ADVANCED CONNECTIONS | CYSYLLTIADAU PELLACH

SESSION PLAN

Mentoring Session 6: Revising like a physicist

Aim

To build confidence in preparing for exams through structured strategies.

Learning Objectives

By the end of this session, the mentees will be able to...

- Understand and apply active revision techniques for physics and mathematics.
- Create a tailored revision timetable.
- Identify their strengths and weaknesses using traffic-light techniques.
- Learn strategies for balancing revision with wellbeing.

Prepare in Advance

- Reflect on your own pre-university revision experiences. How did you manage to cope the process? Did you use any useful resources/plans?
- Prepare the whiteboard function on Zoom

Session Flow

Time	Activity
5 min	**Icebreaker: The Virtual Scientist** • Participants type in the chat one physics or maths topic they find most interesting or challenging. • Use a tool like Mentimeter or a Zoom poll to create a quick word cloud from their responses.
30 min	**Revision Techniques Discussion** • Activity Flow: Part 1: 1. Start with Questions (5 mins) 2. Share Tips (10 mins) 3. Side Activity: 'Plan a Day' Challenge (5 mins) Part 2: 1. Traffic-Lighting Topics (10 mins) More info on the next page.
15 min	**Wellbeing & Balance** • Share a digital checklist for wellbeing (e.g., sleep, hydration, breaks, mindfulness). • Breathing Exercise (3-5 mins): Guide participants through a quick relaxation technique like box breathing (inhale for 4, hold for 4, exhale for 4). • Group brainstorm using the chat: • "What's one thing you do to avoid burnout during revision?" • "What's a fun activity you enjoy for breaks?" • Share your own tips for balancing revision and self-care, e.g., exercise, hobbies.
5 min	**Q&A and Reflection** • Open the floor for questions via chat or voice. • Encourage participants to share one actionable takeaway in the chat. • Wrap up with a motivational message: • "Revising like a physicist is about solving the right problems with the right tools. You've got this!" • Give the mentees the link/QR code to complete reflection.

Scaffolding

If a mentee finishes early:

"Chunking" Revision Objective: Break down large Physics topics into manageable chunks to focus on specific learning outcomes.

- Materials: Paper & pen
- Instructions:
  a. Write down the broad Physics topics you need to cover (e.g., Mechanics, Electricity, Waves, etc.).
  b. For each topic, break it down into smaller sub-topics
  c. For each sub-topic, list key concepts, equations, and common exam questions.
  d. Allocate time for each sub-topic in your revision schedule.

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MENTOR GUIDANCE

MENTORING SESSION 6: REVISING LIKE A PHYSICIST

The aim of this mentoring session is to help mentees To develop effective exam techniques for physics and mathematics and to emphasise active learning and wellbeing during exam preparation.

1. Revision Techniques Discussion:

Activity Flow:

- **Start with Questions:**
  - **Encourage participants to share responses in the chat or using voice:**
    - **"Do you have any upcoming mock exams or assessments?"**
    - **"What revision techniques have worked or failed for you in the past?"**
    - **"How do you think final exams differ from mocks?"**
- **Share Tips:**
  - **Use slides to structure the discussion. Include:**
    - **Plan: Introduce the importance of timetables and show a digital template.**
    - **Organise: Highlight tools like Google Drive, online flashcards (e.g., Quizlet), and free maths/physics resources.**
    - **Routine: Discuss productive daily habits.**
    - **Work Together: Suggest the mentees to study together at school. For example, they can do practise questions or past papers at home in the evening and discuss them as a group.**
  - **Why collaborative learning?**
  - **Everyone approaches problems differently, so discussing past papers allows mentees to learn new problem-solving methods and perspectives.**
  - **You can clarify doubts by explaining concepts to others, which reinforces your understanding.**
  - **Peer feedback helps refine strategies and avoid common mistakes.**

Side Activity:

- **"Plan-a-Day" Challenge:**
- **Participants type in the chat what their ideal revision day looks like (e.g., hours for study, breaks, wellbeing activities).**

Traffic-Lighting Topics (10 mins) **more on page 3**

Activity Flow:

- **Share a traffic-light template via Google Docs or a downloadable PDF.**
- **Participants:**
  - **Spend 2-3 minutes marking topics red (don't know), amber (unsure), or green (confident).**
  - **Share one or two "red" or "amber" topics in the chat.**
- **Group Discussion (5 mins):**
  - **Participants suggest resources or tips for tackling these tricky topics.**
  - **Use polls to vote on the most challenging topic, then provide targeted advice or examples.**

Tool Suggestions:

- **Google Jamboard for collaborative marking.**
- **Screen share to demonstrate traffic-lighting in real time.**

Adapted Tools for Online Delivery
Polls: Use Zoom polls, Mentimeter, or Slido to gather responses.
Collaborative Docs: Share links to Google Docs, Slides, or Jamboard for live interaction.
Quizzes: Use Kahoot, Quizlet Live, or Poll Everywhere for fun, interactive problem-solving.
Whiteboard: Use a virtual whiteboard for live explanations and discussions.

PHYSICS MENTORING PROJECT | PROSIECT MENTORA FFISEG

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TRAFFIC LIGHT REVISION TEMPLATE

Instructions:

1. List all the topics or subtopics you need to revise.
2. Use the colors Red, Amber, or Green to indicate your confidence level:

- Red: You don't understand the topic and need urgent revision.
- Amber: You have some understanding but need more practice.
- Green: You are confident in this topic and just need a quick review.

Subject	Topic	Confidence Level (🟥/🟧/🟩)	Specific Challenges	Action Plan	Resources Needed	Progress Notes
Mathematics	Differentiation	🟥	Chain rule, second derivatives	Watch 3 videos, do textbook exercises 7-10	Class notes, textbooks	Still struggling with tougher problems.
Physics	Mechanics (Forces)	🟧	Resolving forces at angles	Review notes, attempt 5 past papers, group study	Revision guides, past papers	Understanding improved; some gaps left.
Chemistry	Organic Reactions	🟩	Forgetting reagents and conditions	Make flashcards, quiz self	Flashcards, YouTube	Confident; scored 90% on a quiz.

Steps for Using the Template:

1. Write down topics: Break subjects into smaller, manageable sections.
2. Evaluate yourself: Honestly assess your confidence level in each area.
3. Set targeted action plans: Create clear, achievable steps to improve.
4. Prioritise: Focus more time on Red topics, moderate time on Amber, and less on Green.
5. Revisit: Update the table as you revise and progress. Move topics up to Amber or Green as your confidence improves. 🟥 (Red) → 🟧 (Amber) → 🟩 (Green)

Benefits of This Format:

- Breaks topics into manageable tasks.
- Encourages honest self-reflection about what's difficult.
- Keeps progress visible, motivating you as topics shift to Green.
- Ensures you have a concrete plan for each weak area.

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REVISION TECHNIQUES:

1. Spaced Repetition:
   - Why it works: Spaced repetition is proven to enhance memory retention by revisiting information at increasing intervals.
   - How to apply it: Review the material in short sessions (e.g., 10-15 minutes) multiple times a day. Gradually space out your review times—first after an hour, then a day, then a week.

2. Active Recall:
   - Why it works: Actively recalling information reinforces neural pathways and improves memory.
   - How to apply it: Test yourself on the key points in the table, covering specific topics and asking yourself the confidence level, action plan, and any challenges you might face. Try to recall the information in an exam condition.

3. Mind Mapping:
   - Why it works: Creating visual connections between ideas helps in understanding and memorisation.
   - How to apply it: Draw a mind map based on the table. For example, for each subject, link the topic to specific challenges, action plans, and confidence levels. It makes the information more interconnected and memorable.

4. Mnemonics:
   - Why it works: Mnemonics are memory aids that simplify complex information into a format that's easier to recall.
   - How to apply it: Create acronyms or phrases for each section. For example,

Energy Conservation
K: Kinetic Energy (½mv²)
U: Potential Energy (mgh)
Acronym: "Keep Up the Energy" (K + U = constant)

5. Teaching It:
   - Why it works: Teaching someone else forces you to recall and understand the material more deeply.
   - How to apply it: Explain a topic to a peer or even to yourself aloud, detailing each part as if you were the teacher.

By actively using these techniques, you'll be able to internalise the knowledge and remember it more effectively.

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BRIGHT IDEAS!

This page contains ideas for alternative sessions, changes/additions, extra activities, etc.
Feel free to use as you wish!

MENTORING SESSION 6: REVISING LIKE A PHYSICIST

UCAS Research

Ask the mentees to open the UCAS website, and encourage them to get creative exploring different degree options.

- Remind the mentees to be open-minded about degree routes, as there will be many they haven't heard about before!
- Encourage mentees to take notes and write down pros/cons of each degree they are interested in.
  - This information can be used in the future when they apply for degrees!

Exploring Worries

If you think the mentees are particularly anxious about university, take time to focus on this. Open a discussion about why they are feeling this way, so you can help address those concerns. You could even tailor future sessions to come back to this!

Career Hot Potato

You can repeat this with different careers, or choose careers that the mentees have previously shown interest in!

1. Suggest a STEM career (e.g. biomedical scientist, engineer, etc.)
2. Randomly select a mentee. They have to come up with a degree that would enable someone to work in that field, and list one thing that would be useful from that degree in the chosen field.
3. Continue randomly selecting mentees until they run out of ideas!

I Wanna Be Like You

Choose some role models or famous people in a STEM industry, and explore their university/career journeys. Really nice way to show there's no fixed path to success or a good career!

An example: Bessie Blount (left-handed, nurse, invented apparatus for disabled veterans, then changed career at 55 to become a forgery expert with Scotland Yard)