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# SCO INTERNATIONAL OLYMPIAD

## CLASS 2 CODING SYLLABUS

A practical guide for schools, teachers, parents, and students

**Designed from Class 2 coding pathways and aligned with SCO's platform flow for guided preparation, practice, assignments, reporting, and future-ready digital growth.**

- age-fit coding guidance for Class 2 / early-primary learners globally
- chapter-wise pathways across Basic Coding, AI Examples, Pattern Games, Sprite Games, Practice Studio, and Teacher Guidance
- preparation roadmap, classroom ideas, and future-skill framing for digital confidence and creative problem-solving

| | | | | |
|---|---|---|---|---|
| Basic Concepts | AI Examples | Pattern Games | Game Creation | Practice Assignments |
| Coding for Kids | Teacher Guide | Latest Scenarios | School Readiness | Creative Thinking |

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# SCO International Coding Olympiad - Class 2

Official Syllabus Guide for Students, Teachers, Parents, and Schools

## Purpose of this syllabus

This Class 2 Coding Olympiad syllabus introduces young learners to basic computational thinking through stories, patterns, simple commands, AI examples, and teacher-friendly game activities. The focus is not on typing difficult code; it is on helping children understand instructions, sequences, decisions, repetition, creativity, and safe digital thinking.

| For Students | For Teachers | For Schools |
|---|---|---|
| Learn coding ideas through puzzles, games, sprites, patterns, and simple real-life examples. | Use short activities, unplugged tasks, visual blocks, and guided classroom discussion. | Build future-ready digital confidence with age-fit, safe, and inclusive learning. |

## Syllabus at a Glance

| Chapter | Chapter Name | Core Learning Focus | Expected Outcome |
|---|---|---|---|
| 1 | Basic Concepts of Coding | Instructions, sequence, input/output, algorithm, debugging, condition | Learners explain code as step-by-step instructions and arrange simple commands correctly. |
| 2 | Examples of AI | AI in daily life, pattern recognition, safe use, human guidance | Learners identify simple AI examples and understand that AI follows patterns/data, not magic. |
| 3 | Pattern Recognition Games | Shape, number, colour, direction, and repetition patterns | Learners predict next steps, find errors, and solve coding-style puzzles. |
| 4 | Simple Game Creation | Sprites, stage, events, motion, loops, scoring, teacher-guided split project | Learners understand how a simple sprite game is planned and tested. |
| 5 | Olympiad Practice, Assignments, and Latest Scenarios | Practice studio, assignments, real-life coding situations, responsible digital habits | Learners prepare for Olympiad questions through applied scenarios and revision tasks. |

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## Learning Approach for Class 2 Coding

At this age, coding should be introduced as structured thinking. Children learn best when coding is connected to daily actions such as brushing teeth, giving directions to a robot, arranging patterns, sorting objects, and creating simple game rules.

- Use short activities of 5-10 minutes before moving to longer practice.
- Prefer visual and unplugged examples before introducing block-based coding vocabulary.
- Encourage students to say the steps aloud before writing or arranging commands.
- Celebrate debugging as improvement, not as failure.
- Use teacher-led demonstration for AI examples and make safety/ethics age-appropriate.

## Competency Map

| Competency | Class 2 Meaning | Evidence of Readiness |
|---|---|---|
| Sequencing | Putting instructions in the correct order | Can arrange robot steps or daily routine steps correctly. |
| Pattern Thinking | Finding what repeats or changes | Can complete shape, colour, number, or direction patterns. |
| Conditionals | Using an if-then idea | Can explain actions such as: If it rains, use an umbrella. |
| Loops | Repeating an action | Can identify repeated steps and say when a loop saves work. |
| Debugging | Finding and fixing mistakes | Can spot a wrong direction, missing stop, or repeated question. |
| Creativity | Making a simple story/game with sprites | Can describe a sprite, stage, event, and goal. |

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# Chapter 1: Basic Concepts of Coding

Small note, learning outcomes, classroom use, and practice direction

**Chapter Note:** This chapter introduces coding as a clear way of giving instructions to a computer, robot, or digital character. Students connect coding with simple daily-life steps so the subject feels familiar and friendly.

## Learning Outcomes

- Understand that code is a set of instructions.
- Arrange simple steps in the correct sequence.
- Recognize input devices such as keyboard and mouse, and output devices such as monitor and speaker.
- Explain algorithm, command, program, condition, and debugging in simple language.
- Identify basic on/off or yes/no logic using 1 and 0 at an introductory level.

## What Students Will Learn

- Code as instructions: “Move forward,” “Turn left,” “Say hello.”
- Algorithm as a recipe or routine with steps.
- Input, output, and simple computer parts.
- Debugging by finding a wrong or missing step.

## Classroom and Home Practice Ideas

- Human Robot: One student gives commands while another follows them exactly.
- Routine Algorithm: Arrange cards for brushing teeth or packing a school bag.
- Bug Hunt: Find the missing step in a square-drawing command list.

## Assessment Focus

Students should be able to read a short command sequence and choose which step comes next or which step is wrong.

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# Chapter 2: Examples of AI

Small note, learning outcomes, classroom use, and practice direction

**Chapter Note:** This chapter gives an age-appropriate introduction to artificial intelligence through examples children may see in daily life, such as voice assistants, picture sorting, recommendations, and smart learning tools. The focus is on curiosity, safety, and human control.

## Learning Outcomes

- Recognize AI as a computer system that can notice patterns and make suggestions.
- Identify simple AI examples such as voice assistants, face filters, translation tools, and smart recommendations.
- Understand that AI can make mistakes and needs human checking.
- Learn safe behavior: do not share personal information with digital tools.
- Describe how AI uses examples/data to learn patterns at a very basic level.

## What Students Will Learn

- AI is not magic; it follows patterns from examples.
- AI may help sort pictures, answer simple questions, or recognize repeated patterns.
- People must use AI responsibly and carefully.

## Classroom and Home Practice Ideas

- Sorting Game: Sort animal cards by features and discuss how AI might learn from examples.
- AI or Not AI: Decide whether a calculator, voice assistant, TV remote, and drawing app are AI-like tools.
- Safe AI Rule Card: “Ask an adult before sharing information.”

## Assessment Focus

Students should identify AI examples and explain why a smart tool still needs human guidance.

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# Chapter 3: Pattern Recognition Games

Small note, learning outcomes, classroom use, and practice direction

**Chapter Note:** This chapter strengthens coding thinking through shape, colour, number, movement, and direction patterns. Pattern recognition helps students predict, classify, and solve problems before formal coding begins.

## Learning Outcomes

- Complete shape, colour, number, and movement patterns.
- Recognize repeated actions that can become loops.
- Find odd-one-out items in a coding or logic group.
- Trace simple robot paths and predict final direction.
- Use reasoning to explain why an answer fits the pattern.

## What Students Will Learn

- Alternating patterns such as red-blue-red-blue.
- Growing patterns such as +2, +3, or double.
- Directional thinking with left, right, forward, and stop.
- Loops as repeated patterns in action.

## Classroom and Home Practice Ideas

- Pattern Cards: Students complete missing shapes or colours.
- Robot Path Mat: Use arrows to move a token to a star.
- Loop Spotter: Circle actions that happen again and again.

## Assessment Focus

Students should solve pattern questions and explain the rule in one simple sentence.

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# Chapter 4: Simple Game Creation (Teacher-Friendly Split Chapter)

Small note, learning outcomes, classroom use, and practice direction

**Chapter Note:** This chapter introduces game creation in small teacher-guided parts: choosing a sprite, setting a background, adding movement, using events, adding a goal, testing, and improving. It is designed to be classroom-friendly even when full computer access is limited.

## Learning Outcomes

- Understand a sprite as a character or object in a game.
- Identify the stage/background where the game happens.
- Use events such as clicking a flag or pressing a key to start actions.
- Describe how loops keep movement or animation going.
- Use simple scoring or counters through the idea of variables.
- Test a game and suggest one improvement.

## What Students Will Learn

- Sprite, stage, event, motion, show/hide, sound, and backdrop.
- Simple game goal such as collect coins, reach the star, or avoid walls.
- Scoring and counters as variables.
- Debugging when the character moves the wrong way or never stops.

## Classroom and Home Practice Ideas

- Split Project Part 1: Choose sprite and stage.
- Split Project Part 2: Add arrow-key movement or simple button event.
- Split Project Part 3: Add goal and score counter.
- Split Project Part 4: Test, fix, and present the game idea.

## Assessment Focus

Students should be able to match a game problem with a coding idea such as event, loop, condition, variable, or debug.

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# Chapter 5: Olympiad Practice, Assignments, and Latest Scenarios in Coding for Kids

Small note, learning outcomes, classroom use, and practice direction

**Chapter Note:** This chapter prepares students for Olympiad-style questions using real-life coding scenarios, assignments, simple digital awareness, and applied problem-solving. Questions connect coding with robots, games, AI, safety, and everyday instructions.

## Learning Outcomes

- Attempt coding questions based on stories, pictures, and short command lists.
- Choose the best command sequence for a given task.
- Identify errors in logic and suggest simple fixes.
- Apply safe and responsible digital habits in age-appropriate situations.
- Build confidence through practice assignments and revision tasks.

## What Students Will Learn

- Olympiad question types: patterns, command order, input/output, debug, AI examples, game events.
- Latest scenarios: smart tools, voice commands, robot helpers, simple AI sorting, and safe device use.
- Practice habit: read the situation, find the rule, choose the answer, then explain why.

## Classroom and Home Practice Ideas

- Weekly Assignment: 10 mixed questions from patterns, robot commands, and conditions.
- Scenario Discussion: What should a smart robot do if it sees rain?
- Mini Revision Cards: Algorithm, loop, condition, event, variable, output, debug.

## Assessment Focus

Students should solve mixed-format Olympiad practice questions and give a short reason for their answer.

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# Student, Teacher, and School Implementation Guide

Making Class 2 coding practical, safe, and enjoyable

| Student Routine | Teacher Routine | School Routine |
|---|---|---|
| Practice 10-15 minutes, 3 times a week using picture questions, patterns, and command cards. | Begin with an unplugged example, then discuss one coding word and one practice question. | Offer common worksheets, visual activities, safe device habits, and Olympiad revision support. |

## Suggested Monthly Preparation Roadmap

| Month / Stage | Learning Focus | Practice Output |
|---|---|---|
| Stage 1 | Basic instructions, algorithms, input/output, debugging | Students arrange simple step cards and find missing commands. |
| Stage 2 | AI examples and responsible digital habits | Students identify smart tools and explain safe-use rules. |
| Stage 3 | Pattern recognition and robot-path puzzles | Students solve shape, number, direction, and loop questions. |
| Stage 4 | Sprite game creation and testing | Students describe a simple game with sprite, stage, event, goal, and score. |
| Stage 5 | Olympiad practice and revision | Students solve mixed questions and explain the logic behind answers. |

## Teacher-Friendly Split Plan for Simple Game Creation

| Lesson Part | Teacher Action | Student Task | Coding Idea |
|---|---|---|---|
| Part 1: Story | Show a simple maze or collect-the-star game idea. | Say the game goal in one sentence. | Goal setting |
| Part 2: Sprite | Introduce sprite and stage. | Choose or draw a character and background. | Objects and environment |
| Part 3: Movement | Demonstrate arrow or button movement. | Decide left/right/up/down commands. | Events and motion |
| Part 4: Repetition | Show repeated movement or animation. | Identify what repeats. | Loop |

| | | | |
|---|---|---|---|
| Part 5: Rules | Create a simple if-touching-wall rule. | Explain what happens when a condition is true. | Condition |
| Part 6: Score | Add simple points or count. | Track collected objects. | Variable |
| Part 7: Test | Run the game and ask what went wrong. | Find and fix one bug. | Debugging |

## Assessment Blueprint for SCO Coding Olympiad Class 2

| Area | Recommended Weight | Sample Question Style |
|---|---|---|
| Basic Concepts of Coding | 25% | Identify code, command, input/output, algorithm, or debugging. |
| Examples of AI | 15% | Choose AI-like examples and safe actions. |
| Pattern Recognition Games | 25% | Complete a pattern or predict a robot direction. |
| Simple Game Creation | 20% | Match sprite, event, loop, condition, score, or bug. |
| Olympiad Practice and Latest Scenarios | 15% | Solve story-based coding situations and digital awareness questions. |

## Readiness Checklist

- Can explain coding as giving instructions to a computer or robot.
- Can arrange 3-5 steps in the correct order.
- Can identify an algorithm in daily life.
- Can complete simple repeating patterns.
- Can understand “if...then...” from daily situations.
- Can identify a loop when an action repeats.
- Can explain that debugging means fixing a mistake.
- Can identify a sprite, event, and simple game goal.
- Can recognize AI examples and safe-use rules.

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## Quick Revision Keywords

| | | | |
|---|---|---|---|
| **Code** | **Command** | **Program** | **Algorithm** |
| **Sequence** | **Input** | **Output** | **Binary** |
| **Condition** | **Loop** | **Pattern** | **Sprite** |
| **Stage** | **Event** | **Variable** | **Function** |
| **Debugging** | **AI** | **Safe Use** | **Practice Studio** |

## Framework Alignment Note

The syllabus is designed around early computational thinking: sequence, pattern recognition, loops, events, conditionals, variables, functions, debugging, creative projects, and responsible AI awareness. These areas are consistent with elementary computer science learning practices used in international school-level CS frameworks and block-based coding environments.

| Reference Area | How It Supports This Syllabus |
|---|---|
| CSTA K-12 Computer Science Standards | Supports grade-band progression in algorithms, programming, computing systems, and responsible learning. |
| Code.org CS Fundamentals | Supports elementary-friendly approaches to algorithms, loops, events, conditionals, and unplugged activities. |
| Scratch Foundation Learning Library | Supports creative coding with sprites, events, motion, sounds, backdrops, and playful projects. |
| UNESCO AI Competency Framework for Students | Supports age-appropriate AI awareness, human-centered thinking, and responsible use. |

## SCO International Olympiad Learning Support

SCO International Olympiad encourages structured practice, free learning support, guided preparation, assignments, and student-friendly digital learning pathways. The Class 2 Coding Olympiad syllabus is intended to help young learners become confident problem-solvers who can read instructions carefully, think logically, and enjoy creative technology learning.