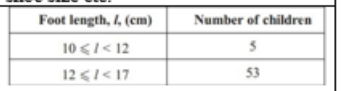
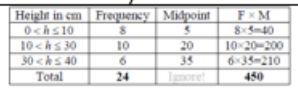
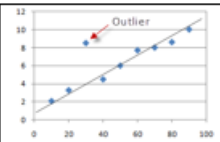
Year 7 Autumn 1

Unit 1 Analysing and displaying data

Topic/Skill	Definition/Tips	Example
1. Types of Data	**Qualitative** Data – **non-numerical** data **Quantitative** Data – **numerical** data **Continuous** Data – data that can take **any numerical value** within a given range. **Discrete** Data – data that can take **only specific values** within a given range.	Qualitative Data – eye colour, gender etc. Continuous Data – weight, voltage etc. Discrete Data – number of children, shoe size etc.
2. Grouped Data	Data that has been **bundled in to categories**. Seen in grouped frequency tables, histograms, cumulative frequency etc.	 Foot length, l, (cm) | Number of children $10 \leqslant l < 12$ | 5 $12 \leqslant l < 17$ | 53
3. Primary /Secondary Data	**Primary** Data – **collected yourself** for a specific purpose. **Secondary** Data – **collected by someone else** for another purpose.	Primary Data – data collected by a student for their own research project. Secondary Data – Census data used to analyse link between education and earnings.
4. Mean	**Add** up the values and **divide** by how many values there are.	The mean of 3, 4, 7, 6, 0, 4, 6 is $\frac{3+4+7+6+0+4+6}{7} = 5$
5. 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**.	 Height in cm | Frequency | Midpoint | F × M $0 < h \leq 10$ | 8 | 5 | 8×5=40 $10 < h \leq 30$ | 10 | 20 | 10×20=200 $30 < h \leq 40$ | 6 | 35 | 6×35=210 Total | **24** | [ignore] | **450** **Estimated** Mean height: 450 ÷ 24 = 18.75cm
6. Median Value	The **middle** value. Put the data in order and find the middle one. If there are **two middle values**, find the number half way between them by **adding them together and dividing by 2**.	Find the median of: 4, 5, 2, 3, 6, 7, 6 Ordered: 2, 3, 4, **5**, 6, 6, 7 Median = 5
7. Median from a Table	Use the formula $\frac{(n+1)}{2}$ to find the position of the median. n is the total frequency.	If the total frequency is 15, the median will be the $\left(\frac{15+1}{2}\right) = 8th$ position
8. Mode /Modal Value	**Most** frequent/common. Can have more than one mode (called bi-modal or multi-modal) or no mode (if all values appear once)	Find the mode: 4, 5, 2, 3, 6, 4, 7, 8, 4 Mode = 4
9. Range	**Highest value subtract the Smallest value** Range is a 'measure of spread'. The smaller the range the more consistent the data.	Find the range: 3, 31, 26, 102, 37, 97. Range = 102-3 = 99

10. 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.	
11. Lower Quartile	**Divides the bottom half** of the data into **two halves**. $\mathbf{LQ} = Q_1 = \frac{(n+1)}{4}\,\boldsymbol{th}$ **value**	Find the lower quartile of: 2, **3**, 4, 5, 6, 6, 7 $Q_1 = \frac{(7+1)}{4} = 2nd$ value → 3
12. Lower Quartile	**Divides the top half** of the data into **two halves**. $\mathbf{UQ} = Q_3 = \frac{3(n+1)}{4}\,\boldsymbol{th}$ **value**	Find the upper quartile of: 2, 3, 4, 5, 6, **6**, 7 $Q_3 = \frac{3(7+1)}{4} = 6th$ value → 6
13. Interquartile Range	The **difference** between the **upper quartile and lower quartile.** $IQR = Q_3 - Q_1$ The **smaller** the **interquartile range**, the **more consistent** the data.	Find the IQR of: 2, 3, 4, 5, 6, 6, 7 $IQR = Q_3 - Q_1 = 6 - 3 = 3$

Try these

1. Here is a list of the numbers of bags some shoppers were carrying when leaving a supermarket.
   1 2 5 4 0 5 4
   a Find the median.
   b Work out the mean.
   c Work out the range.
2. Here are the lengths of some lines measured with a ruler.
   4 cm 7 cm 11 cm 7 cm 1 cm
   a Work out the mean.
   b Work out the range.
3. Here are the ages in years of some people in a sports club.
   8 12 25 18 30 23 35 33 28 18
   9 18 22 10 21 15 29 31 20 23

Complete this grouped frequency table using intervals of equal width.
The first interval has been done for you.

Age (years)	Tally	Frequency
0–9		

4. Students in two classes did a test.
   The mean for class A was 56 and the range was 28
   The mean for class B was 75 and the range was 10
   Make two comparisons between class A and Class B.

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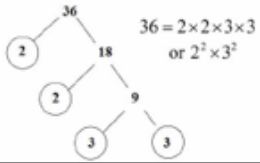
Unit 2 Number Skills

Topic/Skill	Definition/Tips	Example
1. Integer	A **whole number** that can be positive, negative or zero.	$-3, 0, 92$
2. Decimal	A number with a **decimal point** in it. Can be positive or negative.	$3.7, 0.94, -24.07$
3. Negative Number	A number that is **less than zero**. Can be decimals.	$-8, -2.5$
4. Addition	To find the **total**, or **sum**, of two or more numbers. 'add', 'plus', 'sum'	$3 + 2 + 7 = 12$
5. Subtraction	To find the **difference** between two numbers. To find out how many are left when some are taken away. 'minus', 'take away', 'subtract'	$10 - 3 = 7$
6. Multiplication	Can be thought of as **repeated addition**. 'multiply', 'times', 'product'	$3 \times 6 = 6 + 6 + 6 = 18$
7. Division	Splitting into equal parts or groups. The process of calculating the **number of times one number is contained within another one**. 'divide', 'share'	$20 \div 4 = 5$ $\frac{20}{4} = 5$
8. Remainder	The amount '**left over**' after dividing one integer by another.	The remainder of $20 \div 6$ is 2, because 6 divides into 20 exactly 3 times, with 2 left over.
9. Multiple	The result of multiplying a number by an integer. The **times tables** of a number.	The first five multiples of 7 are: 7, 14, 21, 28, 35
10. Factor	A number that **divides exactly** into another number without a remainder. It is useful to write factors in pairs	The factors of 18 are: 1, 2, 3, 6, 9, 18 The factor pairs of 18 are: 1, 18 2, 9 3, 6
11. Lowest Common Multiple (LCM)	The **smallest** number that is in the **times tables** of each of the numbers given.	The LCM of 3, 4 and 5 is 60 because it is the smallest number in the 3, 4 and 5 times tables.
12. Highest Common Factor (HCF)	The **biggest** number that **divides exactly** into two or more numbers.	The HCF of 6 and 9 is 3 because it is the biggest number that divides into 6 and 9 exactly.

13. Prime Number	A number with **exactly two factors**. A number that can only be divided by itself and one. The number **1 is not prime**, as it only has one factor, not two.	The first ten prime numbers are: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29
14. Prime Factor	A factor which is a prime number.	The prime factors of 18 are: 2, 3
15. Product of Prime Factors	Finding out which **prime numbers multiply** together to make the **original** number. Use a **prime factor tree.** Also known as 'prime factorisation'.	 $36 = 2 \times 2 \times 3 \times 3$ or $2^2 \times 3^2$

Try these

1. Find 48 × 100
2. Work out 384 ÷ 4
3. Work out £38 + £2.16 + 42p.
4. Write all the factor pairs of 18
5. Find the lowest common multiple (LCM) of 15 and 20
6. Write down the value of
   a 7^2

   b $\sqrt{100}$
7. The height of the highest mountain in Scotland is 1344 metres.
   The height of the highest mountain in England is 978 metres.
   Work out the difference between these two heights.
8. Some of the factors of 182 are prime numbers.
   Find one of these numbers.