UNIT 1 - EXPRESSIONS, EQUATIONS & INEQUALITIES

ADV. MATHEMATICS 1.2

Content

- Patterns
- Properties of real numbers
- Algebraic expressions
- Solving equations & inequalities

Resources & ICT

- *Algebra 2* by R. Charles, B. Hall, D. Kennedy, A. Bellman, S. Bragg, W. Handlin, S. Murphy & G. Wiggins
- http://www.cie.org.uk/
- www.khanacademy.org

Types of assessment

- Quizzes & tests
- Homework
- Individual problem solving with teacher's aid
- Problem solving on the board
- Classroom discussion
- Written & spoken feedback

Students to Know

- Vocabulary associated with expressions, equations & inequalities
- Number system
- Properties of real numbers

Students to Understand

- Difference between term-to-term (recursive) and position-to-term (explicit) definitions of a sequence
- Difference between simplification & solving
- Combining like terms
- Extraneous solutions
- Interpretation of absolute value as distance

Students to be able to Do

- Recognising patterns & finding the nth term
- Solve linear inequalities & equations in one variable
- Solve absolute value inequalities & equations in one variable
- Graph solutions on a number line
- Translate word problems into equations or inequalities

Cross curricular links

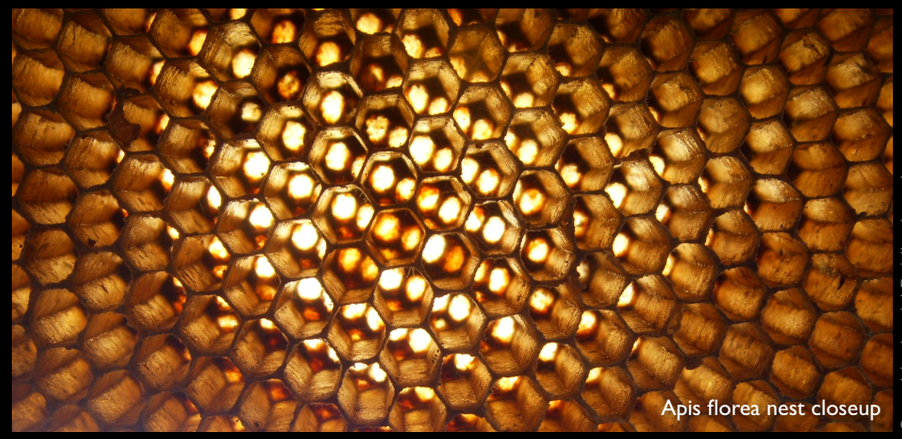
- Sciences, geography & economics; identifying patterns
- Sciences, geography & economics; generating & solving equations from real world situations

Differentiation incl. EAL

- More able students help those who are struggling during problem solving in class
- Support for students through peer tutoring after school

Learning styles activities

- Lectures & note-taking
- Problem solving individually, with classmates and with teacher's aid
- Problem solving at home and in class at their desks or at the board
- Group discussions



Apis florea nest closeup

Sean Hoyland / Public domain

Global citizenship, internationalism, local environment

- Discussions/demonstrations on various terms & methods used in different cultures
- Math as a global language

BRILLANTMONT International School

www.brillantmont.ch

September - 4 weeks

UNIT 2 - LINEAR FUNCTIONS

ADV. MATHEMATICS I.2

Content

- Introductions to functions
- Linear equations & inequalities in two variables
- Direct variation
- Linear systems
- Linear programming

Resources & ICT

- *Algebra 2* by R. Charles, B. Hall, D. Kennedy, A. Bellman, S. Bragg, W. Handlin, S. Murphy & G. Wiggins
- http://www.cie.org.uk/
- www.khanacademy.org

Types of assessment

- Quizzes & tests
- Homework
- Individual problem solving with teacher's aid
- Problem solving on the board
- Classroom discussion
- Written & spoken feedback

Students to Know

- Vocabulary associated with linear functions
- Direct variation equation
- Definition of a function
- Domain & range
- Slope formula
- Different forms for equation of a line

Students to Understand

- Relationship between equations/ inequalities & their graphs
- Difference between elimination & substitution

Students to be able to Do

- Use different forms of an equation of a line to graph
- Develop equation of a line given different information
- Find equation of the line of best fit given a scatterplot
- Find point of intersection of two lines using 2 methods
- Graph a linear inequality
- Find feasible region for a system of inequalities

Cross curricular links

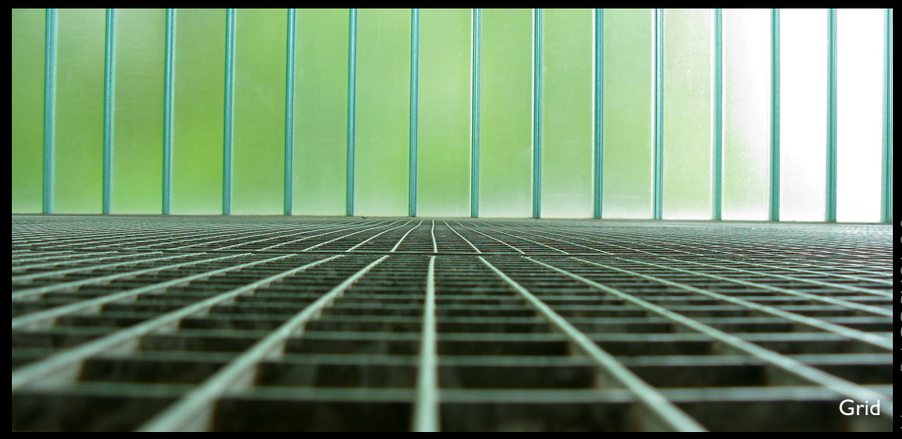
- Sciences, geography & economics; finding equations to make predictions from real world situations
- Sciences, geography & economics; graphing

Differentiation incl. EAL

- More able students help those who are struggling during problem solving in class
- Support for students through peer tutoring after school

Learning styles activities

- Lectures & note-taking
- Problem solving individually, with classmates and with teacher's aid
- Problem solving at home and in class at their desks or at the board
- Problem solving from an algebraic and graphical perspective
- Group discussions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Global citizenship, internationalism, local environment

- Discussions/demonstrations on various terms & methods used in different cultures
- Math as a global language

BRILLANTMONT International School

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October-November - 6 weeks

UNIT 3 - QUADRATIC FUNCTIONS

ADV. MATHEMATICS I.2

Content

- Solving quadratic equations
- Graphing quadratic equations

Resources & ICT

- *Algebra 2* by R. Charles, B. Hall, D. Kennedy, A. Bellman, S. Bragg, W. Handlin, S. Murphy & G. Wiggins
- http://www.cie.org.uk/
- www.khanacademy.org

Types of assessment

- Quizzes & tests
- Homework
- Individual problem solving with teacher's aid
- Problem solving on the board
- Classroom discussion
- Written & spoken feedback

Students to Know

- Vocabulary associated with quadratic functions
- Quadratic formula & the discriminant
- Different forms for equation of a parabola

Students to Understand

- Relationship between quadratic equations & their graphs
- Symmetry in parabolas
- Transformations of x^2

Students to be able to Do

- Solve quadratic equations by factoring, completing the square & quadratic formula
- Graph parabolas given different forms of a quadratic equation

Cross curricular links

- Sciences, geography & economics; finding equations to make predictions from real world situations
- Sciences, geography & economics; graphing

Differentiation incl. EAL

- More able students help those who are struggling during problem solving in class
- Support for students through peer tutoring after school

Learning styles activities

- Lectures & note-taking
- Problem solving individually, with classmates and with teacher's aid
- Problem solving at home and in class at their desks or at the board
- Problem solving from an algebraic and graphical perspective
- Group discussions

Interior detail of Gaudi's Casa Batlló in Barcelona, Spain

Global citizenship, internationalism, local environment

- Discussions/demonstrations on various terms & methods used in different cultures
- Math as a global language

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November-December - 6 weeks

UNIT 4 - FUNCTIONS

ADV. MATHEMATICS I.2

Content

- Graphing functions
- Operations with functions
- Composite functions
- Inverse functions

Resources & ICT

- *Algebra 2* by R. Charles, B. Hall, D. Kennedy, A. Bellman, S. Bragg, W. Handlin, S. Murphy & G. Wiggins
- http://www.cie.org.uk/
- www.khanacademy.org

Types of assessment

- Quizzes & tests
- Homework
- Individual problem solving with teacher's aid
- Problem solving on the board
- Classroom discussion
- Written & spoken feedback

Students to Know

- Vocabulary associated with functions
- Six basic functions

Students to Understand

- How addition, subtraction, multiplication & division of a constant affects a graph
- Relationship between a function and its inverse

Students to be able to Do

- Combine functions using various operations
- Graph familiar and unfamiliar functions based on transformations
- Find equation and graph of an inverse

Cross curricular links

- Sciences, geography & economics; finding equations to make predictions from real world situations
- Sciences, geography & economics; graphing

Differentiation incl. EAL

- More able students help those who are struggling during problem solving in class
- Support for students through peer tutoring after school

Learning styles activities

- Lectures & note-taking
- Problem solving individually, with classmates and with teacher's aid
- Problem solving at home and in class at their desks or at the board
- Group discussions

Detail of the town hall of Großbottwar, Germany

Global citizenship, internationalism, local environment

- Discussions/demonstrations on various terms & methods used in different cultures
- Math as a global language

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December- January - 4 weeks

UNIT 5 - EXPONENTS, RADICALS & RATIONAL EXPRESSIONS

ADV. MATHEMATICS I.2

Content

- Simplification involving exponents, radicals and/or rational expressions
- Solving equations involving exponents, radicals and/or rational expressions
- Introduction to logarithms

Resources & ICT

- *Algebra 2* by R. Charles, B. Hall, D. Kennedy, A. Bellman, S. Bragg, W. Handlin, S. Murphy & G. Wiggins
- http://www.cie.org.uk/
- www.khanacademy.org

Types of assessment

- Quizzes & tests
- Homework
- Individual problem solving with teacher's aid
- Problem solving on the board
- Classroom discussion
- Written & spoken feedback

Students to Know

- Vocabulary associated with exponents, radicals, rational and logarithmic expressions
- Exponent rules
- Factoring

Students to Understand

- Relationship between exponents and radicals
- How to simplify expressions using algebraic rules
- Relationship between exponents and logarithms

Students to be able to Do

- Operations involving exponents, radicals ad rational expressions
- Complete simplification of expressions
- Solving equations involving exponents, radicals ad rational expressions
- Change exponential form to logarithmic form and vice versa
- Solve for unknown exponents using logarithms

Cross curricular links

- Sciences, geography & economics; simplification of expressions
- Sciences, geography & economics; solving equations

Differentiation incl. EAL

- More able students help those who are struggling during problem solving in class
- Support for students through peer tutoring after school

Learning styles activities

- Lectures & note-taking
- Problem solving individually, with classmates and with teacher's aid
- Problem solving at home and in class at their desks or at the board
- Group discussions

Strangler fig, Ta Som, Cambodia

Global citizenship, internationalism, local environment

- Discussions/demonstrations on various terms & methods used in different cultures
- Math as a global language

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January-March - 6 weeks

UNIT 6 - TRIGONOMETRY

ADV. MATHEMATICS I.2

Content

- Trigonometric functions and their graphs
- Radian measure
- Unit circle
- Right triangle trigonometry
- Law of sines and cosines
- Trigonometric identities

Resources & ICT

- *Algebra 2* by R. Charles, B. Hall, D. Kennedy, A. Bellman, S. Bragg, W. Handlin, S. Murphy & G. Wiggins
- http://www.cie.org.uk/
- www.khanacademy.org

Types of assessment

- Quizzes & tests
- Homework
- Individual problem solving with teacher's aid
- Problem solving on the board
- Classroom discussion
- Written & spoken feedback

Students to Know

- Vocabulary associated with trigonometry
- Radian and degree measures of angles
- Six trigonometric ratios
- Cofunctions and reciprocal functions
- Special right triangles
- Law of sines and cosines; trigonometric identities; unit circle
- Graphs of trigonometric functions

Students to Understand

- Relationship between degrees and radians
- How to apply trigonometry
- How to find all solutions to an equation based on domain

Students to be able to Do

- Solve equations involving trigonometric identities
- Draw and solve angle of elevation and depression word problems
- Draw and solve word problems involving bearings
- Find lengths of sides, angle measures and areas in triangles and quadrilaterals
- Apply transformations to graphs of trigonometric functions
- Use trigonometric functions as models

Cross curricular links

- Sciences, geography & economics; finding equations to make predictions from real world situations
- Sciences, geography & economics; graphing

Differentiation incl. EAL

- More able students help those who are struggling during problem solving in class
- Support for students through peer tutoring after school

Learning styles activities

- Lectures & note-taking
- Problem solving individually, with classmates and with teacher's aid
- Problem solving at home and in class at their desks or at the board
- Problem solving from an algebraic and graphical perspective
- Group discussions

Angle of elevation: Los Angeles skyline

Jon Sullivan / Public domain

Global citizenship, internationalism, local environment

- Discussions/demonstrations on various terms & methods used in different cultures
- Math as a global language

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April-June - 10 weeks