



Population Analysis

You need to design and create a **spreadsheet** which can then be used to investigate some aspects of population growth. We will use the **CIA World Factbook** to gather data about different countries around the world and enter the data accurately into a spreadsheet for analysis.

On the spreadsheet there will be the country name, Population, Birth Rate, Life Expectancy etc. The full list is given below & you will be expected to add some columns of your own.

You will use formulae to perform calculations on the data and you will study the effects of changing the data & formulae. Graphs will be used to illustrate your findings. You will develop some further investigations and use advanced formulae and spreadsheet functions. It will be necessary to write up a report as you progress, which should be done on a wordprocessor.



What you need to do.

Background	Design a front cover for the assignment Describe what you are going to do, what type of information is going to be on the spreadsheet and what you are going to use the spreadsheet to investigate.	You need to use a wordprocessor to do this
example	State what the name of your file is and where it will be saved (directory structure) in your report.	

<p>Design example</p>	<p>Create a first design of your spreadsheet and gather the data from the CIA World Factbook for 25 countries. Write down the information on paper in the form of a grid(broadly similar to the layout which will be adopted later for entry into the spreadsheet). The 25 countries must include UK, Sweden, Japan, USA, Mexico, Nigeria, Thailand, Brazil, Ecuador and Egypt. The remaining countries may be chosen by you but try to ensure that they are spread over a variety of regions of the world and that they vary in terms of wealth and population.</p> <p>Enter data onto the spreadsheet and make sure you use plenty of formatting.</p> <ul style="list-style-type: none"> font styles - bold, italic. coloured text and cells data formatting cell borders <p>Use formulae in to find the average population of the countries, maximum population and minimum population. Do the same for other numeric columns such as Birth Rate, Internet Users etc. using appropriate replication methods Print out the spreadsheet. Then Print out the spreadsheet again showing all the formulae.</p>	<p>The information you gather must include:</p> <p>Name of Country Population Birth Rate Death Rate Life Expectancy(M) Life Expectancy(F) Life Expectancy(Overall) Capital City Literacy Rate Population Below Poverty GDP GDP(per capita) Internet Users Government Type</p> <p>Choose at least two others of your own</p> <p>← Use all of these somewhere on your spreadsheet.</p>
<p>Graphs</p>	<p>Use the data on your spreadsheet to print out a graph based on the populations of the first 10 countries on your spreadsheet...but you must give the purpose of the graph. Produce a second graph for a stated purpose</p>	<p>Eg : 'To give a visual representation of the relative populations'</p>
<p>Investigations</p>	<p>Describe and carry out an investigation which involves changing the data. Add a column and put in a formula to calculate the increase in the population of the first country after a year – then</p>	<p>E.g. Find out what countries have the highest population growth. Do any countries have a population decline?</p>

	<p>replicate this formula to the other countries.</p> <p>Add a new column and change this formula to show the percentage increase in population rather than the actual increase. Note down the values for USA, UK and Sweden and state the values in your write up</p>	
	<p>Describe and carry out an investigation which involves changing a formula on the spreadsheet. You should now investigate the effects on the percentage change in population of each country receiving 100 000 refugees/asylum seekers. Change the formula in the new column to accommodate this but make sure that the additional 100 000 population comes from a cell reference (<i>N.B. place the number in any free cell e.g. B28 then refer to B28 in the formula rather than 100 000. This is to enable us to experiment with different values without having to change the formula every time</i>). Note down the figures for USA, UK & Sweden. Has the effect of the extra population been significant?</p> <p>What if the refugee/asylum seeker numbers changed from 100 000 to 200 000? Change the data to study the effect of this. Again note down the figures for USA, UK & Sweden</p>	
	<p>Additional investigations.</p>	
<p>Complex features</p>	<p>Use at least three of these complex features:</p> <ul style="list-style-type: none"> • If functions • absolute referencing • sorts • lookup tables • validation techniques • drop-down boxes • protecting cells by hiding or locking 	<p>You will need to make sure that the evidence for the use of these is clear and properly documented.</p> <p>Recommended actions:</p> <p>Add a new column and use the 'If' function to generate a message "Large Population" if the population is greater than or equal to 20 million or "Small Population" if the population is less than 20 million. Later you will refine this to three categories.</p> <p>Sort the spreadsheet in descending order of population. Now sort it in ascending order of GDP(per capita)</p>

		<p>Implement a validation rule on the population column stipulating that the entries have a minimum value of 10000 and a maximum value of 1500 000 000. Try entering some valid and invalid data and 'screen shot' the computer response as evidence that the validation rule is effective. Impose a validation rule of your own choice to any other appropriate column and again provide evidence of its effect.</p>
<p>Advanced processing</p>	<p>Use at least two of the following:</p> <ul style="list-style-type: none"> • import/export to a database • macros • multi-level sorts • multiple if functions • user-interface form with control buttons • multiple sheets with links • headers / footers • pivot table 	<p>Recommended actions:</p> <p>Extend the 'If' function rule in the previous section to provide three possible messages: "Large Population" for populations greater than 50 million, "Medium Population" for populations from 10 million up to 50 million and "Small Population" for populations less than 10 million.</p> <p>Place headers and footers on your spreadsheet. The header should contain the text "Task 2 Spreadsheets & Software Modelling". The footer should contain your name followed by Chepstow Comprehensive School.</p>
	<p>Other things that will gain you marks:</p> <ul style="list-style-type: none"> • make sure your data is accurate (no mistakes) • make sure your data is plausible 	
<p>Look at mark scheme</p>		

Spreadsheets

This will help you with the section where you need to add formulas:

Note down the values for USA, UK and Sweden and state the values in your write up

Population increase after 1 year

= population/1000* (birth rate – death rate)

Population % increase

= population increase after 1 year / population

You should now investigate the effects on the percentage change in population of each country receiving 100 000 refugees/asylum seekers

Percentage change adding 100000 refugees

Put 100000 in any cell then

= population + that cell with 100000 in it

Note down the figures for USA, UK & Sweden. Has the effect of the extra population been significant?

Increase it by 200000

Note down the figures for USA, UK & Sweden. Has the effect of the extra population been significant?

So change the cell with 100000 to 200000

It should change the values automatically

Year 10 CIA Fact book Project

1. Design A Front cover for the project put your name, course and title of the project e.g. A project to gather data about different countries around the world and enter the data to create a spreadsheet for analysis
2. Look on www.cia.gov/cia/publications/factbook/
3. You need to produce a spreadsheet and find information from the website for 25 countries including UK, Japan, USA, Mexico, Nigeria, Thailand, Sweden, Brazil, Ecuador and Egypt and put under the following headings:

- Name of country
- Population
- Birth rate
- Death rate
- Life Expectancy (M)
- Life Expectancy (F)
- Life Expectancy Overall
- Capital City
- Literacy Rate
- Population Below Poverty
- GDP
- GDP (per capita)
- Internet users
- Government Type

You need to add two or your own e.g. Investment (gross fixed), Labour force, Unemployment rate, Public debt, Industrial production growth rate, Current account balance, Debt – external, Telephones - main lines in use, Airports, Heliports, Military manpower - military age, Unemployment rate, Independence, HIV/AIDS - adult prevalence rate, Total fertility rate
E.g.

	A	B	C	D	E	F	G
1	Name of Country		Population(millions)	Birth Rate			
2	Nigeria		137253133	38.24			
3							
4							

4. Make sure you Format your spreadsheet using
 - Font Styles – bold and italic
 - Coloured Text and Cells
 - Data Formatting
 - Cell Borders

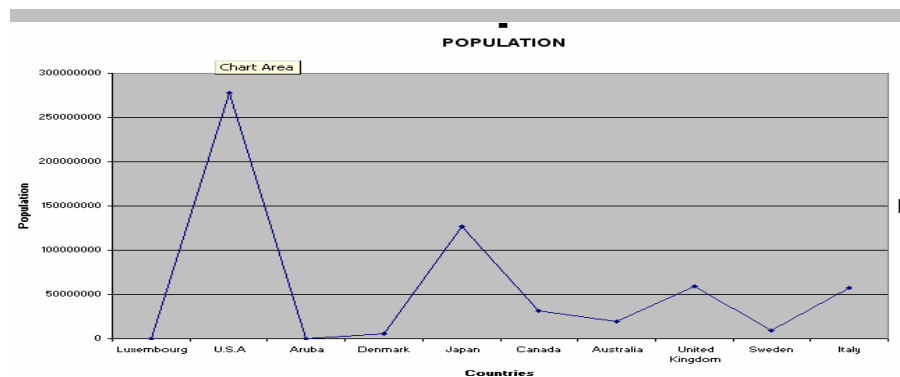
Make sure u print a copy of the spreadsheet

5. Use formulae to find out the

- Average population of the countries (divide by 25)
- Maximum population
- Minimum Population

	A	B	C
1	Name of Country	Population	Population- very large, large or small?
2	Luxembourg	442972	Small Population
3	U.S.A	278058881	Large Population
4	Aruba	70007	Small Population
5	Denmark	5352815	Small Population
7	Average Population	=SUM(B2:B5)	
8	Minimum Population	=MIN(B2:B5)	
9	Maximum Population	=MAX(B2:B5)	

- Find the average, minimum and maximum for the numeric columns such Birth rate, Internet users, death rate, literacy rate and so on
 - Print out the spreadsheet
 - Print out a copy showing formulas to get this view press ctrl +
 - Use the data on the graph to create a graph for the first 10 countries on the spreadsheet
- e.g.



- You must state the purpose of the graph e.g. to give a visual representation of the relative populations
- Produce a second graph of your choice on a stated purpose
- Need to carry out an investigation in which you must change the data put a new column called **Increase of population after 1 year** you need to use the formula below:

$$\text{Take the population figure for each country}/1000 * (\text{Birth Rate} - \text{Death Rate})$$

- Add a new column and change this formula to show the percentage increase in population rather than the actual increase. Note down the values for USA, UK and Sweden and state the values in your write up
Column called - Population increase after 1 year (%)

This can be calculated using the following formula

$\frac{\text{Population}}{\text{Population increase after 1 year}}$

14. In your report you have to explain the results of this investigation e.g. Does any of the countries have a decline in population. Make a note particularly of
15. UK, Sweden and the USA and put the values in the write up. Describe and carry out an investigation which involves changing a formula on the spreadsheet. You should now investigate the effects on the percentage change in population of each country receiving 100 000 refugees/asylum seekers. Change the formula in the new column to accommodate this but make sure that the additional 100 000 population comes from a cell reference (*N.B. place the number in any free cell e.g. B28 then refer to B28 in the formula rather than 100 000. This is to enable us to experiment with different values without having to change the formula every time*). Note down the figures for USA, UK & Sweden. Has the effect of the extra population been significant?

Make sure u print a copy of this with formulas

16. What if the refugee/asylum seeker numbers changed from 100 000 to 200 000? Change the data to study the effect of this. Again note down the figures for USA, UK & Sweden

Make sure u print a copy of this with formulas

17. Use at least **three** of these complex features:

- **If** functions
- absolute referencing
- sorts
- lookup tables
- validation techniques
- drop-down boxes
- protecting cells by hiding or locking

Add a new column and use the 'If' function to generate a message "Large Population" if the population is greater than or equal to 20 million or "Small Population" if the population is less than 20 million. Using the following formula

=IF (B2>20000000,IF(B2>20000000,"Large Population"," Medium Population"),"Small Population")

18. Sort the spreadsheet in descending order of population. Now sort it in ascending order of GDP(per capita)
19. Implement a validation rule on the population column stipulating that the entries have a minimum value of 10000 and a maximum value of 1500 000 000. Try entering some valid and invalid data and 'screen shot' the computer response as evidence that the validation rule is effective. Impose a validation rule of your own choice to any other appropriate column and again provide evidence of its effect.

GCSE ICT Portfolio Checklist	Marks	Done
Spreadsheet Modelling		
Create spreadsheet, use different data types such as number, text, currency	3	
Directory structure – explain and screenshot where work saved	1	
Check accuracy (spelling)	1	
Check plausibility (sensible, believable)	1	
Simple formulae	1	
Graphs with reasons	1	
Investigation with data change (what happens if I change this number?)	1	
Investigation with formula change (what happens if I change this formula?)	1	
Further investigation	1	
If statement with 2 outcomes	1	
Sort 2 times with reasons	1	
Apply validation rules 2 fields	1	
Extend If statement to 3 outcomes	1	
Insert Header/Footer	1	
General formatting and Design (design of spreadsheet, bold, italic, borders etc)	4	
Communicating Information		
Enter data (text & pics) into Powerpoint	3	
Directory structure	1	
Check accuracy (spelling)	1	
Check plausibility	1	
Summary of data in a word processor	1	
Apply formatting to text (bold, text alignment eg centering)	1	
Simple techniques such as apply borders, fill effects, frames, word art	1	
State purpose and audience of leaflet and print leaflet/poster	1	
State purpose and audience of main powerpoint and print leaflet/powerpoint	1	
Produce advertising poster or leaflet	1	
Add bullet points to a slide	1	
Add a table to a slide	1	
Add Internal & External hyperlinks to a slide	1	
Produce a macro to template a multiple choice question	1	
Add code to make a multiple choice question work	1	
General design & features (include boxes with font sizes, annotate features etc)	3	
Information Handling		
Enter data into database	3	
Directory structure	1	
Check accuracy	1	
Check plausibility	1	
2 x sorts of table with reasons	2	
2 x simple searches (queries) with reasons	2	
2 x complex searches(queries) with reasons	3	
Insert a calculated field on a report	1	
Insert a hyperlink field	1	
Design a data capture form	1	

Design a data structure form	1	
Impose validation rules on 2 fields	1	
Test database & validation rules	2	