

Key Stage 3 Curriculum Map – ICT - Year 8

TERM 1

MODELS AND PRESENTING NUMERICAL DATA

The Task

In this unit, pupils will use spreadsheet software to develop models. They will be introduced to techniques to enable them to create more complex models and to interrogate and analyse them. They will be shown how to generate random numbers to provide test data and to simulate events. They will then consider the purposes for which simulations and animations are used.

The example used in this unit is a school sports day. The lessons are designed for pupils working at Level 6 with an extension activity for pupils working at higher levels.

DEVELOPING IDEAS AND MAKING THINGS HAPPEN

Models and modelling

- Develop ICT-based models and test predictions by changing variables and rules.
- Draw and explain conclusions.
- Review and modify ICT models to improve their accuracy and extend their scope.

FINDING THINGS OUT

Organising and investigating

- Explore and interpret collected data in order to draw conclusions.

TERMS 2 & 3

INTEGRATING APPLICATIONS

The Task

This unit involves a number of tasks related to the needs of a garden centre. During this task pupils will work, individually and in groups, on three subtasks. The first is the development of the financial model. This can be used by the pupils to help with their decision-making. They will next explore the automated control of a greenhouses present at the garden centre before creating both an automated and manually activated presentation detailing the products and services available at the garden centre. The final product is a summary report of the three subtasks.

FINDING THINGS OUT

Organising and investigating

- Understand:
 - how data collection and storage are automated in commerce and some public services;
 - the impact of electronic databases on commercial practice and society;
 - potential misuse of personal data.

DEVELOPING IDEAS AND MAKING THINGS HAPPEN

Analysing and automating processes

- Automate simple processes by:
 - creating templates;
 - creating simple software routines (e.g. style sheets, web queries, control techniques on web pages).
- Consider the benefits and drawbacks of using ICT to automate processes.
- Represent simple design specifications as diagrams.

Models and modelling

- Develop ICT-based models and test predictions by changing variables and rules.
- Draw and explain conclusions (e.g. 'the best value for money is obtained when ...').
- Review and modify ICT models to improve their accuracy and extend their scope (e.g. by introducing different or new variables and producing further outcomes).

Control and monitoring

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- Develop and test a system to monitor and control events by:
 - using sensors effectively;
 - developing, testing and refining efficient sequences of instructions and procedures;
 - assessing the effects of sampling and transmission rates on the accuracy of data from sensors.
- Understand how control and monitoring has affected commercial and industrial processes (e.g. telecommunication, health and transport services).

EXCHANGING AND SHARING INFORMATION

Fitness for purpose

- Recognise how different media and presentation techniques convey similar content in ways that have different impacts.
- Understand that an effective presentation or publication will address audience expectations and needs (e.g. the audience's levels of literacy, familiarity with a topic).
- Devise criteria to evaluate the effectiveness of own and others' publications and presentations, and use the criteria to make refinements.

Refining and presenting information

- Plan and design presentations and publications, showing how account has been taken of:
 - audience expectations and needs;
 - the ICT and media facilities available.
- Use a range of ICT tools efficiently to combine, refine and present information by:
 - structuring a publication or presentation (e.g. using document styles, templates, timelines in sound and video editing, navigational structures in web media).

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TERMS 4, 5 & 6

CASE STUDY - THEME PARK RIDE

The Task

In this case study pupils explore ICT systems within the context of designing a new water ride in a theme park. The ride must be 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 with one or more boats moving through a water channel safely and under control. The system could involve a feedback loop.

Pupils assess the requirements of a new ride, then 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 use a variety of input and output devices to test their procedures, without the need to build models.

Finally, pupils consider how to create an appropriate presentation to be shown to the park manager, outlining the features of the ride and how safety components have been included.

DEVELOPING IDEAS AND MAKING THINGS HAPPEN

Analysing and automating processes

- Represent a system in a diagram, identifying all its parts, including inputs, outputs and the processes used.
- Automate ICT processes.

Control and monitoring

- Review and modify own or others' monitoring and control systems to improve efficiency (e.g. use more efficient procedures, reduce the number of instructions or procedures, add an element of feedback).
- Use ICT to build and test an efficient system to monitor and control events, including:
 - testing all elements of the system using appropriate test data;
 - evaluating the system's performance;
 - annotating work to highlight processes and justify decisions.

Fitness for purpose

- Produce high quality ICT-based presentations by:
 - creating clear presentations, sensitive to audience needs;
 - justifying the choice of form, style and content.
- Use knowledge of publications and media forms to devise criteria to assess the quality and impact of multimedia communications and presentations, and apply the criteria to develop and refine own work.