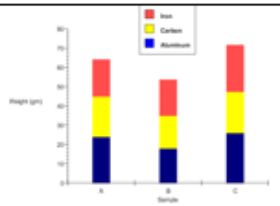
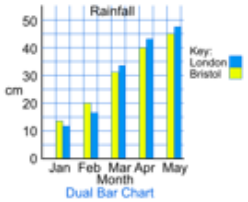
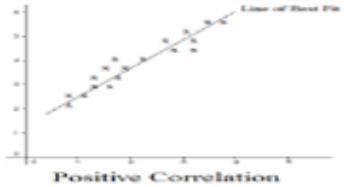
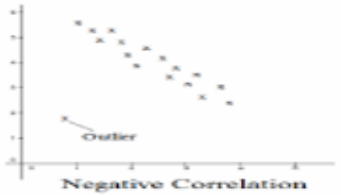
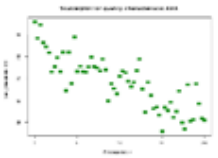
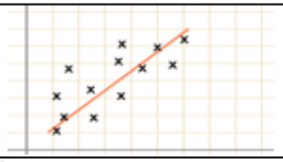
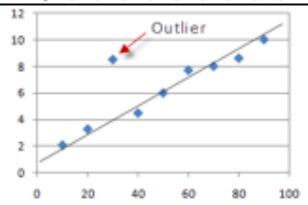
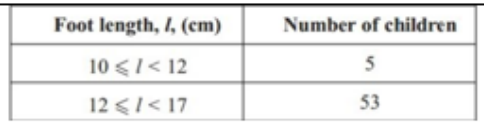
Exmouth Community College
Academy Trust

Year 8 Autumn 2

Unit 3 Statistics, graphs and charts

Topic/Skill	Definition/Tips	Example
1. Types of Bar Chart	**Compound/Composite** Bar Charts show data stacked on top of each other. **Comparative/Dual** Bar Charts show data side by side.	  Dual Bar Chart
2. Pie Chart	Used for showing **how data breaks down into** its constituent **parts**. When drawing a pie chart, **divide 360° by the total frequency**. This will tell you how many degrees to use for the frequency of each category. Remember to **label** the category that each sector in the pie chart represents.	 If there are 40 people in a survey, then each person will be worth 360÷40=9° of the pie chart.
3. Two Way Tables	A table that **organises data** around **two categories.** Fill out the information step by step using the information given. Make sure all the totals add up for all columns and rows.	**Question: Complete the 2 way table below.** | | Left Handed | Right Handed | Total | | Boys | 10 | | 58 | | Girls | | | | | Total | | 84 | 100 | **Answer: Step 1, fill out the easy parts (the totals)** | | Left Handed | Right Handed | Total | | Boys | 10 | *48* | 58 | | Girls | | | *42* | | Total | *16* | 84 | 100 | **Answer: Step 2, fill out the remaining parts** | | Left Handed | Right Handed | Total | | Boys | 10 | *48* | 58 | | Girls | *6* | *36* | *42* | | Total | *16* | 84 | 100 |
4. Correlation	Correlation between two sets of data means they are **connected** in some way.	There is correlation between temperature and the number of ice creams sold.

5. Positive Correlation	As one value **increases** the other value **increases**.	
6. Negative Correlation	As one value **increases** the other value **decreases**.	
7. Scatter Graph	A graph in which values of **two variables** are plotted along two axes to **compare** them and see if there is any **connection** between them.	
8. Line of Best Fit	A **straight line** that **best represents the data** on a scatter graph.	
9. Outlier	A value that 'lies outside' most of the other values in a set of data. An outlier is **much smaller or much larger** than the other values in a set of data.	
10. Types of Data	**Qualitative** Data – **non-numerical** data **Quantitative** Data – **numerical** data	Qualitative Data – eye colour, gender
11. Grouped Data	Data that has been **bundled in to categories**. Seen in grouped frequency tables, histograms, cumulative frequency etc.	
12. Mean	**Add** up the values and **divide** by how many values there are.	The mean of 3, 4, 7, 6, 0, 4, 6 is $\frac{3+4+7+6+0+4+6}{7} = 5$

Foot length, l, (cm)	Number of children
$10 \leqslant l < 12$	5
$12 \leqslant l < 17$	53

13. Mean from a Table	1. Find the midpoints (if necessary) 2. Multiply Frequency by values or midpoints 3. Add up these values 4. Divide this total by the Total Frequency If **grouped** data is used, the answer will be an **estimate**.	<table><tr><th>Height in cm</th><th>Frequency</th><th>Midpoint</th><th>F × M</th></tr><tr><td>$0 < h \leq 10$</td><td>8</td><td>5</td><td>8×5=40</td></tr><tr><td>$10 < h \leq 30$</td><td>10</td><td>20</td><td>10×20=200</td></tr><tr><td>$30 < h \leq 40$</td><td>6</td><td>35</td><td>6×35=210</td></tr><tr><td>Total</td><td>**24**</td><td>Ignore!</td><td>**450**</td></tr></table> **Estimated** Mean height: 450 ÷ 24 = 18.75cm

Try these

2 The table shows the results of a 7-a-side football tournament.

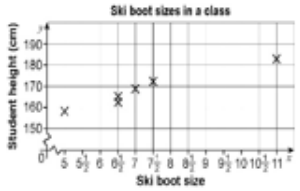
Number of goals scored	0	1	2	3	7
Number of teams	6	4	4	3	1

a Calculate the mean number of goals scored.

3 This two-way table shows the results of a survey about the amount of pocket money some children received per week. Complete the table

	0 < £ ≤ 1	1 < £ ≤ 5	5 < £ ≤ 10	Total
Boys		25		48
Girls	11	15		
Total	30		10	

b What type of correlation does the scatter graph show?



Year 8 Autumn 2

Unit 4 Expressions and equations

Topic/Skill	Definition/Tips	Example
1. Square Number	The number you get when you **multiply a number by itself**.	**1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225…** $9^2 = 9 \times 9 = 81$
2. Square Root	The **number you multiply by itself** to get another number. The reverse process of squaring a number.	$\sqrt{36} = 6$ because $6 \times 6 = 36$
3. Solutions to $x^2 =$ ….	**Equations** involving **squares** have **two solutions**, one **positive** and one **negative**.	Solve $x^2 = 25$ $x = 5 \text{ or } x = -5$ This can also be written as $x = \pm 5$
4. Cube Number	The number you get when you **multiply a number by itself and itself again**.	1, 8, 27, 64, 125… $2^3 = 2 \times 2 \times 2 = 8$
5. Cube Root	The **number you multiply by itself and itself again** to get another number. The reverse process of cubing a number.	$\sqrt[3]{125} = 5$ because $5 \times 5 \times 5 = 125$
6. Powers of…	The powers of a number are that **number raised to various powers**.	The powers of 3 are: $3^1 = 3$ $3^2 = 9$ $3^3 = 27$ $3^4 = 81$ etc.
7. Multiplication Index Law	When **multiplying** with the same base (number or letter), **add the powers**. $a^m \times a^n = a^{m+n}$	$7^5 \times 7^3 = 7^8$ $a^{12} \times a = a^{13}$ $4x^5 \times 2x^8 = 8x^{13}$
8. Division Index Law	When **dividing** with the same base (number or letter), **subtract the powers**. $a^m \div a^n = a^{m-n}$	$15^7 \div 15^4 = 15^3$ $x^9 \div x^2 = x^7$ $20a^{11} \div 5a^3 = 4a^8$
9. Brackets Index Laws	When raising a power to another power, multiply the powers together. $(a^m)^n = a^{mn}$	$(y^2)^5 = y^{10}$ $(6^3)^4 = 6^{12}$ $(5x^6)^3 = 125x^{18}$

10. Notable Powers	$\boldsymbol{p = p^1}$ $\boldsymbol{p^0 = 1}$	$99999^0 = 1$
1. Solve	To find the **answer**/value of something **Use inverse operations** on both sides of the equation (balancing method) until you find the value for the letter.	Solve $2x - 3 = 7$ Add 3 on both sides $2x = 10$ Divide by 2 on both sides $x = 5$
2. Inverse	**Opposite**	The inverse of addition is subtraction. The inverse of multiplication is division.

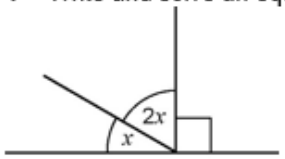
Try these

1 a **i** Write $2 \times 2 \times 2 \times 2 \times 2$ as a power of 2
ii Work out the answer to part **a i**.
b **i** Write n to the power of 3 in index form.
ii Write this as a product .

2 Solve these equations.
a $q + 4 = 11$
b $\frac{s}{4} = 3$

3 Solve these equations.
a $7v - 2 = 19$
b $\frac{3w}{4} = 24$

4 Write and solve an equation to find the size of angle x.



Year 8 – Maths / Unit 4 – HT2