DP AA SL Planner – Unit 1: Limits, Average rate of change

Teacher(s)	Jessica Vaughn	Subject group and course	Mathematics – Analysis & Approaches		
Course part and topic	Topic 5 – Limits, average rate of change, intro to derivatives 5.1-5.2, 1.1-1.3	SL or HL/Year 1 or 2	SL, Yr 2	Dates	August 1-22

Unit description and texts	DP assessment(s) for unit
Measuring and describing change in two variables. Identifying limits, continuity, average rate of change, and instantaneous rate of change. Oxford AA textbook: Chapter 5: Measuring change: Differentiation	Assessment #1 (5.1-5.2, 1.1-1.3) All assessments will use previous IB exam questions from the Questionbank

INQUIRY: establishing the purpose of the unit

Transfer goals
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.
Students should be able to: ● Identify limits of functions from tables and graphs. ● Explain average and instantaneous rates of change. ● Connect average rate of change to the concept of a derivative.

ACTION: teaching and learning through inquiry

Content/skills/concepts—essential understandings	Learning process
	Check the boxes for any pedagogical approaches used during the unit. Aim for a variety of approaches to help facilitate learning.
<u>Students will know the following content:</u> - Concept of a limit of a function - Concept of a derivative <u>Students will develop the following skills:</u> - Identify limits of functions from graphs and tables. - Calculate average rate of change with the slope of a secant line. - Recognize instantaneous rate of change as the slope of a tangent line. - Characterize graphs as increasing/decreasing based on gradient and derivatives. <u>Students will grasp the following concepts:</u> - Describe functions and how they change using limits, rate of change, increasing/decreasing.	Learning experiences and strategies/planning for self-supporting learning: ☒ Lecture ☐ Socratic seminar ☒ Small group/pair work ☒ PowerPoint lecture/notes ☒ Individual presentations ☐ Group presentations ☐ Student lecture/leading ☐ Interdisciplinary learning Details: 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. Teacher will provide multiple resources electronically and in person to support student learning. ☐ Other/s:
	Formative assessment: IB Questionbank Practice problems TOTD – quick checks HW quizzes: limits, intervals of increase/decrease

	Summative assessment:
	Assessment #1 (5.1-5.2, 1.1-1.3)
	All assessments will use previous IB exam questions from the Questionbank

	Differentiation:
	☒Affirm identity—build self-esteem
	☐Value prior knowledge
	☒Scaffold learning
	☒ Extend learning
	Details:
	Limits and derivatives will be brand new content for students. Derivatives will be the focus of most of first semester, so it is important that the concept is understood. Many representations of derivatives and many resources will be used in class with access to additional resources for students who want or need more practice.

Approaches to learning (ATL)

Check the boxes for any explicit approaches to learning connections made during the unit. For more information on ATL, please see the guide.

☒Thinking

☒ Social

☒ Communication

☐ Self-management

☐ Research

Details:

Thinking - making connections within the content and applications

Social – partner work

Communication – utilizing the language and notation of calculus

Language and learning	TOK connections	CAS connections
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.	Check the boxes for any explicit TOK connections made during the unit	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.
☐ Activating background knowledge ☐ Scaffolding for new learning ☒ Acquisition of new learning through practice ☒ Demonstrating proficiency Details: The topic of calculus will be new to the students. The vocabulary and notation will be demonstrated and learned through practice. Multiple notations are commonly accepted in calculus, all will be taught and used throughout the unit. Students will have ample opportunities to utilize the vocabulary and notation in class to get feedback from both the instructor and other students.	☐ Personal and shared knowledge ☐ Ways of knowing ☒ Areas of knowledge ☐ The knowledge framework Details: Students will be introduced to a new mathematical concept: calculus. History on the "fathers" of calculus will be included and the debate over who is actually credited with developing the notation and processes.	☐ Creativity ☐ Activity ☐ Service Details: N/A

Resources

List and attach (if applicable) any resources used in this unit

Textbook - Mathematics: Analysis & Approaches. Chapter 5
IB QuestionBank
Calculus, A Complete Course by Mark Sparks
Master Math Mentor
Khan Academy
Delta Math
www.flippedmath.com