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Workbook 8

Learner Guide

Where Innovative Learning Meets
Social Impact and Sustainability.



Co-Created by

Code Division
NomadAlba
The Data Gals

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Submissions

Assessment

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Weekly Submissions Overview



Submission Requirements for Weekly and Saturday Tasks: Each week you are required to submit tasks for assessment and to contribute to your successful completion and gain of your SQA Accredited PDA in Data Science at Level 8. 📄 **DETAILED TASK ON TASK SHEET**



SUBMISSION 1 :Data and Statistics Apprenticeship Data:

Brief Report

- **Summary of Findings:** Provide an overview of the patterns you observed in your selected demographic or area (Modern Apprentice Data)
- **Data Quality Evaluation:** Discuss the data quality, potential biases, and limitations, and how these might affect the analysis.

SUBMISSION 2 :Data and Statistics Apprenticeship Infographic:

- A completed, clear infographic that highlights the key findings from your data analysis. The infographic should communicate both the patterns identified and the limitations or gaps in the data.

SUBMISSION 3: 321 Reflection & Action Plan

Add your weekly reflection of general progress with a 321 Reflection and Action plan.



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Saturday

Step by Step

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Saturday Agenda



AGENDA – Python, Statistics & Work-Based Learning Workshop

Task 1 – Introduction to Python & Statistics

- Tutor demonstration of basic statistics: Mean, Median, Mode, Standard Deviation, Outliers
- Learners work in pairs to practise coding examples
- Whole-group reflection on how statistics help interpret real-world data

Task 2 – Exploring Scottish Apprentice Statistics

- Review latest Scottish Apprenticeship data presented by Skills Development Scotland (SDS)
- Small-group analysis of:
 - Data quality
 - Presentation style
 - Bias and interpretation
- Group discussion on how statistical presentation influences understanding



Saturday Session PRE SESSION PREP DO BEFORE SESSION



Pre-Session Preparation

- Create a Google Colab account and practise using it
 - Sign in with a Google account and open Google Colab here: <https://colab.research.google.com>
 - Open a new notebook and run simple Python commands (e.g., `print("Hello World")`) to get comfortable with the interface.
- **Review apprenticeship statistics available on Moodle**
 - Look at the latest data for:
 - Modern Apprenticeships (MA)
 - Foundation Apprenticeships (FA)
 - Graduate Apprenticeships (GA)
 - Consider how the information is presented (charts, tables, summaries).
- **Download and read the Self-Evaluation Sheet and Personal Development Plan (from Moodle)**
 - Familiarise yourself with the structure
 - Think about how these documents relate to your own skills and role.



Saturday Session

IN SESSION TASK



Objective:

- Python and Statistics

Resources: Python Notebooks

Time: 90 minutes

Task 1 – Introduction to Python & Statistics

Delivery Structure:

1. Tutor Demonstration
 - Live coding of: mean, median, mode, SD, outliers
 - Explanation of concepts using student-grade data
2. Pair Programming
 - Learners replicate examples
 - Pairs troubleshoot and assist each other
3. Group Reflection
 - What the numbers tell us
 - How statistics improve decision-making

Task 2 – Scottish Apprentice Statistics (SDS)

Delivery Structure:

1. Tutor-Led Exploration
 - Display the latest SDS statistical report
 - Highlight how the data is visualised and narrated
2. Group Discussion
 - Is the data complete?
 - What story is being told?
 - What biases or limitations exist?
3. Collaborative Interpretation Activity
 - Groups summarise key insights on presentation quality
4. Break



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Tuesday

Overview

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Tuesday Overview



Objective:

To provide learners with practical skills in Power Automate, focusing on efficiently creating and managing automated workflows. By the end of the session, participants should feel confident using key Power Automate tools to streamline repetitive tasks and integrate data processes.

Resources: Microsoft Excel Statistics

Time: 6:30 – 8:00 PM

Mode: Online Drop-In Session

Session Overview:

A drop-in session is an informal, supportive learning environment where participants can join at the scheduled time, ask questions, and work through practical tasks at their own pace. The facilitator's role is to guide learners, demonstrate key functions, answer questions, and provide tips for effective use of Excel. Participants are encouraged to actively engage, try the exercises themselves, and seek clarification whenever needed.

Tuesday Evening: Data Analysis and Reflection Support

1. Statistical Methods Review:

- A recap of statistical tools used (mean, median, mode, standard deviation) and how to calculate these values within the context of the dataset.
- Support on how to identify trends and patterns for specific demographics.

2. Critique of Data Quality:

- Discussion of common data quality issues and how they might influence results (e.g., missing data, bias in data collection).
- Guided conversation on how to assess biases, especially with demographic data, and how to reflect on those in your report.

3. Group Work and Troubleshooting:

- Learners can work in pairs to discuss the issues they are encountering in their data analysis and ask the tutor for clarification on specific problems, whether it's about statistical methods or understanding data quality.

Additional Notes for Learners:

- Bring your questions and any forms or workflows you are currently working on.
- The session is interactive—watch demonstrations, then apply the steps yourself.



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Thursday

Overview

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Thursday Overview



Objective:

To provide learners with practical skills on designing Infogrphics using Canva. By the end of the session, participants should feel confident using key Canva to create visualisations for data.

Resources: Canva

Time: 6:30 – 8:00 PM

Mode: Online Drop-In Session

Session Overview:

A drop-in session is an informal, supportive learning environment where participants can join at the scheduled time, ask questions, and work through practical tasks at their own pace. The facilitator's role is to guide learners, demonstrate key functions, answer questions, and provide tips for effective use of Excel. Participants are encouraged to actively engage, try the exercises themselves, and seek clarification whenever needed.

Thursday Evening: Infographic and Data Visualization Support

1. Introduction to Infographics:

- A short presentation on what makes an effective infographic, focusing on design principles and how to convey complex data simply and visually.

2. Hands-On Canva Training:

- Walkthrough of how to use Canva to create infographics, including how to choose templates, add charts/graphs, and customize visuals.
- Learners will begin creating their infographics with guidance on effective data visualization techniques.

3. Design Support and Troubleshooting:

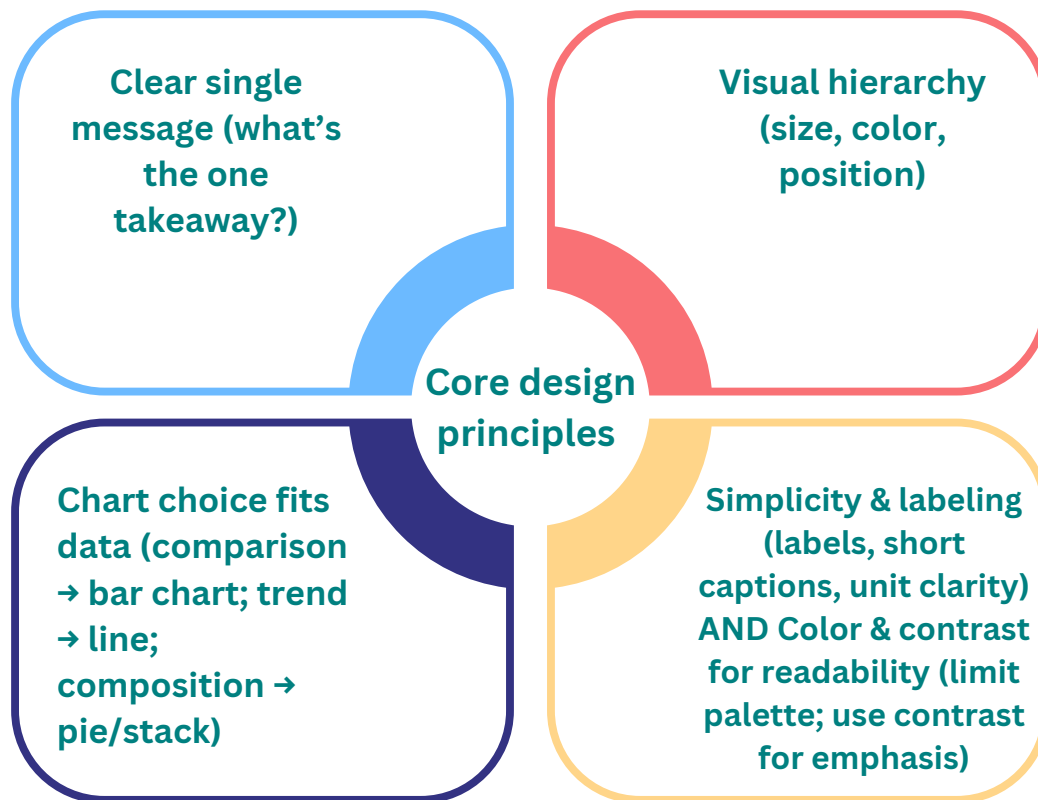
- Personalized support while learners create their infographics, helping them choose the right design elements, charts, and visual cues to represent their findings clearly.



Thursday Task Sheets



1. What makes an effective infographic (7 minutes)



2. Live demo: Canva basics (6 minutes)

3. Common problems

Problem: Canva chart not accepting pasted values

- Fix: Open the chart data editor, paste values into cells one column at a time; ensure no header row conflict.

Problem: Learner can't share screen in SpatialChat

- Fix: Check browser permissions (camera/microphone/screen sharing). Suggest trying a different browser (Chrome/Edge usually work best).

Problem: Too many words in infographic

- Fix: Convert long sentences into a headline + 2 bullet numbers/visual cues; remove filler.

Problem: Chart type feels "wrong"

- Fix: Ask: "Do you want to show a comparison, trend, or composition?" Map to bar, line, pie/stack respectively.



Thursday Task Sheets



Hands-on creation (25 minutes)

Structure:

- 5 min: Plan (in your zone). Learners choose one simple message & a chart type.
- 15 min: Build in Canva (create title, 1 chart, 1 visualization element, a caption).
- 5 min: Prepare to present (choose 1 slide/part to show).

Step by Step Reminder

1. Open Canva: [CANVA TEMPLATE LINK](#)
2. Choose your infographic page (1,2,3 etc) - This is the post “Create new design → “Infographic” or custom size.” step
3. Add title (one sentence maximum).
4. Insert chart → choose correct chart type.
5. Enter data → double-check numbers and labels.
6. Add a short caption (1–2 lines) explaining source or units.
7. Add 1 icon or image for visual interest, placed near the headline or the chart.
8. Review visual hierarchy: Title > Chart > Caption.
9. Download PNG and copy share link.

Accessibility & inclusivity tips

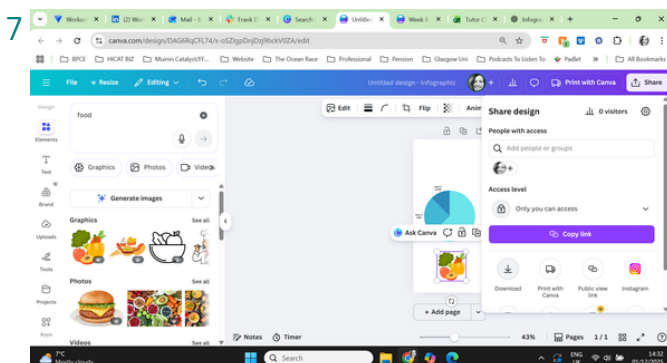
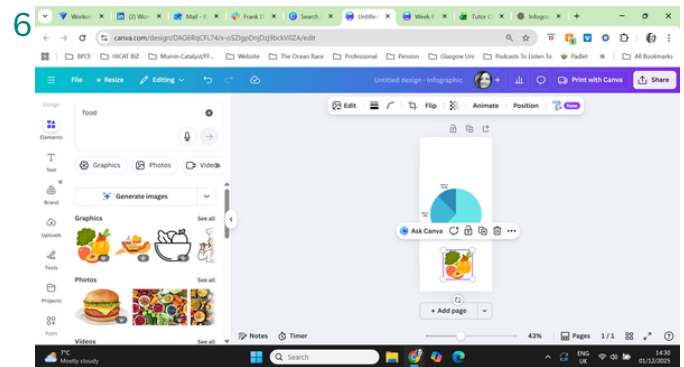
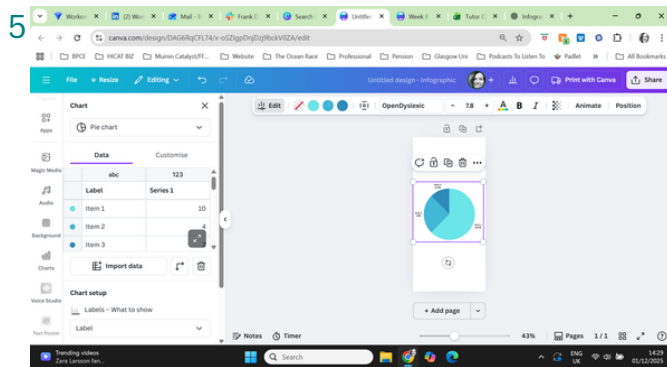
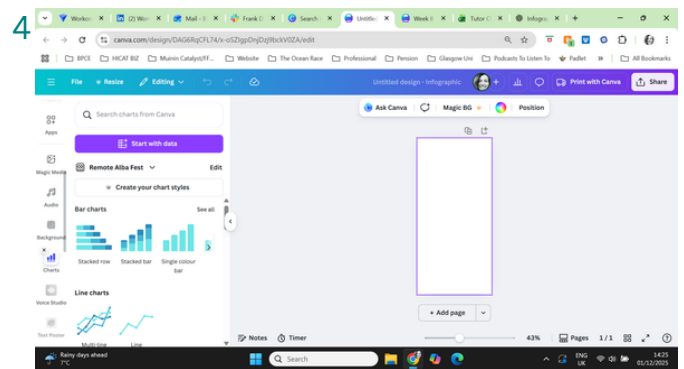
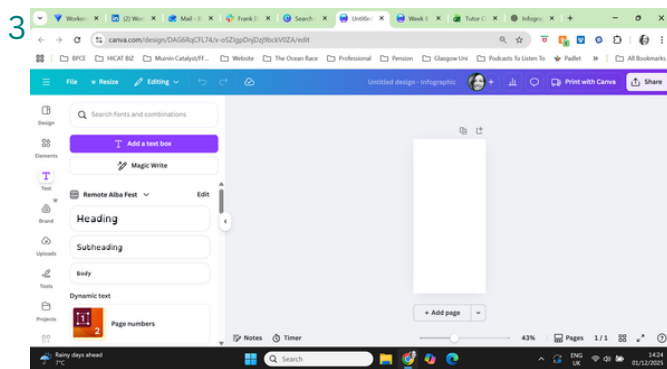
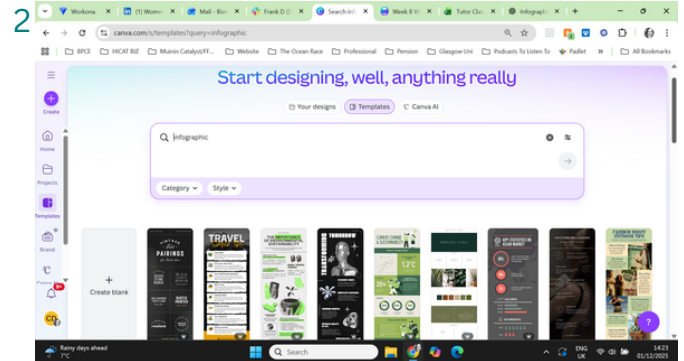
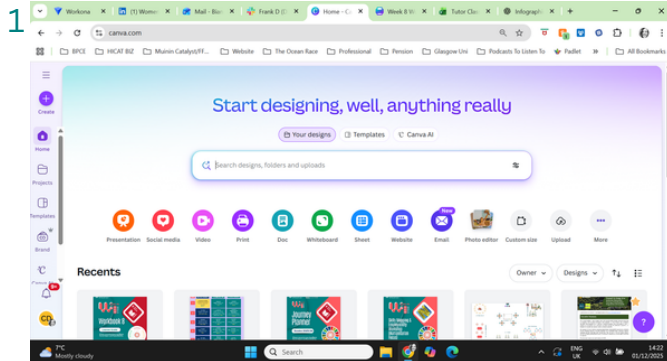
Use high-contrast text and background; avoid red/green combinations only.
Use readable fonts (minimum 16px visually); ensure labels aren't in all-caps.
Provide alt text for exported images when posting.
Speak descriptions aloud when presenting results.

Infographic Quick Checklist

One-sentence headline → the single takeaway.
Chart type → matches your message (comparison/trend/composition).
Labels & units → every axis and series labeled.
Visual hierarchy → title > chart > caption.
Limit colours → 2 primary + 1 accent.
Export & share → PNG + Canva link.



Thursday Task Step by Step





Thursday Task Sheets



Finished? Try refine

Think: **contrast, iconography, spacing**

1. Write a one-sentence takeaway (headline).
2. Choose a chart that matches the takeaway.
3. Enter data into Canva chart; **check labels**.
4. Add a **small visual cue** or icon to support the message.
5. Save/export a PNG and a shareable Canva link.



EXAMPLE TEMPLATE

Template 1 –Transport Mode Preference

Headline:

“How Do People Prefer to Travel?”

Sub-Headline (optional):

A simple breakdown of four common transport choices.

Chart Caption:

Sample survey data. Use a pie or stacked bar chart to show proportions clearly.

Small Notes (placeholders for learners):

- Car: ____
- Bike: ____
- Bus: ____
- Walk: ____
- Tip: Keep slices to 4–5 max and use high-contrast labels.

Assessment / Success criteria (quick rubric)

Complete (3 points): Title + chart + label + caption + export link.

Good (2 points): Title + chart + at least one label + export link.

Needs work (1 point): Attempted chart or text but missing labels or clear takeaway.



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Workbook 8

Detailed Tasks

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Main Weekly Task



Task Overview: You can use either Python or Excel to analyse your data

Data Selection and Focus Area:

- Choose a Dataset: Select one of the following datasets for your analysis:
 - Modern Apprentices
 - Graduate Apprentices
 - Foundation Apprentices
- Select a Specific Focus Area or Demographic:
- To make your analysis more focused and insightful, choose one of the following areas or demographics to explore within your dataset:
 - Age Group: How does participation in apprenticeships vary by age
 - Gender: Are there notable differences in apprenticeship enrollment or success rates between genders?
 - Geographical Region: Analyze apprenticeships by region in Scotland
 - Ethnicity or Other Demographics: If available, explore how different ethnic groups or socio-economic backgrounds are represented in apprenticeship data.
 - Apprenticeship Type: Investigate trends within a specific type of apprenticeship (e.g., engineering, digital, healthcare).

Data Analysis:

- Basic Statistical Analysis:
- Calculate key statistics for your selected demographic, such as:
 - Mean: What is the average number of apprenticeships in your focus area (e.g., age group, region)?
 - Median: What is the middle value of your data for this demographic?
 - Mode: Are there any common trends or frequent values (e.g., most common apprenticeship type for a given age group)?
 - Standard Deviation: How spread out are the data points for your focus area? Is there much variation or is it more concentrated?
 - Outliers: Identify if there are any extreme values or outliers in the data for your selected focus area.
- Pattern Identification:
 - Explore the data for trends related to your chosen focus area. For example:
 - Is there a significant increase or decrease in apprenticeships within a specific age group or region?
 - Are certain demographics underrepresented in certain apprenticeship types?
 - Do apprenticeship trends correlate with other factors such as economic conditions, gender representation, or geographical location?



Main Weekly Task



Data Quality Evaluation:

- Critique the Dataset:
- Assess the completeness and reliability of the data for your selected focus area:
 - Are there missing values or incomplete data for certain regions or demographics?
 - Are certain groups or regions underrepresented or omitted from the data?
 - How might biases in the data (e.g., underreporting of certain demographics) impact the conclusions that can be drawn? Consider how certain biases could distort policy-making or public perception of apprenticeship programs.
- Reflection on Biases:
- Write a brief reflection on the quality and bias of the data. Discuss:
 - What aspects of the dataset could lead to a misleading interpretation?
 - What is missing from the data that could improve the overall understanding of apprenticeship trends in Scotland?

Create an Infographic:

- Based on your findings, create an infographic to visually communicate the key insights and trends from your analysis. The infographic should:
 - Highlight Key Statistics: Use clear, simple charts or graphs (e.g., bar charts, line graphs, pie charts) to display your findings, such as mean, median, trends, or outliers.
 - Emphasize Patterns: Focus on the key patterns you identified in your selected demographic (e.g., a rising number of apprentices in a particular age group or a gender gap in certain sectors).
 - Address Data Quality: Visually represent any biases or gaps in the data, such as a "missing data" section for underrepresented regions or groups.
- Use Canva or other design tools to create the infographic, ensuring it is visually clear, accurate, and easy to understand for a general audience.

Deliverables:

1. Brief Report:

- Summary of Findings: Provide an overview of the patterns you observed in your selected demographic or area.
- Data Quality Evaluation: Discuss the data quality, potential biases, and limitations, and how these might affect the analysis.

2. Infographic:

- A completed, clear infographic that highlights the key findings from your data analysis. The infographic should communicate both the patterns identified and the limitations or gaps in the data.



Reflective Practice & Wellbeing



Your Blog

Fridays participants complete a weekly reflection in the dedicated reflection blog on Moodle. This week you must complete a reflective blog capturing your impressions of the this weeks programme with:

- **321 Refecting (see below) ,**
- **Saturday Session Tasks**
- **Weekly Tasks**



3

2

1

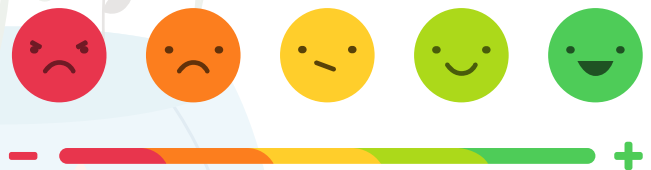
Things

- you learned
- you found interesting
- you want to learn more about and how you plan to do it

HELLO Friday

Wellbeing & Resilience Activity

You have a weekly wellbeing prompts to promote SDG 3 Good Health and Wellbeing.



This week, try: Title: "Question Leaf"

Activity: Find a leaf, observe its veins and imperfections. Write one open question about it (not to be answered). Reflect on curiosity over perfection.

Purpose: Cultivates tolerance for ambiguity, open-mindedness, and emotional flexibility.

Reflection questions

Why do you think employers value agility and flexibility?



Action Plans Next Steps



Estimated Time: 10 minutes

Tools: Trello Board/ Personal Time Management Planner/ Blog)

Consider and record (daily) weekly intentions for the following week.
This promotes self efficacy and active participatory learning.

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Example Statement starters:

Encouraging Creative Thinking

- *“If I combined this week’s method with another approach, I might be able to...”*

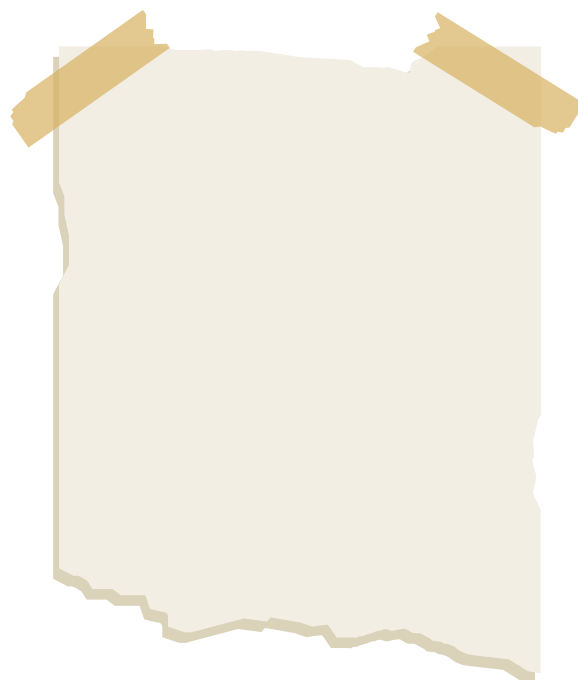
Blending Reflection with Growth

- *“This week challenged me to think differently about...”*

Notes / Questions for Tutor

Record key notes and questions to ask during Tuesdays or Thursdays drop in sessions 6.30 - 8pm.

NOTES



MENTORSHIP PREP

Accountability & Mentoring Development

Record key takeaways each week and prepare questions for and to share learnings with your Mentor each month during your 1-2-1 sessions.