

Year 8 MYP Sciences Assessment Task Criterion D

Unit The science behind the Hocus Pocus

Global Context [Fairness and development](#)

Statement of inquiry Science can be used to explain an altered view of reality that leads to a fairer justice system for all.

Assessment notice: _____

Assessment due: _____

Assessment criterion: **D – Reflecting on the impacts of science**

Assessment task type: Analytical research essay based on fictional situations

The assessment:

- is to be a maximum of 400 and diagrams must be used when applying scientific knowledge.
- the essay needs to be submitted in print.
- should contain acknowledgement of any sources used and presented. Hyperlinks are not acceptable.



Task Explanation:

In a Criterion D task it is important to find a problem that science is trying to solve. We have studied a number of ways that revealed how flawed our perception of reality is. We have seen the impacts of afterimages that have challenged our sense of reality and studied the parts of the eye, that function in a coordinated way, to form images of the real world.

Magicians have proved time and time again that our perception of reality can be manipulated. Magicians have long taken advantage of perceptual processes involving attention and awareness to manipulate their audience's conscious experience during magic tricks. Science, in particular neuroscience, is studying magic to unravel the many ways the brain perceives reality with profound impacts on our justice system where eyewitness accounts are highly valued as a source of truth.

Using the resources below and the lesson notes provided, answer the following question giving examples from those you have been exposed to in class with a scientific explanation to support your case.

Can an eyewitness account be a simple illusion?

You may wish to use hypothetical situations and take the role of a barrister arguing in a court of law for your client.

Use of clear explanations with appropriate scientific language will surely impress the jury. As the barrister in charge answer the moral, ethical and social questions listed in the definitions on the last page.

<https://www.youtube.com/watch?v=mf5otGNbkuc>

[Click](#) to see the class notes on illusions and how the brain organises its sensory input to complete reality for the individual.

[Click](#) to see the class notes on afterimages caused by neural adaptation.

You should include proper use of scientific language such as:

- how [neurons work](#), mentioning neurotransmitter and synapse and how neural adaptation comes about.
- how nerve cells transmit information from one to another and how nerve cells can lose function after repeated stimulation
- an explanation why afterimages occur and how [misdirection](#) or change blindness takes place
- the significance and the location of the blind spot in the eye and how a person can look straight at an object and not observe a critical bit of information.

Criterion D: Reflecting on the impacts of science

Students will be assessed on how well they:

- i. **explain** the ways in which science is applied and used to address a specific problem or issue of the failings of an eyewitness account.
- ii. **discuss** and **evaluate** the various implications of using science and its application to better understand the value of an eyewitness account. Examples are given using scientific knowledge to explain the relevance of an eyewitness account.
- iii. **apply** scientific language **effectively**, such as:
 - detailing the many parts of the eye and detailing their function in creating a perfect or imperfect image.
 - discuss with examples how the brain reacts to images that fall on the blind spot with possible impact on eyewitness accounts.
 - detailing how a nerve cell functions in transmitting information

iv. **document** the work of others and sources of information used.

Level	Level Descriptor
0	The student does not reach a standard identified by any of the descriptors below.
1-2	The student is able to: <ol style="list-style-type: none"> i. state the ways in which science is used to address a specific problem or issue ii. state the implications of using science to solve a specific problem or issue, interacting with a factor iii. apply scientific language to communicate understanding but does so with limited success iv. document sources, with limited success.
3-4	The student is able to: <ol style="list-style-type: none"> i. outline the ways in which science is applied and used to address a specific problem or issue ii. outline the implications of using science and its application to solve a specific problem or issue, interacting with a factor iii. sometimes apply scientific language to communicate understanding iv. sometimes document sources correctly.
5-6	The student is able to: <ol style="list-style-type: none"> i. summarise the ways in which science is applied and used to address a specific problem or issue ii. describe the implications of using science and its application to solve a specific problem or issue, interacting with a factor iii. usually apply scientific language to communicate understanding clearly and precisely iv. usually document sources correctly.
7-8	The student is able to: <ol style="list-style-type: none"> i. describe the ways in which science is applied and used to address a specific problem or issue ii. discuss and evaluate the implications of using science and its application to solve a specific problem or issue, interacting with a factor iii. consistently apply scientific language to communicate understanding clearly and precisely iv. document sources completely.

Criterion D: Reflecting on the impacts of science

(MYP 3) Achievement Level Rubric

- Research, analyse and evaluate how well the science is applied to the evaluating the **moral, ethical and social** issues of the use of eyewitness accounts as a very strong argument for seeking a conviction against a person charged with a crime.
- As stated on the cover of this assessment task, the maximum number of words is 500. This does not include the bibliography.
- Also include a bibliography. Use at least 6 sources for your information.
- Please pay close attention to the Assessment Criteria

GUIDANCE: WRITING A ONE WORLD ESSAY or ARTICLE

OVERVIEW

Essay Focus

At the start of the essay you need to outline what the essay is about and what you are going to write. For example

- Faced with a relatively limited ability to attend to all incoming data (and to later recall it), the brain compensates by making unconscious, unavoidable assumptions. This forms the bases of some of the most famous magic tricks.

“In this essay it will be argued that our justice system relies on eyewitness accounts that can be flawed. Even eyewitness accounts need to be properly challenged, with the use of scientific knowledge, to work out in what context observations were made and conclusions formulated by the witness.”

Introduction:

1st paragraph: briefly describe how science is addressing the reliability or unreliability of eyewitness accounts in the justice system.

2nd/ paragraph: describe the scientific ideas or processes which are used to address this problem. ie. afterimage, attention blindness or misdirection just to name a few.

3rd paragraph: explain how well science addresses the problem, benefits and limitation of eyewitness accounts.

Eg, *Is the scientific argument compelling for or against eyewitness accounts?*

Body:

- Firstly, **evaluate**, with examples, the limitations of an eyewitness account as evidence in our Justice system.

You may give examples describing the science behind each example. A few are listed below and were covered in class.

The formation of coloured [afterimages](#) as a result of nerve cells in the retina becoming fatigued, that can falsely identify a car due to its colour. The [McGurk](#) effect that implies that vision can influence what we hear and the [optic nerve illusions](#) that show how the brain fills in gaps to create reality. The existence of a [blind spot](#), where the witness can justifiably suggest to the court that they didn't see an event taking place.

- Then evaluate the benefits of using eyewitness accounts. You may use a persuasive argument.

**** Hint- It is easier to argue the middle ground than to argue the extremes, such as, eyewitness accounts are totally unreliable or that they are totally reliable.*

Conclusion:

- Very briefly **summarise** the main ideas of the essay and the main issue.
- End with a **recommendation/evaluation** based on your argument. This may take the form of a recommendation of under what conditions should an eyewitness account be viewed highly as evidence and when should it not.

REFERENCING

Use of Websites

Author unknown: Name of website. (online) Available URL (date of access)

Author known: Last name, first name. Title of Site. (online). Available URL (date of access).

Definitions

State is defined as “to give a specific name, value or other *brief answer* without explanation or calculation.”

Describe is defined as “to give a *detailed* account”

Explain is defined as “to give a *clear* account including *causes and reasons* or *mechanisms*.”

Discuss is defined as “to give an account including, where possible, *a range of arguments* for and against, the *relative importance* of various factors and *comparisons* of alternative hypotheses.”

Evaluate: is defined as “to assess the implications and limitations”; making *an informed judgement* or *assessment*

Social: is defined as “of or pertaining to the life, welfare, and relations of human beings in a community.”

The people affected or involved, from a few people up to the global community. How will this application of science affect society, will it allow criminal to escape prosecution? Will it unfairly affect one group of society over another? Will everyone have access to the defence by science or only the privileged wealthy who can afford good legal representation.

Ethical: is defined as “pertaining to or dealing with morals or the principles of morality; pertaining to right and wrong in conduct.” Is it right or wrong to use science in this way to avoid prosecution? Is there a time when science should not be allowed in the defence of a crime?

Moral Principles of right or wrong behaviour derived from a particular society. Can we excuse wrong behaviour if its clearly shown by science to be an unintentional act?