

**Tutor Training**

**Online Workbook**

2022-23

**Tutor name:**

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# Welcome

Welcome to The Scholars Programme and thank you for applying to work with us in non-selective state schools across the UK. At The Brilliant Club, we believe that the PhD community has a major role to play in increasing the number of pupils from under-represented backgrounds progressing to the most competitive universities. You are now part of this movement, and we look forward to working with you this academic year and beyond.

The tutor training will support you to design and develop your own Scholars Programme course. This handbook provides templates to begin planning your course alongside the online training sessions you will complete over the coming weeks. The templates included here are designed to align directly with the Course Design Template you will receive from our Teaching and Learning team following the completion of your online training. We have noted where this is the case on the relevant templates. With this in mind, we encourage you to make use of these templates, and some of the examples and guidance in the appendices to begin planning your course.

Once you complete the online training, our Teaching and Learning team will be in touch to share your course design template link. This will allow you to share your course plans with our team and receive feedback so that you can continue planning your Scholars Programme course.

Thank you in advance for all the hard work you will put into designing your course. We hope you will find this training and the resources below useful and look forward to learning more about your Scholars Programme course soon.

Dr Lauren Mottle

*Teaching and Learning Manager*

# Training Overview

**Planning**

* What will pupils know/be able to do by the end of a tutorial/programme?
* What will you include and why?

**Participation**

* What will pupils do?
* What will you be doing?

**Progress**

* How will you know what pupils have learnt?
* How will you support them?

# Module 1: Planning

Backwards Planning

* Backward Design or ‘Backwards Planning’ refers to the process of planning a course or sequence of learning, where the designer focuses on the desired end result of the project first.
* Rather than beginning the planning process with a focus on a specific subject area or a series of activities, the design process begins by asking what learners should be able*to understand and do* at the end of the course.



*Understanding by Design*

Grant Wiggins and Jay McTighe

Concept Mapping

**Example or Case Study**

NB: this activity will be useful to complete the rest of the tasks which inform your course design template

Backwards Planning Template

NB: this can be directly added to your Course Design Template following the training

|  |
| --- |
| **Final Assignment and course aims (Video 1)** |
| **Final Assignment Title** |  |
| **Course aims** | **Understand (subject knowledge)** | **Be able to do (academic skills)** |
| **Baseline Assignment question (Video 2)** |
| **Baseline Assignment Title****Video 2** |  |

\*Your baseline assignment should allow you test some of the subject knowledge and most, if not all, of the academic skills you have identified above.

For further examples in a range of subject areas, please see [Appendix 1](#_Appendix_1:_Aligning)

* [Arts and Humanities](#_Arts_and_Humanities)
* [Social Science](#_Social_Science)
* [STEM](#_STEM)

**Backwards Planning: Tutorial outcomes and homework assignments**

NB: this can be directly added to your Course Design Template following the training

\*remember to review your course aims to ensure your outcomes and assignments supports pupil progress towards these aims

|  |
| --- |
| **Tutorial 1** |
| **Secondary Concept from concept map covered in this tutorial** | **Tutorial Outcomes** | **Homework Task – Baseline Assignment** |
| **Tutorial 2** |
| **Secondary Concept from concept map covered in this tutorial** | **Tutorial Outcomes** | **Homework Task** |
| **Tutorial 3** |
| **Secondary Concept from concept map covered in this tutorial** | **Tutorial Outcomes** | **Homework Task**  |
| **Tutorial 4** |
| **Secondary Concept from concept map covered in this tutorial** | **Tutorial Outcomes** | **Homework Task**  |
| **Tutorial 5** |
| **Revise and Prepare for Draft Assignment** | **Tutorial Outcomes** | **Homework Task – Draft Assignment** |

**Backwards Planning: Achieving tutorial outcomes**

|  |
| --- |
| **Backwards Planning for Tutorial #\_\_\_\_\_\_\_\_** |
| **Learning Outcomes for this tutorial** |  |
| **Tutorial Aims** | **Understand (subject knowledge)** | **Be able to do (academic skills)** |
| **Resource to be used:** |
| **Task or activity to be set** |  |
| **Outcomes** | **What knowledge or skills will pupils develop?**  | **Which learning outcomes does this activity achieve?** |

On the next page, we have shared a suggested planning template for your tutorials. Please feel free to copy this as many times as you need to plan your tutorials.

 The Course Design Template will ask you to outline the main case studies/sources and activities each tutorial will include.

\*Please see [Appendix 3](#_Appendix_3:_Completed) for an example of completed tutorial planning templates

**Tutorial Planning Template**

**Tutorial Number:**

**Tutorial Objectives:**

**Starter**

* Hook students’ interest
* Check what they’ve retained from the previous tutorial

**Learning Activity**

* Deliver the key concepts of the tutorial
* Consider how students can experience independent or university-style learning

**Main Activities**

* Plan opportunities for students to actively engage with the content
* Encourage student-led and university-style learning

**Plenary**

* Allow students to demonstrate that they have met the tutorial objectives
* Plan opportunities to assess students’ understanding

**Checking Understanding Question**

* Are they ready to learn new content?

**Resources**

**Hinge Point Activity**

* How can students demonstrate an understanding of the key concepts?

**Resources**

**Checking Understanding Question**

* How can students demonstrate an understanding of the key concepts?

**Resources**

**Checking Understanding Question**

* How successfully have students met the tutorial objectives?

**Resources**

**Tutorial Notes**

* Plan your next tutorial based on students’ progress in this tutorial

# Module 2: Marking and Feedback

Feedback

Good feedback is…

Pupil A states in their meta-cognition exercise that they feel confident evaluating events, but their essay is very descriptive. How would you approach this in Tutorial 6?

Pupil B has misunderstood one of the primary concepts on the course. How would you approach this in Tutorial 6?

When reading the draft essay, you notice that Pupil C is taking work from other sources and not referencing them properly. You remind the pupil in Tutorial 6 about plagiarism rules, but they do not change the draft before submitting the final assignment. How would you approach this in Tutorial 7?

Marking and Moderation

**Marking**

Marks for both the baseline assessment and final assignment should be submitted via the VLE. You should submit marks in the same way for both the baseline assessment and the final assignment.

The table below outlines what marks you should submit.

|  |  |  |  |
| --- | --- | --- | --- |
| Assignment type | Problem set | Skills in the mark scheme | Overall mark |
| Essay based | These assignments will not have a problem set so this box should be left blank | A mark out of 100 should be submitted for each of the skills in the mark scheme | The overall mark should be submitted out of 100 and should be made up of an average of the marks given for each skill |
| Problem set and research question | A mark out of 100 for the problem set | A mark out of 100 should be submitted for each of the skills in the mark scheme | The final mark should be given out of 100 and made up of 50% problem set and 50% research question (an average of the marks awarded for each skill in the mark scheme) |

**Moderation**

To ensure consistency of marking, we operate a national moderation process. You will be contacted ahead of the final assignment deadline by a member of our team, who will act as your ‘Moderation Lead’.

They will match you up with a PhD tutor teaching a course in a similar subject discipline to you. You will check each other work, and the Moderation Lead will ensure consistency of approach.

Further details of how this process will work, will be outlined by your Moderation Lead in advance of the final assignment deadline.

Final Assignment Feedback form: Arts/Hum, Social Sciences and STEM Essay assignments

|  |  |
| --- | --- |
| **Title of Assignment** |  |
| **ORIGINAL MARK / 100** |  | **FINAL MARK / 100** |  |
| **DEDUCTED MARKS** |  | **FINAL GRADE** |  |
| **Subject Knowledge** |
|  |
| **Critical Thinking** |
|  |
| **Written Communications** |
|  |
| **Overall Comments (participation, effort, resilience)** |
|  |

**Final Assignment Feedback form: STEM problem-set assignments**

|  |  |
| --- | --- |
| **Title of Assignment** |  |
| **Name of Pupil** |  |
| **Name of School** |  |
| **ORIGINAL ESSAY MARK %** |  | **FINAL MARK %** |  |
| **PROBLEM SET MARK %** |  | **FINAL GRADE** |  |
| **DEDUCTED MARKS** |  |
| Please note, the final mark is made up of 50% for the Essay Marks, 50% for the Problem Set, followed by any final deductions |
| **ESSAY FEEDBACK**  |  **Essay mark: \_\_\_%** |
| Knowledge and Understanding |
|  |
| Critical Evaluation |
|  |
| Structure and Presentation |
|  |
| **PROBLEM SET FEEDBACK** | **Problem Set Mark: \_\_\_%** |
|  |
| **OVERALL COMMENTS** (participation, effort, resilience) |
|  |

# Appendix 1: Aligning your baseline and final assignment

Jump to

* [Social Science](#_Social_Science)
* [STEM](#_STEM)

# Arts and Humanities

Example 1 – Literature/American Studies

**Final Assignment Question:** What can the Harlem Renaissance tell us about the capacity of literature (as well as music and art) to enact real-world change? (2000 words)

* Using materials we have looked at together as well as those you have researched yourself and the debates over the legacy of the Harlem Renaissance we have discussed in this tutorial, reflect upon the function of art then and now as an agent for change (racist attitudes, politics etc.).
* Be sure to balance your discussion to include both examples from the Harlem Renaissance and the present day, drawing parallels and highlighting differences.

|  |  |
| --- | --- |
| Subject Knowledge (Understand) | Academic Skills (Be able to do) |
| * **Assess the relationship between literature, music and art and movements for social change**
* Evaluate how identity, particularly race and gender, influences and is influenced by art and activism
* Apply relevant race and gender theories to historical analysis
* Trace the influence of the Harlem Renaissance into future movements
 | * **Analyse literature/art/music to support an academic argument**
* **Use evidence to support claims and assertions**
* **Make links between subjects and use concepts from tutorial in unfamiliar contexts**
* **Moving beyond description to evaluation and include reasoned points**
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question:**

Drawing upon our discussion of “If We Must Die”, compare this poem to Beyoncé’s “Freedom” (lyrics are provided in Appendix 4, but I would encourage you to also listen to the song if you can on YouTube or elsewhere: it’s powerful stuff!).

Think particularly about the language and imagery used in both texts. How is the speaker/singer characterised in both cases? Identify any similarities or differences. With all of these things in mind, analyse how both McKay and Beyoncé use poetry and music to reflect and advance the fight for racial liberation. (c. 500 words)

Example 2 – Postcolonial Studies (English)

**Final Assignment Question:** "Can Texts Fight Colonialism and Inequality?"

Evaluate the question referring in your answer to at least TWO texts, one of which has not been examined during the course.

|  |  |
| --- | --- |
| Subject Knowledge | Academic Skills |
| * **Apply post-colonial theory to texts**
* **Identify and utilise examples of colonial or post-colonial language in texts**
* **Opportunity to use relevant technical terms**
* Evaluate the meaning/definition of a text and the role it can play in shaping society
* Describe and evaluate how post-colonial texts challenges colonial narratives
 | * **Use evidence to support claims and assertions**
* **Make links between subjects and use concepts from tutorial in unfamiliar contexts**
* **Apply post-colonial theories to move beyond description to evaluation and include reasoned points**
* **Develop close reading skills**
* Conduct independent research and reading
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question:** Write a short analysis of an excerpt from Frankenstein included on the next page in your handbook. You should discuss the colonial binary of master/slave and explore the resistance is voiced through the monster's tale. 300 words, double spaced.

Specifically, this test connects with the final assignment as it will assess:

* your ability to write clearly and effectively
* your skills in developing arguments
* your ability to close read texts
* your understanding of some of the key ideas developed in Tutorial 1

Example 3 – Psychology/Music – Ages 17-18

Final Assignment Question: Why should hip-hop/rap music be considered a relaxing music style?

Introduction

* This section should include some background information on both stress and music listening. What is stress? How does it impact our daily lives? Why is music listening a good stress management technique?
* You should briefly refer to the general controversiality of hip-hop/rap music as a music genre and its current status as a stress-management technique in comparison to other less controversial genres.

Main body

* You should discuss the potential relaxing properties of hip-hop/rap music as a genre. You should also consider and discuss any other aspects that could lead people to become relaxed as a consequence of listening to hip-hop.
* You should then critically discuss what factors could negatively influence people’s beliefs about the relaxing nature of hip-hop/rap music.
* Through critical reasoning, you should share your own views about the current status of hiphop/rap music as a stress-management technique, considering the aspects discussed above and providing recommendations for further research.

Conclusion

* In this section, you should briefly summarise your argument, using it to concisely answer the essay question.

You are encouraged to make use of relevant sources and course content throughout the essay. The construction of coherent arguments, that demonstrate that you are able to appropriately use critical reasoning and draw conclusions from it, will be favoured over your actual final argument. Additionally, you should discuss definitions of any relevant concepts where possible. It is recommended that you use examples of other relevant music genres to compare hip-hop/rap music to, when and where appropriate. You are expected to go beyond the course material and include information acquired through independent research.

|  |  |
| --- | --- |
| Subject Knowledge | Academic Skills |
| * **Evaluate the relationship between relaxation and music**
* **Analyse the influence of different musical genres on stress (positive and negative)**
* Define and apply “objective” and “subjective” features to assess a piece of music
* Consider what “relaxing music” means for psychologists and academic researchers
 | * **Use evidence from academic texts to support claims and assertions**
* **Independently make links between subjects and use concepts from tutorial in unfamiliar contexts**
* **Move beyond description to evaluation and include reasoned points to support an argument**
* **Develop a clear point of view and develop that point of view throughout the essay**
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question**: Does listening to different music styles influence people’s levels of stress equally?

This first assignment consists of a short essay (500 words). Your essay should include the following sections:

* Introduction
	+ Some background information on both stress (what is it?, how can it affect us?) and music listening (how does it relate to stress?) should be provided here.
	+ You should state your general opinion/beliefs regarding the essay question (is music listening
	+ helpful? If so, do you think all music styles are equally helpful?).
* Main body
	+ You should expand on your answer to the essay question, justifying and critically analysing your views (Why do you think/not think all music styles equally affect our stress levels? Are there any aspects that could make you think otherwise?)
* Conclusion
	+ In this section, you should provide your final answer to the essay question, and concisely state the reason(s) why.

In this assignment, you could:

* Include examples of music styles for illustration or comparison purposes.
* Do extra reading and use the sources you have researched to support your arguments.
* If you do include any sources to support your argument, please ensure you add these to a bibliography, which is not included in the word count.

Example 4 – English

**Final Assignment Question:** How does poetry explore various conflicts: inner conflicts, conflicts between people, and conflicts between an individual vs. society? How does writing poetry, which is an imaginary act, provide solutions or alternate routes to conflict? Our discussions of imagination versus reality might be useful here.

Instructions:

* Choose three poems to analyse. Two poems should ones we discussed on the course. The third poem should either be from Appendix 4 or from your own outside reading. If you choose a poem from your own outside reading, please bring a copy of it so I can read it during tutorial 6 and tutorial 7.
* Be sure to develop your points fully and support them with evidence from your chosen texts.
* For the two poems discussed on the course, please read the interviews/articles about the poets and their poems and quote from them in your essay. You will find these in Appendix 3.
* I would also encourage you to read through Appendix 4, which contains more information about poetry in general. You may want to quote from these materials in your essay, but this is optional.

|  |  |
| --- | --- |
| Subject Knowledge | Academic Skills |
| * **Analyse how conflict is presented in poetry**
* **Define different types of conflict**
* **Identify and utilise different types of conflict to support a critical reading of a text**
* Assess how the imagined world of poetry can provide alternative routes to conflict
* Define and utilise key vocabulary associated with poetry and its evaluation
 | * **Use evidence to support claims and assertions**
* **Independently interpret poetry to support an academic argument**
* **Analyse content effectively to support an argument; move beyond description to evaluation and include reasoned points**
* **Critically read and evaluate a text**
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question:** What conflicts are portrayed in William Stafford’s poem ‘Traveling through the Dark’?

* 500 words
* Develop your points fully and use evidence from the poem to support them
* Read and refer to critical commentary on ‘Traveling through the Dark’. Choose EITHER passage A or B and reflect on how these texts affect your reading of Stafford’s poem and the conflicts portrayed.
* Refer to ‘How to Read & Analyse Poetry’ for help getting started

Example 5 – Philosophy

**Final Assignment Question:** To what extent is OIC true for us and the Ancient Greeks?

The purpose of the assignment is to assess the knowledge you have acquired about OIC and related matters so far, as well as your ability, developed through your reading, writing, research and discussion, to argue about these in a critical and scholarly manner. You will firstly be expected to briefly demonstrate an understanding of OIC.

After this, you will be expected to consider the extent to which OIC is operative

in your own culture, utilising the scientific and philosophical literature discussed in prior tutorials, as well as your own research. This will be followed by analysing the extent to which it was operative in the ancient world, utilising the primary and secondary sources to which you have already been exposed, again supplemented by your own research. You are encouraged to contrast the role of OIC in both modern and ancient contexts, and offer some reasons why similarities or differences might have occurred.

|  |  |
| --- | --- |
| Subject Knowledge | Academic Skills |
| * **Define and evaluate the philosophical concept “ought implies can”**
* Utilise philosophical thought experiments to interrogate “ought implies can”
* Evaluate philosophical arguments around “ought implies can”
* Apply “ought implies can” to our culture today
 | * **Make links between subjects and use concepts from tutorial in unfamiliar contexts**
* **Move beyond description to evaluation and include reasoned points**
* **Use of evidence to support assertions consistently and clearly**
* **Constructing a clear point of view in position to the question that is clearly argued throughout.**
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question:** What is meant by ‘ought implies can’, and do you think it is true?

* I want you to answer two questions:
	+ What is meant by ‘ought implies can’?
	+ Do you think it is true?
* Word limit: 500 words ±10%.
* Referencing and bibliography: not required.
* The purpose of this assessment is to check whether you understand the core concept of ‘ought implies can’, and to see whether you think it’s true or false. With regards to Question 2, there is no ‘right’ or ‘wrong’ answer. Rather, I want you to think hard about OIC, and the extent to which you’re convinced (or unconvinced) that it’s a valid principle. Try to argue as clearly and academically as possible, and feel free to refer any examples or evidence that leads you to prefer one view over another.

Example 6 – History

**Final Assignment Question:** “Divergent ethnicities cannot live peacefully together intimes of economic depression”: to what extent does thisstatement explain the causes of the 1919 Seaport Riots?

|  |  |
| --- | --- |
| Subject Knowledge | Academic Skills |
| * **Identify key events and relevant historical contexts in the 1919 Seaport Riots**
* **Place local histories in local and global contexts**
* Evaluate broader contexts impacting local histories
* Identify and assess racialised language in historical texts
* Evaluate the particular role racialisation played in the 1919 Seaport riots
 | * **Use historical evidence to support claims and assertions about a historical moment**
* **Make links between subjects and use concepts from tutorial to evaluate a historical event**
* **Move beyond description to evaluation and include reasoned points**
* **Construct a clear point of view in position to the question that is clearly argued throughout.**
* **Conduct independent research and reading**
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question:**

Your task is to write a 200-300 word essay on the events that happened in South Shields on the 4th February 1919 and highlight the contexts that you believe to have surrounded the riot.

You should consider the contexts as separate – social, economic and political – but also suggest how they might interact, be dependent upon or relate to one another.

You should use the reading excerpts that have been provided throughout the tutorial and additional material is available in the source book appendix.

# Social Science

Example 1 – Political Sociology

**Final Assignment Question:** “Who decides who is, and is not, a terrorist?”

To answer this essay question, you will need to:

* Use case studies. You can draw on the one’s we have discussed in class or find your own. **Please remember to be careful if you are looking for sources on terrorism online on your own and speak to me if you have any concerns.**
* You should, in your answer, draw on topics from all the lessons, even if you are focussing on one specific aspect of the course (i.e. religion, or anti-terror law).
* I will expect to see evidence of correct referencing in your work. If you make a claim, back it up with evidence (an article, a quote from a book, etc). You can find some guidance on referencing in the appendix.
* As part of your answer, I’d like you consider how we might try to combat the threat of terrorism better. This will be based on your own impressions, and what you’ve learned in the course.

|  |  |
| --- | --- |
| Subject Knowledge (Understand) | Academic Skills (Be able to do) |
| * **Critically analyse ‘terrorist’ and ‘terrorism’**
* **Evaluate how society creates a definition of terrorist/terrorism and how that can change**
* **Demonstrate a good understanding of relevant topics**
* Correctly use technical terms
 | * **Use evidence to support claims and assertions**
* **Make links between subjects and use concepts from tutorial in unfamiliar contexts**
* **Moves beyond description to evaluation and includes reasoned points**
* **Demonstrate clear structure and presentation**
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question:** How do we talk about Terrorism?

For your first assessment, I want you to read the two newspaper extracts closely. Both of these articles are about Osama Bin Laden, the leader of Al Qaeda. The first is from 1993, and the second is from 2011. Both of them are from *The Independent* (a British newspaper).

Your task, in 350-400 words, is:

* Read the two articles carefully and think about why Osama Bin Laden is portrayed in two very different ways.
* You should consider the language used in both articles, why Western views on Bin
* Laden changed.
* You should also try to connect your answer to how definitions of terrorism are fluid (i.e. they can change over time).

As well as the articles below, you may want to draw some parallels with the exercise about Nelson Mandela in Tutorial 1.

Example 2 – Social Science

**Final Assignment Question:** “How do social and political factors influence the **integration and mental heath/psychosocial wellbeing** of people from migrant communities in the UK?

The tutor has then suggested the following structure to pupils with further guidance on what might be discussed in each:

* Introduction
* Spotlight 1: Define and explain what migration studies is.
* Spotlight 2: Evaluate the main disciplines that migration studies covers.
* Spotlight 3: Compare one source from tutorial 3 with one from tutorial 4
* Spotlight 4: Give your opinion on “the migration debate”
* Spotlight 5: Suggest 1-2 interventions or strategies that the British government could develop to support the mental health and psychosocial well being of migrants in the UK
* Conclusion

|  |  |
| --- | --- |
| Subject Knowledge | Academic Skills |
| * **Define migration and diaspora and identify its causes**
* Explore who studies migration and evaluate what this contributes to the debate
* Evaluate influence of discourse around migration on public opinion and individual migrants (benefits and pitfalls)
* **Correctly use technical terms**
* **Demonstrate a good understanding of relevant topics**
 | * **Use evidence to support claims and assertions**
* **Make links between subjects and uses concepts from tutorial in unfamiliar contexts**
* **Move beyond description to evaluation and includes reasoned points**
* **Demonstrate clear structure and presentation**
* Critique various sources for reliability/bias/agendas
* **Conduct independent research**
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question:**

With reference to the information we have learned during Tutorial 1, using **one** factor per paragraph:

1. Define what is meant by social, political, psychological and economic factors
2. Give one example of each of these factors. The example must be from your **own independent research**
3. Explain how the factor you have chosen benefits and/or disadvantages society.

Your assignment should be approximately 500 words in total and each paragraph should be clearly written using the Point, Evidence, Explanation, Link (PEEL) and be between 100-125 words in length.

Example 3 – Economics

Final Assignment Question: How should the government buy trains?

The Department for Transport (DfT) has asked you to write an essay that responds to the question of train procurement and provides policy advice using evidence. The paper must include an executive summary at the beginning (150-200 words, counted towards the word limit) that will provide the essential information contained in the essay (remember, the Transport Secretary is a busy person!) Always define terms and concepts so that everyone can understand what you are talking about. Remember, how the government buys trains affects many people, and everyone should be able to read your essay!

Suggested structure of the essay (each section can have multiple paragraphs):

* **Introduction (300 words):** State the importance and relevance of the question being asked (why is the government buying trains at all?)
* **Section 1 (400 words):** Describe the procurement process associated with buying trains.
* **Section 2 (400 words):** Discuss the challenges that can occur in the different stages of procurement using economic theory and examples from a recent train purchase. In particular, explain and argue the opportunities and challenges associated with:
	+ Imperfect competition (hint: the use of market price)
	+ International trade (hint: industrial protectionism, specialization)
* **Section 3 (400 words):** Explore the complexity of the procurement by stating some common challenges of megaprojects
* **Conclusion (300 words):** Summarise the main lessons that the Department for Transport should remember when buying trains in the future. Provide justifications for the advice you are providing.

|  |  |
| --- | --- |
| Subject Knowledge | Academic Skills |
| * **Describe the procurement processes for train purchases**
* **Assess the challenges of procuring trains**
* **Convey key subject knowledge and use relevant technical terms**
* Apply economic theories to the train procurement process
 | * **Use evidence to support claims and assertions**
* **Make links between subjects and use concepts from tutorial in unfamiliar contexts**
* **Move beyond description to evaluation and include reasoned points**
* **Clearly conveys their own position/point of view**
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question**: Why does the government buy trains, and what are the challenges that can occur in procuring trains?

* **Introduction (60 words):** Start by stating the importance of trains. Explain any general terms or concepts that you would be using throughout the text. Also, tell the reader about the structure of the essay.
* **Section 1 (80 words):** Respond to the first part of the question; refer to tutorial discussions and previous knowledge, but also consult additional resources in Appendix 3 to provide information about UK government’s involvement in buying trains; describe the situation of train purchase and ownership in the UK before focussing on the specific question.
* **Section 2 (120 words):** Respond to the second part of the question; refer to tutorial discussions and materials and feel free to consult more resources within and outside the handbook. Make sure you provide context before launching into a discussion and give examples to help the reader understand what you are saying and why you are saying it.
* **Conclusion (40 words):** Finish the essay by summarising and providing any further thoughts on the questions. Always remember, the introduction and conclusion are the most read portions of your essay and therefore should fit together well (so that even if someone skips the 200 words in between, they can still get an essential understanding of the contents).

# STEM

Example 1 – Computer Science with Problem Set

**Final Assignment Question:** Should we build a quantum computer?

Introduction: (250 words)

* This section should include some background information about quantum computers. What are they? How do they work? How much progress has been made towards building a powerful quantum computer? (See Appendix 4)
* You should also express an opinion on the essay question

Main Body (500 words)

* In this section, you should talk about the potential applications of quantum computers. Will quantum computers help solve the world’s problems? Or will they create more problems? How big an effect would a quantum computer have on our world?
* Remember to critically analyse your sources. Are your sources from reliable publications? Do the authors have vested interests which means they are biased in favour of (or against) quantum computers? Have any claims been exaggerated?

Conclusion (200 words)

* In this section you should summarise your argument and give a conclusion which answers the essay question. Remember to cite the evidence you have collected in support of your conclusion.

[Part 2 of the Final Assignment is a Problem Set of quantum logic problems]

|  |  |
| --- | --- |
| Subject Knowledge (Understand) | Academic Skills (Be able to do) |
| * **Explain key algorithms and evaluate their importance**
* Assess the possibilities of a quantum computer (both its applications and limitations)
* Identify the differences between quantum computing and regular (classical) computing
* Explore the relationship between the H-box and quantum computing
 | * **Select the most relevant scientific evidence to support claims**
* **Use correct scientific language**
* **Explain the value or significance of selected evidence**
* **Highlight and evaluate competing points of view**
* **Showcase independent thought**
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question:** What is the most important algorithm in the modern world?

In your essay of 300 words, I want you to compare two algorithms from the three case studies from the tutorial. Your essay should include the following:

* A brief description of each algorithm (what problem does it solve, how does it work, who invented it) [200 words]
* A discussion of which algorithm you think is more important and why. What would the world be like without this algorithm? [200 words]
* You should have enough information from the case studies to do your essay, but I encourage you to do some additional research.

[Part 2 of Baseline assignment is a problem set of logic problems]

Example 2 – Biological Sciences – Ages 17-18

**Final Assignment Question:** For a cancer of your choice describe the development, current research and future outlook for patients developing the disease. Your response should also include an assessment of which research you think will be most effective or most promising and why.

|  |  |
| --- | --- |
| Subject Knowledge | Academic Skills |
| * **Apply biological knowledge to anticipate outcomes**
* **Assess the role of mutations in cancer and cancer research**
* Evaluate possible scientific outcomes and existing research in cancer treatments
* Explore potential treatments for cancer and apply scientific knowledge to the problem.
 | * **Select scientific evidence to support claims**
* **Use correct scientific language**
* **Explain the value or significance of selected evidence**
* **Showcase independent thought and make point of view clear**
* Highlight competing points of view
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question:** Write a paragraph of 300 words describing how mutations in cell division in the human might lead to disease. What implications might this have for society if scientists could identify and fix all mutations – are all mutations a bad thing?

Example 3 – Neuroscience – Ages 17-18

Final Assignment Question: Would you recommend taking a memory enhancing drug?

A brand new memory enhancing drug has come on the market and many news outlets have jumped onto its discovery saying it can cure Alzheimer’s disease, amnesia and improve cognitive performance. Write an opinion article for Nature Magazine about whether you think a single drug could realistically perform all the above functions from a neuroscience perspective. State the pros and cons of memory enhancement and conclude with your recommendation on taking memory enhancing drugs.

In your essay, please include:

* An introduction to neuroscience and memory problems
* The neuroscience of memory formation
* How this drug might work on a neuron
* Experimental means of testing memory using this drug
* A balanced argument for and against using this drug to enhance memory in Alzheimer’s disease, amnesia and cognitive performance.
* A conclusion summarising your recommendation, why you think this and the future directions of memory enhancement

Your article should be structured using appropriate subheadings, including introduction and conclusion. Include diagrams when they will help explain your point. These must be labeled or commented on in the text. Your opinion is the most important part of this assignment. Think of your point of view before you write the essay and keep this in mind throughout!

Extra reading and research is encouraged. Search for information about the neuroscience of memory on the internet and look out for news articles and scientific websites. Make sure to comment on the reliability of these sources and reference them as stated below.

|  |  |
| --- | --- |
| Subject Knowledge | Academic Skills |
| * **Identify the regions of the brain and define the functions of brain cells**
* Describe the process of signal transmission and assess its implications for human function
* Evaluate the changes in synaptic processes and their influence on memory/memory disorders
 | * **Select scientific evidence to support claims**
* **Use correct scientific language**
* **Explain the value or significance of selected evidence**
* **Highlight competing points of view**
* **Showcase independent thought and make point of view clear**
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question**: Which region of the brain is the most important for human function and why?

In this assignment, you should:

* Introduce the reader to the brain, describing some of its anatomical features
* Using at least 3 brain regions, argue for and against why they could be considered the most important
* Conclude with a definitive answer and reason (‘The most important region is … because …’)
* Please look over the mark scheme on page 6 whilst writing this assignment as this will be used to give you your grade.

In this assignment, you could:

* Include diagrams supporting your essay to aid the reader’s understanding.
* Include extra reading from the internet to support your argument

Example 4 – Engineering/Biomedical Sciences

**Final Assignment Question:** How can 3D printing be used to replicate human tissue?

|  |  |
| --- | --- |
| Subject Knowledge | Academic Skills |
| * **Describe the nature of 3D printing, its uses and its limitations**
* Explain the relevant biological concepts, particularly around cell composition
* Infer what aspects of biology need to be considered in the context of 3D printing
* Evaluate the uses and limitations of 3D printing
 | * **Use scientific evidence to support claims**
* **Use correct scientific language**
* **Explain the value or significance of selected evidence**
* **Showcase independent thought**
* **Highlight competing points of view**
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question:** Write a paragraph of 300 words that explains the concept of 3D Printing. You should define the process, but also discuss the benefits, as well as some of the limitations of 3D printing.

Example 5 – Exercise Science

**Final Assignment Question:** Assess the benefits of exercise for a condition of your choosing. Your essay title should be “The benefits of exercise in (insert condition name)”

The essay will need to include:

* An overview of the condition – Symptoms? Causes? Who does it affect?
* The effect exercise can have upon this condition
* An evaluation of any secondary complications
* An assessment of the different types of exercise and whether they have all have the same impact on the condition?
* You should also clearly state which type of exercise you would recommend to people with this condition and why you have chosen this.

|  |  |
| --- | --- |
| Subject Knowledge | Academic Skills |
| * **Describe the main types of exercise**
* **Evaluate the impact of exercise on different parts of the body/different body systems**
* Explain inflammatory bowel disease and how scientists have used exercise to treat this disease
 | * **Use scientific evidence to support claims**
* **Use correct scientific language**
* **Explain the value or significance of selected evidence**
* **Showcase independent thought and have a clear point of view consistently argued throughout the essay**
* **Highlight competing points of view**
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question:**

You have been selected to present at your local authority defending why your school should get more gym equipment. This will involve writing 500 words evaluating “the benefits of exercise in the general/healthy population”.

Firstly, you should evaluate the role exercise can play in benefitting people who are free from illness. Use the knowledge you gained from the first tutorial about to different activity types and the specific individual benefits these may have.

You should ten select one type of exercise we discussed in Tutorial 1 (aerobic, resistance, balance or flexibility) and discuss how this exercise benefits different systems in the body (e.g. circulatory, immune, muscular system etc.) and say why/how this exercise is important for maintaining people’s general health.

Example 6 – Environmental Science – Ages 17-18

**Final Assignment Question:** An organisation with responsibility for a stately home and garden is interested in how they can supportand encourage wildlife. They are asking people for ideas but have already said they are very keen tohelp “save the bees” and they are interested in setting up honeybee hives. The garden is large, and allof its neighbours are farms growing various different food crops.

Using information covered in tutorials and recent academic research, write a letter to the organisation explaining what you think they should do to “save the bees”. In your essay please include:

* Why are pollinators so important?
* Why bees are such good pollinators?
* The challenges being faced by wild bees and how they are linked
* What do you think the garden should do, bearing in mind its neighbours?
* Analyse by providing evidence whether the introduction of honeybees is a good idea?

You may want to do some extra reading and research to help support your argument about how to save the bees. If so include a list of the books, websites or academic papers you use (see Appendix 1 in the handbook for more help on referencing). Some useful papers are included in the handbook. These are a good place to start.

|  |  |
| --- | --- |
| Subject Knowledge | Academic Skills |
| * **Describe the process of pollination**
* **Evaluate the importance of pollination for ecology, evolution and the economy**
* Describe and assess the role of bees in pollination
* Identify and prioritise interventions to protect pollinators
 | * **Select scientific evidence to support claims**
* **Use correct scientific language**
* **Explain the value or significance of selected evidence**
* **Highlight competing points of view**
* **Showcase independent thought and make point of view clear**
* **Written work has a clear structure**
 |

**\*Bolded text can be assessed in both baseline and final assignment**

**Baseline Assignment Question:** Explain the biology of pollination and why it is so fundamental to plant andpollinator biodiversity. Which aspect of pollination do you think is most important to protect?

Think about including the following:

* What is pollination?
* How does it happen in nature?
* Why is it important for plants, pollinators and the environment?
* Why is it important for evolution?
* Why is it important for farming and the economy?

Your word count is 500 words, you can use images or diagrams to help you explain, but if you do you should say where you found them (see Appendix 1 in the handbook for more help on referencing). All homework and assignments, including the baseline and the final assignment are marked using the mark scheme in the front of the handbook (pages 7-8). You get a mark out of 100 for each of the five sections based on how many of the bullet points your work matches. So make sure you check your work against the mark scheme to see if you can improve.

# Appendix 2: Teaching Vocabulary Strategies

|  |
| --- |
| **Teaching Vocabulary Strategies** |
| **Student Friendly Definitions** | 1. Select a word: *devious*
2. Look at dictionary definition: *straying from the right course; not straightforward*
	1. Think about this definition from a student’s point of view. How is the definition unhelpful or potentially misleading?
3. Creating a student friendly definition:
	1. How might you characterise the words so that their meaning are specific?
	2. What everyday language might you use to create and explanation?
 |
| **Cloze exercises** | Widening Participation to higher education is a \_\_\_\_\_\_\_\_ priority for the UK and Scottish governments. WP aims to address the \_\_\_\_\_\_ in the take-up of higher education opportunities between different social groups.1: decisive strategic diplomatic considerate2: discordance error discrepancies miscalculation* Forces students to select between words and choose the appropriate answer.
* Extension: ask students to explain and justify their choices
 |
| **Generating examples** | In this activity, pupils are asked to generate appropriate contexts or situations for statements or questions about new words.For example:1. Three things that a *philanthropist* would do.
2. What might someone who is *exuberant* say about your work?
3. How would a cook show they are *industrious*?
 |

|  |
| --- |
| Using the examples above, plan an activity for one of your tutorials: |

# A screenshot of a computer  Description automatically generatedA screenshot of a cell phone  Description automatically generated Appendix 3: Completed tutorial planning template - *Please note that the following examples are from pre-designed courses for pupils ages 9-11*

# Appendix 4: Tutorial Top Tips

Below are tips from former Scholars Programme PhD tutors

|  |  |
| --- | --- |
| **Progress**Checking understanding | * Build the tutorial around hinge point questions (questions that allow you to check pupils have understood concepts). If they have not understood a concept or are confused, it is worth spending time to set them straight before moving on to the topics that follow.
* Allow time to go back over concepts and check understanding at the end of the tutorial – for example, plan ten minutes at the end of each tutorial for this.
* I found it helpful allowing the students to mind-map on the topic prior to the start of each tutorial. It allowed me to gauge their level of understanding and provided the opportunity to correct any misconceptions.
 |
| **Planning** Planning to develop knowledge and skills | * Develop tutorials based on the university style and explain to the pupils that you are going to treat them as being university students. This will capture their attention and will make the tutorials more challenging. Pupils' interests are often not related to the subject of your research so try to make tutorials more research-orientated than subject-orientated. Make this clear that through the tutorials they will learn how researchers work at the university and they will have the opportunity to develop general research skills.
* It's more important for pupils to develop key skills than for you to deliver all your content.
* Teach few points well rather than many points poorly. Also, begin development of their writing skills from tutorial 1 feedback.
 |
| **Planning** Planning to adapt your delivery in tutorials | * Prepare for parts of the tutorial to be dropped if something else needs to be focused on for longer. Extra parts can then be added in if you finish everything quicker than expected.
* I find that being flexible with planned activities helps with getting pupils to engage in debates. Sometimes, what they find most interesting and what gets them thinking and talking can take them off at tangents from the core tutorial topics. I have found it helpful to support these digressions, within reason, and that it is helpful to build some flexibility into tutorial plans to anticipate them.
* Keep it simple - if you think you might not have time to cover everything you want to in a session, you won't! Plan less – for example, be clear on one or two key concepts that you want to get across.
* Don't be afraid to let the students take control - some of the most exciting discussions we had happened when I let the students pursue points we might consider tangents. By letting them follow their ideas through, they learnt how to relate their ideas back to the question at hand, which really comes in handy for essay writing.
* Your two groups can need completely different support, so be prepared to adapt the delivery of exactly the same content!
 |
| **Planning**Setting up the final assignment | * Asking the pupils what would help them most in preparation for the assignment is super helpful.
* Plan at least 20 minutes for them to ask questions about the final assignment
 |
| **Preparing for schools** | * Don't assume that IT facilities will work smoothly (e.g. sometimes school intranet won't let you open your emails to bring up files, sometimes it won't let you plug in a USB, etc.) - so if you want to present a short PowerPoint always good to have a backup by bringing your own laptop/tablet.
* Flexibility - throughout the tutorials things will inevitably change due to the nature of schools and students. Sometimes schools do unexpected things, some students leave and others join late, and what you thinks are the easiest parts of the course are sometimes the most difficult for students.
 |

# Appendix 5: Further reading

**Planning**

* *Understanding by Design* – G. Wiggins & J. McTighe
<https://cft.vanderbilt.edu/guides-sub-pages/understanding-by-design/>
	+ Explains planning backwards, starting with objectives, then how understanding will be assessed, and then how content will be taught
* *The Vocabulary-Comprehension Relationship across the Disciplines: Implications for Instruction* – J. Harmon & K. Wood
<https://www.mdpi.com/2227-7102/8/3/101?utm_source=TrendMD&utm_medium=cpc&utm_campaign=Education_TrendMD_0>
	+ Discusses the relationship between vocabulary and comprehension in academic contexts, and the implications this has for instruction
* *Tips on Writing Course Goals, Learning Outcomes and Measurable Learning Objectives* – Iowa State University, Center for Excellence in Learning & Teaching
<http://www.celt.iastate.edu/teaching/preparing-to-teach/tips-on-writing-course-goalslearning-outcomes-and-measureable-learning-objectives/>
	+ Suggests how to apply Bloom’s taxonomy to create observable and measurable tutorial objectives

**Participation – to be covered in further detail at Training Day**

* *“More Effective Questioning,” Fast and Effective Assessment* – G. Pearsall
<http://www.ascd.org/publications/books/118002/chapters/More-Effective-Questioning.aspx>
	+ Outlines a range of strategies for effective questioning
* *Inside the Black Box: Raising Standards Through Classroom Assessment* – P. Black & D. Wiliam
<https://www.rdc.udel.edu/wp-content/uploads/2015/04/InsideBlackBox.pdf>
	+ Discusses the importance of formative assessment in achieving positive pupil outcomes
* *Taxonomy of Educational Objectives* – B. Bloom
	+ Explores how thinking progresses in level of difficulty, which can be used in questioning to push students towards higher-order thinking

**Progress**

* *The Zone of Proximal Development* – L. Vygotsky
	+ Explores how to provide students with enough support to progress
	+ Hinge point
* *20 Ways To Provide Effective Feedback For Learning* – TeachThought
<https://www.teachthought.com/pedagogy/20-ways-to-provide-effective-feedback-for-learning/>
	+ Provides suggestions for ensuring that feedback is purposeful.

**Additional Research**

* *32 Research Based Instructional Strategies* – TeachThought
<https://www.teachthought.com/learning/32-research-based-instructional-strategies/>
	+ Lists effective teaching strategies and the supporting research.

