

Why Does ToK Exist?

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Born in the UK, I studied Philosophy at the University of Kent and, after a year of making pizzas, moved to Spain, where I have been living and teaching since 2002.

I began teaching the DP in 2015 with ToK and English B, and then became a teacher of Global Politics in 2018. This has been a factor in my enrolling in an Open University course on International Relations, which I am currently studying.



For the past 3 years I have been the ToK coordinator at Colegio San Patricio, as well as a teacher of Group 2 English B. The school is currently going through a 5-year evaluation, and ToK has a central role to play in this.

I try to teach ToK in ways that, though focused on evaluation, challenge preconceptions and provoke student engagement.

Does ToK Exist To Torture IB Students?



According to the ToK Guide (p.12)...



“The ToK course plays a special role in the DP by providing an opportunity for students to reflect on the nature, scope and limitations of knowledge and the process of knowing.”

...but according to me...



“ToK can help you get better grades in the other subjects (the ones that really matter, with 7 points).”

For Example...

Language and Literature SL & HL Evaluation Criteria A

5	<p>The response demonstrates a thorough and perceptive understanding of the literal meaning of the text. There is a convincing and insightful interpretation of larger implications and subtleties of the text.</p> <p>References to the text are well-chosen and effectively support the candidate's ideas.</p>
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For Example...ToK Guide (p.6)

“The following 12 concepts have particular prominence within, and thread throughout, the TOK course: evidence, certainty, truth, interpretation, power, justification, explanation, objectivity, perspective, culture, values and responsibility.”

For Example...Biology HL IA Assessment Criteria

Mark	Descriptor
5–6	<p>A detailed conclusion is described and justified which is entirely relevant to the research question and fully supported by the data presented.</p> <p>A conclusion is correctly described and justified through relevant comparison to the accepted scientific context.</p> <p>Strengths and weaknesses of the investigation, such as limitations of the data and sources of error, are discussed and provide evidence of a clear understanding of the methodological issues* involved in establishing the conclusion.</p> <p>The student has discussed realistic and relevant suggestions for the improvement and extension of the investigation.</p>

*See exemplars in TSM for clarification.

For Example... ToK Guide (p.13) of TOK Guide

Methods and Tools

This element focuses on exploring the methods, tools and practices that we use to produce knowledge. This includes the building of conceptual frameworks, the establishing of traditions and practices, as well as the methodologies employed by formal disciplines. It also includes consideration of the cognitive and material tools that we have available to help us in the pursuit of knowledge, and of how these tools have changed as a result of technological developments.

Examples of knowledge questions relating to methods and tools include the following.

- What assumptions underlie the methods of inquiry used in these themes/areas of knowledge?
- Does what is seen to constitute “good evidence” vary from discipline to discipline and culture to culture? How is knowledge produced and communicated in these themes/areas of knowledge?
- How important are material tools in the production and acquisition of knowledge?

For Example... Mathematics applications and interpretation SL & HL IA Assessment Criteria (p. 87)

Criterion D: Reflection

Achievement level	Descriptor
0	The exploration does not reach the standard described by the descriptors below.
1	There is evidence of limited reflection.
2	There is evidence of meaningful reflection.
3	There is substantial evidence of critical reflection.

For Example...ToK Guide (p.8)

“The aims of the TOK course are:

- to encourage students to reflect on the central question, “How do we know that?”, and to recognize the value of asking that question.

How Can We Reinforce The Message That ToK Is Valuable Throughout The Whole Programme?



How Can We Reinforce The Message That ToK Is Valuable Throughout The Whole Programme?



- By working on the skills they need to support their studies in both ToK itself and in other subjects;
- By drawing on the expert knowledge of other subject colleagues;
- By demonstrating ToK's role in the core and stressing how it supports learning in the students' other Diploma subjects.

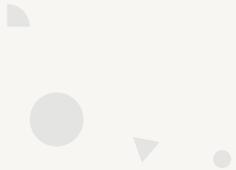


Methodology in the Natural Sciences



Knowledge Question:

What is the
Scientific Method?



Biology: Molecular Biology and Ecology.

Core

Topic 2: Molecular biology

21 hours

Essential idea: Living organisms control their composition by a complex web of chemical reactions.

2.1 Molecules to metabolism

Nature of sciences:
Falsification of theories—the artificial synthesis of urea helped to falsify vitalism. (1.5)

Understandings:

- Molecular biology explains living processes in terms of the chemical substances involved.
- Carbon atoms can form four covalent bonds allowing a diversity of stable compounds to exist.
- Life is based on carbon compounds including carbohydrates, lipids, proteins and nucleic acids.
- Metabolism is the web of all the enzyme-catalysed reactions in a cell or organism.
- Anabolism is the synthesis of complex molecules from simpler molecules including the formation of macromolecules from monomers by condensation reactions.
- Catabolism is the breakdown of complex molecules into simpler molecules including the hydrolysis of macromolecules into monomers.

Utilization:
Syllabus and cross-curricular links:
Chemistry
Topic 4 Chemical bonding and structure
Option B Biochemistry

Aims:

- **Aim 7:** ICT can be used for molecular visualization of carbohydrates, lipids and proteins in this sub-topic and in 2.3 and 2.4.
- **Aim 6:** Food tests such as the use of iodine to identify starch or Benedict's reagent to identify reducing sugars could be carried out.

IB
Biology

Core

Topic 4: Ecology

12 hours

Essential idea: The continued survival of living organisms including humans depends on sustainable communities.

4.1 Species, communities and ecosystems

Nature of sciences:
Looking for patterns, trends and discrepancies—plants and algae are mostly autotrophic but some are not. (3.1)

Understandings:

- Species are groups of organisms that can potentially interbreed to produce fertile offspring.
- Members of a species may be reproductively isolated in separate populations.
- Species have either an autotrophic or heterotrophic method of nutrition (a few species have both methods).
- Consumers are heterotrophs that feed on living organisms by ingestion.
- Detritivores are heterotrophs that obtain organic nutrients from detritus by internal digestion.
- Saprotrophs are heterotrophs that obtain organic nutrients from dead organisms by external digestion.
- A community is formed by populations of different species living together and interacting with each other.
- A community forms an ecosystem by its interactions with the abiotic environment.
- Autotrophs obtain inorganic nutrients from the abiotic environment.
- The supply of inorganic nutrients is maintained by nutrient cycling.
- Ecosystems have the potential to be sustainable over long periods of time.

International-mindedness:

- The need for sustainability in human activities could be discussed and the methods needed to promote this.

Utilization:
Syllabus and cross-curricular links
Geography
Part 2A: Fresh water-issues and conflicts
Environmental systems and societies
Topic 2.1 Species and populations

Aims:

- **Aim 6:** It would be best for students to obtain data for the chi-squared test themselves, to give first-hand experience of field work techniques.

IB
Biology

Compare and Contrast the Different Methodologies

Similarities

Differences

Make Notes on the Methodology Demonstrated



Make Notes on the Methodology Demonstrated



How Do these Descriptions of the Scientific Method Differ?

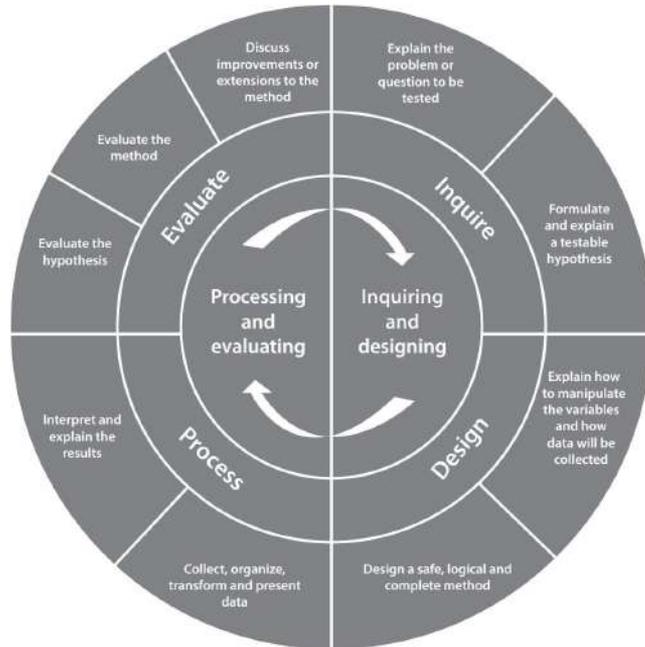


Figure 4
The experimental cycle

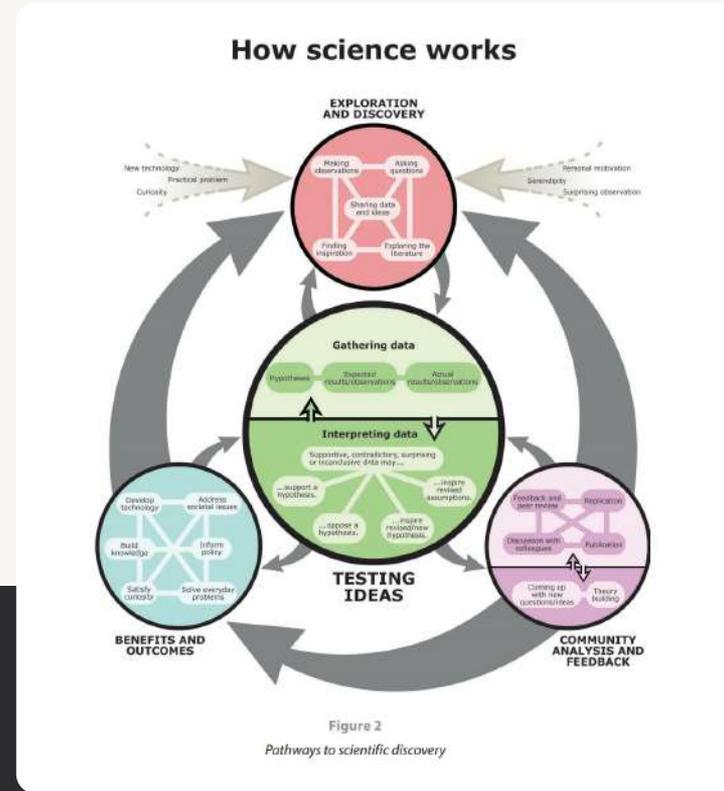
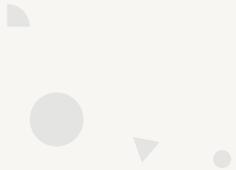


Figure 2
Pathways to scientific discovery

Knowledge Question:

Is There A Single Scientific
Method?



Connection to the Natural Sciences

Mark	Descriptor
5–6	<p data-bbox="324 358 1707 445">A detailed conclusion is described and justified which is entirely relevant to the research question and fully supported by the data presented.</p> <p data-bbox="324 481 1649 568">A conclusion is correctly described and justified through relevant comparison to the accepted scientific context.</p> <p data-bbox="324 604 1746 743">Strengths and weaknesses of the investigation, such as limitations of the data and sources of error, are discussed and provide evidence of a clear understanding of the methodological issues* involved in establishing the conclusion.</p> <p data-bbox="324 779 1669 867">The student has discussed realistic and relevant suggestions for the improvement and extension of the investigation.</p>

*See exemplars in TSM for clarification.

Follow-Up Activities

- If your school subscribes to Kognity, read section 4.5.3: The Sciences, Methods and Tools
- Identify two objects that demonstrate different methodologies in the natural sciences



The Arts - Interpretation

- How much of the knowledge we construct is determined by the intention of the communicator, by our own assumptions, and by the way the communication is valued by the community?

(Adapted from Language & Literature Guide p.23)

The Arts - Interpretation

- Denotation and Connotation
- Semiotics

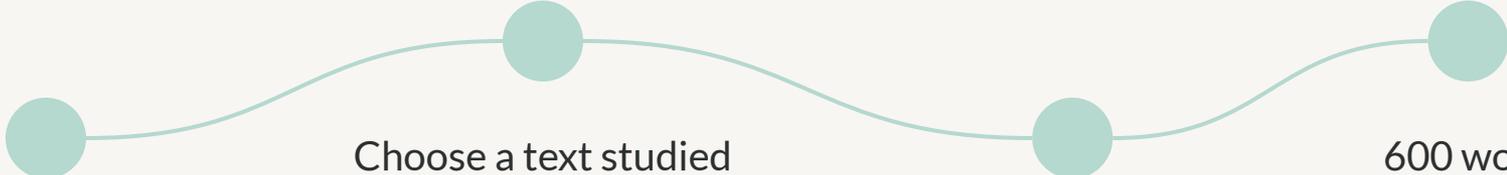


Ferdinand de Saussure

Ferdinand de Saussure, c. 1900.

Keystone/Hulton Archive/Getty Images

Follow-Up Activities



If your school subscribes to Kognity, read Section 4.6.2 The Arts, Perspectives

Choose a text studied in (Language &) Literature and identify icons, indexes and symbols

Reflect on your interpretation with regards to the intentions of the author, the reader's assumption, and the values of the community

600 word written reflection

The Arts - Interpretation

- May 2021 Essay Titles

6. “Avoiding bias seems a commendable goal, but this fails to recognize the positive role that bias can play in the pursuit of knowledge.” Discuss this statement with reference to two areas of knowledge.”

Mathematics - Reflection



What steps can we take to help ourselves avoid being misled by statistics used in unclear or disingenuous ways in the media?

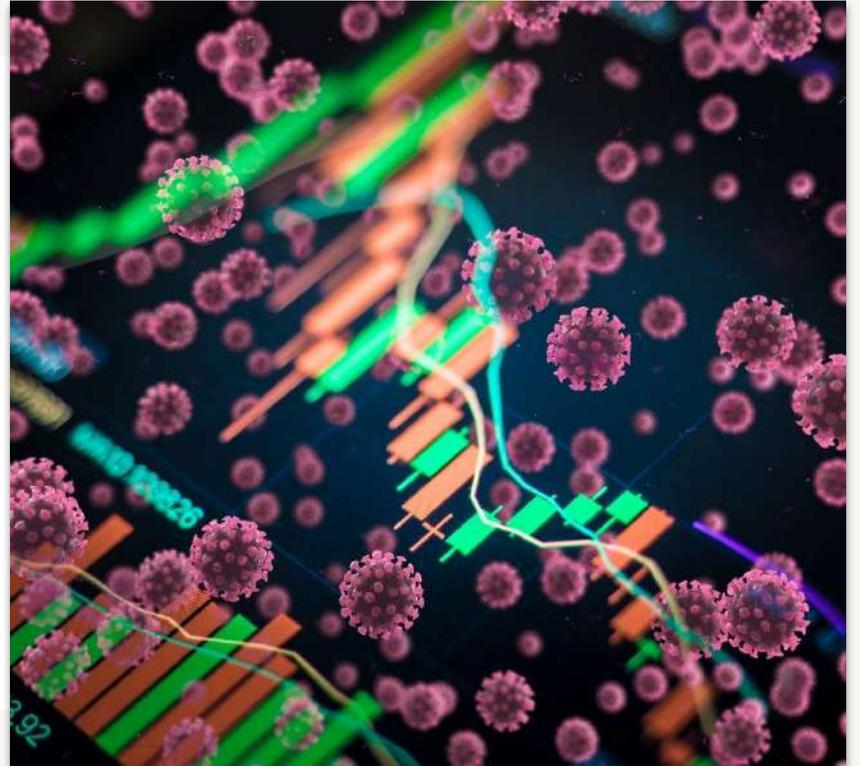


In what ways can statistical data be used or misused to justify political actions?

Mathematics - Reflection

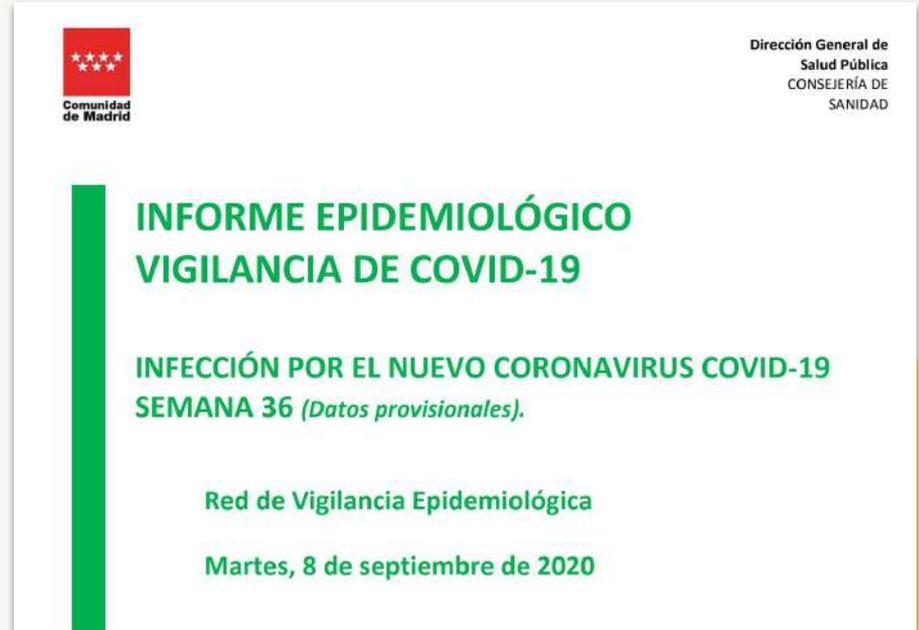
Discussion on NYU article: What Numbers Can—and Can't—Tell Us About the Pandemic

<https://www.nyu.edu/about/news-publications/news/2020/july/what-numbers-can-and-can-t-tell-us-about-the-pandemic.html>



Mathematics - Reflection

- Look at activity from My IB Mathematics Teaching and Learning resources and in particular the discussion questions
- Identify something (relevant) the data tells us, and something it does not from local Covid Data



Mathematics Reflection

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4. “Statistics conceal as much as they reveal.” Discuss this claim with reference to two areas of knowledge.

And Finally...

- Make ToK part of the DP by making it relevant to your students' other Diploma studies.
- Use the opportunity to connect with other teachers and ask for examples of teaching and learning materials that they use that can be used to stimulate discussions in ToK in response to the knowledge questions in the Guide.

