Jeavons Wood
Primary School

Knowledge Organiser for Year 3

Big question: How can we use sequences and loops to solve problems?

National curriculum specification (KS2)
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller part • 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

In this unit, the children will:
This unit introduces students to computational thinking. They'll begin to understand what a sequence is, be able to follow instructions to create a sequence, and describe the sequence to their peers. They'll learn how to break problems down into smaller parts, identify cause and effect, and understand simple loops. Finally, they'll explore the process of testing and debugging programs to ensure that their programs work as intended. Your students find ways of helping the main characters, and practice recounting an experience using relevant details. This will help to develop their collaborative conversation skills.

Key vocabulary:	
Sequence	A sequence is an **ordered set of steps or instructions** that a computer or person follows to complete a task. In programming, the order matters because changing it can change the outcome.
Instructions/Algorithm	Instructions are **specific commands or steps** that tell a computer (or robot) what to do. They form the building blocks of a program.
Decomposition	Break down problems into smaller, manageable parts.
Cause and effect	Understanding that **one action (cause) leads to a specific result (effect)**. In programming, this helps predict what will happen when a command runs
Loops	A **set of instructions that repeats** until a condition is met. A simple loop repeats the same steps multiple times without complex conditions.
Testing	Running a program to **check if it works as intended** and produces the correct results.
Debugging	Finding and **fixing errors (bugs)** in a program so that it works correctly.

Programs	A **collection of instructions** that a computer or robot follows to perform a task.

Teacher Subject Knowledge:	
Best practices when using Lego Essentials Kit	• **Rules**: Create classroom rules for hands-on work (e.g., only use elements from one set, use storage box lids as trays for working on/presenting/transporting models, ask peers for help first, guidelines for speaking/listening vs. working). • **Tidy-up**: Reserve time for students to store or disassemble their creations. • **Lost & found**: Create a "lost & found" jar for LEGO elements found on the floor. Students missing an element should look in the jar. • **Evaluation**: Evaluate your lessons and reflect on the experience. Compare notes with a colleague or search social media for tips and tricks. • **Checking & sorting**: Regularly check and sort the sets. Use the element overview on "side 2" of the top card inside the storage box as a checklist. • **Exploration**: Allow time for your students to explore the tutorial activities under Start in the app. • **Grouping**: Decide the best way to group your students for effective collaborative learning.
Lesson objectives	**Lesson 1:** -Follow instructions to create a program -Identify the main characters in a story -Practice helping a story character -Participate in collaborative conversations **Lesson 2:** -Use directional vocabulary to describe a sequence -Break a problem down into smaller parts -Practice helping a story character -Participate in collaborative conversations **Lesson 3:** -Describe a program's sequence of events, goals, and expected outcome -Explore objects that can be seen if light is available -Practice helping a story character -Participate in collaborative conversations **Lesson 4:** -Identify cause and effect -Develop a program to solve a problem -Practice helping a story character -Participate in collaborative conversations **Lesson 5:** -Understand that an action can be repeated -Develop programs that use simple loops (repetitions) to address a problem -Practice helping a story character -Participate in collaborative conversations **Lesson 6:** -Identify and fix errors in a program (test and debug)

	-Test to ensure the program works correctly -Practice helping a story character -Participate in collaborative conversations **Lesson 7:** -Apply computational thinking skills to solve the given problem -Identify the main characters and their problem in the story -Participate in collaborative conversations to solve the problem
Links to learning & where to find content to support the teaching of the lessons	Year 2/3 - Boat Trip – Great Adventures **Teacher resources and training**: https://education.lego.com/en-us/teacher-resources/lego-education-spike-essential/start-here/lego-education-spike-essential-start-here-prepare-to-teach#Choose%20Your%20First%20Lessons