering the contents of each session. The pace is rapid, and children will have needed to cover the lower levels of Rapid Router to have a thorough understanding of the computer science principles of sequencing, repetition and selection in a visual language such as Blockly.

The teaching plans are intended to be adapted by each teacher to meet the needs of their classes. For example, you may decide not to use each level covered in each session.

Special needs pupils

You may decide to stick to Blockly, as the challenge of text-based coding in Python may complicate the basic programming principles you've already taught these pupils. They may benefit more from similar work using Scratch to reinforce the sequence, repetition and selection concepts. Remember, there is not a specific expectation in the National Curriculum to use a text-based language at KS2. It is included in Rapid Router to offer challenge and excitement to those children who are ready for it.

UKS2 learning expectations:

In this activity set, the children will:

- Revisit the skills of **sequencing**, **repetition** and **selection** learnt in LKS2
- Learn to use **procedures** in programming
- Transfer these skills from Blockly, a visual programming language to Python, a text-based language
- Compare and contrast the two languages, understanding the importance of precision and syntax in Python
- Design, write and debug programs in Python using **repetition**, **selection** and output (print)
- Learn to create and increment **variables** in Python (extension)
- Links to the National Curriculum for Computing PoS

Links to the National Curriculum for Computing PoS

Key stage 2

Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use **sequence**, **selection**, and **repetition** in programs; work with **variables** and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information