DP AI SL Planner – Unit 2 Topic 4: Statistics and probability

Teacher(s)	Jessica Vaughn	**Subject group and course**	Mathematics – Applications and Interpretations		
Course part and topic	Topic 4 – Statistics and probability 4.1-4.11	**SL or HL/Year 1 or 2**	SL, Yr 2	**Dates**	end of Aug -Nov
Unit description and texts		**DP assessment(s) for unit**			
Presentation of data and analyzing data to describe and make predictions. Pearson AI textbook: Chapter 1: Number and Algebra Basics Chapter 7: Descriptive statistics Chapter 8: Probability Chapter 12: Probability Distributions Chapter 13: Statistical Analysis Chapter 14: Bivariate Analysis		Assessment #2 (1.6-1.7, 4.1-4.3) Assessment #3 (4.4, 4.10) Assessment #4 (4.11, 4.5, 4.6) Assessment # 5 (4.7-4.9) 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:

- Represent and interpret real world data in graphical and numerical form (histograms, cumulative frequency curves, box and whisker plots)
- Conduct calculations and tests that determine relationships between variables.
- Determine the likelihood of events occurring and evaluate risks.

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> ● Methods of organizing and interpreting data visually: histograms, cumulative frequency curves, box and whisker plots ● Methods of summarizing data with measures of central tendency (mean, median, and mode) and measures of dispersion (IQR, standard deviation, range) ● Methods of looking for relationships and patterns in data (correlation, regression). ● Methods of finding the likelihood of events with probability ● Methods of testing hypotheses and drawing conclusions with statistical tests (chi squared, t-test) <u>Students will develop the following skills:</u> ● Organizing, representing, analyzing and interpreting data, and utilizing different statistical tools facilitates prediction and drawing of conclusions. <u>Students will grasp the following concepts:</u> ● Organize, represent, analyze, and interpret data. ● Utilize different statistical tools to make predictions and draw conclusions. ● Different statistical techniques apply in different situations. These techniques require justification and identification of their limitations and validity. ● Correlation, regression, and modeling identify patterns, model structure in events, and facilitate the ability to make predictions.	Learning experiences and strategies/planning 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. Students have a background in many of these topics from previous math courses. The 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: graphs, central tendency, hypothesis testing
	Summative assessment: Assessment #2 (1.6-1.7, 4.1-4.3) Assessment #3 (4.4, 4.10) Assessment #4 (4.11, 4.5, 4.6) Assessment # 5 (4.7-4.9) 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: Students have seen statistical and probability topics in previous courses. This unit is heavily focused on science which may be foundational or concurrent. This unit will build on their background in algebra and geometry. They will also

	be given multiple opportunities to practice math skills with IB questionbank problems and resources from Hodder and Pearson (students will be given choice in questions/ difficulty levels), where available. Students will be given formative assessments in multiple levels to differentiate. Some assignments will require different modes of representation- graphs, written analysis, and presentations.

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, choosing appropriate functions to model the situations at hand

Social – partner/group work

Communication – utilizing the language and notation of statistics to display and summarize data easily. Written analysis of statistics. Working with IB Math command terms to understand question structure.

Self-management- Students given choice in level of the questions they answer so they can push for higher-level understanding

Research- Students will be researching topics in order to write papers related to statistical concepts.

Language and learning *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.*	**TOK connections** *Check the boxes for any explicit TOK connections made during the unit*	**CAS connections** *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: Students have a background in statistics and probability from previous courses. This unit will build on their knowledge of univariate statistics, displaying data, bivariate statistics, and probability of combined events. Students will practice the skills required in order to demonstrate proficiency.	☒ Personal and shared knowledge ☐ Ways of knowing ☒ Areas of knowledge ☐ The knowledge framework Details: Students will discuss ethics related to statistical testing. Students will be able to give their personal and shared experiences when discussing ethics and bias.	☐ Creativity ☐ Activity ☐ Service Details: N/A

Resources *List and attach (if applicable) any resources used in this unit*
Textbook - Oxford: Mathematics: Applications & interpretations, Chapters 3, 6, 7, 8 Textbook - Pearson Mathematics Applications & Interpretations. Chapters 1,7,8,12,13,14 IB QuestionBank MyiMaths EdPuzzle using pre-approved videos Chrisos Nikolaidis' website: https://www.christosnikolaidis.com/en/mai

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

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