

Year 7

Autumn 1	Number and Proportion How does the base 10 system work? How do vectors show positive and negative numbers on a number line? How do I round to decimal places and significant figures? How do I find the median of a set of numbers? How do I convert between different metric units? Maritime: Can I read ocean depth measurements and distances using place value and units? Eco Futures: Can I interpret large environmental data sets (e.g. global temperatures, emissions)? Careers: Can I use place value when working with data in finance, engineering, and science? Addition and subtraction How do I find the perimeter of a shape? How do I find a missing angle on a straight line or around a point? How do I calculate the mean of a set of numbers? Maritime: Can I calculate journey distances and fuel usage for ships? Eco Futures: Can I calculate total and remaining energy use or carbon emissions? Careers: Can I apply addition and subtraction in budgeting, stock control, and logistics?
Autumn 2	Multiplication and division How can I select the best strategies to multiply and divide? What is a highest common factor? What is a lowest common multiple? Can I use the application of multiplication and division in area and volume problems? Maritime: Can I calculate speed (distance ÷ time) for vessels? Eco Futures: Can I calculate total energy usage or population growth? Careers: Can I use multiplication/division in engineering, retail pricing, and construction? Powers and roots How do I write an integer as a product of its prime factors? What are exponents and roots? What are prime and composite numbers? Why is index notation useful? Maritime: Can I interpret scale and scientific measurements used in ocean science? Eco Futures: Can I model exponential growth such as population or pollution? Careers: Can I use powers in science, computing, and financial modelling?
Spring 1	Order of operations How do I correctly do the order of operations with the four operators? How do I correctly do the order of operations that include brackets and exponents? Maritime: Can I solve navigation calculations accurately using correct order? Eco Futures: Can I correctly calculate environmental formulas using multiple steps? Careers: Can I follow multi-step calculations in programming, finance, and engineering? Directed Number How do I add and subtract with directed numbers? How do I multiply and divide with directed numbers? Where do we use negative numbers outside the classroom? Maritime: Can I interpret sea level changes and elevations (above/below sea level)? Eco Futures: Can I analyse temperature changes above and below zero? Careers: Can I use directed numbers in finance (profit/loss) and science?
Spring 2	Fractions How do I find fraction of amounts? What is a sneaky one? How do I add and subtract fractions? How do I multiply fractions? What is the reciprocal and how does it relate to dividing by a fraction? Maritime: Can I calculate proportions of cargo or fuel used on a journey? Eco Futures: Can I use fractions in environmental contexts such as land use? Careers: Can I use fractions in cooking, construction, and manufacturing?
Summer 1	FDP equivalence Can I find a percentage using a decimal multiplier? How can I convert a fraction to a decimal? What does the word percentage mean? What is a terminating decimal? Maritime: Can I compare fuel efficiency or cargo percentages? Eco Futures: Can I analyse percentages in environmental change? Careers: Can I apply percentages in finance (interest, discounts, tax)? Introduction to algebra How do I simplify an expression? How do I substitute numbers into an expression? What is a variable? What is an expression? Maritime: Can I model relationships such as speed, distance and time? Eco Futures: Can I represent environmental patterns using algebra? Careers: Can I use algebra in coding, engineering, and economics?
Summer 2	Manipulating and simplifying expressions Can I set up an algebraic expression? Can I simplify indices and coefficients when multiplying and dividing terms? Can I tell the difference between an expression and an equation? Maritime: Can I calculate the fuel usage of a ship to help make our shipping more environmentally friendly? Eco Futures: Can I calculate my electricity output in my home to reduce help reduce my carbon footprint? Careers: Can I use algebraic expressions in computer programming?

Year 8

Autumn 1	Estimation and use of a scientific calculator Can I convert between units of time using a calculator? Can I calculate an upper or lower bound given a degree of accuracy? Maritime: Can I estimate journey times and fuel needs efficiently? Eco Futures: Can I estimate environmental impact using rounded data? Careers: Can I use estimation to check accuracy in engineering and finance? Drawing and measuring angles; construction How can I label lines and angles? Which scale do I use on a protractor? Can I construct a perpendicular bisector? Can I construct simple 'Loc'i based on specific rules? Maritime: Can I use bearings and angles for navigation at sea? Eco Futures: Can I use maps to analyse environmental regions? Careers: Can I apply construction skills in architecture and engineering? Expanding and Factorising Can I expand single and double brackets? Describe why factorise is the opposite of expand? Maritime: Can I rearrange formulas used in navigation calculations? Eco Futures: Can I model growth and changes in environmental systems? Careers: Can I use algebraic manipulation in engineering and data science?
Autumn 2	Linear Equations How does the 'balancing method' solve equations? How do I solve one and two-step equations? Maritime: Can I solve equations linking speed, distance, and time? Eco Futures: Can I model environmental changes using equations? Careers: Can I solve problems in finance, engineering, and computing? Proportional reasoning What is the difference between direct and inverse proportion? How can I use a decimal multiplier to calculate a percentage change? Maritime: Can I scale maps and calculate fuel consumption rates? Eco Futures: Can I calculate proportional increases in emissions or energy use? Careers: Can I use proportions in design, medicine dosing, and business?
Spring 1	Polygons and Angles How many line angle facts are there? How can I find the exterior and interior angles of polygons? Can I find a bearing using angle rules? Maritime: Can I use bearings and angles for routes at sea? Eco Futures: Can I analyse shapes in land use and mapping? Careers: Can I apply angle rules in construction and surveying?
Spring 2	Discrete Data and Continuous Data Can I describe the difference between discrete and continuous? How can I distinguish between mean, median, mode and range? Maritime: Can I analyse shipping or ocean data sets? Eco Futures: Can I analyse carbon footprint data? Careers: Can I interpret data in healthcare, business, and research?

Year 9

Summer 1	Ratio Can I express relationships as ratios? Can I simplify ratios including those that include fractions and scaling upto fractions? Can I use unit ratio in context such as maps and scale drawing? Can I convert between fractions and ratios and between ratios and fractions? Can I find the value of parts of a ratio given other parts or the whole? Maritime: Can I compare cargo loads or fuel mixtures? Eco Futures: Can I compare resource use ratios? Careers: Can I use ratios in engineering and design? Formulae Can I evaluate expressions and formulae by substitution, including inputs and outputs? Can I write formulae in words and letters, including SDT/DMV/PFA? Can I generate sequences from formulae? Can I rearrange linear formulae? Maritime: Can I apply formulas for navigation? Eco Futures: Can I use formulas to model environmental processes? Careers: Can I use formulas in science and engineering? Bivariate data & Time Series Can I write the data handling cycle, using data to address a hypothesis, overview of the types of data and ask good questions? Do I know the difference between categorical (qualitative) data and frequency tables? Can I draw graphical representations of discrete numerical data - vertical line, bar charts, pie charts, pictograms? Can I use measures of central tendency of ungrouped data - mean, mode and median, from lists and from a frequency table? Can I use the measures of spread - range, interquartile range and identify outliers? Can I compare data sets through graphs, central tendency and spread? Maritime: Can I interpret shipping data? Eco Futures: Can I analyse climate data? Careers: Can I use statistics in research and business?
Summer 2	Cartesian Grid Can I draw an accurate Cartesian grid and plot 2D coordinates in four quadrants? Can I express number relationships graphically, as a means of picturing the relationship? Can I plot quadratic number relationships on a Cartesian grid given the algebraic form of the relationship? Can I read values of variables from a graph (including quadratic, piecewise linear, exponential and reciprocal graphs)? Can I draw and recognise graphs of y=n and x=n? Can I use the gradient and y-intercept of a line to write the equation in the form y = mx+c; Can I identify parallel lines from their equations? Maritime: Can I read navigation and ocean graphs? Eco Futures: Can I interpret climate graphs? Careers: Can I use graphs in business and science?
Autumn 1	Area Can I define area? Can I find the area of triangles and quadrilaterals? Can I find the area of compound shapes? Can I solve problems involving area? Can I find the area of a circle? Maritime: Can I calculate areas of ports and sea regions? Eco Futures: Can I calculate land use such as forests? Careers: Can I use area in construction and architecture? Introduction to Sequences Can I generate terms of a sequence from term-to-term and position to term rules; find missing terms in a sequence? Can I find and use the nth term of an arithmetic (linear) sequence? Can I recognise common sequences (triangular numbers, square numbers, cube numbers, Fibonacci-style sequences)? Can I work with visual and algebraic representations of arithmetic sequences? Maritime: Can I identify patterns in tides? Eco Futures: Can I model environmental patterns? Careers: Can I use sequences in coding?
Autumn 2	Linear Inequalities Can I represent single (e.g. x>3) and double (e.g. 3<x<5) linear inequalities on a number line? Can I solve single linear inequalities in one variable, represent the solution(s) on a number line and algebraically using set notation? Can I solve compound linear inequalities in one variable, representing the solution(s) on a number line? Can I set up inequalities from contexts? Can I represent inequalities involving only x or y by shading on a graph? Maritime: Can I represent safe operating conditions? Eco Futures: Can I model safe pollution limits? Careers: Can I use constraints in finance and engineering? Standard form Can I convert large and small numbers in standard form? Can I convert from 'almost standard' form to standard form? Can I compare numbers in standard form (and "almost standard" form)? Can I add and subtract in standard form, by converting to normal form and by using distributivity? Can I multiply and divide in standard form (using commutativity)? Maritime: Can I work with ocean data and distances? Eco Futures: Can I express very large/small environmental data? Careers: Can I use standard form in science and computing?
Spring 1	Contextual graphs Can identify important sections of general "real-life" graphs, interpreting y-intercepts as a fixed value/charge, etc, and gradient as a rate of change in context? Can I draw and read from and extrapolating from conversion graphs? Can I use distance-time graphs, including finding the average speed, and the speed of a section as the gradient of the line? Can I use Velocity-time graphs, including finding the acceleration as the gradient and displacement as the area under the graph? Maritime: Can I analyse distance-time graphs for ships? Eco Futures: Can I interpret environmental graphs? Careers: Can I interpret graphs in transport and science? Introduction to Probability Can I systematically list and use the product rule for counting? Can I record, describe and analyse the frequency of outcomes of simple probability experiments? Can I formalise language and notation, calculating theoretical probability? Can I generate theoretical sample spaces, including systematic listing of combinations and outcomes, and use these to calculate probabilities? Can I record outcomes and possibilities using frequency trees, two-way tables and simple Venn diagrams? Maritime: Can I assess risk in sea travel? Eco Futures: Can I predict environmental events? Careers: Can I use probability in finance and insurance?
Spring 2	Congruence and Similarity Do I understand the concept of congruence? Can I draw and identify translations, reflections and rotations of shapes? Can I draw and identify combinations of transformations? Do I understand the concept of similarity? Can I identify scale factors when finding dimensions of similar shapes? Can I draw and identify enlargements of shapes with positive, negative and fractional scale factors? Can I identify and prove congruent triangles? Maritime: Can I use a scale model of a ship to test the stability, resistance and fuel efficiency of the real thing? Eco Futures: Can I calculate how much a scale factor can increase energy direction by increasing the size of a solar panel? Careers: Can I use congruence in civil engineering to test if bridges and roads fit exactly?
Summer 1	Right-Angled Triangles Can I use Pythagoras' Theorem in 2D to find missing sides? Can I prove a triangle is right-angled with Pythagoras' Theorem? Can I use Pythagoras' Theorem to find the distance between two points? Can I use trigonometric ratios to find missing sides and angles in right-angled triangles? Can I recall the exact values of sin, cos and tan for angles of 0, 30, 45, 60, 90? Can I solve problems involving Pythagoras and trigonometry? Maritime: Can I calculate the shortest distance between two points at sea using Pythagoras Theorem? Eco Futures: Can I use trigonometry to calculate the angles of blades in wind turbines to maximise their efficiency? Careers: Can I use Pythagoras to work out the exact sizes of roof beams? Circles Can I recall the names of the parts of circles? Can I find the area and circumference of a circle and parts of circles? Can I express answers in terms of Pi? Can I solve problems with the circumference and area of a circle? Can I identify and use circle theorems? Maritime: Can I calculate the area of a propeller blade to maximise its effectiveness? Eco Futures: Can I work out the water flow in a pipe through its circumference? Careers: Can I calculate the best angle of transmission when using satellite and communication systems?
Summer 2	Advanced Proportion and Rates of Change Can I find the original value after a percentage change or given a percentage of it? Can I calculate simple interest? Can I work direct linear proportion numerically, graphically and algebraically? Can I calculate with compound units such as speed, density and pressure? Maritime: Can I understand calculations using pressure for understanding underwater pressures on submarines and hulls? Eco Futures: Can I use compound units to help analyse energy efficiency (e.g. fuel consumption, renewable energy output)? Careers: Can I calculate speed and fuel efficiency when working in logistics and transport?