Oxford International Primary

5

Computing
Student Book

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5

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Student Book

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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 5 (ages 9–10).

1. **The nature of technology:** Introduction to computer networks
2. **Digital literacy:** Searching for information on the world wide web
3. **Computational thinking:** How we use loops and other structures in programming
4. **Programming:** Using programming skills to control on-screen actions
5. **Multimedia:** Taking digital photographs
6. **Numbers and data:** Using a spreadsheet to help with realistic business activities

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.

Activity Every lesson involves a learning activity for the students.

Extra challenge Activities to extend students who are able to do more.

Think again Questions check students' understanding of the lesson.

Additional features

You will also find these features throughout the book:

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

Be creative Suggestions for creative and artistic work.

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

Digital citizen of the future 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: Computer networks

You will learn

→ how digital devices can be connected to make networks

→ what the internet is and what services it provides

→ how the internet helps us work together in the modern world.

A computer is a powerful tool that we use for working and learning. Connecting computers together makes them more powerful and more useful. When computers are connected, we can use them to communicate with each other. We can share files and search for information on the web. We use networks to connect computers together. In this unit you will learn how networks improve the way we live our lives.

Talk about...

Do you think you will use computers in your job when you leave school? Would you like to work in computing when you leave school? Can you think of any jobs that don't use computers?

Learning outcomes: Explain that digital devices can be connected by communication links; Explain what the internet is and some internet services such as the world wide web; Describe some ways the internet helps us work together in the modern world

network   network device
local area network
wide area network
internet   world wide web
Wi-Fi   server   hub   router

Class activity

Here are two statements about how young people should use the internet.

1 "The internet is dangerous. Young people should not be allowed to use the internet."

2 "Young people should be able to use the internet whenever and wherever they choose."

Discuss the statements in your class. List the arguments for and against each statement.

Can your class write your own statement about how young people should use the internet?

Digital citizen of the future

Whatever you do in your future life, computers and networks will play an important part. The world of computing changes quickly. You will need to keep your skills up to date so you can use technology at work and at home. At work you will go on training courses to learn new skills. At home you will use the internet to learn new skills. As a good digital citizen, you will help people who have fallen behind with their computing skills.

Did you know?

Today, almost every computer is connected to a network. The biggest network in the world is the internet. The internet has the potential to connect computers wherever they are.

1.1 What is a network?

What are networks for?

In offices and schools, computers are usually connected to make a computer **network**.

Networks are complicated to set up. Networks are expensive to run because they need a trained person to fix problems. Most organisations think the cost is worth it because a network has many advantages.

The advantages of networks

- **Communicating:** We can send messages and emails over the network.

- **Sharing:** We use a network to share files and expensive devices like printers.

- **Saving work:** We can save files onto network storage drives. You can use your files on any computer on the network. It is easy to share files with other people.

- **Working together:** Networks help people to work together.

What makes a network?

Four things are needed to make a network:

- **Network devices** to send messages and files between computers, and to store files and applications

- **Cables** to join the devices together

- **Network software** to make the devices work together

- Rules that allow all the parts of a network to work together

You will learn more about network devices and how they are connected in Lessons 1.2 and 1.3.
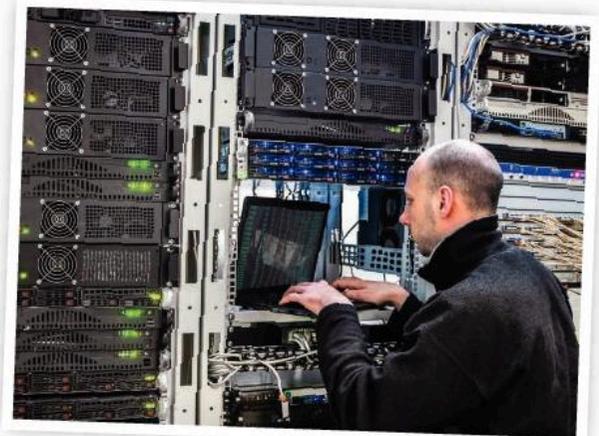
The two main types of network

- A **local area network** (LAN) joins computers in a single building. A LAN allows people in that building to work together. A school network is a LAN.

- A **wide area network** (WAN) joins computers that are far apart. An organisation with offices in different cities or countries uses a WAN so the employees can work together. The internet is a WAN.
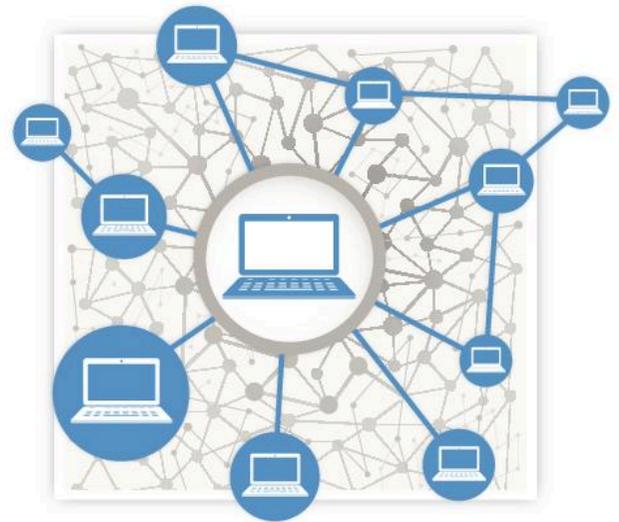
The 'invisible' network

A school network can have 30 or more network devices. It can have 10 kilometres of cable running around the school.

A network is big, but most people don't notice it is there. Most of the equipment is locked away to keep it safe. But there are clues that the network exists. In this unit you will learn to spot the clues.

Activity

Web Valley Primary School has 60 network connections. The average cable used for each connection is 50 metres long. How many metres of network cable are there in the school? Convert your answer to kilometres.

Extra challenge

Use a spreadsheet to solve the problem in the activity.

Then use your spreadsheet to solve this problem:

Web Valley Secondary School has 140 network connections. The average cable is 65 metres long. How many kilometres of network cable are there in Web Valley Secondary School?

Think again

Do you save your school work to the school network? What is your personal area of the school network called? Is there an area on the network that your teacher uses to share files with the class?

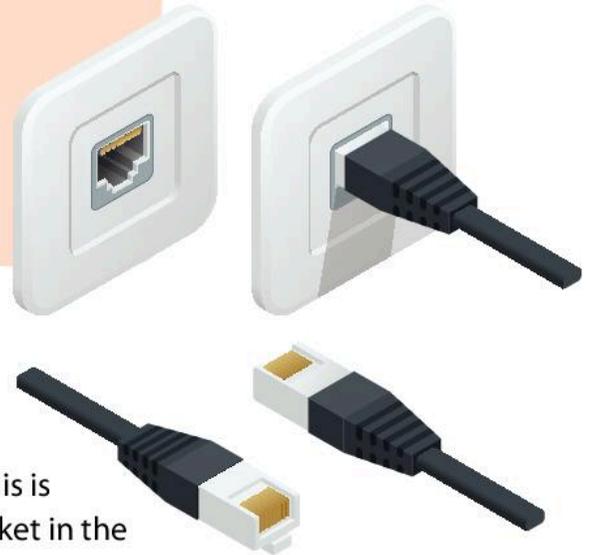Where is the network equipment in your school stored?

In this lesson

You will learn:

→ how computers are connected to a network

→ how to set a strong password and how to keep your password safe.

Connecting to a network

There are two ways to connect a computer to a network.

Wired connection

If you use a cable to plug the computer into the network, this is called a **wired connection**. A network cable connects a socket in the computer to an identical socket on the wall of a room.

If you see a socket like the one in the picture, it is a clue that the building you are in has a local area network (LAN).

Wireless (Wi-Fi) connection

You can also connect to a network using a **wireless connection**. This is also called **Wi-Fi**.

Networks use a device called a **wireless access point** (WAP) to provide a wireless connection. If you are close to a WAP, you can connect to a network without using a cable. A place where a wireless connection is available is called a hotspot.

You usually see WAPs high on the wall or on the ceiling.

Laptop and tablet computers usually use a wireless connection to a network. Desktop computers are usually connected to a network with a cable.