# Solutions for all
# Coding and Robotics

## Foundation Phase Workbooks and Teacher's Guides

solutions for all

**Coding and Robotics**

Workbook 1

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DIGITAL SCHOOLHOUSE

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**Coding and Robotics**

Workbook 2

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DIGITAL SCHOOLHOUSE

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**Coding and Robotics**

Workbook 3

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DIGITAL SCHOOLHOUSE

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*Ignite curiosity. Empower 21st century learners!*

# Workbook Features

## INTERESTING THEMES TO CATCH LEARNERS' ATTENTION

Each unit is organised according to a theme and is colour coded for easy identification.

Unit 3: Robots............................. 35

Unit 4: Fantastic Fish................ 69

Unit 6: Internet.......................... 108

## ICONS TO GUIDE LEARNERS

Each feature in the Workbook is highlighted with a unique icon so learners can easily recognise what they are dealing with.
*(see bookmark with all icons)*

- Get started
- Checkpoint
- Algorithms
- Communication

## PROGRESSION AND DIFFERENTIATION

The activities and questions in the Workbook show progression from beginner to intermediate and advanced levels. Most levels have extension questions that require learners to demonstrate a deeper understanding of the material.

a. With a friend, talk about the software icon you drew for Question 16. Do not name it!

b. Ask your friend if they can tell you the name of the software
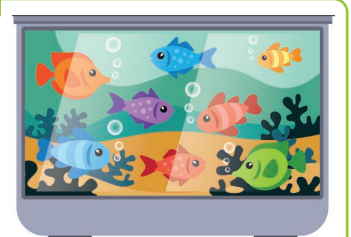
c. Did they guess correctly?  Yes/ No

## INTRODUCTION TO UNIT

At the start of each unit, this feature briefly describes what the theme of the unit is and the main aspect learners will learn.

### About fantastic fish

In this unit, you will learn how to make your own virtual fish tank using ScratchJr. ScratchJr is programming software for a tablet computer.
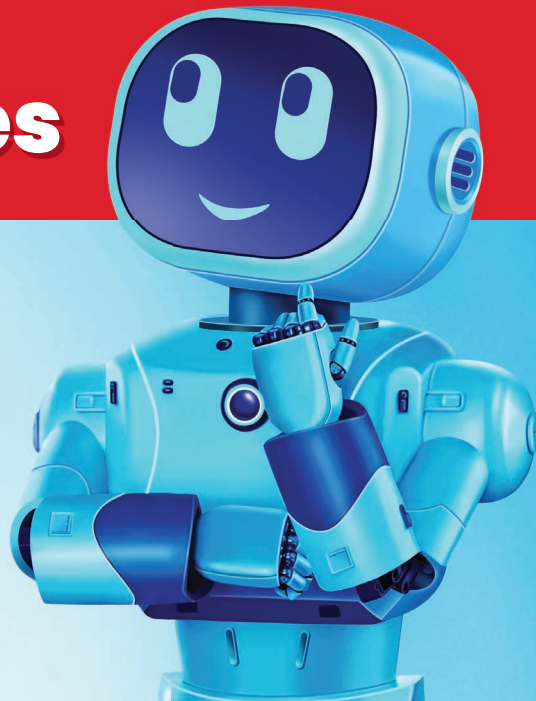
## PHOTOS, ARTWORK AND SCREENSHOTS

We include artwork that considers diverse and inclusive contexts. There is an abundance of colourful artworks, photos and screenshots from the software that learners use to make the subject interesting.

Fish

MATCH the correct object to object

# Workbook Features

## 'TOP TIP!' AND 'WELL DONE!' BOXES

'Top Tip!' boxes to provide helpful advice to learners and 'Well done!' boxes to encourage them.

**Well done!** You made your own webpage layout!

**Top Tip!** When your friend reaches the corner of the table, remember to use the turn right and turn left instructions to make them turn.

## COMPUTATIONAL THINKING

Computational thinking is a new skill, which will equip learners with a range of 21st century skills.

This shows you when you need to think carefully about how to find the answer for an activity. At these times you will focus on a skill in computational thinking: decomposition, pattern recognition, abstraction or algorithmic design. Your teacher will guide you as you go along.

## ASSESSMENT SUPPORT

Sufficient assessment opportunities are included.

### Checkpoint
Every lesson ends with a checkpoint activity to assess the learners' understanding of what they have learnt.

At the end of the lesson, your teacher will ask you to finish the checkpoint question. It helps your teacher to check that you understand the main idea you have learnt.

### Unit Tests
The short unit test, which is answered in the Workbook, checks that the learners have achieved the entire Unit's learning satisfactorily.

1. Zola uses the internet. She reads a comment about a video. The comment upsets her. What should she do?

A. Switch off the computer   B. Tell a trusted adult
C. Cry in a corner            D. Keep it to herself   (1)

2. Name two internet services that are not websites. (2)

3. Someone asks you to tell them your username and password. What two things should you do? (2)

## EXTENSIVE LANGUAGE SUPPORT

Extensive language support is provided to enhance reading with understanding in this new subject.

All new and technical words are indicated in bold and explained in a 'New words' feature at the start of each lesson.

Computers are **electronic** devices that can help us to do **tasks**. They do this by following **instructions** and working things out. They are important to us. People use computers to search the **internet** and do their weekly shopping. Computers even help us to learn more about the world around us.

**New words**

| | |
|---|---|
| **Electronic:** | needing electricity to work |
| **Task:** | a job done by a computer |
| **Instruction:** | words or pictures that tell you what to do |
| **Internet:** | the network of computers that are linked |

## INFORMATION BOXES

Between the activities and questions there are portions of information and explanations.

The parts of a computer that you can touch are called hardware. The parts that you cannot see or touch are called software.
A screen is hardware.
Tablet computers are special because they have a **touchscreen**.
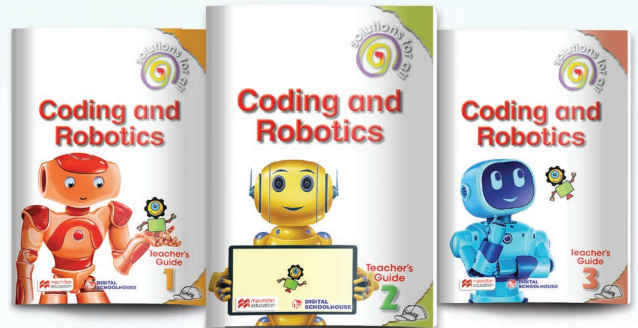In today's lesson, you will learn how to use a tablet computer.

# Teacher's Guides

A **comprehensive Teacher's Guide** offers clear step-by-step instructions for each lesson, eliminating the need for additional lesson plans. It also boosts novice teachers' confidence in delivering this new subject.

The design and layout of the Teacher's Guide make lesson planning very manageable. Each and every lesson includes the following portions:

- Lesson relevance to computing
- Lesson Learning Objectives (LOs)
- Lesson prior learning
- Lesson outcome profiles
- Classroom tips
- Lesson preparation
- Lesson new words

## Strategies for teaching new words

Language support is crucial due to the technical nature of the subject. Ten effective strategies are provided for teaching and learning new words. A downloadable glossary includes all new words, even from previous grades.

## Resources list for each lesson

Teachers will be able to prepare thoroughly for each lesson by using the resource list at the start of each lesson.

## Computational thinking support

The four types of computational thinking are flagged in the questions in each unit. There are also explanations of why each of the flagged questions represents that specific category of computational thinking.

## Extensive guidance on using digital resources

All relevant digital resources are listed for each lesson.

Information on how to access and download them and steps to provide the learners with the relevant digital resources are outlined.

Answers to all activities and questions, including the Unit test, are provided.

Each activity or question in each lesson is answered in the Teacher's Guide. Brief memoranda for the Unit tests are also provided.

# Continue Professional Development

We offer more than just **Coding and Robotics** learning solutions. **Macmillan Teacher Campus** is committed to your success and provides hands-on, practical workshops in various formats. These workshops offer insights into the new Coding and Robotics curriculum and how to implement it using the *Solutions for all* Coding and Robotics series.

There are short, informative videos on our social media platforms and website, addressing product-related queries, exploring interesting Coding and Robotics topics, and offering valuable tips for teachers.

With our dedicated teacher support, you'll feel confident and well-prepared to navigate the world of technology education in your classroom.

**MACMILLAN TEACHER CAMPUS ONLINE**

**Scan this code to visit our website and get access to:**

- Workshops
- Accredited courses
- Teacher support programmes
- Learner support
- Macmillan Online Teacher Campus (MOTC)

# Frequently Asked Questions

## What is coding?

Coding, or programming, is instructing a computer to perform a specific task. It involves writing instructions in a language that a computer understands. Think of it as giving commands to a robot or other object.

## What is robotics?

Robotics involves designing, building, and programming robots to perform various tasks. It's a hands-on application involving coding and engineering principles.

## Why is this subject important to learners?

Knowing coding and robotics is crucial in today's tech-driven world. It's not just about programming; it includes internet safety, document design, and effective communication. These skills are essential for future careers and daily life in the 21st century. This subject also boosts logical thinking, problem-solving, collaboration, critical thinking, creativity, and communication skills—the 4Cs for success. Additionally, it falls under STEM education, a valuable area for today's learners. It fosters patience, perseverance and confidence in digital skills.

## What is computational thinking?

Computational thinking is a problem-solving approach that mirrors how computers tackle problems. In simpler terms, it's about thinking like a computer.

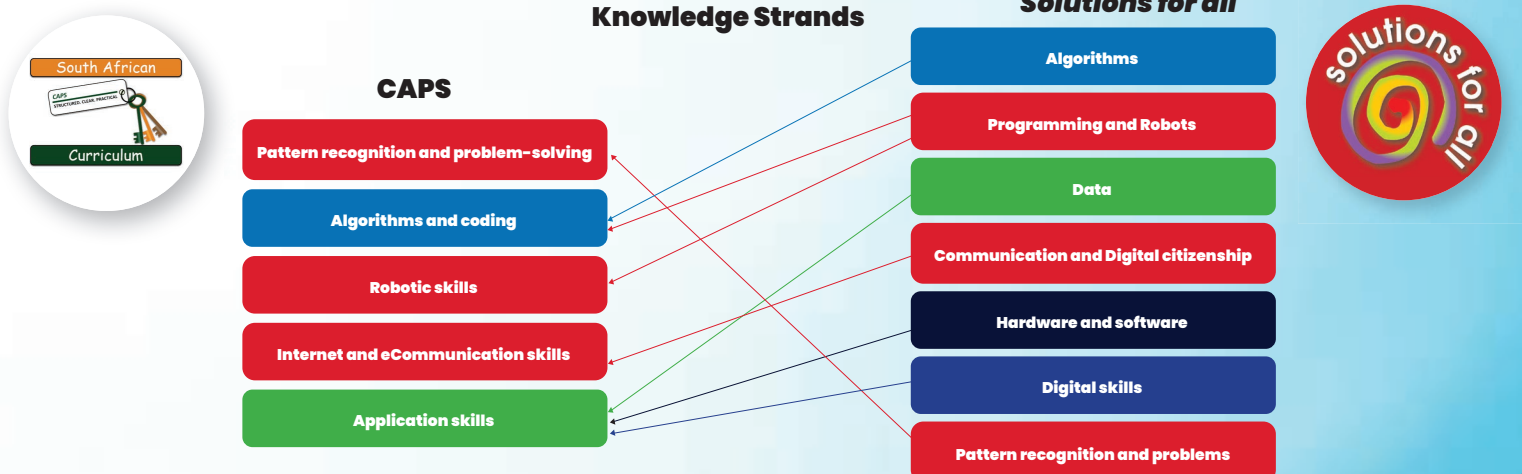There are four key aspects of computational thinking:

1. Algorithmic design: Defining the steps needed to solve a problem.
2. Abstraction: Identifying the essential ideas to solve a problem and excluding unnecessary details.
3. Decomposition: Breaking down a problem into smaller components to simplify solving it.
4. Pattern recognition: Recognising similarities in smaller parts to aid in problem-solving.

## What are the digital requirements for using the *Solutions for all* Coding and Robotics series?

For the Foundation Phase, learners will use ScratchJr (Grade 1) or Scratch (Grades 2 and 3) for coding, which can be downloaded once for offline use. Basic documents, spreadsheets, presentations, and email tools must be loaded onto school computers. Internet access is required for learning about online communication and safe internet use. The *Solutions for all* Coding and Robotics series provides offline teaching examples with teacher guidance for alternatives to internet-based learning.

## Are the *Solutions for all* Coding and Robotics books CAPS-aligned?

Yes, the *Solutions for all* Coding and Robotics Foundation Phase series is aligned with the draft Coding and Robotics curriculum. It covers all the curriculum requirements. Adjustments will be made if needed once the final CAPS curriculum is released. The books use seven "strands" to address the five content areas in the curriculum.
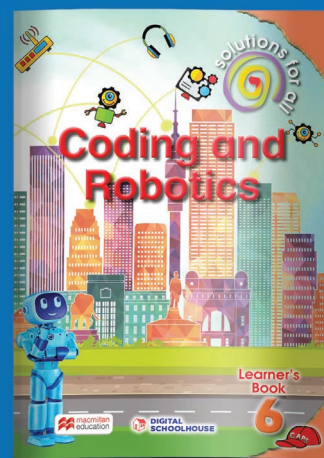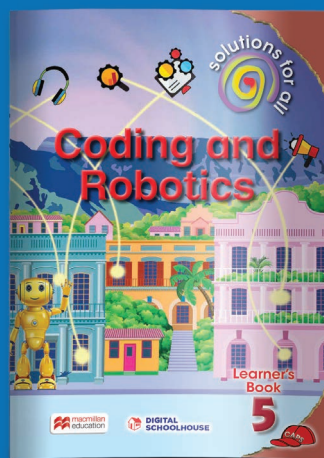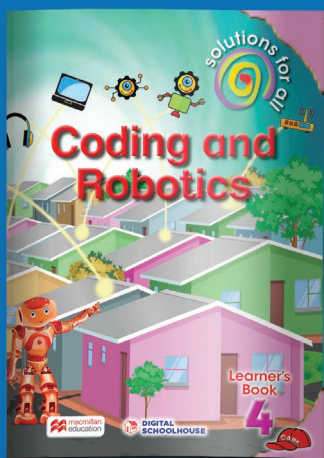
**Knowledge Strands**

**Solutions for all**

**CAPS**

South African
CAPS
STRUCTURED, CLEAR, PRACTICAL
Curriculum

| CAPS | Solutions for all |
|------|-------------------|
| Pattern recognition and problem-solving | Algorithms |
| Algorithms and coding | Programming and Robots |
| Robotic skills | Data |
| Internet and eCommunication skills | Communication and Digital citizenship |
| Application skills | Hardware and software |
| | Digital skills |
| | Pattern recognition and problems |

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# Forthcoming in this series

## Solutions for all
# Coding and Robotics

## Intermediate Phase
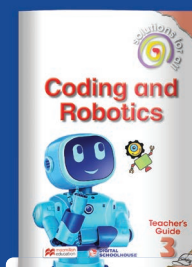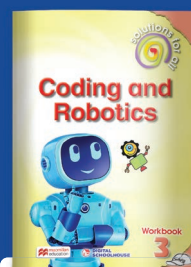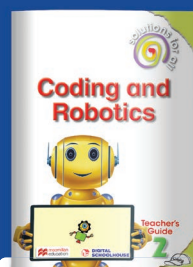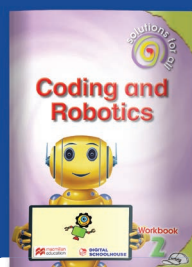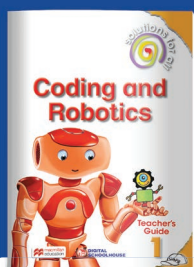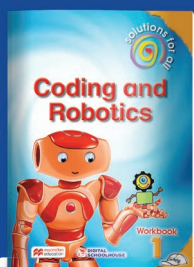### Learner's Books and Teacher's Guides
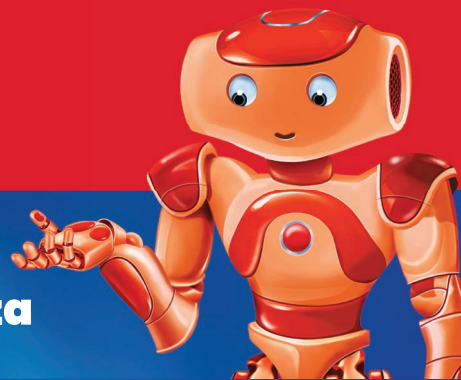


## Senior Phase available in 2025!

## View sample pages online!

*Scan these QR codes to view samples of the Foundation Phase Workbooks and Teacher's Guides*

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