






Within this presentation, the students use a series of skits to raise a number of factors related to the knowledge issue concerning the interaction of science and ethics. The skits involve characters who see the relationship between science and ethics differently. Each is followed by an analysis of the relevant factors.






Science and Responsibility: Does modern science take responsibility for its moral and ethical implications?

[Presentation 9, from May 2008]



This presentation achieved 19/20, a grade A

Time	Comment
	The students...
0.20	<p> clearly state the broad knowledge issue of the place of ethics in science.</p> <p>Ensure your KI is clear to your audience, but try not to make it too broad to handle in one presentation.</p>
1.00	<p> use a television interview skit to raise more specific KIs.</p> <p>Draw your KIs from real-life situations.</p>
1.50	<p> show awareness of complexity by comparing scientific atomism with two types of holism: Eastern and Western.</p> <p>Make connections and demonstrate perspectives by drawing on different cultures.</p>
2.10	<p> use a specific example of the atomistic approach in genetic engineering to explain both atomism and a version of the scientific method (AOK natural science).</p> <p>Choose examples that illustrate your understanding.</p>
3.30	<p> use a specific counter-example to show problems with atomism, and link it directly to AOK ethics.</p> <p>Using a counter-example can raise questions that allow you to bring in other factors.</p>

Time	Comment
4.10	<p> draw attention to the place of AOK reason in science.</p> <p>Introduce your links to other WOKs or AOKs when they naturally arise.</p>
4.40	<p> show a different scientific perspective (ecology) that includes ethical considerations.</p> <p>Show that there are different approaches possible even within a single AOK.</p>
4.55	<p> back up the claim of damage from scientific inquiry with the example of BT maize.</p> <p>Choosing good examples from your studies or other experience is a way of showing your perspective</p>
5.40	<p> contrast the holistic approach to scientific inquiry with strict control of variables [see 4.40].</p>
6.00	<p> discuss the possibility of combining atomism and holism.</p> <p>Show your understanding by not merely identifying opposing ideas, but also seeing to what extent they are compatible.</p>

## Time Comment

7.00



analyse key concepts: holism and atomism.

Identify the key concepts behind your KI and explicitly analyse them.

8.45



foreshadow the key ideas in the skit to come.

Be explicit about the concepts your situations are raising.

9.00



identify possible clashes of science and ethics, through ideas of objectivity and subjectivity.

Use key concepts to identify features of the AOKs or WOKs worthy of exploration.

11.00



compare the AOKs science and art (literature) for their abilities to understand social implications.

Look at the different ways AOKs can go about achieving the same aim.

11.45



illustrate their point with a skit drawn from literature [see 4.55].

14.30



analyse key concepts, subjectivity and objectivity following the skit [see 7.00].

15.30



defend the claim that scientific objectivity is based in a certain subjective mind set, with WOK emotional underpinnings, and link this to literary insights.

Making fresh links between disparate areas shows your personal reflection.

## Time Comment

16.20



contrast literary hypothetical situations with scientific hypotheses [see 15.30]

17.00



present a parable about the link between scientific advance, applications and ethics [see 4.55].

20.40



explicitly analyse the links raised in the skit [see 7.00].

21.00



present a skit drawing together previous points about how to incorporate literary and religious insights to lend an ethical awareness to scientific research.

An example that synthesizes many of the issues considered previously underlines your depth of understanding.

23.50



summarize the commonality of purpose of AOKs science and ethics, with suggestions about how a synthesis can be achieved [see 15.30].



## Presentation planning document

Submit to: **TOK teacher**

Arrival date: **See below**

Session

School name: .....

- Write legibly using black ink and retain a copy of this form.
- Complete this form in the working language of your school (English, French or Spanish).
- Do not send to IB Cardiff or to the moderator unless you have been instructed to do so. Retain the forms until after the publication of results.

Candidate name: *PreSenter 9*

Candidate session number:

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Title of presentation: *Science and Responsibility: Does modern science take responsibility for its moral and ethical implications?*

Please describe your planning for the presentation, either in the space below, or on an attached A4 word-processed page by completing 1, 2 and 3 below.

1. What is the real life situation under consideration?

*Approaches that modern science already takes to have responsibility for its consequences, and the approaches that modern science needs to take to be able to claim the responsibility for the medical and socio-political implications of its discoveries and work. This will be demonstrated through a series of sketches (Ayurveda Skit, two scientist skit, director of hatcheries, emperor skit and the religion skit).*

The sketches neatly turn some big and general issues into real-life situations. Two of them are taken from literature.

2. What is the TOK knowledge issue that will be the focus of your presentation? (This must be expressed as a question.)

*Science and responsibility- comparing and contrasting the modern scientific method shown through genetic engineering to alternative approaches in traditional medicine, ecology, the arts and religion.*

The KI is stated more succinctly in the presentation than here. It ought to be in question form. Several subsequent KIs are identified in the plan below.

3. Write a summary in note form (for example, a bullet point list), of the way you plan to deal with knowledge issues during your presentation).

First Sub-knowledge issue: Comparing modern science and its atomistic approach towards fact with that of alternative medicine which has a holistic approach.

Atomism/holism- First Sketch:

- Traditional science compared to Modern Science around the basis of genetic engineering.
- Atomism provides us with 'universal' results and replicability.
- In Holism- evaluates all variables (the body, mind and soul are all regarded).
- Reiki works only when the patient believes it will work.
- We will conclude that atomism allows a treatment of many patients rapidly, thus is better for short term treatment. While, holism gives a more complete treatment.

There is a clear statement of the key points to be raised in this skit, and the KI they address.

Second Sub-knowledge issue: Comparing modern science and its objective approach to that of alternative subjective approaches.

Subjectivity/Objectivity- Second Sketch:

- Discusses the need for subjectivity in science as a method to be introspective about the implications of science.
- Subjectivity integrates aspect of ethical, emotional, and spiritual implications.
- Subjectivity allows us to see the horrors that are created through objective science- eg. Frankenstein.
- Objectivity makes science empirically provable and observable.
- The detachment from emotional subjectivity enables scientists to be manipulative as seen in the director of hatcheries skit.
- Objectivity looks at the mineral level- it is methodological as seen in the director of hatcheries skit where the professor creates a new 'efficient' world (the categories of human kind that will make an efficient human race)-it brings out the principle of mass production of the human race.
- We will conclude that scientific objectivity is required at points as it allows data to be replicable yet can create dire consequences.

Third Sub-knowledge issue: How can religion and the arts help us to deal with the issue of responsibility in science?

Hierarchical/non-hierarchical:

- Our Chinese parable skit talks of the evil that can be found within man and his ability to manipulate things around him.
  - Arts and religion use emotion, subjectivity to be fully encompass that which they study.
  - The visuals present in the power point presentations like Michelangelo's Creation of Adam and Eve shows the evil present in humans.
  - We will conclude that religion especially can aid scientists greatly in understand the implications of their work.
- The presentation will talk about alternative methods that could add to modern scientific method so that it can be responsible for its implications. The alternatives that we will take were utilized subjectivity, emotion and a holistic approach to take responsibility for their actions. We will conclude that these methods could help scientists take responsibility for their implications.

An excellent planning document, though it is not necessary to write it out in full sentences as much as is done here. Point-form phrases are sufficient.





## Examiner report

Criterion A: (4) The presentation is very clear about the overall KI, though it is rather broad to be dealt with in detail in a presentation, so they have to break it down later. The students might usefully have drawn a more manageable KI from one of their real-life situations, rather than stating the KI first. Several subsidiary KIs are clearly introduced in this way, arising from subsequent skits.

Criterion B: (5) The presentation analyses the KIs raised in considerable detail, using a series of contrasting concepts (for example holism/atomism, objectivity/subjectivity) to throw light on the issues. It also includes a good range of AOKs and WOKs, very well integrated. Examples chosen are very relevant, highlighting the understanding.

Criterion C: (5) The presenters construct arguments that draw together many considerations in a way that clearly indicates considerable individual and joint

reflection on the issues. The examples are drawn from their previous studies and experiences, and have been neatly chosen to illustrate or raise important TOK matters, as well as highlighting the importance of the main KI.

Criterion D: (5) Having characters in the skits represent differing perspectives assisted the presenters to meet this criterion very clearly. Contrasts were made not only between the perspectives from different AOKs, but also from differing approaches within a single AOK (for example systems-based ecological vs controlled variable approaches in science). Particularly impressive were the attempts to find ways in which the differing perspectives might be reconciled, or at least work together.

Overall ...

This group presentation deals with a broad but clearly important KI: the

connection between science and ethics. Although the KI is probably too broad and hence has not been dealt with fully, the presenters have used the extra time available to a larger group to address a range of underlying issues, while clearly indicating their connections to the main KI. A single presenter would focus on a more sharply drawn KI, such as one of the subsidiary KIs here. A particular strength of the presentation is the way the skits are used: they are well focused and then well analysed. Skits and examples do not explain themselves, commentary and analysis are necessary to draw out their relevance to the KIs, and to make their lessons clear. Incorporating two very relevant skits drawn from literature shows good connections between the TOK presentation and the presenters' wider experiences.

### You should be able to:

- ☐ understand that the task of preparing and giving the TOK presentation is now much clearer. We have discussed the specific structure it must have, and how it differs from other types of presentations
- ☐ understand the process: choose, brainstorm, plan, present. You have been able to watch real presentations from past IB students, and read a commentary pointing out just where they gained and lost marks
- ☐ understand what the **presentation task** requires you to do
- ☐ understand why it is important to find an interesting, substantive **real-life situation**, and what counts as one
- ☐ understand the importance of explicitly stating a **knowledge issue** that arises from your situation
- ☐ understand what each of the **four presentation criteria** requires you to do in stating and exploring your knowledge issue
- ☐ decide whether to give an **individual** or to join in a **group** presentation
- ☐ **plan** your presentation well.