Knowledge Grid. Mathematics- Year 8

Week From 39-week plan	**Tier 3 Vocabulary with key definitions** **Tier 3 words** are subject-specific, used within a particular field. For example, the language of scientists, mathematicians, historians, and literary critics. For maths, this includes words like 'denominator', while science lessons might require learners to understand 'homeostasis'.	**Substantive Knowledge** The specific, factual concepts needed for the topic or subject. (Detail for each included in lesson resources)	**Common Misconceptions** Any idea that students do not accurately understand when studying this content, concept or subject. (Updated live by teachers when misconceptions occur)
1 2 3	**Ratio & Scale** **Ratio-** A ratio compares the sizes of two or more values. **Proportion**- A part, share or number considered in relation to a whole **Divide in a ratio**- Share a quantity into two or more parts so that the shares are in a given ratio. **Simplify**- Rewrite in a simpler form so that the values in each part of the ratio are as small as possible. **Equivalent**- Numbers or expressions that are written differently but are always equal in value, **Factor**- a Positive integer that divides exactly into another positive integer. **Highest common factor**- the greatest number that is a factor of every one of a set of numbers. **Diameter**- the distance from one point on a circle to another point on a circle through the centre. **Radius**- the distance from the centre of a circle to a point on the cicle. **Circumference**- The distance around the edge of a circle. **Gradient**- the steepness of a line.	How to represent ratio in a variety of forms. How to solve ratio problems when the token is known. The links between ratios and fractions. How to write ratios in their simplest form. How to solve ratio problems when one of the shares is known. How to apply ratios to other areas of mathematics.	Not a misconception as such but there is the possibility that students end up with a fairly procedural and superficial understanding of ratio rather than a powerful, deep and flexible understanding. Students should be exposed to a range of representations to help avoid this. Being unclear that the colon should be pronounced 'to' Students not appreciating that the order in ratio matters When simplifying ratios- students only looking to divide the parts of the ratio by 2 and if both parts are not divisible by it then claiming that it cannot be simplified. Leaving parts of the ratio as non-integer values when simplifying ratios. Not appreciating that when writing in the form 1:n parts of ratios can take integer values Students thinking that the '2' in the ratio 2:3 represents 2/3 of a whole (easily avoided with effective representations).
4 5 6	**Multiplicative Change** **Conversion-** Changing from one form to another. E.g. from a percentage to a decimal, from centimetres to metres or from pounds to dollars. **Direct Proportion** - two quantities are in direct proportion when as one increases or decreases, the other increases or decreases at the same rate **Enlargement-** Making a shape bigger or smaller **Proportion**- A part, share or number considered in relation to a whole **Ratio-** A ratio compares the sizes of two or more values. **Scale factor-** How much a shape has been enlarged by. Scale factors are multiplicative.	How to solve problems using direct proportion. How to convert between different units of currency. How to use conversion graphs. The mathematical meaning of the word 'similar'. How to draw and interpret scale diagrams. How to find distances using maps.	Conversion graphs- students not drawing horizontal and vertical lines when reading off them (crucial in order to obtain method marks in examinations) Seeing conversions as additive rather than multiplicative. E.g. £1=$1.50 so to convert from pounds to dollars add 50. Seeing enlargement as a process that only makes shapes bigger. Students struggling with the meaning of map scales without units e.g. 1:10000. Students need to appreciate that all this means is that lengths on a map are 10000 times smaller than lengths in the real world. Students will

	Similar- Two shapes are similar if their corresponding sides are in the same ratio		need to be confident in converting between metric units in order to be successful with this step.
7 8	**Multiply & Divide Fractions** **Commutative** - when an operation can be done in any order **Convert** - change from one form to another, for example a percentage to a decimal **Denominator** - the bottom number in a fraction, it shows how many equal parts one whole has been divided into **Divide** - to split into equal groups or parts **Estimate** - an approximate answer or to give an approximate answer **Expression** - often in a different form **Factor** - a number that divides exactly into another **Non-unit Fraction** - a fraction with a numerator greater than 1 **Numerator** - the top number in a fraction that shows the number of parts **Reciprocal** - the number found by dividing 1 by a given number. The product of a number and its reciprocal is always 1 **Simplify** - rewrite in a simpler form, for example rewrite 8 x 8 as 8^2 **Term** - in algebra, a single number or variable, or numbers and variables combined by multiplication **Unit Fraction** - a fraction with a numerator of 1	How to represent multiplication of fractions. How to multiply a fraction by an integer. How to divide an integer by a fraction. How to divide a fraction by a fraction. Multiplying and dividing improper fractions and mixed numbers. Working with algebraic fractions	• Some students may think that when multiplying fractions, they should add the numerators and denominators, rather than multiplying them. • Some students may think that dividing fractions is the same as multiplying them or may confuse the "invert and multiply" rule. • Students may either forget to simplify the fractions before multiplying or dividing, or they might think they have to simplify only after performing the operation. • Some students may not properly convert mixed numbers into improper fractions before performing the division. • Some students might confuse dividing by a whole number with dividing by a fraction and fail to multiply the fraction by the reciprocal of the whole number. • Some students may mistakenly apply the "multiply and simplify" rule for both multiplication and division with fractions and whole numbers. • Some students may not fully grasp what a reciprocal is and when to use it, especially in division. They might not see that dividing by a fraction requires multiplying by the reciprocal of that fraction. • After dividing or multiplying fractions, students may not always simplify their answers into either an improper fraction or mixed number, depending on the context.
9 10 11	**Working in the Cartesian Plane** **Ascending** - increasing in size. **Axis** - a line on a graph that you can read values from. **Coordinate** - a number or ordered pair used to describe the position of a point **Curve** - a line on a graph showing how one quantity varies with respect to another **Descending** - decreasing in size. **Diagonal** - a line that is neither horizontal nor vertical; in quadrilaterals, a line segment that joins two opposite vertices **Direct Proportion** - two quantities are in direct proportion when as one increases or decreases, the other increases or decreases at the same rate **Equation** - a statement with an equal sign, which states that two expressions are equal in value **Equidistant** - at the same distance from **Gradient** – the steepness of the line. **Graph** - a diagram showing how values change. **Linear** - forming a straight line **Mean** - the result of sharing the total of the data equally between them in an ordered list	The equations of lines parallel to the axes. How to work with lines in the form $y = kx$. How to link graphs to direct proportion problems. How to work with graphs that have equations of the form $y = x + a$ Non-linear graphs. How to find the midpoint of a line segment. Graphs with a negative gradient.	• Some students may confuse the x-axis (horizontal axis) with the y-axis (vertical axis), especially when given coordinate points like (x,y)(x, y)(x,y). • Students may plot points incorrectly by mixing up the order of coordinates or misplacing them on the graph. • Some students may struggle with negative coordinates, thinking that a negative x or y value means a movement in the wrong direction. • Students might not recognize that the Cartesian plane is divided into four quadrants with different signs for the coordinates in each quadrant. • Some students may struggle to understand the origin as the point where the x-axis and y-axis intersect, or they might confuse the origin with other points on the grid. • Students may incorrectly interpret the scale on the axes, especially if the intervals between numbers on the axes are not uniform. • Some students may mix up the equation of a line with its graphical representation or struggle with the idea of plotting a linear equation.

	Midpoint- the point halfway between two points **Multiple**- the result of multiplying a number by a positive integer. **Negative**- numbers less than zero. **Non-Linear** - not forming a straight line **Origin** - the point where the x-axis and y-axis meet (0, 0) **Parallel** - always the same distance apart and never meeting **Quadrant** - one of the four sections made by dividing an area with an x-axis and a y-axis **Ratio** - a ratio compares the sizes of two or more values **Scale** - the ratio of the length in a drawing or a model to the actual object **Sequence** - a list of items in a given order, usually following a rule **Substitute** - to replace letters with numerical values **Symmetrical** - when one half of a shape is the mirror image of the other		• Students may struggle with understanding the slope-intercept form of an equation (y=mx+c), especially the meaning of the slope (m) and y-intercept (c). • Some students may believe that the slope of a line must always be a whole number. • Some students may mistakenly think that the slope between two points represents the distance between them, or they may confuse the rise and run with distance. • Some students may be unsure how to represent horizontal or vertical lines in the Cartesian plane.
12 13	**Representing Data** **Axis** - a reference line on a graph **Class interval** - the range of data in each group **Continuous** - data that is measured **Coordinate** - a number or ordered pair used to describe the position of a point **Correlation** - a connection between two or more things **Decrease** - to make something smaller **Discrete** - data that can only take certain values **Estimate** - an approximate answer or to give an approximate answer **Non-linear** - not forming a straight line **Origin** - the point where the x-axis and y-axis meet (0, 0) **Outlier** - a value that differs significantly from the others in a data set **Qualitative data** - data that describes with words **Quantitative** - numerical data **Range -** the difference between the greatest value and the smallest value in a set of data **Relationship** **Scale** - the ratio of the length in a drawing or a model to the actual object **Variable** - a numerical quantity that might change, often denoted by a letter, for example x or t	How to draw and interpret scatter graphs. How to read and interpret frequency tables. How to represent data in two way tables. Different types of data.	Not checking which variable is represented on which axis. Belief that a line of best fit must go through the origin / every point. Not “using the graph” to make an esitmate. Extrapolating when not appropriate. Believing that the is no relationship between variables because their isn't a linear correlation. Not using inequalities for grouping continuous data.
14	**Tables and Probability** **Intersection** - the set containing all the elements of A that also belong to set B. **Outcome** - the possible result of an experiment **Probability** - how likely an event is to occur **Product** - the result of a multiplication **Sample space** - the set of all possible outcomes or results of an experiment **Set** - a collection of objects or numbers	How to construct a sample space diagram for one or more events. How to find probabilities from two way tables and Venn diagrams. How to use the product rule to find the total number of possible outcomes.	Giving probabilities as words rather than values. Choosing the incorrect region from the Venn diagram. Not considering regions outside Venn diagrams when writing sets or probabilities.

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	Two-way table - this displays two sets of data in rows and columns **Union** - the set containing all the elements of A or B or both A and B		
15	**<u>Revision and Assessment</u>**		
16 17 18	**<u>Brackets, Equations and Inequalities</u>** **Coefficient** a number in front of a variable, for example for 4x the coefficient of x is 4 **Equivalent** numbers or expressions that are written differently but are always equal in value **Expand** multiply to remove brackets from an expression **Expression** a collection of terms involving mathematical operations **Factor** a positive integer that divides exactly into another positive integer **Factorise** put an expression in brackets by taking out the highest common factors. **Highest Common Factor** the greatest number that is a factor of every one of a set of numbers **Identity** a statement that is true no matter what the values of the variables are **Inequality** a comparison between two quantities that are not equal to each other **Like Terms** terms with the same variable and power **Product** the result of multiplying two numbers or variables **Simplify** rewrite in a simpler form for example rewrite 8 x h as 8h **Solution** a value you can substitute in place of the unknown in an equation to make it true **Solve** find a value that makes an equation true **Subject** single variable that everything else is equal to **Substitute** to replace letters with numerical values **Term** in algebra, a single number or variable, or a number and variable combined by multiplication and division; in sequences, one of the members of a sequence	How to form and use algebraic expressions. How to expand single brackets. How to expand a pair of binomials. How to factorise an expression. How to form and solve equations and inequalities. How to solve an equation involving brackets. How to solve equations and inequalities with unknowns on both sides. The difference between formulae, equations and identities.	Some students may not fully grasp why brackets are used in equations. They may see brackets as just a grouping tool and not realize that they indicate the operations that should be completed first. For example, in the expression $5+(2\times3)$5+(2 |times 3)5+(2×3), students might incorrectly evaluate $5+2\times35+2$ |times 35+2×3 first, not recognizing the need to do the multiplication before addition. When students are asked to expand expressions like $3(4+x)$, they may forget to distribute the number outside the bracket to each term inside. A common mistake would be something like $3\times4+3$, forgetting to multiply 3 by both 4 and x, and getting an incorrect answer like $12+x$. It's essential that students remember to multiply everything inside the bracket by the term outside. Students sometimes mistakenly treat variables as if they are numbers rather than placeholders. For example, in the equation 2x+4=10, a student might incorrectly treat the x as a 1 or something similar, leading to errors when solving for x. They might also struggle with understanding how to isolate variables correctly. When solving inequalities, students might apply the same rules as for equations. For example, when dividing or multiplying by a negative number, they might forget that they need to **reverse the inequality sign**. For instance, in -2x<6, students might divide both sides by -2 and incorrectly get $-3x<-3$ instead of $x>-3$. Inequality symbols can confuse students, especially when comparing values. For instance, they might mix up $\geq$ and $\leq$, or misinterpret the meaning of $>$ and <, leading to mistakes in how they approach solutions. Some might also struggle with understanding what solutions to inequalities look like on a number line or in interval notation. When working with equations that involve negative numbers, students might fail to correctly apply the negative sign. Confusing expression and equation
19	**<u>Sequences</u>** **Constant** not changing	How to generate a sequence given in words. How to describe a sequence.	

	Geometric Sequence a sequence is geometric if the value of each successive term is found by multiplying or dividing the previous term by the same number **Linear** forming a straight line. **Linear Sequence** a sequence whose terms are increasing or decreasing by a constant difference **Non-Linear** not forming a straight line **Sequence** a list of items in a given order, usually following a rule **Term** in algebra, a single number or variable, or a number and variable combined by multiplication and division; in sequences, one of the members of a sequence **Term-to-Term** a rule that describes how you get from one term of a sequence to the next	How to generate a sequence using a simple algebraic rule. How to find out whether a given number is in a sequence. How to generate a sequence using a complex algebraic rule. How to find the rule for the nth term of a sequence	
20	**<u>Indices</u>** **Base** the number that gets multiplied when using a power/index **Coefficient** a number in front of a variable, for example for 4x the coefficient of x is 4 **Expression** a collection of terms involving mathematical operations **Index/Indices** an index number (or power) tells you how many times to multiply a number by itself **Power (or exponent)** this is written as a small number to the right and above the base number, indicating how many tines to use the number in a multiplication **Simplify** rewrite in a simpler form for example rewrite 8 x h as 8h **Term** in algebra, a single number or variable, or a number and variable combined by multiplication and division; in sequences, one of the members of a sequence	How to add and subtract expressions with indices. How to use the addition law of indices. How to use the subtraction law of indices. How to simplify powers of powers.	Students might struggle with understanding that any number raised to the power of 0 is **1** and any number raised to the power of 1 is the number itself Multiplying/dividing base numbers Applying the rules even when base numbers are not equal Students sometimes think that negative indices mean the result is negative or that the negative exponent should simply flip the sign of the number. When raising a bracket to a power, students may forget that they need to apply to everything in the brackey. When a expression is in a bracket with more than one term they may forget that they need to expand the bracket this many times. Eg $(x + 2)^2 = (x + 2)(x + 2)$ **not** $x^2 + 2^2$
21	**<u>Standard Form</u>** **Base** the number that gets multiplied when using a power/index **Index/Indices** an index number (or power) tells you how many times to multiply a number by itself **Power (or exponent)** this is written as a small number to the right and above the base number, indicating how many tines to use the number in a multiplication **Standard (index) form-**A number written in the form $a \times 10^n$ where A is at least 1 and less than 10 and n is an integer	How to work with large numbers in standard form. How to work with decimal numbers in standard form. How to compare numbers in standard form. How to use standard form in real-life contexts with and without a calculator. The meaning of fractional and negative powers.	Students may struggle to grasp that **standard form** is always written as $a \times 10^n$, where a is a number between 1 and 10, and n is an integer (positive or negative). When converting numbers to standard form, students sometimes make mistakes with how powers of 10 work Forgetting to adjust numbers when not written in correct standard form In problems involving multiplication or division with numbers in standard form, students might struggle with the rules for multiplying and dividing the powers of 10. For example, in multiplying $(2 \times 10^3) \times (3 \times 10^4)$, students might fail to correctly apply the rule$a \times b \times 10^m \times 10^n = ab \times 10^{m+n}$, leading to errors in their calculations.

	Commutative- when an operation can be done in any order **Reciprocal**- the number found by dividing 1 by a given number. The product of a number and its reciprocal is always 1		Lots of misconceptions when adding/subtracting standard form with different indices
22 23	**<u>Fractions and Percentages</u>** **Decrease** – to make something smaller **Equivalent –** numbers or expressions that are written differently but are always equal in value **Increase** – to make something larger **Loss** – if you buy something and then sell it for a smaller amount **Multiplier** – a number you multiply by **Original (value)** - a value before a change takes place **Profit** – if you buy something and then sell it for a higher amount **VAT (Value Added Tax)** - in the UK, VAT is currently added as a further 20% of the value of an item	How to convert between fractions decimals and percentages. How to work with percentages greater than 100%. How to increase and decrease by a given percentage. How to express one number as a fractional percentage of another. How to work out percentage change. How to find the original number given the result of a percentage change.	1/3 = 0.3, and other similar misconceptions, arise from failure to adequately approach equivalence problems. Guides should include division methods shown to convert from a fraction to a decimal. Students regularly fail to understand the significance of denominators. 13/25 on a test is a better score than 5/10, for example, but students often see this as 'student A got 12 incorrect, student B only got 5 incorrect' and misunderstand the problem. Use of a calculator, including decimal multipliers and the percentage button, should be addressed. 24.7%, for example, is often incorrectly entered as 24.7 since this already contains a decimal. Understanding why we use 0.247 here ("percent means 'out of 100'") should be reinforced. This should have been addressed in Year 7 but may resurface if not fully mastered. Percentage increase/decrease problems should be addressed in context, for example a decrease of 150% is incorrect and should not be asked for. Students get hung up on '(change/original) x 100', both in reference to which the 'original' amount is and also whether this is represents an increase or decrease.
24 25	**<u>Number Sense</u>** **Continuous** – data that is measured **Discrete** – data that can only take certain values **Estimate** – an approximate answer or to give an approximate answer **Power** – this is written as a small number to the right and above the base number, indicating how many times to use the number in a multiplication e.g. the 5 in 2^5 **Significant Figure** – the most important digit(s) in a number that give you an idea of its size	How to round numbers to a given number of significant figures. The difference between significant figures and decimal places. How to solve problems with money. How to convert metric units. How to perform calculations involving time. How to work with calendars. How to convert units of area and volume.	It is important when rounding to avoid the phrase "round down" as this can lead to misconceptions. "When estimating, round to one significant figure"; this commonly used phrase causes issues in other areas of Maths, for instance when calculating a mean from a grouped frequency table students are told to 'estimate the mean', and this does NOT require rounding of values. Errors when rounding to one decimal place versus one significant figure occur frequently, teachers should consider which numbers they use as input/guides to avoid misconceptions.
26	**<u>Revision and Assessment</u>**		
27 28	**<u>Angles in Parallel Lines and Polygons</u>**	How to find missing angles on a line and at a point.	Students regularly forgetting basic angle facts e.g. Angles on a straight line and around a point.

29	**Adjacent -** Next to each other. **Vertically opposite -** Angles opposite each other when two lines cross. **Alternate -** A pair of angles between a pair of parallel lines on opposite sides of the transversal. **Co-Interior -** Pair of angles between a pair of parallel lines on the same side of the transversal. **Corresponding –** A pair of angles in matching positions compared with the transversal. **Transversal** A line that crosses at least two other lines. **Bisect -** To cut in half. **Construct -** Draw accurately using a ruler and compasses. **Diagonal –** A line that is neither horizontal nor vertical; In quadrilaterals, a line segment that joins two opposite vertices. **Isosceles –** Having two sides the same length. **Exterior angle -** An angle between the side of a shape and a line extended from the adjacent side. **Interior angle -** An angle on the inside of a shape. **Polygon –** A closed 2D shape with straight sides. **Regular Polygon -** Polygon whose sides are all equal in length and whose angles are all equal in size. **Proof -** An argument that shows that a statement is true. **Equidistant -** At the same distance from.	The rules for angles between parallel lines and a transversal. How to solve complex angle problems. The properties of special quadrilaterals. How to prove geometrical facts. How to construct angle bisectors and perpendicular bisectors how to work out interior and exterior angles of a polygon.	Angles in parallel line rules – students regularly fail to remember the name of each rule and their concepts. Misconception of Co-Interior Angles and angles on a straight line. Students forget that they can make links there with co-interior angles totalling 180 degrees. Common misconceptions arise with angles in polygons and students struggle to remember the formula (n-2) x180. Definitions of Interior and Exterior – students can often remember what they mean but forget how to find them or what the sums of interior/ exterior angles are. Adjacent – A key word that is used in various areas of Geometry topics and that students continuously forget the meaning of. Differences between Regular and Irregular Polygons and their properties. Constructions – We often see misconceptions arise when students misuse Protractors. They can read the wrong numbers and forget which way they should be measuring.
30 31 32	**<u>Area of Trapezium and Circles</u>** **Area -** The space inside a 2D shape. **Formula –** A rule connecting variables written with mathematical symbols. **Perpendicular height -** The height of a shape measured at a right angle to the base. **Sector -** Part of a circle formed by two radii and a fraction of the circumference. **Radius -** The distance from the centre of the circle to a point on the circle. **Diameter -** The distance from one point on a circle to another point on the circle through the centre. **Pi -** Pronounced "pie" and written using the symbol π. It is the ratio of the circumference of a circle to its diameter. **Compound shape -** Also known as a composite shape, this is a shape made up of two or more other shapes.	How to calculate the area of rectangles triangles and parallelograms. How to calculate the area of a trapezium. How to find the area of a circle with and without a calculator. How to calculate the area and perimeter of a compound shape.	Lots of common misconceptions around naming parts of circles. Still very commonly mis-answered in exams. Students regularly fail to remember geometry formulae from basic area of a triangle to area of a circle to area of a sector etc. Students commonly forget which part of the circle they need to use within their formula and substitute incorrect numbers e.g. using the circumference for area etc. Common misconceptions around slanted heights being used instead of perpendicular heights. This can be seen in a variety of shapes – parallelograms, triangles, trapeziums etc. Students can often struggle with finding the area of a shape by counting squares. This is classed as an easy and basic skill but still lots of students getting these wrong in exams when shapes have half squares etc.
33	**<u>Line Symmetry and Reflection</u>** **Line of symmetry -** a line that cuts a shape exactly in half **Regular -** a shape that has equal sides and equal angles **Polygon -** a closed 2-D shape with straight sides	Recognising lines of symmetry. How to reflect shapes in horizontal and vertical lines.	• Students may think that reflection and rotation are the same thing. For example, they might believe that reflecting a shape over a line will result in a shape that looks the same as rotating it by 180

	Equilateral – having all it's sides the same length **Isosceles -** having two sides the same length	How to reflect shapes in diagonal lines.	degrees, when in fact the two are different transformations. A reflection creates a mirror image, whereas rotation turns a shape around a fixed point. • Some students might struggle to identify the line of symmetry in a shape, thinking that it's any line that divides a shape into two parts, rather than the specific line where one half is a mirror image of the other. For example, with a square, students might incorrectly think that any diagonal can be considered a line of symmetry, instead of recognizing that the two diagonals are the only valid lines of symmetry for a square. • Students may mistakenly believe that a shape can only have one line of symmetry. For example, when working with a rectangle, they might think it only has one line of symmetry (the vertical one), not recognizing that it also has a horizontal line of symmetry. • A common misconception is that every shape must have one or more lines of symmetry. Students might assume that irregular shapes always have symmetry, when in fact, many irregular shapes do not have any lines of symmetry at all. For example, a scalene triangle or an irregular quadrilateral may not have any lines of symmetry. • When reflecting a shape, students might not pay attention to the orientation of the shape. For example, after reflecting a letter (like "P") over a vertical line, students may forget that the letter has flipped horizontally and appears as "backwards," which is an important detail for the accuracy of the reflection. • Students sometimes struggle with how to position points after a reflection, especially when reflecting shapes across non-vertical or non-horizontal lines. For example, if a shape is reflected over a diagonal line, students might struggle to understand that the distance from the point to the line of symmetry should be the same on both sides of the line.
34 35 36	**<u>Data Handling Cycle</u>** **Questionnaire -** a list of questions to gather information **Biased -** unfair	How to set up a statistical inquiry. How to draw and interpret various charts and graphs.	• Some students might not appreciate the importance of accurate and consistent data collection. For example, if students collect data in a sloppy or haphazard manner (e.g., asking biased or poorly-worded survey questions), they may believe the analysis stage will still work, even if the data is not reliable. • A common misconception is that any type of graph or chart can be used to represent any kind of data. For example, students might use a pie chart to display data that would be more effectively shown

			as a bar chart (e.g., comparing numerical values) or line graph (e.g., showing trends over time), without considering the most suitable method of representation. • Students may overlook the presence of outliers (values that are significantly higher or lower than the rest of the data), either by mistakenly excluding them or not understanding their impact on the analysis. They might think all data points are equally important, even if a few outliers can significantly skew the results or give a misleading picture of the data.
37	**<u>Measures of Location</u>** **Average-** a number representing the typical value of a set of data **Mean**- the result of sharing the total of the data equally between them in an ordered list **Median** - the middle halfway between two others **Mode** - the item which appears most often in a set of data **Estimate -** an approximate answer or to give an approximate answer **Midpoint-** the point halfway between two points **Modal class** - the class in a set of grouped data that contains the highest frequency **Outlier-** a value that differs significantly from the others in a data set **Range**- the difference between the greatest value and the smallest value in a set of data **Consistent**- Data that is unchanging	How to identify the mode of a set of data. When it is appropriate to use each type of average. How to find averages from frequency tables. How to identify outliers. How to compare distributions.	The mode is simply the most frequent value in a data set. In some cases, it can be misleading because it doesn't necessarily represent the typical or central tendency of the data. For instance, if a dataset has several values that occur with the same highest frequency, there might be multiple modes (bimodal or multimodal distributions). The median is the middle value when the data is ordered, but if there's an even number of values, the median is the average of the two middle numbers, not just one of them. The range is simply the difference between the highest and lowest values, but it can be misleading because it is highly influenced by outliers or extreme values. A large range doesn't necessarily indicate that the data points are widely spread out — it could just be that one or two extreme values are skewing the measure. The mean can be heavily influenced by outliers and skewed data. For instance, in income data, a few very high incomes could make the mean significantly higher than what most people earn. In these cases, the median might provide a more representative measure of central tendency. People often think that estimation is just a random guess, but it's actually a process of making an informed approximation based on rounding. Estimation involves using known information and applying a method (like rounding numbers) to arrive at a reasonable answer, rather than simply pulling a figure out of nowhere.
39	**<u>Review Week</u>**		