

# Theory of knowledge guide

First assessment 2015

**Introduction to Tok...read this essential IBO information**

## Knowing about knowing

TOK is a course about critical thinking and inquiring into the process of knowing, rather than about learning a specific body of knowledge. It is a core element which all Diploma Programme students undertake and to which all schools are required to devote at least 100 hours of class time. TOK and the Diploma Programme subjects should support each other in the sense that they reference each other and share some common goals. The TOK course examines how we know what we claim to know. It does this by encouraging students to analyse knowledge claims and explore knowledge questions. A knowledge claim is the assertion that “I/we know X” or “I/we know how to Y”, or a statement about knowledge; a knowledge question is an open question about knowledge. A distinction between shared knowledge and personal knowledge is made in the TOK guide. This distinction is intended as a device to help teachers construct their TOK course and to help students explore the nature of knowledge.

## The ways of knowing

While there are arguably many ways of knowing, the TOK course identifies eight specific ways of knowing (WOKs). They are language, sense perception, emotion, reason, imagination, faith, intuition, and memory. Students must explore a range of ways of knowing, and it is suggested that studying four of these eight in depth would be appropriate.

The WOKs have two roles in TOK:

- they underlie the methodology of the areas of knowledge
- they provide a basis for personal knowledge.

Discussion of WOKs will naturally occur in a TOK course when exploring how areas of knowledge operate. Since they rarely function in isolation, the TOK course should explore how WOKs work, and how they work together, both in the context of different areas of knowledge and in relation to the individual knower. This might be reflected in the way the TOK course is constructed. Teachers should consider the possibility of teaching WOKs in combination or as a natural result of considering the methods of areas of knowledge, rather than as separate units.

## The areas of knowledge

Areas of knowledge are specific branches of knowledge, each of which can be seen to have a distinct nature and different methods of gaining knowledge. TOK distinguishes between eight areas of knowledge. They are mathematics, the natural sciences, the human sciences, the arts, history, ethics, religious knowledge systems, and indigenous knowledge systems. Students must explore a range of areas of knowledge, and it is suggested that studying six of these eight would be appropriate.

The knowledge framework is a device for exploring the areas of knowledge. It identifies the key characteristics of each area of knowledge by depicting each area as a complex system of five interacting components. This enables students to effectively compare and contrast different areas of knowledge and allows the possibility of a deeper exploration of the relationship between areas of knowledge and ways of knowing.

TOK at a glance

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## Assessment

There are two assessment tasks in the TOK course: an essay and a presentation. The essay is externally assessed by the IB, and must be on any one of the six prescribed titles issued by the IB for each examination session. The maximum word limit for the essay is 1,600 words.

The presentation can be done individually or in a group, with a maximum group size of three.

Approximately

10 minutes per presenter should be allowed, up to a maximum of approximately 30 minutes per group.

Before the presentation each student must complete and submit a presentation planning document (TK/PPD) available in the Handbook of procedures for the Diploma Programme. The TK/PPD is internally assessed alongside the presentation itself, and the form is used for external moderation.

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TOK plays a special role in the Diploma Programme by providing an opportunity for students to reflect on the nature of knowledge. The task of TOK is to emphasize connections between areas of knowledge and link them to the knower in such a way that the knower can become aware of his or her own perspectives and those of the various groups whose knowledge he or she shares. TOK, therefore, explores both the personal and shared aspects of knowledge and investigates the relationships between them.

The raw material of TOK is knowledge itself. Students think about how knowledge is arrived at in the various

disciplines, what the disciplines have in common and the differences between them. The fundamental question of TOK is “how do we know that?” The answer might depend on the discipline and the purpose to which the knowledge is put. TOK explores methods of inquiry and tries to establish what it is about these methods that makes them effective as knowledge tools. In this sense TOK is concerned with knowing about knowing.

The individual knower has to try to make sense of the world and understand his or her relationship to it. He or

she has at his or her disposal the resources of the areas of knowledge, for example, the academic disciplines studied in the Diploma Programme. He or she also has access to ways of knowing such as memory, intuition,

reason and sense perception that help us navigate our way in a complex world.

It is easy to be bewildered by the sheer diversity of the knowledge on offer. For example:

- In physics, experiment and observation seem to be the basis for knowledge. The physicist might want to construct a hypothesis to explain observations that do not fit current thinking and devises and performs experiments to test this hypothesis. Results are then collected and analysed and, if necessary, the hypothesis modified to accommodate them.
- In history there is no experimentation. Instead, documentary evidence provides the historian with the raw material for interpreting and understanding the recorded past of humanity. By studying these sources carefully a picture of a past event can be built up along with ideas about what factors might have caused it.
- In a literature class students set about understanding and interpreting a text. No observation of the outside world is necessary, but there is a hope that the text can shed some light upon deep questions about what it is to be human in a variety of world situations or can act as a critique of the way in which we organize our societies.
- Economics, by contrast, considers the question of how human societies allocate scarce resources. This is done by building elaborate mathematical models based upon a mixture of reasoning and empirical observation of relevant economic factors.
- In the islands of Micronesia, a steersman successfully navigates between two islands 1,600 km apart without a map or a compass.

In each case above there is clearly knowledge at work, although the collection as a whole illustrates a wide variety of different types of knowledge. The task of TOK is to examine different areas of knowledge and find

out what makes them different and what they have in common.

At the centre of the course is the idea of knowledge questions. These are questions such as:

- what counts as evidence for X?
- what makes a good explanation in subject Y?

Nature of the subject

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- how do we judge which is the best model of Z?
- how can we be sure of W?
- what does theory T mean in the real world?
- how do we know whether it is right to do S?

While these questions could seem slightly intimidating in the abstract, they become much more accessible when dealt with in specific practical contexts within the TOK course. They arise naturally in the subject areas, the extended essay and CAS. The intention is that these contexts provide concrete examples of knowledge questions that should promote student discussion.

Discussion forms the backbone of the TOK course. Students are invited to consider knowledge questions against the backdrop of their experiences of knowledge in their other Diploma Programme subjects but also in relation to the practical experiences offered by CAS and the formal research that takes place for the extended essay. The experiences of the student outside school also have a role to play in these discussions, although TOK seeks to strike a balance between the shared and personal aspects of knowledge.

Recognizing the discursive aspect of the course, the TOK presentation assesses the ability of the student to apply TOK thinking to a real-life situation. The TOK essay gives the opportunity to assess more formal

argumentation prompted by questions of a more general nature.

TOK is a course in critical thinking but it is one that is specifically geared to an approach to knowledge that is mindful of the interconnectedness of the modern world. “Critical” in this context implies an analytical approach prepared to test the support for knowledge claims, aware of its own weaknesses, conscious of its perspectives and open to alternative ways of answering knowledge questions. It is a demanding course but one that is an essential component not only of the Diploma Programme but of lifelong learning.

## TOK and international-mindedness

**“Teachers open the door, but you must enter by yourself.”** Chinese proverb

Knowledge can be seen as the shared legacy of mankind, a legacy which has been shaped and influenced by a wide range of cultures. This era of increased global interconnectedness promises unprecedented possibilities for interaction and enhancement of mutual understanding arising from the nurturing of international-mindedness.

The Chinese anticipated a period of “Tai”, a time when communication between individuals and the world at large is totally open and people are receptive to new ideas. The TOK course provides an ideal vehicle for such global exchange and beneficial action through its examination of shared and personal knowledge in an atmosphere of critical and reflective inquiry.

We have inherited rich traditions from indigenous knowledge systems, stretching back to the origins of our societies and cultures. Africa, where the human adventure began, has transmitted a treasure trove of wisdom. The Swahili proverb *akili ni mali* (“intelligence is wealth”) and the Gikuyu saying, “wisdom is ahead

of might”, represent the clear call for the primacy of good thinking for humans to survive and flourish. Early African cultures celebrated diversity, a model for our times. The Asante proverb from West Africa *tenabea nyinaa nse* reminds us that all dwelling places are not alike and the Swahili *kila ndege huruka na mbawa zake*

encourages every bird to fly with its own wings.

Responsible action underpins this respect for diversity. This is also seen in the Australian aboriginal idea of “Dreamtime”, which promotes a sophisticated ecological perspective, including a celebration of nature’s bounty in multiple art forms and careful stewardship of the earth’s resources.

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Ancient Asian civilizations have bequeathed profound insights which continue to guide our thinking. The Chinese were among the first cultures to recognize knowledge (“Shi”), its power, and the deep respect for learning and the wise sage figure permeates educational systems in that part of the world. The understanding of the self is seen as the essential foundation to effective membership and action in ever expanding spheres of community. The Indian concept of “Brahman” links the individual knower to a boldly conceived “universal spirit”, a sense of human and cosmic unity.

The Chinese sage, Confucius, inspired a tradition of inclusive and merit-based education allied to critical thinking: “A gentleman can see a question from all sides without bias”. Inheriting the inquiring spirit of Indian Vedanta, the Buddha boldly linked human suffering and dissatisfaction not only to a craving for physical and worldly pleasures but also to an attachment to ideas, opinions, and beliefs, to be replaced by a more dynamic and open-minded approach to knowledge construction. Greek thinkers introduced the notion of political democracy and the important foundations of modern science and mathematics, while their dramatists confronted audiences with complex characters and multiple perspectives. The deep understandings of these traditions were preserved and enriched in the golden age of Islamic civilization in the 10th to 12th centuries CE, a renaissance of learning and artistic flowering that continues to inspire our knowledge quest.

Students and teachers today are the inheritors of this grand journey. The path ahead, as usual, presents us with both opportunities and challenges. The TOK classroom invites a unique partnership of learning, for global controversies often rest on significant knowledge questions that can provide useful starting points for TOK explorations and TOK, in turn, can contribute significantly to the understanding of these large questions. The IB vision of internationally minded individuals implies a global engagement, embodying a commitment to address these 21st century challenges. TOK exists at the very core of the quest, as we strive toward an enlightened and fulfilled humanity.

## Engaging with sensitive topics

Studying TOK allows the opportunity for students to engage with exciting, stimulating and personally

relevant topics and issues. However, it should be noted that often such topics and issues can also be sensitive and personally challenging. Teachers should be aware of this and provide guidance to students on how to approach and engage with such topics in a responsible manner.

## Concurrency of learning

The TOK course requires at least 100 hours in the classroom spread over two years of the Diploma Programme. It would not be possible to teach all the different topic suggestions in this guide to the same depth in this time, therefore teachers will have to select which topics to cover in more detail and which in less detail. The important point is that coverage should be broad enough to provide a balanced outlook.

## Prior learning

The TOK course requires no specific prior learning. No particular background in terms of specific subjects studied for national or international qualifications is expected or required.

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## Links to the Middle Years Programme

The programmes of the IB place the student at the centre of the models. This underscores the IB's belief in educating the whole person and placing importance on student inquiry as the driving force for learning. The embodiment of the characteristics of the learner profile are the aim of IB programmes; they are brought into focus in the Primary Years Programme (PYP), refined and developed through the Middle Years Programme (MYP) and exemplified in the Diploma Programme and the Career-related Certificate.

The process of inquiring into subject content through the different perspectives provided by MYP global contexts enables students to develop a deeper understanding of both the subject and the dimensions of the global contexts. Through the inquiry cycle of understanding and awareness, reflection and action, students engage in reflection and metacognition, which can lead them from academic knowledge to thoughtful action, helping to develop positive attitudes and a sense of personal and social responsibility. Alongside the development of thinking skills, MYP students are prepared for TOK in the Diploma Programme

in many ways, three of which are the ability to think critically, to reflect and to make connections.

- MYP students are asked to question and challenge information and arguments. These critical thinking skills will help students in TOK understand that there are different ways of thinking about knowledge claims.
- Self-evaluation is important in the MYP. Students are encouraged to reflect at different stages in the learning process. Active reflection on one's own perspectives is an important attribute of a TOK student.
- The ability to make connections across subjects to create products or solutions is important in the MYP. In TOK, this ability will allow students to make links between ways of knowing and areas of knowledge.

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## ToK Aims

The overall aim of TOK is to encourage students to formulate answers to the question “how do you know?”

in a variety of contexts, and to see the value of that question. This allows students to develop an enduring fascination with the richness of knowledge.

Specifically, the aims of the TOK course are for students to:

1. make connections between a critical approach to the construction of knowledge, the academic disciplines and the wider world
2. develop an awareness of how individuals and communities construct knowledge and how this is critically examined
3. develop an interest in the diversity and richness of cultural perspectives

and an awareness of personal  
and ideological assumptions

4. critically reflect on their own beliefs and assumptions, leading to more  
thoughtful, responsible and  
purposeful lives

5. understand that knowledge brings responsibility which leads to  
commitment and action.

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It is expected that by the end of the TOK course, students will be able to:

1. identify and analyse the various kinds of justifications used to support  
knowledge claims

2. formulate, evaluate and attempt to answer knowledge questions

3. examine how academic disciplines/areas of knowledge generate and  
shape knowledge

4. understand the roles played by ways of knowing in the construction of  
shared and personal knowledge

5. explore links between knowledge claims, knowledge questions, ways  
of knowing and areas of  
knowledge

6. demonstrate an awareness and understanding of different perspectives  
and be able to relate these to  
one's own perspective

7. explore a real-life/contemporary situation from a TOK perspective in  
the presentation.

Knowledge is the raw material of the TOK course. It is important that students and teachers have a clear idea of what might be meant by the term “knowledge”, however, this is not such a simple matter. Thinkers have wrestled with the problem of a simple definition of knowledge since before the time of Plato, without substantial consensus. How can we expect students to be able to tackle this question satisfactorily?

TOK is not intended to be a course in philosophy. While there might be a certain degree of overlap in the terms that are used, the questions that are asked, or the tools that are applied to answer these questions, the approach is really quite different. It is not a course of abstract analysis of concepts. TOK is designed to apply a set of conceptual tools to concrete situations encountered in the student's Diploma Programme subjects and in the wider world outside school. The course should therefore not be devoted to a technical philosophical investigation into the nature of knowledge.

It is useful for students to have a rough working idea of knowledge at the outset of the course. Towards the end of the course this picture will have become more rounded and refined. A useful metaphor for examining knowledge in TOK is a map. A map is a representation, or picture, of the world. It is necessarily simplified—indeed its power derives from this fact. Items not relevant to the particular purpose of the map are omitted. For example, one would not expect to see every tree and bush faithfully represented on a street map designed to aid navigation around a city—just the basic street plan will do. A city street map, however, is quite a different thing to a building plan of a house or the picture of a continent in an atlas. So knowledge intended to explain one aspect of the world, say, its physical nature, might look really quite different to knowledge that is designed to explain, for example, the way human beings interact.

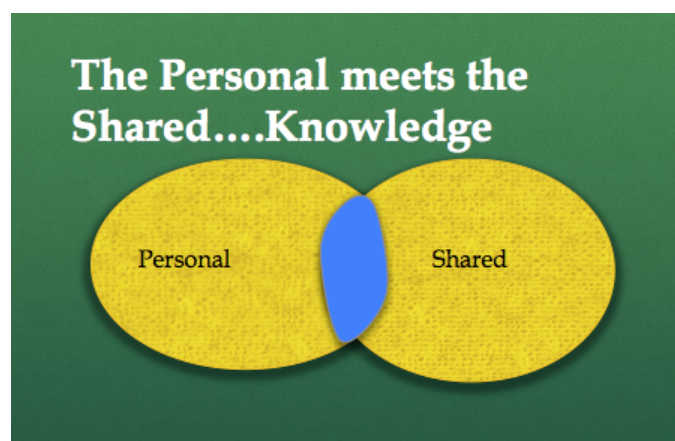
Knowledge can be viewed as the production of one or more human beings. It can be the work of a single individual arrived at as a result of a number of factors including the ways of knowing. Such individual knowledge is called personal knowledge in this guide. But knowledge can also be the work of a group of people working together either in concert or, more likely, separated by time or geography. Areas of

knowledge such as the arts and ethics are of this form. These are examples of shared knowledge. There are socially established methods for producing knowledge of this sort, norms for what counts as a fact or a good explanation, concepts and language appropriate to each area and standards of rationality. These aspects of areas of knowledge can be organized into a knowledge framework.

## Shared and personal knowledge

In many languages, the verb “to know” has two first person forms: “I know” and “we know”. “I know” refers

to the possession of knowledge by an individual—personal knowledge. “We know” refers to knowledge that belongs to a group—shared knowledge. It can be useful in TOK to draw a distinction between these two forms of knowledge, as illustrated below.



### Shared knowledge

Shared knowledge is highly structured, is systematic in its nature and the product of more than one individual. Much of it is bound together into more or less distinct areas of knowledge such as the familiar groups of subjects studied in the Diploma Programme. While individuals contribute to it, shared knowledge does not depend only upon the contributions of a particular individual—there are possibilities for others to check and amend individual contributions and add to the body of knowledge that already exists.

Examples are easy to come by.

- Physics is a subject discipline with knowledge that is shared. Many have access to it and can contribute to it. Much of the work done is by teams of people building on existing knowledge. While individuals can and do contribute to this body of knowledge, the work of individuals is subject to group processes such as peer review and replication of experimental results before it becomes part of the corpus.
- The knowledge required to build a computer is also shared. It is unlikely that there is an individual who has the knowledge of building such a device from scratch (rather than simply assembling it from pre-constructed components). Yet we know how to make computers. A computer is the result of a complex worldwide cooperative effort.

Shared knowledge changes and evolves over time because of the continued applications of the methods of inquiry—all those processes covered by the knowledge framework. Applying the methodology belonging to an area of knowledge has the effect of changing what we know. These changes might be slow and incremental—areas of knowledge possess a certain stability over time. However, they could also be sudden and dramatic, revolutionary shifts in knowledge or paradigm shifts, as an area of knowledge responds to new experimental results, say, or advances in the underlying theory.

There might be areas of knowledge that are shared by all of us. The subjects studied in the Diploma Programme might fall into this category. Of course it is not the case that every IB student understands higher level biology or geography, but rather it is knowledge that is available subject to certain conditions.

#### Knowledge in TOK

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We are all members of other smaller groups too. We are members of ethnic groups, national groups, age groups, gender groups, religious groups, interest groups, class groups, political groups, and so on. There might be areas of knowledge that we share as members of these groups which are not available to those outside, such as knowledge that is anchored in a particular culture or in a particular religious tradition. This might raise questions regarding the possibility of knowledge transgressing the boundaries of the group.

Here are some examples of such questions:

- Is it really possible to have knowledge of a culture in which we have not been raised?
- Are those outside a particular religious tradition really capable of understanding its key ideas?
- Does there exist a neutral position from which to make judgments about competing claims from

different groups with different traditions and different interests?

- To what extent are our familiar areas of knowledge embedded in a particular tradition or to what extent might they be bound to a particular culture?

Thinking about shared knowledge allows us to think about the nature of the group that does the sharing. It allows international-mindedness into our exploration of knowledge questions.

## Personal knowledge

Personal knowledge, on the other hand, depends crucially on the experiences of a particular individual. It is gained through experience, practice and personal involvement and is intimately bound up with the particular local circumstances of the individual such as biography, interests, values, and so on. It contributes to, and is in turn influenced by, an individual's personal perspective.

Personal knowledge is made up of:

- skills and procedural knowledge that I have acquired through practice and habituation
- what I have come to know through experience in my life beyond academia
- what I have learned through my formal education (mainly shared knowledge that has withstood the scrutiny of the methods of validation of the various areas of knowledge)
- the results of my personal academic research (which may have become shared knowledge because I published it or made it available in some other way to others).

Personal knowledge therefore includes what might be described as skills, practical abilities and individual talents. This type of knowledge is sometimes called procedural knowledge, and refers to knowledge of how to do something, for example, how to play the piano, how to cook a soufflé, how to ride a bicycle, how to paint a portrait, how to windsurf, how to play volleyball and so on.

Compared to shared knowledge, personal knowledge is often more difficult to communicate to others. Sometimes it has a stronger linguistic component and is communicable to others, but often it cannot easily be shared. For example, an experienced tea taster who has developed their palette through years of experience of tasting different teas will have a complex knowledge of tea tastes. But the tea taster might find it difficult to describe the taste of a particular tea in words in a way that can be understood by others. The taster might use metaphor and simile to try to relate the experience of drinking this tea to others but the task is a difficult one. In this way personal knowledge is frequently characterized by this difficulty in sharing.

Personal knowledge also includes a map of our personal experiences of the world. It is formed from a number of ways of knowing such as our memories of our own biography, the sense perceptions through which we gain knowledge of the world, the emotions that accompanied such sense perceptions, the values and significance we place on such thoughts and feelings.

### Knowledge in TOK

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Like shared knowledge, personal knowledge is not static, but changes and evolves over time. Personal knowledge changes in response to our experiences. What is known by an 18-year-old could be quite different to what he or she knew at only 6 years of age. The various ways of knowing covered in the TOK course contribute to these changes.

## Links between shared and personal knowledge

Clearly there are links and interactions between shared knowledge and personal knowledge. These are discussed in more depth in the knowledge framework.

Consider the example of a scientist such as Albert Einstein who has contributed much to modern physics. Clearly, he had some personal qualities that enabled him to see further than some of his peers. He had personal knowledge, a way of looking at things perhaps, that he was able to use to propel his exploration of the difficult questions that characterized the physics of the early 20th century. But his insights had to go through a thorough process of review before being accepted as part of the shared body of knowledge that is the discipline of physics.

There were disciplinary-specific methods that placed demands on Einstein's thought. For example, his ideas had to be logically consistent, had to conform to previous experimental findings and had to go through a process of peer review. They also had to provide predictions that could be independently tested and verified (for example, the predictions made about the visibility of stars normally obscured by the sun in the solar eclipse of 1919). Only then could Einstein's vision become an accepted part of physics. This illustrates how personal knowledge leads to advances in shared knowledge.

The reverse process can and does occur. Shared knowledge can have a big effect on our personal view of the world. Not only do the familiar areas of knowledge impinge on our personal experiences—someone studying economics might regard everyday shopping in a different light as a result of studying economics—but shared knowledge as membership of our cultural, ethnic, gender and other groups might influence our world view. This is what we call perspective. Membership of such groups provides a horizon against which the significance of the events of our lives is measured. Acknowledgment of such perspectives is an important goal of the TOK course.

From an individual perspective, shared knowledge often appears in the form of an authority—a source



of knowledge whose justification is not immediately available to the individual. An example here is the authority of medical science to the patient who is not trained in medicine.

## Balance between shared and personal knowledge

It is important that the TOK course reflects the balance between shared knowledge and personal knowledge. Too much emphasis on the personal at the expense of the shared is likely to result in a course that is oriented towards the subjective experiences of the students and does not look at knowledge beyond the individual to how knowledge is constructed in the wider world. There is a tendency for such a course to become a succession of personal anecdotes strung together with little or no analysis.

Biasing the course in the opposite direction risks losing the important links between the areas of knowledge and the individual knower. Shared knowledge has a significance and value for the individual that gives it relevance and importance. There is a danger that such a TOK course could become too arid and factoriented.

Making the distinction central to the course brings the balance of these two elements to the forefront.

The ideal balance might not be 50:50; it is likely that significantly less time will be spent on personal knowledge and more on shared knowledge. It is also likely that the best strategy is not to teach them entirely separately. It seems difficult to examine areas of knowledge without considering the impact on individual knowers. Similarly, it seems difficult to examine personal knowledge in a vacuum without acknowledging that as individuals we are embedded in a web of social relationships.

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## Knowledge claims

In TOK there are two types of knowledge claims.

- Claims that are made within particular areas of knowledge or by individual knowers about the world. It is the job of TOK to examine the basis for these first-order claims.

- Claims that are made about knowledge. These are the second-order claims made in TOK that are justified using the tools of TOK which usually involve an examination of the nature of knowledge.

Here are some examples:

- “There are an infinite number of prime numbers.” This is a first-order knowledge claim because it resides firmly inside the area of knowledge mathematics. It is established using the method of mathematical proof.

- “Mathematical knowledge is certain.” This is a second-order knowledge claim because it is about mathematical knowledge. We establish this by examining the methods of mathematics themselves using the tools of TOK.

Both types of knowledge claims might be found in TOK. The first type will feature in examples offered in the essay and presentation illustrating the manner in which areas of knowledge go about the business of producing knowledge. The second type will constitute the core of any piece of TOK analysis.

## Knowledge questions

TOK is primarily concerned with knowledge questions. This phrase is used often in describing what is seen in a good TOK presentation or a good TOK essay. An essay or presentation that does not identify and treat a knowledge question has missed the point. It also occurs in the assessment descriptors that examiners use to mark the essay and that the teacher uses to mark the presentation. To put it briefly, the whole point of the presentation and essay tasks is to deal with knowledge questions.

Knowledge questions are questions about knowledge, and contain the following features.

- Knowledge questions are questions about knowledge. Instead of focusing on specific content, they focus on how knowledge is constructed and evaluated. In this sense, knowledge questions are a little different from many of the questions dealt with in the subject classrooms. In this way, they are considered second-order questions in TOK.

- Knowledge questions are open in the sense that there are a number of plausible answers to them. The questions are contestable. Dealing with open questions is a feature of TOK. Many students encountering TOK for the first time are struck by this apparent difference from many of the other classes in their school experience. Many find the lack of a single “right” answer slightly disorienting. Nevertheless, knowledge questions underlie much of the knowledge that we take for granted. Much of the disagreement and controversy encountered in daily life can be traced back to a knowledge question. An understanding of the nature of knowledge questions can allow a deeper understanding of these controversies.

- Knowledge questions should be expressed in general terms, rather than using subject-specific terms. For example, instead of a question focusing on a specific model in development economics, such



as the Harrod-Domar model, a knowledge question might focus on the reliability of modelling as a method of gaining knowledge in economics.

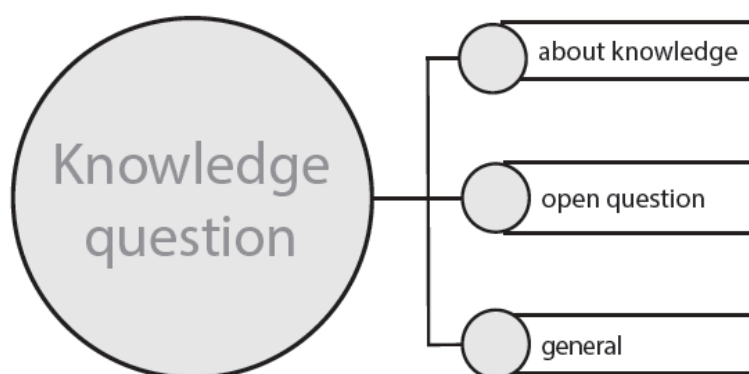


Figure 3

## Knowledge question

It might be worth considering and discussing with students why questions of knowledge are open and therefore so interesting. Why is it that the typical TOK question does not have one straightforward correct answer? Students might find themselves facing this sort of question in class. Perhaps a typical response might start with “it depends what we mean by ...” In other words, the first task in trying to answer a TOK question is to establish an understanding of the key concepts involved. There may be a number of different ways of thinking about these concepts. Each might give rise to a different analysis and ultimately a different answer to the question.

It is inevitable that personal perspectives will play a part in the judgments made in any analysis. The intellectual resources that each of us has to draw upon might well be different and lead us to different or even diametrically opposed conclusions.

The possibility of a lack of unanimity in answering TOK questions can be initially challenging for students. After all, in mathematics a student getting a different answer to his or her neighbour can be a cause for concern, prompting the thought that one or other has made a mistake. In a TOK question it is perfectly conceivable that the answers differ. What is important is that the analysis is thorough and that there are good reasons to back it up. It is possible that both conclusions are true. It is tempting to explain the plurality of good answers to knowledge questions in terms of a type of truth relativism: “it is just a matter of perspective”. A more likely explanation is that different interpretations of key ideas account for the different conclusions or that the weighting of different factors in the argument differ.

### Knowledge questions are general questions about knowledge

Another challenging aspect of TOK is the requirement that a knowledge question is somehow more general than the particular examples which illustrate it. This requirement springs from the idea that TOK deals with second-order questions.

For example:

- In physics, one deals with questions about the material world. In TOK, we ask questions about knowledge in

physics. How can the physicist be sure of his or her conclusions given that they are based on hypothesis and experiment? The student in TOK is not talking in physical terms because he or she is not talking about the physical world but the discipline of physics. Therefore, it is necessary to use a different, more generalized vocabulary. The physicist uses terms like particle, energy, mass and charge. In TOK, the student uses terms such as hypothesis, experimental data, interpretation, anomaly, induction, certainty, uncertainty, belief and knowledge. So knowledge questions should employ these terms, not the terms of physics.

This distinction can be seen in the following diagram.

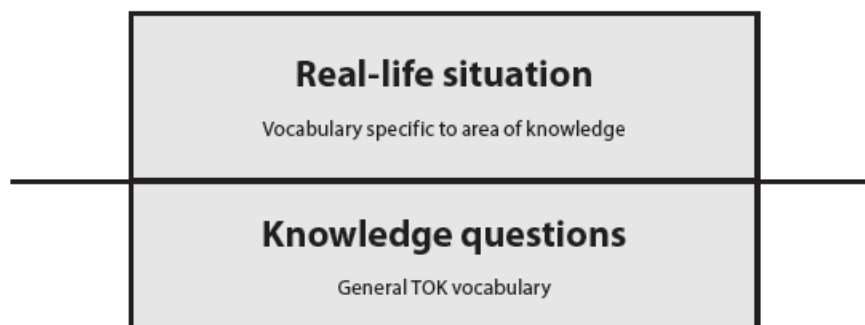


Figure 4

## Examples of knowledge questions

You can find knowledge questions underlying almost any issue. They are sometimes difficult to formulate precisely but they often lurk underneath popular and often controversial subjects that are discussed in the media,

for example. It is a very useful exercise to try to tease out knowledge questions underlying articles in the media.

Here are two examples of a topic that has been discussed in newspaper articles and possible knowledge questions associated with the topic.

Example 1: Future population growth in Africa

- Not a knowledge question: “How can we predict future population growth in Africa?” This is not a knowledge question because it is a technical question within the discipline of population studies.
- Good knowledge question: “How can a mathematical model give us knowledge even if it does not yield accurate predictions?” This is now sufficiently general and explores the purpose and nature of mathematical modelling.

Example 2: The placebo effect and its impact on the medical profession

- Not a knowledge question: “How does the placebo effect work?” An answer to this might involve a technical explanation in psychology. This therefore sits above the line in figure 4.
- A good knowledge question: “How could we establish that X is an ‘active ingredient’ in causing Y?” This question is actually a rather general one about how we can know about causal links. It is a classic knowledge question.

## Knowledge questions and assessment

Knowledge questions are at the heart of the assessment of TOK. The presentation and the essay both deal with knowledge questions.

The diagram in figure 4 can help explain the two assessment tasks in TOK. The TOK presentation starts above the line with a real-life situation described in “real-life” terms. At a certain point in the presentation the student is required to identify the underlying knowledge question (below the line). This is then explored using the language of TOK and a conclusion is reached which is translated back into real-life terms.

The TOK essay follows a path that is in some sense a mirror image of this. The prescribed titles for the essay are expressed in rather general TOK language; they sit below the line. The student is required to identify knowledge questions connected to the prescribed title. The student must then give them some concrete form by finding examples (above the line) which illustrate them. These examples are explored using the tools of TOK (which might require some excursions back below the line). Finally, a general conclusion to the essay will be located in TOK language below the line.

More details and guidance on the assessment tasks can be found in the section “Assessment details”.

Theory of knowledge guide 23

The TOK course identifies eight specific ways of knowing (WOKs). They are:

- language
- sense perception
- emotion

- reason
- imagination
- faith
- intuition
- memory.

Students must explore a range of WOKs. It is suggested that studying four of these eight in depth would be appropriate. The WOKs selected for detailed study should be carefully selected to ensure a coherent and balanced approach.

There are two central purposes to the WOKs in TOK. On the one hand they are the tools that answer the question “how do we know?” and on the other hand they help us answer the question “how do I know?” For example, we can analyse the role of imagination in the construction of shared knowledge in terms of scientific discovery, but we can also discuss imagination in the context of personal knowledge and understanding.

While there may be a place in a TOK course to analyse WOKs and their impact on how individuals construct their own personal knowledge, TOK teachers are encouraged to explore WOKs, not in isolation, but from the perspective of their contribution to understanding different areas of knowledge.

## Specific ways of knowing

Below is a brief introduction to each WOK. The questions preceding the description of each WOK are simply stimulus questions, designed to promote discussion and raise awareness of the individual WOKs and their impact on knowledge.

### Language

How does language shape knowledge? Does the importance of language in an area of knowledge ground it in a particular culture? How are metaphors used in the construction of knowledge?

Language can refer to the mental faculty which allows people to learn and use complex communication systems, or it can refer to those systems themselves. Language consists of a system of signs with agreed or conventional meanings combined according to a set of rules for the purposes of communication, formulation of ideas, storage of knowledge or as a medium of thought. The term “signs” can be interpreted very broadly to include letters, symbols, sounds, gestures, images and even objects. Language is a crucial part of our daily lives, but is also filled with potential problem areas, for example, ambiguity, sarcasm, irony and translation issues.

Language plays an important role in communicating knowledge. However, some see language as having an even more central role, arguing that language doesn’t just describe our experiences of the world but in fact actually structures those experiences. In the section on the knowledge framework there is a discussion about whether certain types of knowledge are actually constituted by language—the idea that language is part and parcel of the knowledge claim itself and not merely a description of something that exists independently of language. The view that facts about the world might be determined by the language is called linguistic determinism.

### Sense perception

How can we know if our senses are reliable? What is the role of expectation or theory in sense perception? What is the role of language in sense perception?

Sense perception is the process by which we can gain knowledge about the outside world. Traditionally, there were believed to be five senses: sight, touch, smell, taste and hearing. However, many now argue that there are others such as a sense of heat, sense of pain, sense of movement, sense of balance and the senses of hunger and thirst, or a sense of where our body parts are.

Historically, the view that the senses provide the basis for all our knowledge was challenged by the idea that prior concepts might be needed before any perception takes place at all. Indeed, it is common now to view sense perception as an active process of interpreting the world according to prior expectations, conceptual frameworks and theories. There is, therefore, some disagreement as to whether we directly perceive the world as it is, or whether perception is an active process where we supply much of the content of our experiences ourselves.

### Emotion

Are emotions universal? Can/should we control our emotions? Are emotions the enemy of, or necessary for, good reasoning? Are emotions always linked to belief?

The naturalistic view of emotions is that they are the products of natural processes, with physiological causes and effects. One supporter of this view was Darwin, who believed that emotions are purely physiological and therefore universal and experienced across all cultures. However, there seem to be many examples of

culturally bound emotions, for example, the Chinese notion of “sad love”. The opposite view is therefore that of the social constructionists, who argue that emotions depend on a social consciousness, and have no natural basis at all. For example, emotions such as shame seem to presuppose a notion of right and wrong. Emotion has sometimes been regarded as an unreliable way of knowing. Emotions have, for example, been criticized as being irrational obstacles to knowledge that distort our picture of reality. However, others believe that not only do emotions help make sense of social and cultural experiences and behaviours, but they are also the source of social, ethical and political knowledge by helping us form an understanding of the world around us.

## Reason

What is the difference between reason and logic? How reliable is inductive reasoning? Are we predictably irrational?

Reason allows us to go beyond the immediate experience of our senses. It is closely linked to logic—the deducing of valid conclusions from given starting points or premises. Human reasoning can also be inferential in nature, allowing conclusions to be drawn that cannot be strictly deduced from their premises. It then becomes an interesting question of whether standards of rationality and norms of reasoning are grounded in culture. Areas of knowledge might set their own requirements for the types of reasoning that are accepted.

Inductive reasoning is the process of supporting general statements by a series of particular ones—the reverse of deductive reasoning which tends to proceed from the general to the particular. Inductive reasoning is by its nature inferential. Statements involving the word “all” are often not strictly provable given the difficulties in making observations of an infinite set of particulars. This is of importance in the natural sciences but also in human sciences such as psychology and economics.

## Imagination

What is the role of imagination in producing knowledge about a real world? Can imagination reveal truths that reality hides? What is the role of the imagination in understanding others?

Imagination is often identified in a narrow sense as the capacity to form a mental representation of something without the stimulus of sense experience. Traditionally imagination has been associated with imagery and making a mental image of something. However, more recently interest in the imagination has also focused on exploring propositional imagining, or “imagining that”. The importance and power of the imagination is highlighted by a number of medical conditions which impact upon it, for example, conditions which can impair imagination such as severe autism, or conditions which can cause delusions such as severe schizophrenia.

Imagination is sometimes viewed in a broader way as being associated with creativity, problem-solving and originality. Here it might be the making of connections between otherwise disparate ideas in order to solve problems. This might be useful in model making or theory creation in the sciences and solving structural problems in the arts. Imagination is, however, also sometimes distrusted, in part because it is regarded as something that is derived in the mind of the individual and therefore subjective. Imagining is also sometimes associated with counterfactual reasoning; imagining “what would happen if ...”, or “what would have happened if ...”.

Imagination is also sometimes associated with possibility, in that it can be argued that only things which are possible can be imagined. In this way, the imagination is seen by some to provide evidence of what is and is not possible. In daily life, imagination has a particularly prominent role in entertainment, for example, fictional films or television programmes. However, it can be argued that imagination also plays a deeper role, for example, in moral education, developing empathy, or providing opportunity for self-expression and an increased understanding of the self.

## Faith

Should humanism or atheism be described as a faith? Can theistic beliefs be considered knowledge because they are produced by a special cognitive faculty or “divine sense”? Does faith meet a psychological need?

The term “faith” is most frequently used to refer specifically to religious faith, but can also be used in a secular sense as a synonym for trust. Although most associated with belief in a God or gods, faith can be religious without being theistic, for example, in Buddhism. Alternatively it can be seen as a commitment to a particular interpretation of experience and reality which is not necessarily religious at all, such as humanism. Logical positivism claims that statements of faith have no meaningful cognitive content, so it doesn’t make sense to speak of faith as a way of knowing. However, for many people faith is a key way in which they try to understand and explain the world.

The evidence on which faith is based on is often controversial. This is particularly the case in the example of scripture, which those within the religious group often see as infallible evidence, while those outside the religious group might be more circumspect. While critics argue that faith is irrational and incoherent, others would argue that faith should be seen as a way of going beyond reason rather than being purely irrational. Indeed, although faith is often contrasted with reason, many religions regard faith and reason as interdependent, for example, natural theology argues that it is only possible to access God through reason, and many religions regard reason as a God-given gift.

Some would argue that the criticism and controversy surrounding the evidence for faith claims is misplaced, arguing that faith is an act of trust and is an example of knowledge which is not evidence based. Indeed, in some traditions belief that is not based on evidence is seen as superior to belief that is based on evidence, the demand for concrete evidence being seen to signify a lack of faith. Given this controversy, teachers should provide the opportunity for a critical discussion of faith as a way of knowing. Its inclusion as a way of knowing should not be seen as an excuse for unthinking acceptance of knowledge claims in religion or other areas of knowledge.

## Intuition

Why are some people considered more intuitive than others? Are there certain things that you have to know prior to being able to learn anything at all? Should you trust your intuition?

Intuition is sometimes described as immediate cognition, or knowledge which is immediately evident without prior inference, evidence or justification. Intuition is often contrasted with reason, as it is regarded as knowing without the use of rational processes. Jung (Psychologische Typen 1921) famously referred to intuition as perception via the unconscious, highlighting the idea that intuition is often seen as beliefs which are known without understanding how they are known.

Intuition is sometimes associated with the concepts of instinct and innate knowledge. For example, some would argue that although we do not have innate knowledge of any particular language, we have an intuitive capacity to use language. Intuition has been much discussed in the field of ethics in terms of whether we have moral intuition, or a kind of innate sense of right and wrong. It is also seen by some to play an important role in scientific advances.

To know something by intuition is to know something through introspection or an immediate awareness. In this way, some argue that it is impossible to justify, or that as it is immediately evident it requires no further justification. Some people are regarded as more intuitive than others, with intuitive people often being said to make quick instinctive decisions without having any identifiable rationale for those decisions. However, some have denied the existence of intuition as a separate way of knowing. For example, it has been suggested that intuition is a term which is often used to describe a combination of other ways of knowing, such as prior experience, heightened sense perception and an active imagination.

## Memory

Can we know things which are beyond our personal present experience? Is eyewitness testimony a reliable source of evidence? Can our beliefs contaminate our memory?

Many discussions of knowledge tend to focus on how beliefs and knowledge are formed rather than on how they are remembered by the individual. However, most of the knowledge that individuals have is in the form of memory and therefore how we retain information and how past events and experiences are reconstructed is an important aspect of how personal knowledge is formed.

Memory, and particularly habit, has a strong link to procedural knowledge and remembering how to perform actions. In contrast to perception, memory refers to things which are not currently happening. And in contrast to imagination, memory refers to things which we believe really happened. Some would argue that memory is not itself a source of knowledge, but instead is a process which we use to recall knowledge gained in the past. However, although memory refers to knowledge gained in the past, it can be argued that even new knowledge is dependent on and influenced by memory. For example, how we interpret new situations can be heavily influenced by experience and previous events. In this way, apart from being a “storage unit” for existing knowledge, memory can also be a mechanism that allows us to process new and unique situations.

The importance of memory can be highlighted by imagining the challenges that would be presented by losing our memory. Because so much of our personal knowledge is in the form of memory, issues surrounding the reliability of memory are also crucial. Memory retrieval is often regarded as unreliable, for example, because it is seen to be subjective or heavily influenced by emotion. However, we rely on our memory every day and because many of our memories seem to be reliable, this gives us confidence that our other memories are reliable.

## Ways of knowing do not operate in isolation

Ways of knowing should not be viewed in isolation. They interact in various ways in the construction of knowledge and the formation of knowledge claims. For example, even a simple claim such as “this table is blue” involves a number of ways of knowing coming together. I need language to be able to understand the terms “table” and “blue”. I need a conceptual system based on reason to realize that a table is something that has the possibility of being blue. I need sense perception to recognize that what I see is a table and that the colour of the table is blue. In this way, the individual ways of knowing are woven together into more elaborate structures in order to generate knowledge in the areas of knowledge.

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How do we know things? We know things because we use a range of methods of inquiry that incorporate ways of knowing to help construct knowledge in different areas of knowledge (AOKs).

The theory of knowledge course distinguishes between eight AOKs:

- mathematics
- natural sciences
- human sciences
- history
- the arts
- ethics
- religious knowledge systems
- indigenous knowledge systems.

Students must explore a range of AOKs. It is suggested that six of these eight would be appropriate. While this guide identifies eight broad AOKs, students should be encouraged to think about individual academic disciplines, that is, to think about the nature of knowledge in their own specific IB subjects, such as chemistry, geography and dance.

### Knowledge framework

One effective way to examine the AOKs is through a knowledge framework. A knowledge framework is a way of unpacking the AOKs and provides a vocabulary for comparing AOKs.

For each AOK the following can be examined:

- scope, motivation and applications
- specific terminology and concepts
- methods used to produce knowledge
- key historical developments
- interaction with personal knowledge.

Within this knowledge framework, key features of each area are identified, as are specific terminology and concepts which shape that area of knowledge. The key historical developments that have influenced and shaped each area are identified, as well as the ways that each makes use of particular methodology. Finally, there is opportunity for reflection on the interaction between shared and personal knowledge in each area. Knowledge frameworks are a very effective device to compare and contrast areas of knowledge.

The idea is that each AOK can be thought of, broadly speaking, as a coherent whole—a vast system with a rich inner structure. TOK aims to explore this structure and to understand just what it is that gives each AOK its particular character. It is also concerned with what these AOKs have in common. A useful strategy is to build a TOK course around comparing and contrasting the various AOKs, to look for features they have in common but also to highlight their differences and pinpoint what gives each its own characteristic flavour. Comparison of different AOKs is not purely a descriptive task. It is analytical in the sense that the student should link the practices of inquiry to the knowledge that comes out in the end. For example, the reliability of knowledge within an AOK will depend critically upon the methods used to produce it. Making links of this sort is what is meant by analysis in TOK.

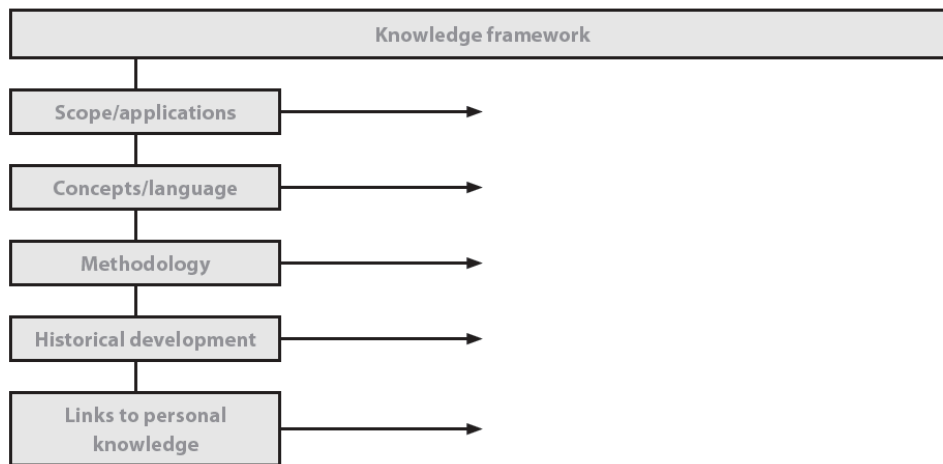


Figure 5

### 1. Scope/applications

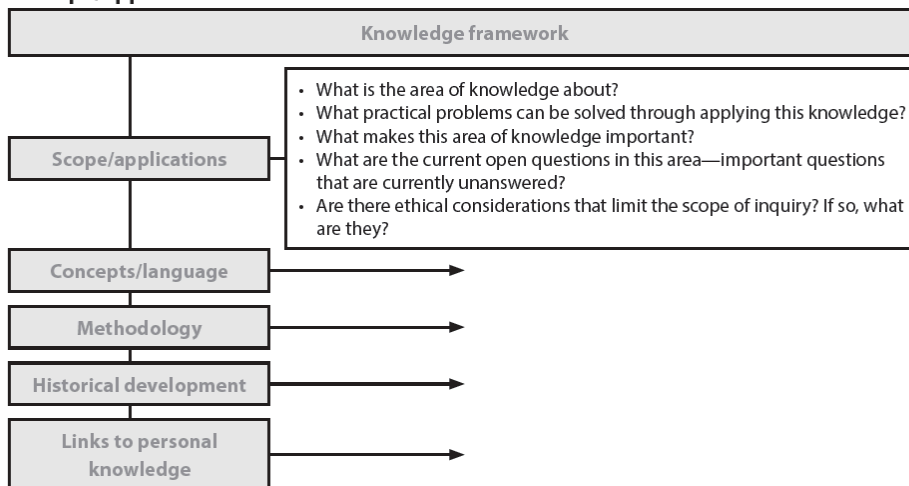


Figure 6

This component attempts to explore the range of the specific AOK within the totality of human knowledge and how that knowledge is used. Scope refers to the definition of the AOK in terms of subject matter, and the form that an AOK takes depends critically upon the nature of the problems it is trying to answer.

For example:

- biology studies living organisms and is mainly concerned with how they function
- mathematics is the study of quantity, space, shape and change
- in engineering, however, precise numerical methods are a matter of life and death

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- music might not seem concerned with solving practical problems at all but the composer has to solve the “musical engineering” problems of building a piece of music; it has to be a unified whole and yet at the same time there has to be some sort of inherent contrast there to provide tension and energy and, for the listener, interest.

Exploration of the scope and applications of a particular AOK can lead to interesting discussions of the ethical considerations that have to be taken into account. Practitioners in a particular AOK might not be permitted to explore all the aspects that are of interest. There might be moral and ethical limits on the sort of investigations they undertake and experiments they perform.



## 2. Concepts/language

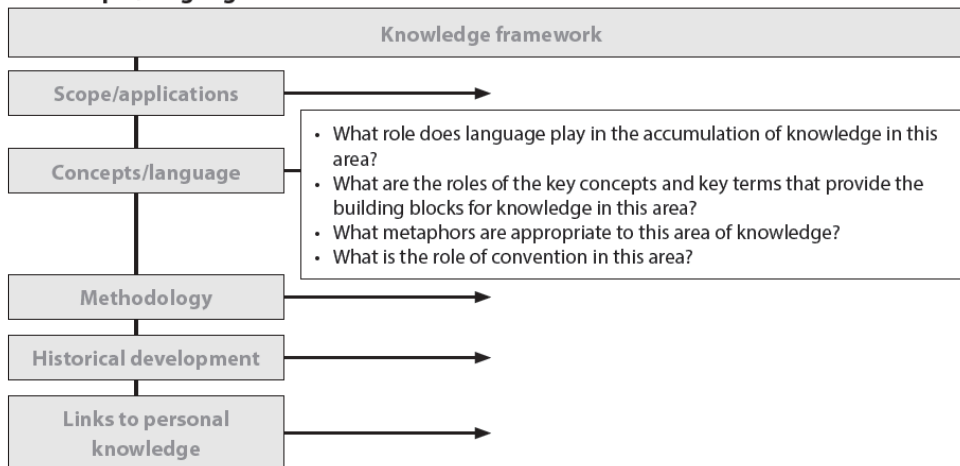


Figure 7

This element explores the way in which language is used in the production of knowledge in each AOK. The key idea is that language does not just communicate pre-existing “non-verbal” knowledge but that, in many cases, the language used actually constitutes knowledge. Take language away and there is nothing left. One of the reasons for this is that the language names concepts—these are the building blocks for knowledge. An AOK is a system of relationships between its key concepts. Different building blocks build quite different

AOKs and produce different ways of thinking about the world.

For example:

- in physics key concepts include those of causation, energy and its conservation principle, field, charge and so on
- in visual arts we might be concerned with the colour palette, texture, composition, movement, symbolism and technique

• in music the central concepts might be melody, rhythm, harmony, tension, relaxation, texture and colour. Discussions of the concepts and language that shape an AOK can link well to discussions about shared knowledge. Language allows knowledge to be passed on to others and to be accumulated over time for future generations. This is what makes this sort of knowledge “shared knowledge”. The fact that it can be communicated between individuals across space and over time is important. A significant proportion of current knowledge is not new but has been passed down to us from the past or from other parts of the world.

## 3. Methodology

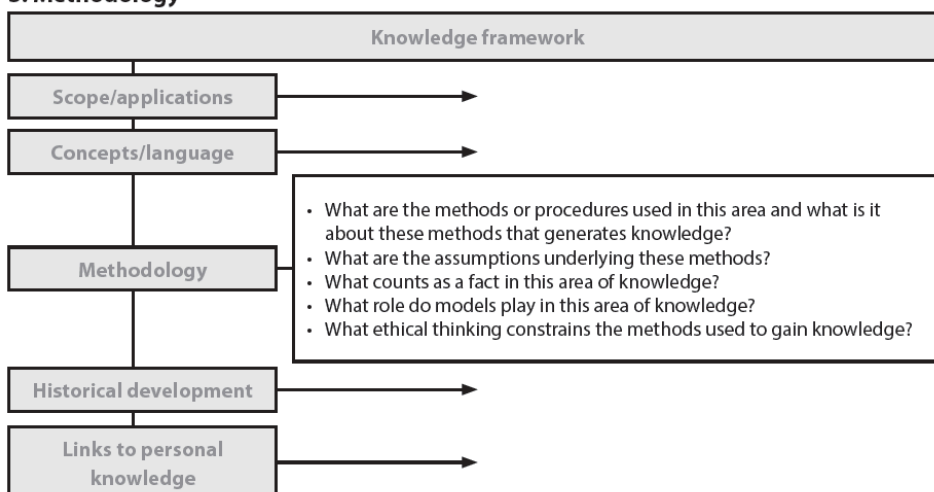


Figure 8

One of the most striking differences between the AOKs is the methods that they use. Examining and comparing the methodologies of the different AOKs begins with students being able to identify the specific methods or procedures used in an AOK, and exploring the assumptions that underlie those methods. Assumptions and values play an important part in the methodology that underpins the production of knowledge. Each AOK establishes certain things as being important and others less so—each has a set of values that underpin the knowledge that is produced. No AOK is value free—some methods are better than others, some facts are more reliable than others, some theoretical models give better understanding than others. Recognition of these values and how they affect the methodology that is used is crucial to understanding the character of the AOK.

For example, in the natural sciences, much knowledge comes about through testing hypotheses by experiment; this assumes that laboratory conditions accurately mimic what happens in the rest of the universe and that the world can be understood as a system of causes determining effects.

One way to explore methodology is to examine the question of what counts as a fact in this particular AOK. Another way would be to examine the question of what counts as an explanation in this particular AOK. For example:

- in history, an explanation might consist of an overarching theory giving plausible motivations to the various historical actors that joins up the isolated historical documents
- in literature, the explanation of text might involve examination of its themes, motives and characterization through the literary devices employed.

Another way to explore methodology is to examine any constraints on the methods that can be used; for example, ethical constraints on experiments conducted in the human sciences.

#### 4. Historical development

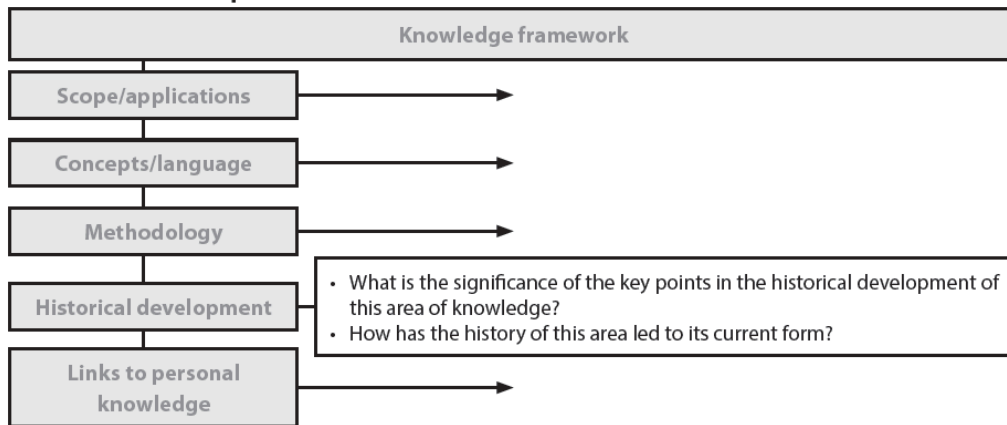


Figure 9

AOKs are dynamic entities that change over time as conceptual developments and advances are made in methodology. This need not be seen as a problem but rather an advantage—our systems are flexible and capable of responding to developments. Knowledge can, therefore, be considered provisional.

For example:

- consider a Swedish school textbook in history from 1912: it is quite different in its idea of history from those used today; a physics textbook from 1912 seems to have much the same idea about physics but the content is likely to be different
- an artwork might derive much of its meaning from the historical context in which it is produced and might even reference other earlier works.

Tracking the rough historical development of an AOK is a valuable tool in TOK. It is tempting to speculate that if we re-ran the history of human knowledge then the AOKs might look quite different to their current form. How much of our knowledge depends on accidents of history? Are certain AOKs more susceptible to these historical factors than others? Even our systems of measurement (m, kg, s) are historically situated and so, of course, are the concepts and the language employed by subject disciplines. Interesting discussions can be had over why particular historical events and factors have had such an impact on the development of a particular AOK.

## 5. Links to personal knowledge

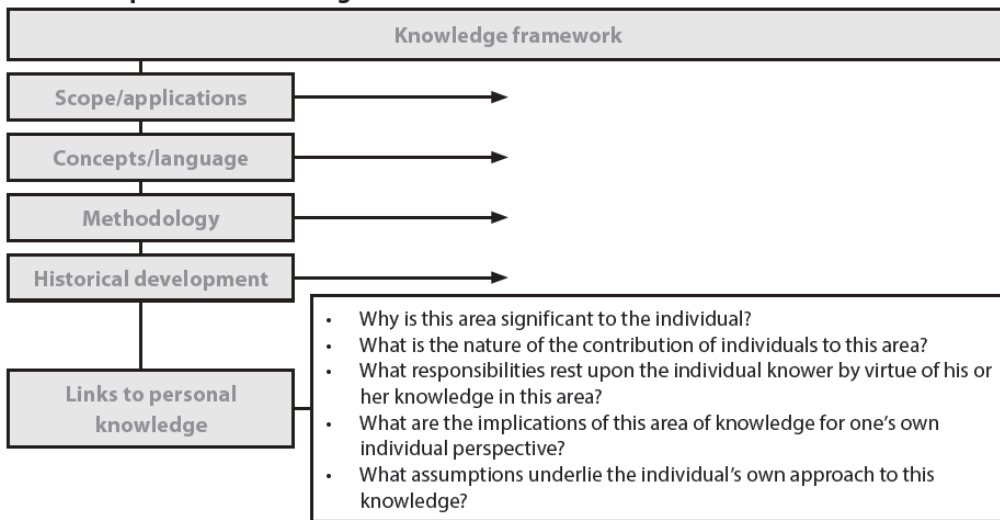


Figure 10

There are links and interactions between shared and personal knowledge. Individuals contribute to shared knowledge. Their contributions have to go through whatever validation procedures are required by a particular discipline in order to be counted as “common” knowledge in that area. But shared knowledge also contributes to an individual’s own understanding of the world. This is one, but not the only, purpose of shared knowledge—that it enables individuals to make sense of the world. The nature of this interaction between shared and personal knowledge is the last component of the knowledge framework to be examined. It is important because it addresses the question “so what does this mean for me?” What impact do these AOKs have on our individual lives and the way in which we view the world? How does this area form or change our perspective?

## Specific areas of knowledge

On the following pages there is a brief introduction to each AOK. There are also diagrams providing examples of how each AOK could be approached, including suggested topics for study and knowledge questions. It should be noted that these are suggestions only, and can be used or substituted for others according to the specific interests and needs of the TOK teacher and students. These diagrams are tools which teachers should use with good judgment, being careful not to use them in such a way that the course becomes formulaic.

See relevant section on website for further information on each AOK and WOK!