

## Progression guide for models and modelling (Developing ideas and making things happen)

| Concepts  | Aspects of level | Models and modelling aspect of National Curriculum level description<br>Key characteristics of National Curriculum level description  | Expansion of level description | Illustration<br>What might pupils do?  |
|---|------------------|---|--------------------------------|--|
| <p><b>Rules:</b><br/>Pupils understand the overall structure of a model is determined by the rules (formulae) of the model and make simple models.</p>      | 5                | <p>They explore the effects of changing the variables in an ICT-based model.</p> <p><b>Combining the features of a model to understand the overall structure.</b></p>   |                                | <ul style="list-style-type: none"> <li>Set up or alter variables within a model to compare the relative cost of different mobile phone providers (Unit 8.4 lessons 2, 3).</li> </ul>   |
| <p><b>Validity:</b><br/>Pupils improve the validity and efficiency of models by: varying rules; and comparing results with other reliable data sources.</p> | 6                | <p>They use ICT-based models to make predictions and vary the rules within the models. They assess the validity of these models by comparing their behaviour with information from other sources.</p> <p><b>Integration and efficiency of model by critical evaluation.</b></p> |                                | <ul style="list-style-type: none"> <li>Pupils may use absolute variables to increase efficiency, e.g. an absolute cell reference for VAT enables the whole model to be updated quickly with various VAT rates (National Curriculum in Action).</li> <li>From case study 9.3: Pupils set up a financial plan based around a theatre booking system to model ticket pricing. The plan includes information on possible income and expenditure to be available on the school intranet or a file in the school library (so that pupils are finding information for themselves). (Bearing in mind that the production must not make a loss) pupils decide what price to set for the tickets.</li> <li>Pupils investigate the effect of different prices for seats.</li> <li>They consider the impact of a pricing structure depending on age/income.</li> <li>They ascertain the costs involved.</li> </ul> |