



**12 Lessons (24 Cards - 30 minute projects)
Learning Objectives**

Lesson 1: Cards 1, 2	Create a Scrolling Background Simulate Gravity & Wrap-around Code to cause and counteract gravity
Lesson 2: Cards 3, 4	Variables in Lists (Multiples) Remainder Patterns (Long Division) Counting using lists v using variables
Lesson 3: Cards 5, 6	Make a Q & A with no repetition Make a Tables Test - no repetition How to randomise a quiz with lists
Lesson 4: Cards 7, 8	Use slider variables to create polygons Use slider variables to rotate polygons Correlate copybook and code
Lesson 5: Cards 9,10	Code petals, flowers with new blocks Code a shape to grow with a new block Code Skill: How to define a new block
Lesson 6: Cards 11,12	Draw a triangle with a <i>Draw line</i> block Measure angles with virtual protractor Correlate copybook and code
Lesson 7: Cards 13,14	Code strategies for problem solving Code a Unitary Method algorithm Make Thinking Visible with Code
Lesson 8: Cards 15,16	Rows and Columns (with a variation) Find the Missing Large Number Code a Boolean expression (True/False)
Lesson 9: Cards 17,18	Create a list of pictures Create a Picture Quiz Use the list feature: insert at random
Lesson 10: Cards 19, 20	Draw and Calculate Area of Circle Draw a Pie Chart Correlate copybook and code
Lesson 11: Cards 21,22	Code and solve the 9-Dot puzzle: Draw and Map paths on the grid Correlate copybook and code
Lesson 12: Cards 23,42	Ungroup a sprite for extra costumes Animate the sprite to make angles Create a resource for juniors

Maths Labels Aligned to the Flip-Cards

NUMBER:	Cards: 3, 4, 5, 6, 15, (16), (20)
SPATIAL AWARENESS:	Cards: (10), 24
SHAPE:	Cards: 7, 8, 10,11
ALGEBRA:	Cards: 21, 22
MEASUREMENT:	Cards: 12, 19,
DATA:	Card: (3, 4) , 20

**COMPUTATIONAL THINKING CONCEPTS
for 11-12 Year Olds using SCRATCH CODE**

When it comes to Scratch, Computational Thinking can be described as the learning and development that takes place with Scratch. In their definition, the developers of Scratch see it as a set of concepts, practices and perspectives. The concepts can be listed as: **sequences, loops, parallelisms, events, conditionals, operators and data.** Procedures (more blocks) were introduced as a new feature in Scratch 2.0 and procedures are included here as they are well within the capability of this age group to understand. For 11-12 year olds all the computational thinking concepts can be identified with a colourful code block in one of the Scratch palettes. The concepts are listed showing where they are used during the lessons.

(Card Numbers in brackets)

Sequence of Say commands Angle types (24),
of Repeat loops to do/ undo an action (24),
of if/Then conditions to choose a costume (15),

Procedures* define a procedure
(New Blocks)

to draw a Petal (9), to draw a Flower (9),
to draw a Triangle (10), to draw a Line (11),

Loops (with options, variables and offsets)

Repeat until loop (length of list 3, 18),

Loops /Nested loops with offset value (15),

with *procedure to grow & rotate in a design (10)

Parallelism Event (many) e.g. Flag clicked or Key press that makes several things happen simultaneously

Events Flag clicked, Key pressed, Sprite clicked,

Send/Receive Broadcast (17, 18, 19),

Create clone, Start as a clone (15),

Conditionals If/Then If<arrow key pressed> (2), If<Greater/ Equal (1), If/Then/Else If <correct input> (5, 6)

Operators Arithmetic operators: +, -, x, ÷

(used in combinations 4, 7, 8, 13, 14, 16, 20),

equality/inequality operators

greater than/ equal/ less than

Data mod expressions with Remainders (4)

Variables: Make, Set, Change (1, 3, 5, 6, 7, 8, 15),

Variables used in Boolean Logic (14),

Variable values Min & Max set by slider

(7, 8, 11, 12, 15, 19, 20),

Lists: Create with a Variable, with list items (5, 16)

Delete, Insert (6, 17, 18) and Add to a list (17, 18)

example from Card 14 **A maths problem and its Solution in Code**
A car travelled 234 Km in 3 hours. At that rate, about how far did it travel in 50 minutes?

**What makes this the correct solution?
What exactly will the code make sprite say?**

LOGICAL REASONING:	Cards 1, 2, 9, 13, 14, 16, 17, 18, (21), (22)
Scratch GRAPHIC EDITOR SKILLS:	Card 23