Oxford International Primary

4

Computing

Student Book

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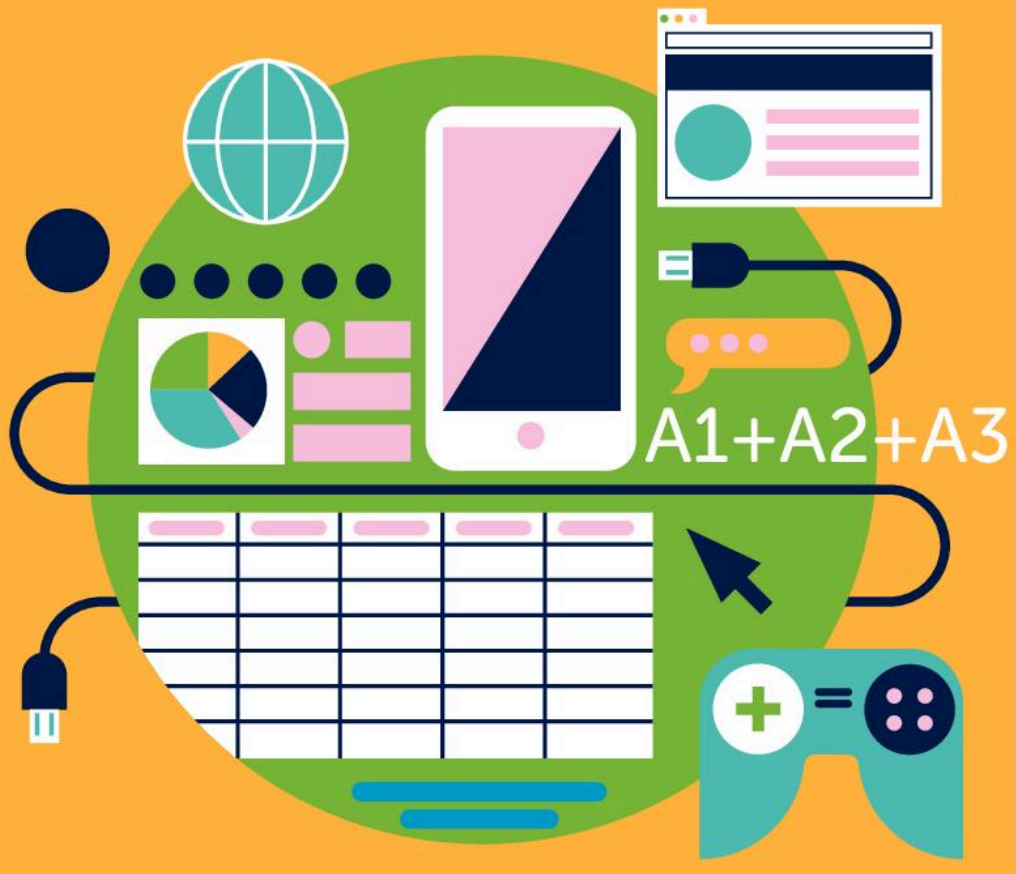

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Contents

Introduction

Delivering computing to young learners

Oxford International Primary and Lower Secondary Computing is a complete syllabus for computing education for ages 5–14 (Years 1–9). By following the program of learning set out in this series, teachers can feel reassured that their students have access to the computing skills and understanding that they need for their future education.

Find out more at:
www.oxfordprimary.com/computing.

Structure of the book

This book is divided into six chapters, for Year 4 (ages 8–9).

1. **The nature of technology:** Introduction to microprocessors and how they help us at work and at home
2. **Digital literacy:** Finding information safely using a web search
3. **Computational thinking:** Using variables and conditional structures in a program
4. **Programming:** Making programs with different types of input and output
5. **Multimedia:** Changing how a document looks
6. **Numbers and data:** Using a spreadsheet to process data

What you will find in each unit

- Introduction: An offline activity and a class discussion help students to start thinking about the topic.
- Lessons: Six lessons guide students through activity-based learning.
- Check what you know: A test and activities allow you to measure students' progress.

What you will find in the lessons

Although each lesson is unique, they have common features: learning outcomes for each lesson are set out at the start; learning content delivers skills and develops understanding.

Every lesson involves a learning activity for the students.

Activities to extend students who are able to do more.

Questions check students' understanding of the lesson.

Additional features

You will also find these features throughout the book:

The word cloud builds vocabulary by identifying key terms from the unit.

Suggestions for creative and artistic work.

Extra tasks that can be taken outside the classroom and into the home.

Advice on using computers responsibly in life.

Glossary Key terms are identified in the text and defined in the glossary at the end.

Assessing student achievement

The final pages in each unit give an opportunity to assess student achievement.

- Developing: This acknowledges the achievement of students who find the content challenging but have made progress.
- Secure: Students have reached the level set out in the programme for their age group. Most should reach this level.
- Extended: This recognises the achievement of students who have developed above-average skills and understanding.

Questions and activities are colour-coded according to achievement level. Self-evaluation advice helps students to check their own progress.

Software to use

We recommend Scratch for writing programs at this age. For other lessons, teachers can use any suitable software, for example: Microsoft Office; Google Drive software; LibreOffice; any web browser.

Source files


You will see this symbol on some of the pages.

This means that there are extra files you can access to help with the learning activities. For example, Scratch programming files and downloadable images.

To access the files, click 'Download resources' at:
www.oxfordprimary.com/computing.

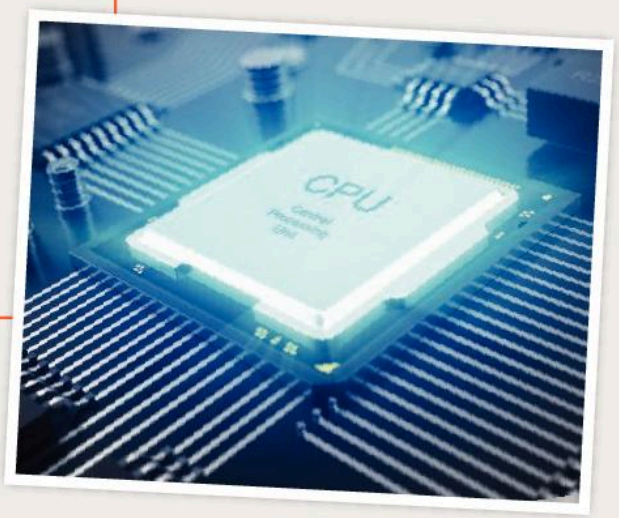
Teacher's Guides

For more on these topics, look at the Teacher's Guide that accompanies this book.

1 The nature of technology: Computers around us

You will learn

- that computer power improves how devices such as TVs and cars work
- how computers and technology improve the way people work
- about computer storage and why it is important.



Computer power is used to improve the way that devices work at home, at work and at school. TVs, cars, mobile devices, smartphones and fridges are all powered by computers. Computers are changing the way we live.

Talk about...

If all computers disappeared tomorrow...

- what would you miss about computers in your home life?
- what would you miss about computers at school?

Learning outcomes: Describe how computers may be used in the world of work; Identify a range of modern devices which contain computer processors (for example, embedded processors); Describe what storage is and why it is important

Class activity

Make a list of the types of computers you use at home and at school. For example, do you use a tablet computer? Do you use different types of computers to do different things?

microprocessor
robot sensors
storage drive
data file back-up file
flash drive

Digital citizen of the future

Computers can improve the way we learn, work and enjoy our spare time. However, not everyone can afford to buy a computer. Some charities collect computers that are no longer used. These computers are given to people who cannot afford to buy their own. Would you donate a computer you no longer use?

Did you know?

In 2015, scientists at Michigan University created Michigan Micro Mote, the world's smallest computer. The Mote measures 2mm × 2mm × 4mm. That's smaller than a grain of rice! The Mote is being used in medical implants and in driverless cars.

1.1 The power of computers

In this lesson

You will learn:

- how computers help us to work
- how important a microprocessor is to a computer
- that microprocessors are small enough to be used in other devices.

Spiral back

Last year, you learned that there are different types of computer. Desktop computers, laptops, tablets and smartphones are all types of computer. Now you will learn about how we use computers to help us learn, work and enjoy our free time.

How computers help us to work

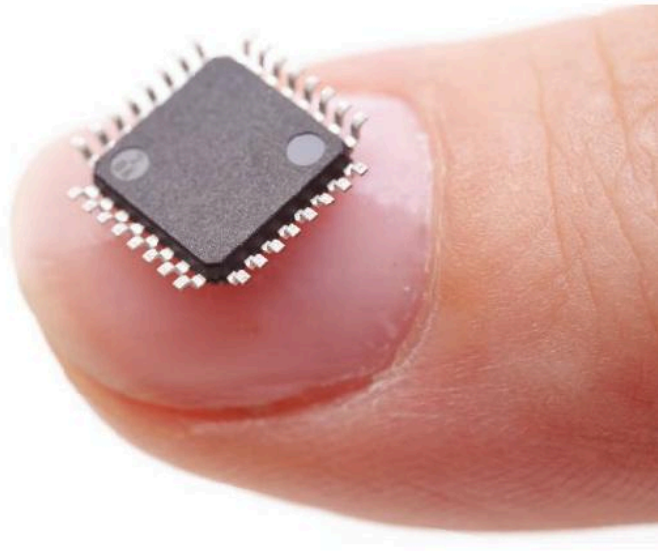
You use computers at home and at school to help you to do your school work. You can use a computer to research information for a project. You use a word processor to create homework that looks good and is easy to read. Computers make it easy for you to make changes to documents.

You use computers to communicate and share ideas with other people. You use email to share your documents with classmates and your teacher.

Computers help people to do their jobs.

- People use word processors to **produce documents**, such as reports, plans and letters to customers. Spreadsheets show how much money a business is making. Attractive presentations give information to staff and customers.
- Computers help people to **find information** they need to do their jobs. Computers can store a lot of data. You can find information quickly.
- Computers send emails and messages to customers and work colleagues. Voice and video conversations mean people can **communicate** wherever they are in the world.

Computers helps us to work quickly and accurately. A computer is a powerful tool.



What makes a computer so powerful?

A computer has many parts inside. The most important part inside a computer is called the microprocessor.

The **microprocessor** is the computer's brain. It does all the important work inside the computer. Whenever you use a computer, everything you see on the screen or hear through the speakers has been created by the microprocessor. A microprocessor is so small it will fit on the tip of your finger.

Where else can you find microprocessors?

Microprocessors are not just used in computers – they are everywhere! A microprocessor is small enough to fit into almost any device or machine. Microprocessors are used in the home in devices like televisions. Microprocessors are used in the workplace in **robots** and other machines. Microprocessors make devices more powerful and easier to use.

Activity

List the types of computer you use at home or at school. Which type of computer do you prefer to use for your school work? Why?

Think again

Talk to a family member who is in work. What do they use computers for at work? How do computers make it easier for them to do their job?

Extra challenge

List three ways that you use computers to help you do school work. For each one, say how you would complete the work without a computer. How does using a computer make it easier to do your school work?

1.2 Microprocessors at home

In this lesson

You will learn:

- how microprocessors improve how devices work in the home and in a car.

Microprocessors in the home

TV

Microprocessors let us pause programmes or record them to watch later. TVs have remote controls to change channels and adjust the volume. You can control some TVs with your voice. These functions are controlled by microprocessors.

Washing machine

Microprocessors make sure you can wash your clothes without damaging them. They control the amount of time that the clothes are washed. They also control the speed of the spin dryer.

Fridge

Sometimes, a device with a microprocessor is also connected to the internet. A device which is connected to the internet is a **smart device**. A smart refrigerator warns us if food is out of date. You can check what is in your smart refrigerator using your smartphone while you are at the supermarket.

Home systems

Microprocessors are used in home alarm and heating systems. Sensors can be installed in rooms to detect movement. A microprocessor uses information from the sensors to sound an alarm or turn on lights and heating when someone enters a room.