Computer Science Modelling Data - Spreadsheets

Year 7 Term 5

Trinity MAT

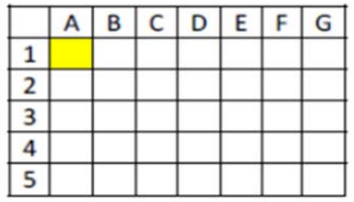
Key Terms

Modelling	A program which has been developed to mimic a real life system. Spreadsheets use mathematical formulas and calculations to predict what is likely to happen based on data recorded about what actually did happen in the past. Software includes Microsoft Excel and Google Sheets.
Cell	One box on a spreadsheet. A group of cells together is called a **range.**
Cell reference	The unique 'address' of a cell on a spreadsheet, made up of the Column letter and Row number, e.g. A1
Range	A group of cells that are next to each other, e.g. A2:B6
Active cell	The currently selected cell. It has a thick black line around it with a small dot called the fill handle in the bottom right corner.
Row	A group of cells 1 cell **high** going across a worksheet. In Excel, these are the numbers down the left side of the page.
Column	A group of cells 1 cell **wide** going from the top to the bottom of a worksheet. In Excel these are the letters going across the top of the page.
Label	This is a piece of text that explains what the data in the cell next to it represents.
Absolute cell reference	Refers to a specific cell and doesn't change when copied to other cells using the fill handle. E.g.D3
Chart	A picture of data made from a range of cells. There are lots of types which are useful for different reasons, e.g. pie, line, scatter, area, radar, bar, radar etc.
Legend	A table that explains which data is represented by different colours on a chart.
Formula	Used in a spreadsheet cell, this **starts** with an '=' and combines numbers, mathematical operators and functions to manipulate data.
Function	These are built in to spreadsheets and perform standard tasks, like finding the average, highest and lowest of a set of numbers. They always look like =FunctionName(Details the function needs). Tooltips will appear as you type them to tell you what details that function needs.
Fill	Copies the contents of a cell or range of cells into others by dragging the fill handle in the bottom right of the active cell or range.
Conditional formatting	Changes what a cell looks like based on rules about the data a cell contains.

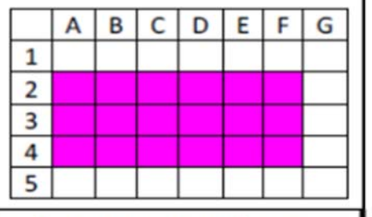
Key Facts/Methods/Processes/Questions

Where are Computer Models used?	Computer models are used in schools to predict student performance in exams, they are used to predict the weather, to predict how financial markets are going to change, to see whether car components will fit together before they are made and to see if a business is making enough money to stay open.
How are spreadsheets used in computer models?	Spreadsheets are very good at processing data and then presenting it in graphical form. Presenting data in the form of a chart makes it much easier to understand, which makes it more persuasive than a table of numbers.

Cell references begin with a letter, and finish with a number. EG: A1



A range is a selection of cells. EG: (A2:F4)



Golden rule: every formula always starts with an =

Name of the formula

See below for common formulae. Normally written in capitals.

=SUM(B10:B23)

= sign

An equal sign tells Excel that the cell contains a formula.

The selected range

The range used in the formula. This can be selected by clicking and dragging.

Cell Formatting

Number	Tell the spreadsheet what type of data the cell contains, e.g. currency, percentage, date, time, etc.
Alignment	Align the text in the cell vertically (top, bottom or middle), horizontally (left or right) or at an angle.
Font	Change the font used, text size and colour.
Border	Add a solid, dotted, dashed or coloured border to the cell.
Adjusting column width and row height	To adjust a column's width or a row's height, move your mouse cursor between two columns or rows. Click and drag to resize. To automatically resize a row to fit the data entered in a cell, double-click between the current row and the row after it.

Modelling Data

Example Question

1. Begin by calculating **Min Max Average** for the price of the products sold.

2. Use a function to calculate the **total stock.**

3. Add an **IF function** to monitor stock levels. If stock falls below 20 then **'Re-Order'** or **'No Action'**.

4. Add conditional formatting on the Re-Order cells.

Stock

Stock Information | Min Stock Level: 20

Stock Code	Description	Price	Stock	Re-order Stock
D1	Daisy Card	1.99	15	ReOrder
D2	Daisy Card1	1.99	12	ReOrder
D3	Daisy Crazy Challenge Game	5.99	78	No Action
D4	Daisy Cushion	6.99	20	No Action
D5	Daisy Stickers	2.99	56	No Action
D6	Daisy Diaper Cover	7.99	23	No Action
D7	Daisy Doll	9.5	10	ReOrder
D8	Daisy DollsHouse	52	23	No Action
D9	Daisy Flower	3.5	24	No Action
D10	Daisy Fragrance	25.99	23	No Action
D11	Daisy Frame	11.5	23	No Action
D12	Daisy Lip Gloss	3.5	25	No Action
D13	Daisy Magazine	3.5	29	No Action
D14	Daisy Paper	4.99	32	No Action
D15	Daisy Pendent	15.99	33	No Action
D16	Daisy Perfume Ring	20	25	No Action
D17	Daisy Pots with Flowers	6.1	25	No Action
D18	Daisy Tableware	19.5	35	No Action
D19	Daisy Tabelware1	45.5	5	ReOrder
D20	Daisy Tableware Portmeirion	78	9	ReOrder

Min	1.99	Stock Total	525
Max	78		
Average	16.3755		

Common Functions

= sum ( )	Adds a range of cells together.
= average ( )	Finds the average for a range of cells.
= min ( )	Returns the smallest value in the range.
= max ( )	Returns the highest value in the range.
= count ( )	Counts how many cells meet a condition, e.g. count(A:A, "April") would return the number of times the word April (with a capital letter), occurs in column A.

Advance Functions

IF	Change the value of a cell if something is true, e.g. if a customer's total bill is over £100, deduct 10% from their bill.
COUNTIF –	Adds up cells that meet a certain rule, e.g. count the number of students that achieved level 6.
VLOOKUP	Matches contents of a cell with an answer, eg how much is a pepperoni pizza?

Charts and Graphs

Charts and graphs provide a visual representation of data, which can often be easier to understand.
There are several types of charts and present data - you must always consider which would be a suitable chart or graph for your model.

Line graph – to show a change over time.
Pie chart – show the individual parts that make up a whole.
Bar chart – compare things that aren't directly related.
Scatter graph – look for a pattern or link between two sets of data.