# DP AI SL Planner – Unit 1 Topic 4: Statistics and Probability

<table>
<thead>
<tr>
<th>Teacher(s)</th>
<th>Subject group and course</th>
<th>Course part and topic</th>
<th>Dates</th>
</tr>
</thead>
</table>
| Echo Fritch           | Mathematics – Applications and Interpretations | Topic 4 – Statistics and probability 4.1-4.11
|                       |                                   | Topic 1 - Number & Algebra 1.1, 1.6                        | SL, Yr 2 |
|                       |                                   |                                                            | Aug - Nov |

## Unit description and texts
Presentation of data and analyzing data to describe and make predictions.
Pearson Applications & Interpretations
SL 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

## DP assessment(s) for unit
- Diagnostic Exam (for data collection purposes, not for a grade)
- Assessment #1 (4.1 - 4.3, 1.1, 1.6)
- Assessment #2 (4.4 - 4.6, 4.10)
- Assessment #3 (4.6, 4.7)
- Assessment #4 (4.8 - 4.9, 4.11)
- 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

<table>
<thead>
<tr>
<th>Content/skills/concepts—essential understandings</th>
<th>Learning process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will know the following content:</td>
<td>Check the boxes for any pedagogical approaches used during the unit. Aim for a variety of approaches to help facilitate learning.</td>
</tr>
<tr>
<td>• Methods of organizing and interpreting data visually: histograms, cumulative frequency curves, box and whisker plots</td>
<td></td>
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<tr>
<td>• Methods of summarizing data with measures of central tendency (mean, median, and mode) and measures of dispersion (IQR, standard deviation, range)</td>
<td></td>
</tr>
<tr>
<td>• Methods of looking for relationships and patterns in data (correlation, regression).</td>
<td></td>
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<tr>
<td>• Methods of finding the likelihood of events with probability</td>
<td></td>
</tr>
<tr>
<td>• Methods of testing hypotheses and drawing conclusions with statistical tests (chi squared, t-test)</td>
<td></td>
</tr>
<tr>
<td>Students will develop the following skills:</td>
<td></td>
</tr>
<tr>
<td>• Organizing, representing, analysing and interpreting data, and utilizing different statistical tools facilitates prediction and drawing of conclusions.</td>
<td></td>
</tr>
<tr>
<td>Students will grasp the following concepts:</td>
<td></td>
</tr>
<tr>
<td>• Organize, represent, analyze, and interpret data.</td>
<td></td>
</tr>
<tr>
<td>• Utilize different statistical tools to make predictions and draw conclusions.</td>
<td></td>
</tr>
<tr>
<td>• Different statistical techniques apply in different situations. These techniques require justification and identification of their limitations and validity.</td>
<td></td>
</tr>
<tr>
<td>• Correlation, regression, and modeling identify patterns, model structure in events, and facilitate the ability to make predictions.</td>
<td></td>
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</tbody>
</table>

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Resources, materials, assessments not linked to SGO or unit planner will be reviewed at the local school level.
### Formative assessment:
IB Exercises from Christos Nikolaidis’ IB Math Applications website
TOTD – quick checks

### Summative assessment:
- Assessment #1 (4.1 - 4.3, 1.1, 1.6)
- Assessment #2 (4.4 - 4.6, 4.10)
- Assessment #3 (4.6, 4.7)
- Assessment #4 (4.8 - 4.9, 4.11)

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 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.

Students will be given formative assessments in multiple levels to differentiate.

Some assignments will require different modes of representation - graphs, written analysis, and presentations.

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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. 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.

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<table>
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<tr>
<th>Language and learning</th>
<th>TOK connections</th>
<th>CAS connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>Check the boxes for any explicit TOK connections made during the unit</td>
<td>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.</td>
</tr>
<tr>
<td>☒ Activating background knowledge</td>
<td>☒ Personal and shared knowledge</td>
<td>☐ Creativity</td>
</tr>
<tr>
<td>☐ Scaffolding for new learning</td>
<td>☐ Ways of knowing</td>
<td>☐ Activity</td>
</tr>
<tr>
<td>☒ Acquisition of new learning through practice</td>
<td>☒ Areas of knowledge</td>
<td>☐ Service</td>
</tr>
<tr>
<td>☒ Demonstrating proficiency</td>
<td>☐ The knowledge framework</td>
<td>Details: N/A</td>
</tr>
</tbody>
</table>

**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.

Details:
Students will discuss ethics related to statistical testing. Students will be able to give their personal and shared experiences when discussing ethics and biases.

<table>
<thead>
<tr>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>List and attach (if applicable) any resources used in this unit</td>
</tr>
</tbody>
</table>

**Textbook - Mathematics: Applications & Interpretations.** Chapters 1, 7, 8, 12, 13, 14

**IB QuestionBank**


EdPuzzle using pre-approved videos

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

<table>
<thead>
<tr>
<th>What worked well</th>
<th>What didn’t work well</th>
<th>Notes/changes/suggestions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>List the portions of the unit (content, assessment, planning) that were successful</td>
<td>List the portions of the unit (content, assessment, planning) that were not as successful as hoped</td>
<td>List any notes, suggestions, or considerations for the future teaching of this unit</td>
</tr>
</tbody>
</table>

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