

## Course Outline: IB Math Applications and Interpretations SL, Year 1

Begin semester 1, year 1

### Unit 1, Measuring space: accuracy and 2-D Geometry **(3 weeks)**

- 1.1 Measurements and estimates
- 1.2 Recording measurements, significant digits, rounding
- 1.3 Measurements: exact or approximate
- 1.4 Speaking Scientifically
- 1.5 Trigonometry of right-angles triangles and indirect measurements
- 1.6 Angles of elevation and depression

### Unit 2, Representing space: non-right-angled trigonometry and volumes **(3 weeks)**

- 2.1 Trigonometry of non-right triangles
- 2.2 Area of a triangle formula; applications of right and non-right-angled trigonometry
- 2.3 3-D geometry: solids, surface area and volume

### Unit 4, Dividing up space: coordinate geometry, lines, Voronoi diagrams **(4 weeks)**

- 4.1 Coordinates, distance and the midpoint formula in 2-D and 3-D
- 4.2 Gradient of a line and its applications
- 4.3 Equations of straight lines: different forms of equations
- 4.4 Parallel and perpendicular lines
- 4.5 Voronoi diagrams and the toxic waste dump problem

### Unit 5, Modelling constant rates of change: linear functions **(3 weeks)**

- 5.1 Functions
- 5.2 Linear models
- 5.3 Arithmetic sequences
- 5.4 Modelling

### Unit 10, Modelling rates of change: exponential and logarithmic functions **(5 weeks)**

- 10.1 Geometric sequences and series
- 10.2 Compound interest, annuities, amortization
- 10.3 Exponential models
- 10.4 Exponential equations and logarithms

End Semester 1, year 1

Begin semester 2, year 1

Unit 3, Representing and describing data: descriptive statistics (**3 weeks**)

3.1 Collecting and organizing univariate data

3.2 Sampling techniques

3.3 Presentation of data

3.4 Bivariate data

Unit 6, Modelling relationships: linear correlation of variate data (**3 weeks**)

6.1 Measuring correlation

6.2 The line of best fit

6.3 Interpreting the regression line

Unit 7, Quantifying uncertainty: probability, binomial and normal distributions (**6 weeks**)

7.1 Theoretical and experimental probability

7.2 Representing combined probabilities with diagrams

7.3 Representing combined probabilities with diagrams and formulae

7.4 Complete, concise, and consistent representations

7.5 Modelling random behavior: random variables and probability distributions

7.6 Modelling the number of successes in a fixed number of trials

7.7 Modelling Measurements that are distributed randomly

Unit 8, Testing for validity: Spearman's, hypothesis testing and  $\chi^2$  test for independence (**4 weeks**)

8.1 Spearman's rank correlation coefficient

8.2  $\chi^2$  test for independence

8.3  $\chi^2$  goodness of fit test

8.4 The t-test

Math Exploration dedicated time (**2 weeks**)

Choose topic

Begin research

Develop research question

Build introduction

Compile sources

End semester 2, year 1

Begin semester 1, year 2

Unit 12, Analyzing rates of change: differential calculus **(3 weeks)**

12.1 Limits and derivatives

12.2 Equations of tangent and normal lines

12.3 Maximum and minimum points and optimization

Math Exploration dedicated time **(1week)**

Unit 13, Approximating irregular spaces: integration **(4 weeks)**

13.1 Finding areas

13.2 Integration: the reverse process of differentiation

Math Exploration dedicated time **(1week)**

Unit 11, Modelling periodic phenomena **(3 weeks)**

11.1 An introduction to periodic functions

11.2 An infinity of sinusoidal functions

11.3 A world of sinusoidal models

Unit 9, Modelling relationships with functions: power functions **(4 weeks)**

9.1 Quadratic models

9.2 Problems involving quadratics

9.3 Cubic models, power functions and direct and indirect variation

9.4 Optimization

Math Exploration dedicated time **(1week)**

Review **(1week)**

7.6 Modelling the number of successes in a fixed number of trials (Repeated w/modifications from year 1)

7.7 Modelling Measurements that are distributed randomly (Repeated w/modifications from year 1)

End semester 1, year 2

Begin semester 2, year 2

IA Feedback/follow-up and Unit 1: Review & revisit modelling and investigation activity **(1 week)**

Unit 2: Review & revisit modelling and investigation activity **(1 week)**

Unit 3 and 6: Review & revisit modelling and investigation activity **(1 week)**

Units 4 and 5: Review & revisit modelling and investigation activity **(1 week)**

Unit 7: Review & revisit modelling and investigation activity **(1 week)**

Unit 8: Review & revisit modelling and investigation activity **(1 week)**

Unit 9: Review & revisit modelling and investigation activity **(1 week)**

Unit 10: Review & revisit modelling and investigation activity **(1 week)**

Unit 11: Review & revisit modelling and investigation activity **(1 week)**

Units 12 and 13: Review & revisit modelling and investigation activity **(1 week)**

Mock exams **(1 week)**

Differentiated instruction, differentiated assignments based on mock exams **(3 weeks)**

Final External Exam preparations **(1 week)**

External Exams

End semester 2, year 2