



Aligning Your Baseline and Final Assignment Examples

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)
<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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]

STEM Example 2 – Cancer/Biological Sciences – Key Stage 5

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
<ul style="list-style-type: none">• 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.	<ul style="list-style-type: none">• 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?

STEM Example 3 – Neuroscience – Key Stage 5

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
<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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

STEM Example 4 – Engineering/Biomedical Sciences

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

Subject Knowledge	Academic Skills
<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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.

STEM 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 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
<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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 then 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.

STEM Example 6 – Environmental Science – Key Stage 5

Final Assignment Question: An organisation with responsibility for a stately home and garden is interested in how they can support and encourage wildlife. They are asking people for ideas but have already said they are very keen to help “save the bees” and they are interested in setting up honeybee hives. The garden is large, and all of 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
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 and pollinator 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.