Key Stage 2-3 Schemes of Work

Key Stage 2 Scheme of Work

Year 1
- Unit 1A. An introduction to modelling
- Unit 1B. Using a word bank
- Unit 1C. The information around us
- Unit 1D. Labelling and classifying
- Unit 1E. Representing information graphically: pictograms
- Unit 1F. Understanding instructions and making things happen

Year 2
- Unit 2A. Writing stories: communicating information using text
- Unit 2B. Creating pictures
- Unit 2C. Finding information
- Unit 2D. Routes: controlling a floor turtle
- Unit 2E. Questions and answers

Year 3
- Unit 3A. Combining text and graphics
- Unit 3B. Manipulating sound
- Unit 3C. Introduction to databases
- Unit 3D. Exploring simulations
- Unit 3E. E-mail

Year 4
- Unit 4A. Writing for different audiences
- Unit 4B. Developing images using repeating patterns
- Unit 4C. Branching databases
- Unit 4D. Collecting and presenting information: questionnaires and pie charts
- Unit 4E. Modelling effects on screen

Year 5
- Unit 5A. Graphical modelling
- Unit 5B. Analysing data and asking questions: using complex searches
- Unit 5C. Evaluating information, checking accuracy and questioning plausibility
- Unit 5D. Introduction to spreadsheets
- Unit 5E. Controlling devices
- Unit 5F. Monitoring environmental conditions and changes

Year 6
- Unit 6A. Multimedia presentation
- Unit 6B. Spreadsheet modelling
- Unit 6C. Control and monitoring - What happens when...?
- Unit 6D. Using the internet to search large databases and to interpret information

Key Stage 3 Scheme of Work

Year 7
- Unit 1. Using ICT
- Unit 2. Information and presentation
- Unit 3. Processing text and images
- Unit 4. Models - rules and investigations
- Unit 5. Data - designing structure, capturing and presenting data
- Unit 6. Control - input, process and output
- Unit 7. Measuring physical data

Year 8
- Unit 8. Public information systems
- Unit 9. Publishing on the web
- Unit 10. Information - reliability, validity and bias
- Unit 11. Data - use and misuse
- Unit 12. Systems - integrating applications to find solutions

Year 9
- Unit 13. Control systems
- Unit 14. Global communication - negotiating and transferring data
- Unit 15. Systems: managing a project

Year 7

Unit 1. Using ICT

In this unit pupils create a multimedia presentation using text, images and sound. In creating their pages, pupils are expected to be sensitive to the needs of their audience.

The unit gives pupils the opportunity to learn about a variety of general topics, such as rules for working with ICT, saving and printing, respecting other people's work and keeping drafts for assessment portfolios. It also prepares pupils for working in a networked ICT room.

The unit is expected to take approximately 4 hours.

Unit 2. Information and presentation

In this unit pupils use a variety of search mechanisms to explore the potential of ICT-based information sources. They research a topic and prepare a presentation for a specific audience. They use websites and CD-ROMs as their main sources.

They explore a range of types of information, such as statistics, legislation and advertising campaigns, and make judgements about the purpose of the information and the viewpoint of the organisation that produced it.

Pupils are given a framework for their research. They aim to answer specific questions and refine and organise their information as required.

The topic of the presentation is chosen by the teacher. It may be on any subject and could be controversial, but should be one that allows different interpretations and viewpoints.

This unit is expected to take approximately 5 hours.

Unit 3. Processing text and images

In this unit pupils work in small groups to prepare a printed newspaper. They gather, process and output information in text and image form and explore a variety of image-capture and image-manipulation methods to create suitable image data. They learn to develop strategies of group working, including data sharing across networks.

There are opportunities for links with English when pupils develop the text for the newspaper. Links could also be made to other subjects when choosing the topics for the articles, *eg the weather, sport*. The newspaper could be produced in another language, providing opportunities to collaborate with the modern foreign languages department.

Note: in some areas the local press are happy to assist or contribute to such activities. It may also be possible to integrate this task within a single 'activity week'.

This unit is expected to take approximately 7 hours.

Unit 4. Models - rules and investigations

In this unit pupils learn how simple models are built by first investigating rules, then by seeing how rules can govern the behaviour of simple models.

The unit concentrates on setting up a model of the operation of a successful tuck shop. Pupils identify the objectives for the retailer, outcomes from a consumer perspective, the constraints under which the tuck shop has to operate and the likely effects on the retailers' objectives.

Pupils discuss the ways in which the model could be presented in a spreadsheet, identifying the inputs, the rules (formulae) and the outputs. Pupils then work in groups to construct

this model, revising cells, formulae and cell references. They test the effectiveness of the model by using sample data representing a number of scenarios.

This unit is expected to take approximately 5 hours.

Unit 5. Data - designing structure, capturing and presenting data

In this unit pupils consider the information that they need in order to collect appropriate data to test a hypothesis. They do this through the scenario of a lottery bid for funding to build new sports facilities on the school site. They collect data using questionnaires, design a structure to contain the data and enter it into a file. Using this data, they analyse results and draw conclusions. During the process they learn how to add fields to the database and consider data-validation techniques that might be used to check the data for accuracy. Once all data has been collated they use the results to produce a report to support the lottery bid.

This unit is expected to take 6 hours.

Unit 6. Control - input, process and output

In this unit pupils learn about control technology through modelling the working of a car park barrier. Pupils program a simple cause and effect model, *eg pressing an input switch that produces an output, such as sounding an alarm*, and develop their knowledge and understanding of control devices by solving a problem using procedures as building blocks. They refine instructions and learn how the order in which instructions are given will be critical to the success of the project. It is important that during this unit pupils use a structured approach to solving this type of problem.

The idea that a counter is used as a control mechanism is important, because it has many applications to everyday life. Pupils also develop their understanding of how criteria are used to make judgements about the success of their projects and areas of development.

This unit is expected to take approximately 5 hours.

Unit 7. Measuring physical data

In this unit pupils learn how to use a computer and remote sensors to measure changes in the physical environment. They compare the use of computerised and manual methods and describe the advantages (and disadvantages) of each.

Through this unit pupils will develop the underpinning knowledge, skills and understanding about data logging they will need to support their work in other subjects, *eg science, geography.*

This unit is expected to take approximately 4 hours.

Year 8

Unit 8. Public information systems

In this unit pupils collate data from a variety of sources to develop a daily information service about weather. They will use a range of sources, *eg a school weather station, measurements, satellite (remote sensing), the internet, other files.*

A key aim of the unit is to develop a system that will meet the potential audience's needs. Pupils investigate these needs and then model the system using presentation software, teletext and multimedia presentations.

This unit is expected to take approximately 7 hours.

Unit 9. Publishing on the web

In this unit pupils learn how to design and build an interactive web page, on a subject of their choice, that can be published on the worldwide web or school intranet. They learn how to control on-screen events and the flow of information accessed through a web page. They learn that web pages are made up of objects, and that these objects can be programmed to carry out actions, *eg a hyperlink can automatically connect a user to a different website, or an area of the screen can be programmed to change when a mouse pointer is passed over it.*

They consider a range of audiences, and how one site can serve a range of needs, eg a site dedicated to a historic town may contain a list of places of interest for the casual tourist, while also offering detailed primary source material for the more serious historian.

This unit is expected to take approximately 7 hours.

Unit 10. Information - reliability, validity and bias

In this unit pupils use the internet to gather information on a particular topic, collate it and present it from a particular viewpoint.

Pupils are given a stance to take and select information to produce an argument that supports this view and challenges other views. This requires them to consider the usefulness, provenance, reliability, status and bias of the information they collect and use. The audience is used to evaluate how successfully the pupils have presented arguments to support their stance.

Areas for research could include any topical subject arousing controversy, *eg genetically modified foods, growth-enhancing hormones,* as long as it is one that allows for a variety of points of view.

This unit is expected to take approximately 7 hours.

Unit 11. Data - use and misuse

In this unit pupils investigate the large-scale use of data by commercial organisations. The unit is based around the use of ICT in the retail industry and pupils find out about electronic stock control systems, including the use of bar codes and electronic point of sale (EPOS) systems, and loyalty cards. The social implications of loyalty cards and EPOS cards are emphasised.

The unit also introduces pupils to the ways in which other organisations collect data, the Data Protection Act, and the different ways data can be protected from misuse or damage.

This unit involves extensive class discussion and will need to be managed so it gives pupils the chance to deduce answers from the facts presented. It can be taught without direct contact with computers, although the use of the internet is encouraged.

Although many of the activities are based around the retail industry other contexts could be used.

This unit is expected to take approximately 3 hours.

Unit 12. Systems - integrating applications to find solutions

In this unit pupils work as a team to set up, organise and run a fundraising event that must make a profit (this is the constraint). They use a wide range of ICT to solve the problems associated with planning such an event. This provides them with the opportunity to

develop further their expertise in the use of spreadsheets and databases, together with word-processing, presentation and desktop publishing software, vector and bitmap-based graphics software and e-mail. This is a controlled, integrated project involving whole-class decisions and combined data to establish the requirements of a system.

This unit is expected to take approximately 12 hours.

Year 9

Unit 13. Control systems

In this unit pupils explore ICT systems through the scenario of designing a new water ride in a theme park. The ride must be a new concept, water based and involve some kind of boat or raft. The design of the boat is not important; the focus is on developing a ride where a number of individual boats move through a water channel safely and under control. The system could involve a feedback loop.

The pupils assess the requirements of a new ride, plan and develop a safety control system. The work provides them with the opportunity to evaluate the use of technology and reflect on its use in other situations. Pupils develop their abilities to plan, build, test, evaluate and document their use of control systems, as well as extending their skills in using sensors and control software.

Pupils might test their procedures using a variety of input and output devices, with no need to build models.

This unit is expected to take approximately 10 hours.

Unit 14. Global communication - negotiating and transferring data

In this unit pupils work with a 'remote partner' in another school to collect common, agreed data for a specific topic. Once the data has been collected, it is transferred electronically and merged to form a complete data set. Pupils then produce a report on their joint findings.

A great deal of preparation is needed for this unit. Teachers will need to identify a suitable school (either locally, in another part of the UK or overseas). Teachers from both schools will need to:

agree on a broad project focus, *eg geographical information, the local area, cultural themes, hobbies, interests*, but not the specifics of what data will be exchanged - this must be left for the class to negotiate

identify the parameters for the project, *eg type of software used, the timing*

agree expected outcomes, *eg what does each school expect to get out of the project*

identify periods of peak activity and how these are to be resolved, *eg when pupils will correspond by e-mail*

agree protocol, *eg replies to e-mail should be made within two days*

The whole class should work together to gather data, maybe in three or four groups to allow for differentiation. Pupils could work individually but this would limit the amount of data that could be collected.

This unit is expected to take approximately 10 hours.

Unit 15. Systems: managing a project

This unit is designed to develop the skills needed to carry out a project systematically. The project is designing a front-of-house ticketing system for a theatre.

Pupils learn to plan the stages of a project, and use a flow chart to record their decisions. They use a design specification as the basis for their work and criteria to evaluate their success. They develop many skills, in particular time management and problem solving. At the end of the unit they produce a written report summarising their project and its success.

The project is limited to three tasks; this allows teachers to ensure their class learns project methods as a whole group. Differentiation is achieved through the work carried out by individual pupils for each of the tasks set within the framework of this unit.

This unit is expected to take approximately 16 hours.