

MATHEMATICS DEPARTMENT SEPT.2009SCHEME OF WORK FOR YEAR 10/11 –NEW GCSE STATISTICS AQA-4310 website (<http://www.aqa.org.uk>)

Any queries please contact Mrs. Evans Maths dept

At this time (09 onwards) we are entering sets for the GCSE AQA exam in Statistics. It is offered as an option for the two year course.

Students will be given the marking guidelines notes for the coursework at an appropriate time.

There is one compulsory piece of coursework that is worth 25%.

Time must be slotted into sections at an appropriate time. There are many alternative mini-projects.

ICT is an essential skill – the book has some chapters that have an ICT element – please follow through these- enlarging – or setting more work as necessary to help the students incorporate this into their coursework.

Statistics – YR 10 /11

New specifications from Sept 2009 –

- General approach replacing traditional CW with a **teacher-friendly approach to Controlled assessment.(see later notes)**
- Reducing exam to 2 hrs (Higher) and 1 ½ hours (Foundation)
- Shifting the focus of written papers away from calculation, towards interpretation and inference, giving a truer representation of modern, real, statistics.
- **Withdrawn the calculation of standardised rates**
- **Withdrawn mention of binomial and uniform distributions**

New content Sept 2009

- Dot plots
- Obtaining data from observations or experiments
- Output gap charts
- Interpreting a value of Spearman's rank Correlation Coefficient(SRCC)
- Multi-stage sampling
- Inter-decile range
- Consumer Price Index(CPI)
- Product Moment Correlation Coefficient(PMCC) interpretation only **not** calculation

Statistics – YR 10 /11

Break down of course-quick notes

Higher

Written paper 2 hours long -worth 100 marks – 75 % of the final grade. Compulsory questions with a combination of short answer, structured and free response questions. Some questions will include stimulus material and some require calculations. (There is more emphasise on interpretation in context compared to previous –just by looking at the ‘new’ specifications. Will amend as we work through)

Plus controlled CW – 40 marks in total. The split is 20 on the actual written pupil CW and the 20 marks on the controlled assessment.(45 mins)

Final Grades (D- A*)

Controlled assessment- the very ‘new’ part to the scheme.

The detailed notes can be found in the AQA specification/or on their website (<http://www.aqa.org.uk>)

- In class CW takes ONLY 5-6 hours – no redrafting/etc – as in previous schemes.
- **The teacher is not to annotate / mark the CW before the controlled test.**
- The task has to be available to be moderated at the end of the course –but is much shorter than previous syllabus.
- The CW carries 20 marks and **is marked by the teacher** using guidelines and a mark scheme from the Board.
- Complete CW when the pupils are practiced in the data handling cycle and relevant sections of the syllabus.
- The written assessment – worth 20 marks - **the pupil is allowed their copy of their CW on the exam desk** with no annotations. **They is not allowed any additional notes.**
- They make **one attempt only** on the controlled test.

Statistics – YR 10 /11-two year course largely based on Key Maths AQA version statistics
1. DATA COLLECTION (6-8 lessons) CHAPTER 1

<u>Approximate timings</u>	CONTENT and MAIN TEACHING OBJECTIVES (L 5-10)	TEACHER'S : DATE COMMENT/EVALUATION
To be completed by half term (Year 10)	<p><u>Section 1-Types of data</u> Types of data.</p> <p>Quantitative and qualitative data.</p> <p>Primary v. Secondary data.</p> <p><u>Section 2 - Sampling</u></p> <p>Sampling-population, Census Bias, Sample Random sample – from tables and show from the scientific calculator. Systematic sample Convenience sampling Stratified sampling Quota Cluster Control group Extraneous variables Estimating population size.</p> <p><u>Section 3 – Designing a questionnaire</u></p> <p>Asking the right questions. Experimental design They should be aware of pilot study – appears after the last ‘rule’.</p>	<p>EX. 1.1</p> <p>MINI-PROJECT – FAST HAND[AFL]</p> <p>SAMPLING -STARTER[AFL]</p> <p>EX.1.2 EX.1.3 EX.1.4</p> <p>EX.1.5 EX. 1.6 Mini-project-Do the ‘fishing’ from the ponds of –paper clips and pond of the drawing pins</p> <p>EX. 1.7 EX.1.8.</p> <p>EX.1.9</p> <p>EXAM QUESTIONS SUMMARY ICT - EXCEL</p>

Statistics – YR 10 /11

2. PRESENTATION OF DATA (7 lessons) CHAPTER 2

<u>Approximate timings</u>	CONTENT and MAIN TEACHING OBJECTIVES (L 5-10)	TEACHER'S : DATE COMMENT/EVALUATION
<u>To be completed by half term(Year 10) Assessment</u>	<p><u>Section 1- Presenting data</u></p> <p>Presentation of data Pictograms and bar charts Multiple bar-charts Composite bar charts Discrete and continuous data <u>Open-ended classes [Only new edition]</u> Level of accuracy [NOT bounds –that occurs later] <u>Choropleth maps[Only new edition]</u></p> <p><u>Section 2 – Line graphs and pie charts</u></p> <p>Drawing and interpreting line graphs Frequency polygons Pie-charts[They should only need revision] Comparative pie charts – teach them to memorise $R_1 = \frac{\sqrt{f_1}}{\sqrt{f_2}}$ $R_2 = \frac{\sqrt{f_2}}{\sqrt{f_1}}$ The above formula is easier to use than the textbook's method. Comparative pie charts-calculate the radius/or frequency from given information.</p>	<p>EX.2.1 EX.2.2</p> <p>EX.2.3</p> <p>EX.2.4</p> <p>EX.2.5 EX.2.6</p> <p>EX.2.7 EX.2.8</p> <p>EXAM QUESTIONS SUMMARY ICT –EXCEL</p>

3. AVERAGES (6 lessons) CHAPTER 3

<u>Approximate timings</u>	CONTENT and MAIN TEACHING OBJECTIVES (L 5-10)	TEACHER'S : DATE COMMENT/EVALUATION
October –Nov (Yr 10)	<p><u>Section 1-Choosing a representative figure</u> Calculating the mode, median and mean for a frequency distribution. Should only be revision – but do emphasise the formulas $X = \frac{\sum fx}{\sum f}$</p> <p>Calculating the mode, median and mean for a grouped frequency distribution of discrete data. Calculating the mode, median and mean for a grouped frequency distribution of continuous data</p> <p><u>Section 2 – Calculations involving the mean</u></p>	<p>EX. 3.1 EX.3.2</p> <p>EX.3.3</p> <p>EX.3.4</p> <p>EX.3.5 <u>MINI-PROJECT: TRAVEL TO SCHOOL[AFL]</u></p>

	<p>Calculations involving the mean</p> <p>Calculating a weighted mean $X = \frac{\sum wx}{\sum w}$</p> <p>Assumed mean [Only in new edition]</p> <p>Geometric mean [Only in new edition] only 1 question see p. 80 ,q10</p> <p><u>Section 3 - Estimation</u> Estimation Estimation of the population mean Estimation of the population proportion [Only the new text has $1/\sqrt{\text{sample size}}$ Must be taught. <u>Section 4 – Control charts</u> [Only in new edition] Control charts-very simple idea</p>	<p>EX. 3.6</p> <p>EX.3.7</p> <p>EX.3.8</p> <p>EX.3.9 EXAM QUESTIONS SUMMARY ICT-EXCEL</p>
--	---	--

4. MEASURES OF SPREAD
(6 lessons) CHAPTER 4

<u>Approximate timings</u>	<u>Approximate timings</u>	<u>Approximate timings</u>
Dec (Yr10) assessment	<p><u>Section 1 - Range</u> Range Finding the range of sets of numbers Median and quartiles Interquartile range Sem-interquartile range</p> <p><u>Section 2 – Cumulative frequency</u> Cumulative frequency Using c.f. to find the median and IQR Cumulative frequency diagrams Step polygons Using c.f. diagrams to find the median and IQR Percentiles and deciles.</p> <p><u>Section 3 – Standard deviation</u> Deviation from the mean Variance and standard deviation Alternative formula for the standard deviation Changing values of a set of data; the effect on the mean and standard deviation Finding the standard deviation from a frequency table Estimating the mean and standard deviation of grouped data.</p>	<p>EX.4.1 EX.4.2</p> <p>EX.4.3</p> <p>EX.4.4</p> <p>EX.4.5 EX.4.6 EX.4.7</p> <p>EXAM QUESTIONS SUMMARY ICT -EXCEL</p>

Statistics – YR 10 /11

5. PRESENTING DATA (6 Lessons) CHAPTER 5

<u>Approximate timings</u>	CONTENT and MAIN TEACHING OBJECTIVES (L 5-10)	TEACHER'S : DATE COMMENT/EVALUATION
Jan - Feb(Year 10) Assessment	<u>Section 1-Two-way tables</u> Defining two-way tables Designing and completing a two-way table <u>Section 2 – stem and leaf diagrams</u> Drawing a stem and leaf diagram Small numbers of stems Using the stem and leaf diagram Comparing two sets of data using back to back stem and leaf diagrams <u>Section 3 – Population pyramids</u> Drawing a population pyramid	EX.5.1 EX.5.2 EX.5.3 EX.5.4 EX.5.5 MINI-PROJECT – HANDSPAN v. FOOTSIZE[AFL] EX.5.6 MINI-PROJECT :TREES[AFL] MINI-PROJECT : LENGTH OF WORD. Young book v. Adult book[AFL] EXAM QUESTIONS SUMMARY

6. PROBABILITY (4 Lessons) CHAPTER 6

<u>Approximate timings</u>	CONTENT and MAIN TEACHING OBJECTIVES (L 5-10)	TEACHER'S : DATE COMMENT/EVALUATION
March –April(Year 10) Easter assessment	<u>Section 1- It all adds up to one</u> Probability scales Equally likely events Probability of an event Probabilities add up to one Discrete uniform distribution Sample space diagrams <u>Section 2 – Conditional probability</u> Finding conditional probabilities <u>Section 3 – Relative frequency</u> Finding relative frequencies Using graphs for relative frequencies Expected number	EX.6.1 EX.6.2 EX.6.3 EX.6.4 EX.6.5 EX.6.6 EX.6.8 EXAM QUESTIONS SUMMARY ICT-EXCEL

7. HISTOGRAMS (6 Lessons) CHAPTER 7

Approximate timings	CONTENT and MAIN TEACHING OBJECTIVES (L 6-10)	TEACHER'S : DATE COMMENT/EVALUATION
May (Year 10)	<u>Section 1- Drawing histograms</u> Equal class widths Unequal class widths Using rounded data Estimating the mode <u>Section 2 – The shape of a distribution</u> Symmetrical distributions Skewed distributions Bimodal distributions	EX.7.1 EX.7.2 EX.7.3 EX.7.4 EX.7.5 EXAM QUESTIONS SUMMARY

8. SHAPES OF DISTRIBUTIONS (6 Lessons) CHAPTER 8

Approximate timings	CONTENT and MAIN TEACHING OBJECTIVES (L 6-10)	TEACHER'S : DATE COMMENT/EVALUATION
June (Year 10) Summer assessment either June or July	<u>Section 1- Box and whisker diagrams</u> Drawing box and whisker diagrams The shape of a distribution Comparing sets of data Identifying outliers <u>Section 2 - The normal curve</u> The shape of a normal curve Calculating standardised scores Using standardised scores to compare distributions	EX.8.1 EX.8.2 EX.8.3 EX.8.4 EX.8.5 EX.8.6 EX.8.8 EXAM QUESTIONS SUMMARY

9. ERROR IN STATISTICS (5 Lessons) CHAPTER

Approximate timings	CONTENT and MAIN TEACHING OBJECTIVES (L 6-10)	TEACHER'S : DATE COMMENT/EVALUATION
Year11(Sept)	<u>Section1 – Errors in measurement</u> Accuracy of a measurement Lower and upper bounds Minimum and maximum values Relative error Percentage relative error <u>Section 2 – Misleading graphs</u> Labelling vertical scales Sloping lines Similar shapes in misleading graphs	EX.9.1 EX.9.2 EX.9.3 EX.9.4 EXAM QUESTIONS SUMMARY ICT - EXCEL

Statistics – YR 10 /11

10. TIME SERIES (6 Lessons) CHAPTER 10

<u>Approximate timings</u>	CONTENT and MAIN TEACHING OBJECTIVES (L 6-10)	TEACHER'S : DATE COMMENT/EVALUATION
Oct(Year11)	<u>Section 1 – Looking for trends</u> Time series Trend lines <u>Section 2 – Moving averages</u> Working out moving averages Seasonal variation Using moving averages to draw trend lines Using the trend line to estimate future values Mean seasonal effect	EX.10.1 EX.10.2 EX.10.3 EXAM QUESTIONS SUMMARY ICT - EXCEL

11. WEIGHTING (6 Lessons) CHAPTER 11

<u>Approximate timings</u>	CONTENT and MAIN TEACHING OBJECTIVES (L 6-10)	TEACHER'S : DATE COMMENT/EVALUATION
Nov (Year 11)	<u>Section 1 – Index numbers</u> Calculating index numbers Price index and percentage relative Using indices to find values Weightings Retail price index (RPI) <u>Section 2 – Birth and death rates</u> Crude death rates Crude birth rates Standard population Standardised death rate	EX.11.1 EX.11.2 EX.11.3 EX.11.4 EX.11.5 EX.11.6 EXAM QUESTIONS SUMMARY

12. FINDING PROBABILITIES (4 Lessons) CHAPTER 12

<u>Approximate timings</u>	CONTENT and MAIN TEACHING OBJECTIVES (L 6-10)	TEACHER'S : DATE COMMENT/EVALUATION
Dec(Year11) Mock	<u>Section 1 – Rules for finding probabilities</u> Independent events Probability of independent events Probability of an event happening more than once Mutually exclusive events Exhaustive events <u>Section 2 – Probability trees</u> Tree diagrams Tree diagrams for dependent events	EX.12.1 EX.12.2 EX.12.3 EX.12.4 EX.12.5 EX.12.6 EXAM QUESTIONS SUMMARY

Statistics – YR 10 /11

13. USING FACTORIALS (0 Lessons) CHAPTER 13

<u>Approximate timings</u>	CONTENT and MAIN TEACHING OBJECTIVES (L 7-10)	TEACHER'S : DATE COMMENT/EVALUATION
	This is no longer on the new scheme LEAVE OUT ALL OF THIS SECTION	

14. SCATTER DIAGRAMS (5 Lessons) CHAPTER 14

<u>Approximate timings</u>	CONTENT and MAIN TEACHING OBJECTIVES (L 6-10)	TEACHER'S : DATE COMMENT/EVALUATION
Go over the mock exam Jan (Year11)	<u>Section 1 – Scatter diagrams</u> Scatter diagrams Drawing the line of best fit Interpolation and extrapolation Types of correlation <u>Section 2 – The equation of the line of best fit</u> Finding the equation of the line of best fit <u>Section 3- Spearman's coefficient of rank correlation</u> The rank of an item The formula for Spearman's coefficient of rank correlation	EX.14.1 EX.14.2 [extra in new edition -EX.14.3] EX.14.4 (BUT EX.14.3 IN old text) EXAM QUESTIONS SUMMARY ICT - EDEXCEL

Statistics – YR 10 /11

15. COURSEWORK (25% of final mark) CHAPTER 15

<u>Approximate timings</u>	CONTENT and MAIN TEACHING OBJECTIVES (L 5-10)	TEACHER'S : DATE COMMENT/EVALUATION
Revise, before completing the CW Feb(Year11) Remaining time Timed assessments – prepare for the final exam. Many practice papers.	See Exam Board notes Step 1 – topic given by exam board – Brainstorm[AFL] The detailed notes can be found in the AQA specification/or on their website (http://www.aqa.org.uk) Step 2 – Form the hypotheses Step 3 – Collect the data Step 4 – Analyse the data Step 5 – Interpret the results Step 6 – Form conclusions and state the limitations	