Logical Reasoning: Sudoku Challenge

Age: 7-11 years

Type: Offline (to be completed without a computer or internet)

Curriculum Links to: Maths

Computational Thinking Concepts & Approaches: Debugging, Collaborating, Logic, Algorithms

Introduction

This is an offline activity in which you will work together with your young learner to complete sudoku puzzles. The emphasis of this activity is on learners using logical reasoning to solve the puzzles – learners have to explain to you how they have worked out each number they add to the sudoku grid. Only if you agree with their reasoning do they add the number and carry on with the challenge.

What you will learn

In this offline project you will learn how to use logical reasoning to solve a problem

Preparation

Ask the learner if they have heard of sudoku before? Can they explain what a sudoku puzzle is and how they are completed? Explain that each row, column and 2 by 2 square should contain the digits 1 – 4. Use the example below as a reference when explaining.

They must work out several of the missing numbers using the information available to them (the numbers already in this grid), and as they do this emphasise their logical reasoning, e.g. This square can't be X or X because... This column/row needs an X but it can't go here because... This square is going to be X because…

Main Activity

1. Ask the learner to draw the sudoku grid below on a separate piece of paper and attempt to complete the missing numbers.

Note: Emphasise that you don't want them just to guess what the missing numbers are, but use the numbers already in the grid to work out logically what the missing numbers will be – like you have just modelled. Stress that their explanations (reasoning) behind how they found the missing numbers are as important as the correct answer

Sudoku Puzzle Example

3	4	1	2
4	2	3	1

2. Ask the learner to explain to you what they think the missing numbers are and how they worked these out:
    - What steps did they take?
    - How did the numbers already in the sudoku square help them?
    - What would they do differently next time?

3. Explain that by using the information in the square and thinking carefully about how this could help us to find the missing numbers, we are using ‘logical reasoning’ to help solve this problem.

4. Give the learner one copy of the sudoku challenge sheet below and one pencil. To encourage them to develop their logical reasoning skills, and their ability to articulate these, they have to explain to you which number to fill in within the grid. Only if you agree with their logic can they fill in the number.

Extra Challenge

Once they have completed the 4 puzzles, why not ask them to make their own Sudoku grid from scratch and challenge you to complete it?

Sudoku Puzzle Sheet

Sudoku Puzzle 1

4			3
	3	2	
	4	3	
3			2

Sudoku Puzzle 2

			3
			1
1			
2			

Sudoku Puzzle 3

	1	4	
4			2
1			4
	4	2	

Sudoku Puzzle 4

		3	
1			
			4
	2		

Sudoku Answer Sheet

EXAMPLE Puzzle

4	2	1	3
1	3	2	4
2	4	3	1
3	1	4	2

Puzzle 1

4	1	2	3
3	2	4	1
1	4	3	2
2	3	1	4

Puzzle 2

2	1	4	3
4	3	1	2
1	2	3	4
3	4	2	1

Puzzle 3

2	4	3	1
1	3	4	2
3	1	2	4
4	2	1	3

Puzzle 4

3	4	1	2
2	1	4	3
1	3	2	4
4	2	3	1

This activity was originally created by Barefoot Computing - https://www.barefootcomputing.org/