

Essential Mathematics

EP Curriculum Map

Unit 1: Number, Data and Graphs

Fundamental Topic: Calculations

Calculations

Content Descriptor	Lesson Names
solve practical problems requiring basic number operations	<ul style="list-style-type: none"> Order of Operations Using Formulas
apply arithmetic operations according to their correct order	<ul style="list-style-type: none"> Order of Operations
ascertain the reasonableness of answers to arithmetic calculations	<ul style="list-style-type: none"> Rounding Sensibly
use leading-digit approximation to obtain estimates of calculations	<ul style="list-style-type: none"> Leading Digit Approximation
use a calculator for multi-step calculations	<ul style="list-style-type: none"> Order of Operations
check results of calculations for accuracy	<ul style="list-style-type: none"> Rounding Sensibly Consequences of Rounding
recognise the significance of place value after the decimal point	<ul style="list-style-type: none"> Thousandths and Beyond
evaluate decimal fractions to the required number of decimal places	<ul style="list-style-type: none"> Thousandths and Beyond
round up or round down numbers to the required number of decimal places	<ul style="list-style-type: none"> Introduction to Rounding Rounding to Decimal Places Rounding Negative Numbers Rounding to Significant Figures
apply approximation strategies for calculations.	<ul style="list-style-type: none"> Rounding Sensibly Rounding Based on Given Values Consequences of Rounding

Topic 1: Number

Ratios

Content Descriptor	Lesson Names
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demonstrate an understanding of the fundamental ideas and notation of ratio	<ul style="list-style-type: none"> • Ratios
understand the relationship between fractions and ratio	<ul style="list-style-type: none"> • Ratios • Scales and Locations on Maps
express a ratio in simplest form using whole numbers	<ul style="list-style-type: none"> • Ratios
find the ratio of two quantities in its simplest form	<ul style="list-style-type: none"> • Ratios
divide a quantity in a given ratio [complex]	<ul style="list-style-type: none"> • Ratios
use ratio to describe simple scales [complex].	<ul style="list-style-type: none"> • Ratios • Scales and Locations on Maps

Rates

Content Descriptor	Lesson Names
review identifying common usage of rates, including km/h	<ul style="list-style-type: none"> • Rates
convert between units for rates	<ul style="list-style-type: none"> • Rates
complete calculations with rates, including solving problems involving direct proportion in terms of rate [0 complex]	<ul style="list-style-type: none"> • Rates
use rates to make comparisons	<ul style="list-style-type: none"> • Rates • Cost per Item
use rates to determine costs.	<ul style="list-style-type: none"> • Rates • Cost per Item • Best Buys Using Unit Costs • When a Best Buy isn't the Best Option

Percentages

Content Descriptor	Lesson Names
calculate a percentage of a given amount	<ul style="list-style-type: none"> • Percentage of an Amount • Finding the Original Amount • Converting Between Fractions, Decimals and Percentages
determine one amount expressed as a percentage of another for same units	<p><i>Coming Soon</i> We want to work with you! If you are interested in partnering with EP to develop this topic, please contact ben.hilliam@educationperfect.com with an expression of interest.</p>
determine one amount expressed as a percentage of another for different units [complex]	
apply percentage increases and decreases in situations, including mark-ups, discounts and GST [complex]	<ul style="list-style-type: none"> • Increasing or Decreasing by a Percentage

determine the overall change in a quantity following repeated percentage changes [complex]	<ul style="list-style-type: none"> Percentage Change Mixed Applications of Percentages
calculate simple interest for different rates and time periods [complex].	<ul style="list-style-type: none"> Introduction to Interest Calculating Simple Interest Rearranging the Simple Interest Formula

Topic 2: Representing Data

Classifying Data

Content Descriptor	Lesson Names
identify examples of categorical data	<ul style="list-style-type: none"> Types of Data
identify examples of numerical data.	<ul style="list-style-type: none"> Types of Data

Data Presentation and Interpretation

Content Descriptor	Lesson Names
display categorical data in tables and column graphs	<ul style="list-style-type: none"> Displaying Data Tallies and Tables
display numerical data as frequency distribution tables, dot plots, stem-and-leaf plots and histograms	<ul style="list-style-type: none"> Displaying Data Tallies and Tables Stem and Leaf Plots Histograms
recognise and identify outliers from a dataset	<ul style="list-style-type: none"> Outliers
compare the suitability of different methods of data presentation in real-world contexts [complex].	<ul style="list-style-type: none"> Displaying Data Pick Your Display Method

Topic 3: Graphs

Reading and Interpreting Graphs

Content Descriptor	Lesson Names
interpret information presented in graphs, such as step graphs, column graphs, pie graphs, picture graphs, conversion graphs of calories \leftrightarrow kilojoules, line graphs using units of energy to describe consumption of electricity, including kilowatt hours	<ul style="list-style-type: none"> Misleading Data and Graphs Dot Plots and Column (Bar) Graphs Line Graphs Pie Charts and Divided Bar Graphs
interpret information presented in two-way tables	<ul style="list-style-type: none"> Two-Way Tables Using Two-Way Tables
discuss and interpret tables and graphs, including misleading graphs found in the media and in factual	<ul style="list-style-type: none"> Misleading Data and Graphs Misleading Reports

texts [complex].

Drawing Graphs

Content Descriptor	Lesson Names
determine which type of graph is best used to display a dataset	<ul style="list-style-type: none"> • Displaying Data • Pick Your Display Method
use spreadsheets to tabulate and graph data [complex]	<i>Further development planned</i>
draw a line graph to represent any data that demonstrates a continuous change, such as hourly temperature [complex].	<ul style="list-style-type: none"> • Line Graphs • Analysing Travel Graphs • Plotting and Reading Travel Graphs

Using Graphs

Content Descriptor	Lesson Names
use graphs in practical situations	<ul style="list-style-type: none"> • Analysing Travel Graphs • Water Evaporation Graphs • Plotting and Reading Travel Graphs
interpret graphs in practical situations [complex]	<ul style="list-style-type: none"> • Analysing Travel Graphs • Water Evaporation Graphs • Plotting and Reading Travel Graphs
draw graphs from given data to represent practical situations [complex]	<ul style="list-style-type: none"> • Water Evaporation Graphs • Plotting and Reading Travel Graphs
interpret the point of intersection and other important features (x - and y -intercepts) of given graphs of two linear functions drawn from practical contexts [complex].	<ul style="list-style-type: none"> • Analysing Linear Graphs

Fundamental Topic: Calculations

Calculations

Content Descriptor	Lesson Names
solve practical problems requiring basic number operations	<ul style="list-style-type: none"> • Order of Operations • Using Formulas
apply arithmetic operations according to their correct order	<ul style="list-style-type: none"> • Order of Operations
ascertain the reasonableness of answers to arithmetic calculations	<ul style="list-style-type: none"> • Rounding Sensibly
use leading-digit approximation to obtain estimates of calculations	<ul style="list-style-type: none"> • Leading Digit Approximation

use a calculator for multi-step calculations	<ul style="list-style-type: none"> • Order of Operations
check results of calculations for accuracy	<ul style="list-style-type: none"> • Rounding Sensibly • Consequences of Rounding
recognise the significance of place value after the decimal point	<ul style="list-style-type: none"> • Thousandths and Beyond
evaluate decimal fractions to the required number of decimal places	
round up or round down numbers to the required number of decimal places	<ul style="list-style-type: none"> • Introduction to Rounding • Rounding to Decimal Places • Rounding Negative Numbers • Rounding to Significant Figures
apply approximation strategies for calculations.	<ul style="list-style-type: none"> • Rounding Sensibly • Rounding Based on Given Values • Consequences of Rounding

Essential Mathematics: Unit 2

Fundamental Topic: Calculations

Calculations

Content Descriptor	Lesson Names
solve practical problems requiring basic number operations	<ul style="list-style-type: none"> • Order of Operations • Using Formulas
apply arithmetic operations according to their correct order	<ul style="list-style-type: none"> • Order of Operations
ascertain the reasonableness of answers to arithmetic calculations	<ul style="list-style-type: none"> • Rounding Sensibly
use leading-digit approximation to obtain estimates of calculations	<ul style="list-style-type: none"> • Leading Digit Approximation
use a calculator for multi-step calculations	<ul style="list-style-type: none"> • Order of Operations
check results of calculations for accuracy	<ul style="list-style-type: none"> • Rounding Sensibly • Consequences of Rounding
recognise the significance of place value after the decimal point	<ul style="list-style-type: none"> • Thousandths and Beyond
evaluate decimal fractions to the required number of decimal places	<ul style="list-style-type: none"> • Thousandths and Beyond
round up or round down numbers to the required number of decimal places	<ul style="list-style-type: none"> • Introduction to Rounding • Rounding to Decimal Places

	<ul style="list-style-type: none"> • Rounding Negative Numbers • Rounding to Significant Figures
apply approximation strategies for calculations.	<ul style="list-style-type: none"> • Rounding Sensibly • Rounding Based on Given Values • Consequences of Rounding

Topic 1: Managing Money

Earning Money

Content Descriptor	Lesson Names
find earnings, including salary, wages, overtime, piece-work and commission	<ul style="list-style-type: none"> • Salaries and Wages • Alternative Sources of Income • Commission • Retirement • Piecework • Royalties • Overtime, Special rates and Allowances • Timesheets • Applying Government Benefits: The Life of Matilda
convert between annual, monthly, fortnightly, weekly and hourly rates of earning [complex]	<ul style="list-style-type: none"> • Salaries and Wages • Alternative Sources of Income • Commission • Piecework • Royalties • Overtime, Special rates and Allowances • Government Benefits and Allowances • Timesheets • Applying Government Benefits: The Life of Matilda
understand the purpose of superannuation	<ul style="list-style-type: none"> • Income in Retirement
interpret entries on a selection of wage or salary pay slips and timesheets	<ul style="list-style-type: none"> • Salaries and Wages • Timesheets
understand the purpose of taxation and the use of tax file numbers	<ul style="list-style-type: none"> • Goods and Services Tax • Income Tax
use tax tables to determine PAYG tax for periodic (weekly/fortnightly/monthly) earnings [complex]	<p><i>Coming Soon - Jan 2021</i> We want to work with you! If you are interested in partnering with EP to develop this topic, please contact ben.hilliam@educationperfect.com with an expression of interest.</p>
interpret entries on a simple PAYG summary	
apply the concepts of taxable income, gross income, allowable deductions and levies in simple contexts [complex]	

calculate a simple income tax return and net income using current income tax rates [complex].

Budgeting

Content Descriptor	Lesson Names
investigate the costs involved in independent living [complex]	<ul style="list-style-type: none"> Budgeting Making a Budget Review: Budgeting Extended Investigation: Preparing a Personal Budget
prepare a personal budget plan [complex].	

Topic 2: Time and Motion

Time

Content Descriptor	Lesson Names
use units of time and convert between fractional, decimal and digital representations	<ul style="list-style-type: none"> Recording Time Digital Clocks
represent time using 12-hour and 24-hour clocks	<ul style="list-style-type: none"> Clocks
calculate time intervals, including time between, time ahead, time behind	<ul style="list-style-type: none"> Duration Time Zones
interpret timetables for buses, trains and/or ferries	<ul style="list-style-type: none"> Reading Timetables Timetables Personal Timetables Using Multiple Timetables
use several timetables and/or electronic technologies to plan the most time-efficient routes	<ul style="list-style-type: none"> Using Multiple Timetables
interpret complex timetables, such as tide charts, sunrise charts and moon phases [complex]	<i>Coming Soon</i> We want to work with you! If you are interested in partnering with EP to develop this topic, please contact ben.hilliam@educationperfect.com with an expression of interest.
compare the time taken to travel a specific distance with various modes of transport.	

Distance

Content Descriptor	Lesson Names
use scales to find distances, e.g. on maps	<i>Coming Soon</i> We want to work with you! If you are interested in partnering with EP to develop
investigate distances through trial and error or	

systematic methods [complex]	this topic, please contact ben.hilliam@educationperfect.com with an expression of interest.
apply directions to distances calculated on maps including the eight compass points in relation to the rising and setting of the sun: N, NE, E, SE, S, SW, W, NW [complex].	

Speed

Content Descriptor	Lesson Names
identify the appropriate units for different activities, e.g. walking, running, swimming, driving and flying	<i>Coming Soon</i> We want to work with you! If you are interested in partnering with EP to develop this topic, please contact ben.hilliam@educationperfect.com with an expression of interest.
use units of energy used for foods, including calories	
use units of energy to describe the amount of energy in activity, including kilojoules.	
calculate speed, distance or time using the formula, speed = distance / time	
calculate the time and costs for a journey from distances estimated from maps, given a travelling speed [complex]	
calculate average speed	<ul style="list-style-type: none"> Included in Unit 1 Topic 3
interpret distance-versus-time graphs, including reference to the steepness of the slope (or average speed) [complex].	

Topic 3: Data Collection

Census

Content Descriptor	Lesson Names
investigate the procedure for conducting a census	<ul style="list-style-type: none"> What is Sampling?
investigate the advantages and disadvantages of conducting a census [complex].	

Surveys

Content Descriptor	Lesson Names
understand the purpose of sampling to provide an estimate of population values when a census is not used	<ul style="list-style-type: none"> What is Sampling?

investigate the different kinds of samples [complex]	<ul style="list-style-type: none"> Types of Sampling: Probability Sampling Types of Sampling: Non-Probability Sampling
investigate the advantages and disadvantages of these kinds of samples [complex].	

Simple Survey Procedure

Content Descriptor	Lesson Names
identify the target population to be surveyed	<i>Coming Soon</i> We want to work with you! If you are interested in partnering with EP to develop this topic, please contact ben.hilliam@educationperfect.com with an expression of interest.
investigate questionnaire design principles, including simple language, unambiguous questions, consideration of number of choices, issues of privacy and ethics, and freedom from bias [complex].	<ul style="list-style-type: none"> Sampling Errors Analysing Sampling in Reports

Sources of Bias

Content Descriptor	Lesson Names
describe the faults in the process of collecting data	<ul style="list-style-type: none"> Sampling Errors Analysing Sampling in Reports Statistics in Organisations
describe sources of error in surveys, including sampling error and measurement error	
investigate the possible misrepresentation of the results of a survey due to misunderstanding the procedure or the reliability of generalising the survey findings to the entire population [complex]	
investigate errors and misrepresentation in surveys, including examples of media misrepresentations of surveys [complex].	

Essential Mathematics: Unit 3

Fundamental Topic: Calculations

Calculations

Content Descriptor	Lesson Names
solve practical problems requiring basic number operations	<ul style="list-style-type: none"> Order of Operations Using Formulas
apply arithmetic operations according to their correct order	<ul style="list-style-type: none"> Order of Operations
ascertain the reasonableness of answers to arithmetic calculations	<ul style="list-style-type: none"> Rounding Sensibly
use leading-digit approximation to obtain estimates of calculations	<ul style="list-style-type: none"> Leading Digit Approximation
use a calculator for multi-step calculations	<ul style="list-style-type: none"> Order of Operations
check results of calculations for accuracy	<ul style="list-style-type: none"> Rounding Sensibly Consequences of Rounding
recognise the significance of place value after the decimal point	<ul style="list-style-type: none"> Thousandths and Beyond
evaluate decimal fractions to the required number of decimal places	
round up or round down numbers to the required number of decimal places	<ul style="list-style-type: none"> Introduction to Rounding Rounding to Decimal Places Rounding Negative Numbers Rounding to Significant Figures
apply approximation strategies for calculations.	<ul style="list-style-type: none"> Rounding Sensibly Rounding Based on Given Values Consequences of Rounding

Topic 1: Measurements

Geometry

Content Descriptor	Lesson Names
recognise the properties of common two-dimensional geometric shapes, including squares, rectangles and triangles, and three-dimensional solids, including cubes, rectangular-based prisms and triangular-based prisms	<ul style="list-style-type: none"> 2D Shapes Regular Polygons Irregular Polygons Composite Shapes Introduction to Solids

	<ul style="list-style-type: none"> • Prisms • Pyramids
interpret different forms of two-dimensional representations of three-dimensional objects, including nets of cubes, rectangular-based prisms and triangular-based prisms [complex].	<ul style="list-style-type: none"> • Nets of Prisms

Linear Measure

Content Descriptor	Lesson Names
use metric units of length (millimetres, centimetres, metres, kilometres), their abbreviations (mm, cm, m, km), conversions between them, and appropriate levels of accuracy and choice of units	<ul style="list-style-type: none"> • Units of Length • Converting Further Units of Length
estimate lengths	<ul style="list-style-type: none"> • Estimating Measurements
calculate perimeters of familiar shapes, including triangles, squares, rectangles, polygons, circles and arc lengths	<ul style="list-style-type: none"> • Perimeter • Finding the Perimeter of a Shape with an Unknown Side • Perimeters of Kites, Rhombuses, Trapeziums and Parallelograms • Perimeter, Composite Shapes and Unknown Sides • Circumference of Circles • Using the Circumference of Circles
calculate perimeters of familiar composite shapes [complex].	<ul style="list-style-type: none"> • Perimeter of Composite Shapes

Area Measure

Content Descriptor	Lesson Names
use metric units of area (square millimetres, square centimetres, square metres, square kilometres, hectares), their abbreviations (mm ² , cm ² , m ² , km ² , ha), conversions between them and appropriate choices of units	<ul style="list-style-type: none"> • Units of Area • Converting Between Units of Area
estimate the areas of different shapes	<p><i>Coming Soon</i></p> <p>We want to work with you!</p> <p>If you are interested in partnering with EP to develop this topic, please contact ben.hilliam@educationperfect.com with an expression of interest.</p>
calculate areas of regular shapes, including triangles, squares, rectangles, parallelograms and circles	<ul style="list-style-type: none"> • Area of Rectangles • Area of Triangles • Area of Parallelograms

	<ul style="list-style-type: none"> Calculating the Area of Circles
calculate areas of regular shapes, including trapeziums and sectors [complex]	<ul style="list-style-type: none"> Area of Trapeziums Using the Area of Circles Area of Rhombus and Kites
calculate areas of composite figures by decomposing them into regular shapes [complex]	<ul style="list-style-type: none"> Area of Composite Shapes
calculate surface areas of familiar prisms, including cubes, rectangular and triangular prisms, spheres and cylinders [complex]	<ul style="list-style-type: none"> Surface Area of Cylinders Surface Area of Prisms Surface Area of Spheres
calculate surface areas of familiar pyramids, including rectangular-based and triangular-based pyramids [complex]	<ul style="list-style-type: none"> Finding the Height of Right Pyramids Surface Area of Right Pyramids Surface Area of Right Cones
calculate surface areas of irregular solids [complex].	<ul style="list-style-type: none"> Surface Area of Complex Solids Surface Area of Composite Solids

Volume and Capacity

Content Descriptor	Lesson Names
use metric units of volume (cubic millimetres, cubic centimetres, cubic metres), their abbreviations (mm ³ , cm ³ , m ³), conversions between them and appropriate choices of units	<ul style="list-style-type: none"> Choosing Appropriate Units of Volume Converting Units of Volume
understand and use the relationship between volume and capacity, recognising that 1 cm ³ = 1 mL (millilitre), 1000 cm ³ = 1 L (litre), 1 m ³ = 1 kL (kilolitre), 1000 kL = 1ML (megalitre)	<ul style="list-style-type: none"> Converting Units of Capacity Converting Further Units of Capacity and Applications Converting between Capacity and Volume Calculating Volume and Capacity
estimate volume and capacity of various objects	<p><i>Coming Soon</i></p> <p>We want to work with you!</p> <p>If you are interested in partnering with EP to develop this topic, please contact ben.hilliam@educationperfect.com with an expression of interest.</p>
calculate the volume and capacity of regular objects, including cubes, rectangular and triangular prisms, and cylinders	<ul style="list-style-type: none"> Volume of Rectangular Prisms Calculating Volume of Rectangular Prisms Calculating Volume of Cylinders Calculating Volume of Triangular Prisms Calculating Volume of Other Regular and Irregular Prisms
calculate the volume and capacity of right pyramids, including square-based and rectangular-based pyramids, and spheres.	<ul style="list-style-type: none"> Volume of Right Pyramids Volume of Right Cones Volume of Spheres

Mass

Content Descriptor	Lesson Names
use metric units of mass (milligrams, grams, kilograms, metric tonnes), their abbreviations (mg, g, kg, t), conversions between them and appropriate choices of units	<ul style="list-style-type: none"> Units of Mass Converting Further Units of Mass and Applications
estimate the mass of different objects	<p><i>Coming Soon</i></p> <p>We want to work with you!</p> <p>If you are interested in partnering with EP to develop this topic, please contact ben.hilliam@educationperfect.com with an expression of interest.</p>
recognise the need for milligrams.	<ul style="list-style-type: none"> Units of Mass

Topic 2: Scales, Plans and Models

Interpret Scale Drawings

Content Descriptor	Lesson Names
interpret commonly used symbols and abbreviations in scale drawings	<p><i>Coming Soon</i></p> <p>We want to work with you!</p> <p>If you are interested in partnering with EP to develop this topic, please contact ben.hilliam@educationperfect.com with an expression of interest.</p>
find actual measurements from scale drawings, including lengths, perimeters and areas	
estimate and compare quantities, materials and costs using actual measurements from scale drawings [complex].	
understand and apply drawing conventions of scale drawings, including scales in ratio, clear indications of dimensions and clear labelling [complex]	
construct scale drawings by hand and by using software packages [complex].	

Creating Scale Drawings

Content Descriptor	Lesson Names
understand and apply drawing conventions of scale drawings, including scales in ratio, clear indications of dimensions and clear labelling [complex]	<p><i>Coming Soon</i></p> <p>We want to work with you!</p> <p>If you are interested in partnering with EP to develop this topic, please contact ben.hilliam@educationperfect.com with an expression of</p>
construct scale drawings by hand and by using software	

packages [complex].

interest.

Right-Angled Triangles

Content Descriptor	Lesson Names
apply Pythagoras' theorem to solve problems for all side lengths using $a^2 + b^2 = c^2$	<ul style="list-style-type: none"> Parts of a Triangle and the Hypotenuse Pythagoras' Theorem Building with Pythagoras Pythagoras' Theorem in 3D
apply the tangent, sine and cosine ratios to find unknown angles and sides [complex]	<ul style="list-style-type: none"> Introduction to Trigonometry Finding Side Lengths Using Trigonometry Finding Angles Using Trigonometry Review Lesson: Trigonometric Ratios Applications of Trigonometry in Coding Using Trigonometric Functions in Real World Applications Using Inverse Trigonometric Functions in Real World Applications
use the concepts of angle of elevation and angle of depression to solve practical problems [complex].	<ul style="list-style-type: none"> Angles of Elevation and Depression Pirates' Treasure

Topic 3: Summarising and Comparing Data

Summarising and Interpreting Data

Content Descriptor	Lesson Names
identify the mode from a dataset	<ul style="list-style-type: none"> The Mode
calculate measures of central tendency, the mean and the median from a dataset	<ul style="list-style-type: none"> The Mean The Median
investigate the suitability of measures of central tendency in various real-world contexts [complex]	<p><i>Coming Soon</i></p> <p>We want to work with you!</p> <p>If you are interested in partnering with EP to develop this topic, please contact ben.hilliam@educationperfect.com with an expression of interest.</p>
investigate the effect of outliers on the mean and the median [complex]	<ul style="list-style-type: none"> The Mean The Median Symmetry and Skew in Data Effect of Shape on Mean and Median
calculate quartiles from a dataset [complex]	<ul style="list-style-type: none"> Quartiles
interpret quartiles, deciles and percentiles from a graph [complex]	

use everyday language to describe spread, including spread out, dispersed, tightly packed, clusters, gaps, more/less dense regions, outliers	<ul style="list-style-type: none"> • Shape and Mode • Symmetry and Skew in Data
calculate and interpret statistical measures of spread, such as the range, interquartile range and standard deviation [complex]	<ul style="list-style-type: none"> • The Range • Quartiles • Introduction to Standard Deviation • Calculating Standard Deviation • Calculating Standard Deviation Using Technology
investigate real-world examples from the media illustrating inappropriate uses of measures of central tendency and spread [complex].	<ul style="list-style-type: none"> • Investigating the Standard Deviation • Using the Standard Deviation to Compare Data Sets • Comparing the Measures of Spread

Comparing Datasets

Content Descriptor	Lesson Names
complete a five-number summary for different datasets	<ul style="list-style-type: none"> • Box and Whisker Plots
construct box plots using a five-number summary	<ul style="list-style-type: none"> • Box and Whisker Plots
compare parallel box plots and back-to-back stem plots for different datasets [complex]	<ul style="list-style-type: none"> • Comparing Data Sets • Back-to-Back Stem and Leaf Plots
compare the characteristics of the shape of histograms using symmetry, skewness and bimodality, where applicable [complex].	<ul style="list-style-type: none"> • Comparing Dot Plots • Comparing Histograms

Essential Mathematics: Unit 4

Fundamental Topic: Calculations

Calculations

Content Descriptor	Lesson Names
solve practical problems requiring basic number operations	<ul style="list-style-type: none"> Order of Operations Using Formulas
apply arithmetic operations according to their correct order	<ul style="list-style-type: none"> Order of Operations
ascertain the reasonableness of answers to arithmetic calculations	<ul style="list-style-type: none"> Rounding Sensibly
use leading-digit approximation to obtain estimates of calculations	<ul style="list-style-type: none"> Leading Digit Approximation
use a calculator for multi-step calculations	<ul style="list-style-type: none"> Order of Operations
check results of calculations for accuracy	<ul style="list-style-type: none"> Rounding Sensibly Consequences of Rounding
recognise the significance of place value after the decimal point	<ul style="list-style-type: none"> Thousandths and Beyond
evaluate decimal fractions to the required number of decimal places	
round up or round down numbers to the required number of decimal places	<ul style="list-style-type: none"> Introduction to Rounding Rounding to Decimal Places Rounding Negative Numbers Rounding to Significant Figures
apply approximation strategies for calculations.	<ul style="list-style-type: none"> Rounding Sensibly Rounding Based on Given Values Consequences of Rounding

Topic 1: Bivariate Graphs

Cartesian Plane

Content Descriptor	Lesson Names
demonstrate familiarity with Cartesian coordinates in two dimensions by plotting points on the Cartesian plane	<ul style="list-style-type: none"> Introduction to Cartesian Planes Coordinates Plotting on a Cartesian Plane
generate tables of values for linear functions, including for negative values of x	<ul style="list-style-type: none"> Plotting Linear Equations Using Tables

graph linear functions for all values of x with pencil and paper and with graphing software.

- Drawing Graphs

Bivariate Scatterplots

Content Descriptor	Lesson Names
describe the patterns and features of bivariate data	<ul style="list-style-type: none"> • Introduction to Bivariate Data • Bivariate Variables
describe the association between two numerical variables in terms of direction (positive/negative), form (linear/non-linear) and strength (strong/moderate/weak).	<ul style="list-style-type: none"> • Analysing Trend by Eye

Line of Best Fit

Content Descriptor	Lesson Names
identify the dependent and independent variable	<ul style="list-style-type: none"> • Bivariate Variables
find the line of best fit by eye	<ul style="list-style-type: none"> • Lines of Best Fit by Eye
use technology to find the line of best fit [complex]	<ul style="list-style-type: none"> • Least Squares Fitting using a Spreadsheet • Least Squares Fitting using a Calculator
interpret relationships in terms of the variables [complex]	<ul style="list-style-type: none"> • Analysing Trend by Eye • Lines of Best Fit by Eye
use technology to find the correlation coefficient (an indicator of the strength of linear association) [complex]	<ul style="list-style-type: none"> • Correlation Coefficient • Calculating the Correlation Coefficient using a Calculator • Calculating the Correlation Coefficient using a Spreadsheet
use the line of best fit to make predictions, both by interpolation and extrapolation [complex]	<ul style="list-style-type: none"> • Making Predictions by Eye • Making Predictions Using the Equation
recognise the dangers of extrapolation [complex]	
distinguish between causality and correlation through examples [complex].	<ul style="list-style-type: none"> • Correlation vs. Causation

Topic 2: Probability and Relative Frequencies

Simulations

Content Descriptor	Lesson Names
perform simulations of probability experiments using technology	<ul style="list-style-type: none"> • Calculating Probability • Likelihood • Differences in Results

recognise that the repetition of chance events is likely to produce different results	<ul style="list-style-type: none"> • Experimental Probability • Relative Frequencies • Using Relative Frequencies
identify relative frequency as probability	<i>Further Development Coming Soon</i>
identify factors that could complicate the simulation of real-world events [complex].	<p>We want to work with you!</p> <p>If you are interested in partnering with EP to develop this topic, please contact ben.hilliam@educationperfect.com with an expression of interest.</p>

Simple probabilities

Content Descriptor	Lesson Names
construct a sample space for an experiment	<ul style="list-style-type: none"> • Introduction to Two-Step Experiments
use a sample space to determine the probability of outcomes for an experiment	
use arrays or tree diagrams to determine the outcomes and the probabilities for experiments.	<ul style="list-style-type: none"> • Tree Diagrams • Using Tree Diagrams • Arrays • Using Arrays

Topic 3: Loans and Compound Interest

Compound Interest

Content Descriptor	Lesson Names
review the principles of simple interest through substitution of given values for other pronumerals into a mathematical formula to find the value of the subject of the formula	<ul style="list-style-type: none"> • Included in Unit 1 Topic 1
understand the concept of compound interest as a recurrence relation	<ul style="list-style-type: none"> • Compound Interest Basic Formula • Rearranging the Compound Interest Formula • Compound Interest - Months and Weeks • Rearranging Compound Interest - Months and Weeks
consider similar problems involving compounding [complex]	<ul style="list-style-type: none"> • Depreciation • Inflation and Purchasing Power • Hyperinflation: The Ever-Expanding Topic
use technology (online calculator) to calculate the future value of a compound interest loan or investment and the total interest paid or earned	<p><i>Coming Soon - Jan 2021</i></p> <p>We want to work with you!</p> <p>If you are interested in partnering with EP to develop this topic, please contact</p>

<p>use technology (spreadsheet) to calculate the future value of a compound interest loan or investment and the total interest paid or earned [complex]</p> <p>use technology (online calculator) to compare, numerically and graphically, the growth of simple interest and compound interest loans and investments</p> <p>use technology (spreadsheet) to compare, numerically and graphically, the growth of simple interest and compound interest loans and investments [complex]</p> <p>use technology (online calculator) to investigate the effect of the interest rate and the number of compounding periods on the future value of a loan or investment</p> <p>use technology (spreadsheet) to investigate the effect of the interest rate and the number of compounding periods on the future value of a loan or investment [complex].</p>	<p>ben.hilliam@educationperfect.com with an expression of interest.</p>
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Reducing Balance Loans

Content Descriptor	Lesson Names
<p>understand that reducing balance loans are compound interest loans with periodic repayments</p> <p>use technology (online calculator) to model a reducing balance loan</p> <p>use technology (spreadsheet) to model a reducing balance loan [complex]</p> <p>use technology (online calculator) to investigate the effect of the interest rate and repayment amount on the time taken to repay a loan</p> <p>use technology (spreadsheet) to investigate the effect of the interest rate and repayment amount on the time taken to repay a loan [complex].</p>	<p><i>Coming Soon</i></p> <p>We want to work with you!</p> <p>If you are interested in partnering with EP to develop this topic, please contact ben.hilliam@educationperfect.com with an expression of interest.</p>