<https://www.teachcomputing.net/ib/option-b1-basic-model.php>

<https://quizlet.com/186682836/ib-computer-science-option-b-modelling-simulation-flash-cards/>

B.1 The basic model (8 hours)Students are expected to use a range of standard spreadsheet software in a variety of ways to create models.  
There is no need to purchase additional specialist software.

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| B.1.1 | Define the term computer modelling. |

computer modelling:

The process of creating a computer model of a system to allow for recording of relevant data and processing the data based on accurate rules to produce useful output.

- Allows us to try and forecast information

Advantages of Spreadsheets for Mathematical Modelling

Mathematical models can easily be made using spreadsheet software which allows formulas to be created and copied for large amounts of data, allows values to be looked up from lookup tables and data to be recorded and updated without calculations having to be redone.

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| B.1.2 | Identify a system that can be modelled. | 2 | Simple examples would involve financial planning, population growth, climate change, building design, engineering design, etc. Other situations could be modelling a game such as checkers or Mancala. |

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| B.1.3 | Identify the variables required to model a given system. | 2 | In an examination students will not be expected to identify more than four variables in a given system. **AIM 4** Applying thinking skills to identify variables and resolve a specified problem. |

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| B.1.4 | Describe the limitations of computer (mathematical) models. | 2 | In many situations it is not possible to know all of the variables involved. **AIM 9** An appreciation of the limitations of computer (mathematical) models. **MYP** Mathematics: forms of numbers, algebra—patterns and sequences, logic, algorithms. |

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| B.1.5 | Outline sensible grouping for collections of data items, including sample data. | 2 | For example, if age, height and weight are recorded for each person, group these as individual cells in a row in a table, or as items in parallel lists. **MYP** Mathematics: forms of numbers, algebra—patterns and sequences, logic, algorithms. |

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| B.1.6 | Design test-cases to evaluate a model. | 3 | **MYP** Design cycle. |

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| B.1.7 | Discuss the effectiveness of a test-case in a specified situation. | 3 |

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| B.1.8 | Discuss the correctness of a model by comparing generated results with data that were observed in the original problem. | 3 | **AIM 6** Develop logical and critical thinking to discuss the correctness of a model |

A simulation is a process of varying the inputs and/or rules of a mathematical model to observe the effects.

Visualisations

Visualisations are graphical representations of the outputs of computer models or simulations. Whether 2D or 3D they can be beneficial in communicating complex data sets in a way that is easily and quickly understood by the audience e.g a large number of temperature and location measurements can be grouped and plotted on a map to be easily understood.

Visualisation is the process of taking a mathematical representation stored in memory and generating and image from it.

