

DP AI SL Planner – Topic 1: Number and Algebra

| Teacher(s) | Jessica Vaughn | Subject group and course | Mathematics – Applications and Interpretations | | |
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| Course part and topic | Topic 1 – Number and Algebra 1.1 – 1.8 | SL or HL/Year 1 or 2 | SL, Yr 2 | Dates | 4 weeks August |
| Unit description and texts | | DP assessment(s) for unit | | | |
| <p>The number and algebra unit will support students' existing knowledge of numerical concepts and techniques, which combined with an introduction to arithmetic and geometric sequences and series, can be used for financial and other applications.</p> <p>Oxford AI textbook: Chapter 1: 1.1, 1.2, 1.3 Chapter 7: 7.1-7.5</p> | | <p>Assessment #1 (1.1- 1.8)</p> <p>All assessments will use previous IB exam questions from the Questionbank. Additional questions will be adapted from Oxford text to cover new content not previously included in IB exams.</p> | | | |

INQUIRY: establishing the purpose of the unit

| Transfer goals |
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| <i>List here one to three big, overarching, long-term goals for this unit. Transfer goals are the major goals that ask students to “transfer” or apply their knowledge, skills, and concepts at the end of the unit under new/different circumstances, and on their own without scaffolding from the teacher.</i> |
| <p>Students should be able to:</p> <ul style="list-style-type: none"> ● Represent patterns, show equivalencies and make generalizations, which enable us to model real-world situations. ● Use an abstraction of numerical concepts and employ variables to solve mathematical problems. |

ACTION: teaching and learning through inquiry

| Content/skills/concepts—essential understandings | Learning process <i>Check the boxes for any pedagogical approaches used during the unit. Aim for a variety of approaches to help facilitate learning.</i> |
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| <p><u>Students will know the following content:</u></p> <ul style="list-style-type: none"> • Numbers and formulae can appear in different, but equivalent forms, or representations, which can help us to establish identities. • Quantities and values can be used to describe key features and behaviors of functions and models, including quadratic functions. <p><u>Students will develop the following skills:</u></p> <ul style="list-style-type: none"> • Modeling real-life situations with the structure of arithmetic and geometric sequences and series allows for prediction, analysis and interpretation. • Approximation of numbers adds uncertainty or inaccuracy to calculations, leading to potential errors but can be useful when handling extremely large or small quantities. <p><u>Students will grasp the following concepts:</u></p> <ul style="list-style-type: none"> • Different representations of numbers enable quantities to be compared and used for computational purposes with ease and accuracy. • Formulae are a generalization made on the basis of specific examples, which can then be extended to new examples • Mathematical financial models such as compounded growth allow computation, evaluation and interpretation of debt and investment both approximately and accurately. | <p>Learning experiences and strategies/planning strategies/planning for self-supporting learning:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Socratic seminar <input checked="" type="checkbox"/> Small group/pair work <input checked="" type="checkbox"/> PowerPoint lecture/notes <input checked="" type="checkbox"/> Individual presentations <input type="checkbox"/> Group presentations <input type="checkbox"/> Student lecture/leading <input type="checkbox"/> Interdisciplinary learning <p>Details:</p> <p>Each section will start with direct instruction and introduction from the instructor. Students will work in small groups to solve problems and complete explorations. Discussions regarding method, alternate approaches, and efficiency will be regularly included in the class.</p> <p>Students have a background in many of these topics from previous math courses.</p> <p>The teacher will provide multiple resources electronically</p> |

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| | <p>and in person to support student learning and extensions.</p> <p><input type="checkbox"/> Other/s:</p> |
| | <p>Formative assessment:</p> <p>IB Questionbank Practice problem sets</p> <p>TOTD – quick checks</p> <p>HW quizzes</p> |
| | <p>Summative assessment:</p> <p>Assessment #1 (1.1- 1.8)</p> <p>All assessments will use previous IB exam questions from the Questionbank Additional questions will be adapted from Oxford text to cover new content not previously included in IB exams.</p> |
| | <p>Differentiation:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Affirm identity—build self-esteem <input checked="" type="checkbox"/> Value prior knowledge <input checked="" type="checkbox"/> Scaffold learning <input checked="" type="checkbox"/> Extend learning <p>Details:</p> <p>Students have seen algebra and number sense topics in previous courses. This unit also supports studies in science and finance that may be foundational or</p> |

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| | <p>concurrent. This unit will build on their background in algebra 1 and algebra 2. They will also be given multiple opportunities to practice math skills with IB questionbank problems and optional resources from Delta Math and Christos Nikoladis' IB Math Applications Website, where available.</p> |
| <p>Approaches to learning (ATL)</p> <p><i>Check the boxes for any explicit approaches to learning connections made during the unit. For more information on ATL, please see the guide.</i></p> | |
| <p> <input checked="" type="checkbox"/> Thinking <input checked="" type="checkbox"/> Social <input checked="" type="checkbox"/> Communication <input checked="" type="checkbox"/> Self-management <input type="checkbox"/> Research </p> <p>Details:</p> <p>Thinking - making connections within the content and applications, choosing appropriate formulas</p> <p>Social – partner/group work</p> <p>Communication – utilizing the language and notation of geometry – using appropriate formulas and units of measurement</p> <p>Self-management- Students given choice in level of the questions they answer so they can push for higher-level understanding</p> | |

| <p>Language and learning</p> | <p>TOK connections</p> | <p>CAS connections</p> |
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| <p><i>Check the boxes for any explicit language and learning connections made during the unit. For more information on the IB's approach to language and learning, please see the guide.</i></p> | <p><i>Check the boxes for any explicit TOK connections made during the unit</i></p> | <p><i>Check the boxes for any explicit CAS connections. If you check any of the boxes, provide a brief note in the "details" section explaining how students engaged in CAS for this unit.</i></p> |

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| <input checked="" type="checkbox"/> Activating background knowledge <input type="checkbox"/> Scaffolding for new learning <input checked="" type="checkbox"/> Acquisition of new learning through practice <input checked="" type="checkbox"/> Demonstrating proficiency <p>Details: Students have a background in algebra and number sense from previous courses. This unit will build on their knowledge of sequences/series, exponents/logs and support concepts in scientific notation, significant figures, percentage error, and compound interest.</p> | <input type="checkbox"/> Personal and shared knowledge <input type="checkbox"/> Ways of knowing <input type="checkbox"/> Areas of knowledge <input type="checkbox"/> The knowledge framework <p>Details: N/A</p> | <input type="checkbox"/> Creativity <input type="checkbox"/> Activity <input type="checkbox"/> Service <p>Details: N/A</p> |
| Resources <i>List and attach (if applicable) any resources used in this unit</i> | | |
| Textbook - Mathematics: Applications & Interpretations. Chapters 1 and 7 IB QuestionBank Christos Nikolaidis' Website: https://www.christosnikolaidis.com/en/mai/ Delta Math | | |

Stage 3: Reflection—considering the planning, process and impact of the inquiry

| What worked well | What didn't work well | Notes/changes/suggestions: |
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| <i>List the portions of the unit (content, assessment, planning) that were successful</i> | <i>List the portions of the unit (content, assessment, planning) that were not as successful as hoped</i> | <i>List any notes, suggestions, or considerations for the future teaching of this unit</i> |

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