

## DP AI SL Planner – Topic 4: Statistics and Probability

<b>Teacher(s)</b>	Echo Fritch	<b>Subject group and course</b>	Mathematics – Applications and Interpretations		
<b>Course part and topic</b>	Topic 4 – Statistics and probability 4.1-4.11	<b>SL or HL/Year 1 or 2</b>	SL, Yr 2	<b>Dates</b>	Sept - Nov
<b>Unit description and texts</b>		<b>DP assessment(s) for unit</b>			
Presentation of data and analyzing data to describe and make predictions. Pearson Applications & Interpretations SL Textbook: Chapter 7: Descriptive Statistics Chapter 8: Probability Chapter 12: Probability Distributions Chapter 13: Statistical Analysis Chapter 14: Bivariate Analysis		Assessment #2 (4.1-4.4, 4.10) Assessment #3 (4.5, 4.6, 4.11 ) Assessment #4 (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 <i>Check the boxes for any pedagogical approaches used during the unit. Aim for a variety of approaches to help facilitate learning.</i>
<p><u>Students will know the following content:</u></p> <ul style="list-style-type: none"> <li>● Methods of organizing and interpreting data visually: histograms, cumulative frequency curves, box and whisker plots</li> <li>● Methods of summarizing data with measures of central tendency (mean, median, and mode) and measures of dispersion (IQR, standard deviation, range)</li> <li>● Methods of looking for relationships and patterns in data (correlation, regression).</li> <li>● Methods of finding the likelihood of events with probability</li> <li>● Methods of testing hypotheses and drawing conclusions with statistical tests (chi squared, t-test)</li> </ul> <p><u>Students will develop the following skills:</u></p> <ul style="list-style-type: none"> <li>● Organizing, representing, analysing and interpreting data, and utilizing different statistical tools facilitates prediction and drawing of conclusions.</li> </ul> <p><u>Students will grasp the following concepts:</u></p> <ul style="list-style-type: none"> <li>● Organize, represent, analyze, and interpret data.</li> <li>● Utilize different statistical tools to make predictions and draw conclusions.</li> <li>● Different statistical techniques apply in different situations. These techniques require justification and identification of their limitations and validity.</li> <li>● Correlation, regression, and modeling identify patterns, model structure in events, and facilitate the ability to make predictions.</li> </ul>	<p>Learning experiences and strategies/planning for self-supporting learning:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Lecture</li> <li><input type="checkbox"/> Socratic seminar</li> <li><input checked="" type="checkbox"/> Small group/pair work</li> <li><input checked="" type="checkbox"/> PowerPoint lecture/notes</li> <li><input checked="" type="checkbox"/> Individual presentations</li> <li><input type="checkbox"/> Group presentations</li> <li><input type="checkbox"/> Student lecture/leading</li> <li><input type="checkbox"/> Interdisciplinary learning</li> </ul> <p>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. Teacher will provide multiple resources electronically and in person to support student learning.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Other/s:</li> </ul>

	<p><b>Formative assessment:</b></p> <p>IB Questionbank Practice problems</p> <p>TOTD – quick checks</p> <p>HW quizzes: graphs, central tendency, hypothesis testing</p> <hr/> <p><b>Summative assessment:</b></p> <p>Assessment #2 (4.1-4.4, 4.10)</p> <p>Assessment #3 (4.5, 4.6, 4.11 )</p> <p>Assessment #4 (4.7-4.9)</p> <p>All assessments will use previous IB exam questions from the Questionbank</p> <hr/> <p>Differentiation:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Affirm identity—build self-esteem</li> <li><input checked="" type="checkbox"/> Value prior knowledge</li> <li><input checked="" type="checkbox"/> Scaffold learning</li> <li><input checked="" type="checkbox"/> Extend learning</li> </ul> <p>Details:</p> <p>Students have seen statistics 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.</p> <p>Students will be given formative assessments in multiple levels to differentiate.</p> <p>Some assignments will require different modes of representation - graphs, written analysis, and presentations.</p>
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### 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 statistics to display and summarize data easily. Written analysis of statistics.

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.

<b>Language and learning</b> <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 <a href="#">the guide</a>.</i>	<b>TOK connections</b> <i>Check the boxes for any explicit TOK connections made during the unit</i>	<b>CAS connections</b> <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>
<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  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.	<input checked="" type="checkbox"/> Personal and shared knowledge <input type="checkbox"/> Ways of knowing <input checked="" type="checkbox"/> Areas of knowledge <input type="checkbox"/> The knowledge framework  Details: Students will discuss ethics related to statistical testing. Students will be able to input their personal and shared experiences when discussing ethics and biases.	<input type="checkbox"/> Creativity <input type="checkbox"/> Activity <input type="checkbox"/> Service Details: N/A
<b>Resources</b> <i>List and attach (if applicable) any resources used in this unit</i>		
Textbook - Mathematics: Applications & Interpretations. Chapters 7, 8, 12, 13, 14 IB QuestionBank		

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

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