

Collins

# Technology 2016

KS3  
GCSE  
Revision

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## Welcome to the 2016 Technology Catalogue

Inside you'll find lots of useful information about resources for GCSE and A-level from Collins, including revision guides and information on free teaching support.

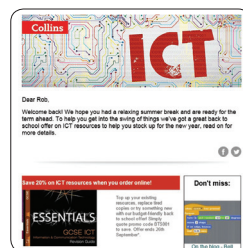
Want to take a closer look? If you would like more information about any of our series, please don't hesitate to contact one of our sales consultants – they'll be happy to answer your questions or visit your school. Find your local representative's details on the back page.

### Find out more

Visit [www.collins.co.uk](http://www.collins.co.uk) for information on all our series, curriculum change support and free content to support your teaching.



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## Key icons used in the catalogue



Age range



For GCSE



For Key Stage 3



For AS and A-level



For BTEC

Exam board specific

**Cambridge**

**Edexcel**

**AQA**

# Collins Cambridge IGCSE® ICT, Second Edition

Age  
14–16

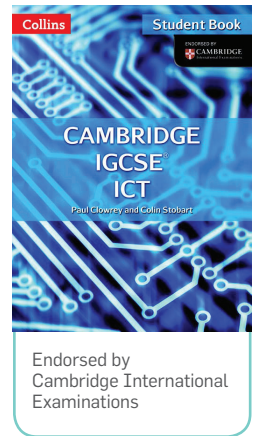
Cambridge

Authors: **Paul Clowrey** and **Colin Stobart**

Teach the 2014 syllabus for first examination in 2016 with confidence using the second edition of this popular course book.

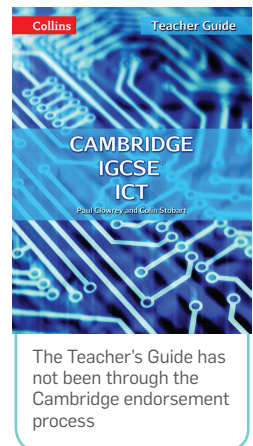
## Student Book

- **Build skills** with an engaging approach that uses scenarios to link the theory to the practice of ICT
- **Fully cover the Cambridge IGCSE® ICT syllabus.** Each topic is broken down into manageable chunks to allow you to apply and consolidate your learning
- **Fully and comprehensively updated** to match the specification and include the latest hardware and software information
- **Have confidence in the content and approach of the Student Book**, which is written by highly experienced ICT teachers
- **Help students prepare for exams** with end of session review and revise sections and summary boxes
- The accompanying CD-ROM includes source files to accompany practical tasks

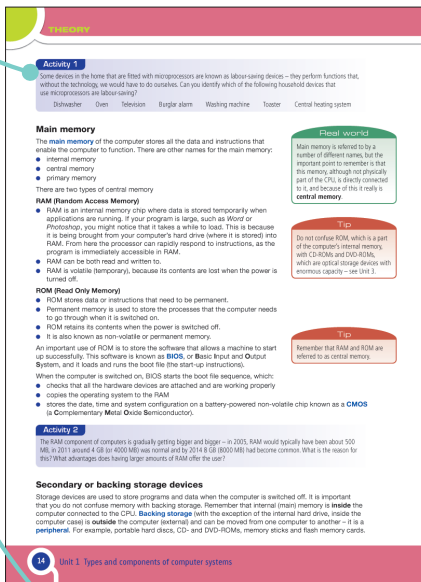
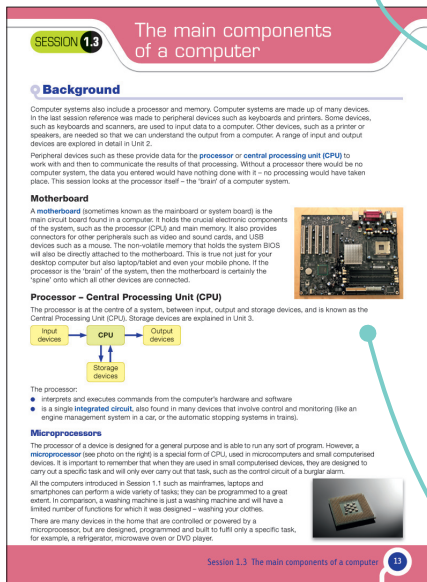


## Teacher Guide

- **Lesson plans for every session** in the Student Book; worksheets for every topic
- **Fully supports the approach of the Student Book Second Edition**, using scenarios and skills-building to link together the theory and practical parts of the syllabus
- **Includes answers to every activity and question** in the Student Book
- CD-ROM contains PowerPoint presentations and all the source files from the Student Book CD-ROM
- Written by highly experienced ICT teachers



Activity suggestions that engage students and help them to consolidate what they've learned



Sample pages from Cambridge IGCSE® ICT, Unit 1

Visual approach to engage students

Praise for the 2012 edition:

*I have to say that I'm incredibly impressed with the Collins Cambridge IGCSE ICT textbook. I've been looking for something that isn't too verbose or too sparse and this certainly fits the bill perfectly! I am also very impressed with how the Theory and Practical work are linked together. I also feel that the students will benefit greatly from the videos.*

International School based in Belgium

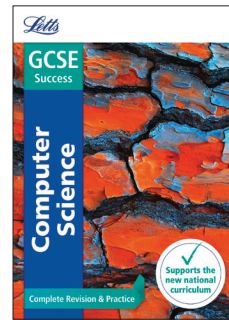
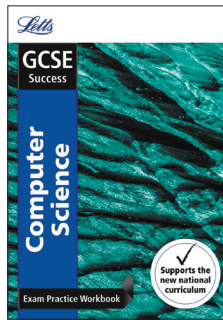
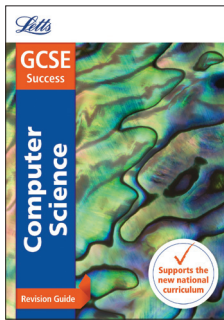
TITLE	ISBN	Price
<b>Collins Cambridge IGCSE® ICT, Second Edition</b>		
Student Book	978-0-00-812097-9	£23.99
Teacher Guide	978-0-00-812098-6	£100.00

# Letts GCSE Revision Success: GCSE Computer Science

NEW

GCSE

This unique and innovative revision guide supports all learning styles so that every student can achieve the best results.



- **Topics are organised into 30-minute revision modules** to aid planning
- **Engaging magazine-style layout and diagrams and charts** communicate key concepts in a clear and effective way for visual learners
- **Hands-on revision activities** for every topic provide revision opportunities for kinaesthetic learners
- **Free audio tracks** talk auditory learners through all the key points
- **Quick tests and exam-style practice questions** for every topic help consolidate what they've learned

### Module 20 Hardware, Software and Boolean Logic

**Hardware and software**  
Hardware and software are the product of hardware and software. It is not having the newest and fastest computer. It has no programs, and the best software in the world cannot operate without hardware of some sort.  
Hardware refers to the parts of the computer that can be touched or seen: they are the physical components – they're 'hard'. Software is the coding, from the machine code to the top level language, which makes the computer perform the operations required.

**Boolean logic and truth tables**  
You ought to remember the word 'Boolean' from binary searches, but it originally refers to the construction of logic gates for computer systems. We use **truth tables** to show how each gate works.  
There are only three gates that need to be known:  
1. AND gates  
2. NOT gates  
3. OR gates

**AND gates**  
An AND gate requires two inputs to be '1' or 'on', before it will operate. In human terms, that could be 'secondary AND' 'national day' – 'massive' 'flashes' or 'signal' will only turn on if both switches are pressed.

**OR gates**  
The truth table for an OR gate looks like this, and you can see that it only says 'on' when both of the inputs are also 'on'.

**NOT gates**  
A NOT gate is the exact opposite of an AND gate: it will only operate when the output is '0' or 'off'. In electronics, often NOT gates are shown with only one input.

**Combining logic gates**  
Logic gates can be combined. An AND gate followed by a NOT gate would look like this:  
To work this out you would need to follow the data, so start with the AND gate:  
Then send the Q input into the NOT gate to find Q.

**Hands on!**  
Design an interactive poster with pockets that you can fill with questions to show each of the gates in action.

**Hardware** > The computer, the phone, the tablet, the laptop is literally hard. You can touch it.  
**Software** > The programs, the apps, or the BIOS. Software is the coding that makes the computer do something.

**Exam Practice Questions**  
1. If a gate has two inputs and operates when either input is on, which type of gate is it?  
2. If a gate has two inputs and only operates when all four are on, which type of gate is it?

'Hands on' activities help students apply what they've learned

Free audio 'walk through' for every topic

Diagrams and charts communicate key concepts in a clear and visual way

### Computer Systems Mind Map

**Exam Practice Questions**

If you need more space to answer the following questions, please use a separate piece of paper.

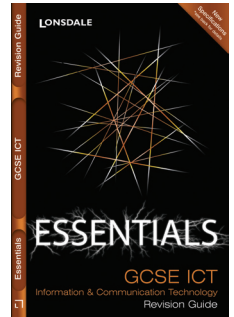
- One characteristic of a smartphone is the large screen. State three other ways in which data can be input to a smartphone. (3 marks)
- Smartphones use solid state media rather than magnetic storage. Identify two differences between these types of storage media and suggest why smartphones use solid state storage. (3 marks)
- The output of an AND gate with three inputs (A, B, C) is ON when any one input is ON. State whether this is true or false. (1 mark)
- What would be the output of this combination of logic gates if A is ON and B is OFF? (2 marks)
- Explain the Von Neumann model of computer architecture. (3 marks)
- What is the fetch-execute cycle? (3 marks)
- Why is it important for computers to have adequate capacity of RAM? (2 marks)
- A lot of companies are now using 'the cloud' for data storage. What is 'the cloud' and why are companies moving their data into this form of storage? (3 marks)

TITLE	ISBN	School's Price	Pub Date
<b>Letts GCSE Revision Success: GCSE Computer Science</b>			
GCSE Computer Science Revision Guide	978-0-00-816204-7	£3.00	June 2016
GCSE Computer Science Exam Practice Workbook	978-0-00-816205-4	£3.00	June 2016
GCSE Computer Science Complete Revision and Practice	978-0-00-816206-1	£5.50	June 2016

# GCSE Essentials ICT

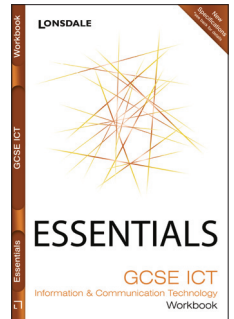
GCSE

- **Student-friendly Revision Guide** concisely covers all the course content and essential skills required for the new ICT GCSE course
- **Uncluttered approach**, with short sentences, focused paragraphs and bullet points help make the content accessible for students of all abilities
- **Contents pages provide a revision checklist** for students to tick off as they progress
- **Relevant diagrams and illustrations clarify key points** and aid visual learning



## Practice makes perfect!

- **Quick tests throughout the book and practice questions** at the end of each section reinforce understanding
- **Accompanying Workbook** matches the Revision Guide page for page, including further practice questions and answers



TITLE	ISBN	Schools' Price	RRP
Revision Guide	978-1-84-419292-2	£2.50	£4.99
Workbook & Answers	978-1-84-419293-9	£2.50	£4.99

Networks
Networks

### Why Network?

A network is a group of connected computers and other devices. Each device is called a **node**. Most personal computers are connected to a network for at least some of the time. The internet is the biggest network of all. It's made up of lots of connected networks.

### Benefits of Networks

- Networked computers can all use the same printer and other peripherals.
- Computers can use the same data, which always lets people to work on a project at the same time.
- Users can communicate on the network and they can log in anywhere and on any machine.
- The processing power of many computers can be combined. This is called **distributed processing**.
- The computers can load software from the same location, which means that they all have the same version of software. This means if ever a **virus** is introduced because only one copy needs to be replaced.

### Internal and External Networks

Most organisations run their own networks. This lets them have total control over the safety of their data, but it also means that they have to take the data that go with running their own networks. Some organisations outsource their networking. They may set up a **WAN** (Wide Area Network). This is held on a remote server and is accessed from any internet connected computer. Connections have to be encrypted because the data travels over public links.

### Components

A **NIC** (Network Interface Card) is needed for each device so that it can send and receive the network signals.

Devices need to be connected via a **carrier medium**.

Medium	Advantages	Disadvantages
Metal cable	<ul style="list-style-type: none"> <li>Uses electrical signals.</li> <li>Cheap to buy</li> </ul>	<ul style="list-style-type: none"> <li>Limited capacity may cause problems in installation.</li> </ul>
Fibre optic cable	<ul style="list-style-type: none"> <li>Uses light beams.</li> <li>High capacity.</li> <li>Resistant to interference and eavesdropping.</li> </ul>	<ul style="list-style-type: none"> <li>Expensive.</li> <li>Needs special NICs.</li> </ul>
Wireless	<ul style="list-style-type: none"> <li>No need for building work.</li> <li>Easy to add new nodes.</li> </ul>	<ul style="list-style-type: none"> <li>Security is more difficult to achieve.</li> <li>Limited range.</li> </ul>

**Hubs and Switches**

Hubs and switches are devices that connect lots of computers to the carrier medium.

- Hubs** are passive – they send data on all connections.
- Switches** can send data in specific directions.

### Quick Test

- What hardware is needed in each computer to connect to a network?
- State one advantage in using wireless technology to set up a network.
- What two items of data do you need to log in to a network?
- Name a device that connects many computers to one carrier line.

**KEY WORDS**

Match each key word with the correct definition before heading on!

- Node
- Distributed processing
- VPN
- NIC
- Carrier medium
- Router
- Hub
- Switch

Quick, end of section tests check understanding

Key words and concepts are highlighted to aid memory and recall



# Think Inside the Sketchbook

Authors: **Gillian Robinson, Alison Mountain and David Hulston**

- Provides an exciting insight into how sketchbooks can be used by teachers and students to make significant changes in attitudes to learning
- The authors clearly highlight ways in which sketchbooks can be used as a playground for imagination and trialling ideas, as well as encouraging exploration and creative thinking

GCSE KS3 AS/A

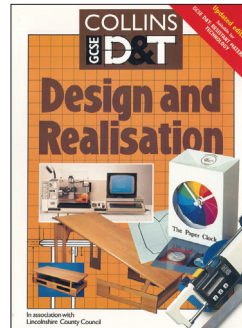


TITLE	ISBN	Price
Think Inside the Sketchbook	978-0-00-743479-4	£25.00

# Collins GCSE Design & Realisation

- Cover GCSE Design and Technology with ease with this title for students of Resistant Materials, Systems and Control Technology and Electronic Products

GCSE

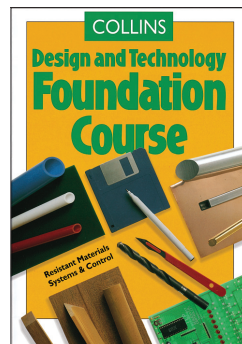


TITLE	ISBN	Price
Collins GCSE D&T – Design and Realisation	978-0-00-322035-3	£25.99

# Collins Design & Technology – Foundation Course

- Teach the essential skills and knowledge for Design & Technology with this clear, full-colour textbook, providing a simple and accessible introductions for students

GCSE



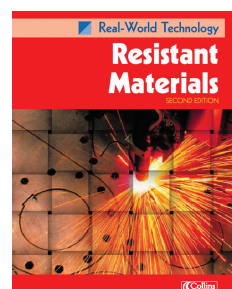
TITLE	ISBN	Price
Collins D&T Foundation Course	978-0-00-327352-6	£19.50

# Real-World Technology – Resistant Materials

Age  
14+

- Teach the knowledge, skills and processes involving **resistant materials** and their application in the lives of designers and manufacturers, with an effective combination of workshop and classroom activity

TITLE	ISBN	Price
Real-World Technology – Resistant Materials	978-0-00-711532-7	£25.00



# Technical Drawing GCE and CSE

AS/A

- Enable students to learn quickly with this flexible, visual-approach based resource

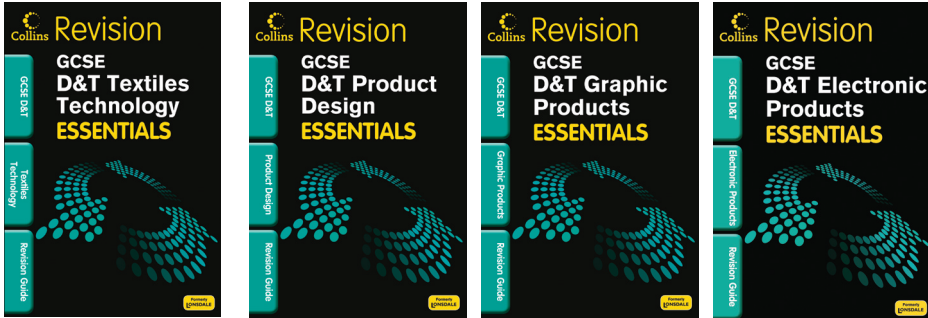
TITLE	ISBN	Price
Technical Drawing GCE and CSE	978-0-00-322298-2	£23.75



# GCSE Essentials Design & Technology

GCSE

Schools' price, just £2.50



- **Student-friendly Revision Guides** concisely cover all the course content and essential skills required for GCSE Food Technology, Textiles Technology, Resistant Materials, Electronic Products, Graphic Products and Product Design
- **Uncluttered approach**, with short sentences, focused paragraphs and bullet points help make the content accessible for students of all abilities
- **Key words and concepts are highlighted** to aid memory and recall
- **Relevant diagrams and illustrations clarify key points** and aid visual learning

Key words and concepts are highlighted to aid memory and recall

**Marking Out Wood**

**Measuring Lengths and Angles**

A steel rule is used to:

- measure lengths when marking on wood
- set gauges and a compass.
- be square to a surface.
- to mark lines to exactly 90° from the edge of the material
- to check that the material has square corners

as a checking tool when assembling components that need to be square.

Before you can use a 90 square you need to have one accurate straight edge on the material. It's also available as a 45° square, one set at 45°.

A sliding bevel is an adjustable angle marker that can be set to any angle.

Card templates are used for marking out curved shapes onto any material. You can make symmetrical shapes using the following method:

1. Fold the template in half and cut both sides together
2. Unfold and draw round the curve.

**Marking the Surface**

A pencil is used for marking wood. It's soft and will not mark the surface too deeply.

A marking knife is a sharp knife used to cut the wood fibres before cutting across the grain.

**Gauges**

A marking gauge is a simple tool for scribing lines parallel to a straight edge on timber. One version has a offset hole for a pencil so it can be used to mark many repeated lines.

A cutting gauge:

- is a simple tool for scribing lines across the grain on timber
- cuts the fibres so they will not tear when sawed.

**Cutting Wood**

**Chiselling Wood**

Chisels need a sharp edge to slice across the grain. There are four types of wood chisel.

A general chisel is a general hand tool.

A bevel-edged chisel is used for corners that are less than 90°, e.g. a dovetail joint.

A mortise chisel is a strong, wider chisel used for chopping deep holes for joints.

A gouge has a curved blade for carving (can be sharpened on the inside or the outside).

**Basic Chiselling Actions**

There are several basic chiselling actions:

- Horizontal paring is cutting across a joint to clean out waste.
- Vertical paring is pushing down onto a work surface to shape the end of a piece of wood.
- Chopping is digging out waste from a mortise by cutting the fibres into short lengths.

**Marking machines** can be used to cut deep recesses for joints.

Hitting a chisel with the steel face of a hammer will damage it so make sure from beech or basswood are used.

**Quick Test**

- 1 Sketch a 3D view of a piece of 3 plywood.
- 2 What does the acronym MDF stand for?
- 3 What are MDF and hardboard made from?
- 4 Which three tools are used to mark a line around the end of a piece of wood?
- 5 Why does a woodworker use a marking knife?

**KEY WORDS**

Match each term with its best word:

before marking out

- Fillet
- Annual rings
- Card bevel
- Gauge
- Plywood

KEY WORDS

- Mortise chisel
- Vertical chisel
- Change
- Horizontal paring
- Vertical paring
- Chopping

Quick, end of section tests check understanding

Sample pages from GCSE Essentials Resistant Materials Revision Guide