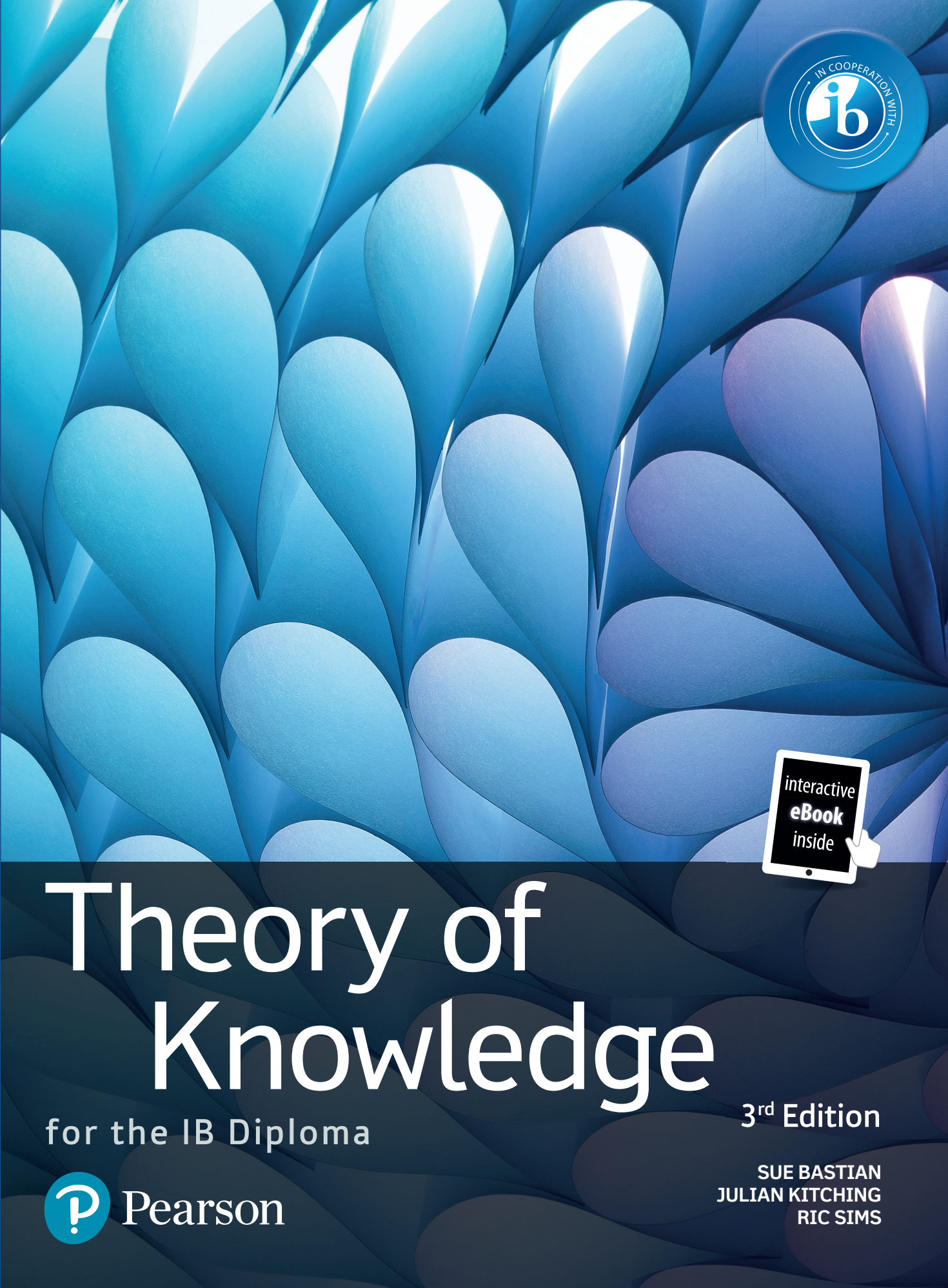

Theory of Knowledge

for the IB Diploma

3rd Edition

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Contents

Introduction

It should be no surprise that the International Baccalaureate (IB) was founded during the turbulent 1960s, when change was imminent around the globe – in politics, in love and war, in music and art, in space travel and even in the traditions of schooling.

Director General of the IB, Olli-Pekka Heinonen, wrote in this article for the International Schools Journal in Spring 2022:

> With the horrors of the Second World War still fresh in their minds, the founders of the IB were motivated to imagine a better way of thinking about education – and how, in turn, education could help build a better and more peaceful world.
>
> (Olli-Pekka Heinonen, 2022)

Although educational reform may lack the drama of the other movements of that era, there were radical ideas suggested in those early IB meetings in Geneva, a center of international organisations. Men and women from a few countries were aspiring to shape a world-wide programme of academic excellence combined with the idealism of shared values, described then as an international baccalaureate, a curriculum and an exam system designed to create a better world.

A better world. Think about that for a minute. Think about its enormity. An education for a better world – a better world where everyone can learn and flourish paired with an education recognised by universities everywhere as worthy for admission – two values folded into a programme of the best kind of teaching and learning.

This is a story you should know as you enter the ranks of the IB Diploma Programme. What is the IB about? What does it stand for?

> *The International Baccalaureate® aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect. (2022)*
>
> (IB Mission Statement)

It takes only seconds for you to read this brief IB mission statement, but many times longer to understand the profundity and the hopefulness of its meaning – that people from countries large and small of diverse cultures should somehow come together to re-imagine what and how we teach, and what and how you learn.

The ten core principles of the Learner Profile support the IB mission and contribute to *international-mindedness* – a way of looking at the world, a way of being in the world. Together they help you recognise your common humanity, your shared guardianship of the planet, and how to thrive in an always-changing world through life-long learning.

> "We are seeing if we can live up to the IB Learner Profile. We are seeing if we can live up to the values that we have written down and deemed important. Now is the time that they are being measured in real life."
>
> (Olli-Pekka Heinonen, 2022)

Fast forward to today. How proud we are to be recognised by a worldwide spread of colleges and universities of the highest reputation. But as IB students and schools we are asked to pay as much attention to the ideals of the *International* name and mission of our organisation as to the *Baccalaureate,* the academic.

You, our students, look to us to get you ready – we are your teachers. You are entitled to be prepared by us to comprehend and thrive in the great world beyond your street, your neighbourhood, your culture, your nation, as a result of the expanded perspectives we arouse and shape in you. Some of this we have tried to do with this book.

In a real sense, then, you have the whole world in your hands. The IB knows this and is asking you to think today, tomorrow, and on and on, about how our teaching and your learning can be relevant to issues of global significance that we all face now, and others that we and you can see only dimly, if at all. You know the list: war, environment, poverty, terror, energy, global warming, disease, and so on. It's a long list. It touches us all.

But it is you who can dispel indifference and ignorance; it is you who can broaden horizons. We teach. We make a difference. You learn. You can make that difference happen.

Idealistic? Yes, indeed! Impossible? Not at all. But we need our ideals in this young IB organisation whose future is brighter than its history is long. We have to keep saying over and over what we are about – to remind ourselves of our ideals. We need young people who respect the pursuit of knowledge and multiple ways of seeing the world, who can experience the joy of discovery of the right word, the right fact, a good explanation, a new way of seeing what is possible and to search for the truth – whatever that turns out to be.

Introduction – Theory of Knowledge

Theory of Knowledge (TOK) is not simply another subject. It is different in kind and purpose. Its goal is an exploration of what we call **areas of knowledge** – the natural sciences, the human sciences, mathematics, history and the arts, as well as **themes** – knowledge and politics, knowledge and technology, knowledge and language, knowledge and religion, and knowledge and indigenous societies, whose central concepts look beyond the classroom. TOK asks you to reflect on your entire school experience – why history, why art, why mathematics, why the sciences and so on. As such, TOK is an inquiry course and its tool of inquiry is 'the question'.

Areas of knowledge
Natural sciences
Human sciences
Mathematics
History
The arts

Themes
Knowledge and politics
Knowledge and technology
Knowledge and language
Knowledge and religion
Knowledge and indigenous societies

From Alec Peterson, the first Director General of the IB and a teacher of TOK himself:

> Within the IB, the nature of the TOK course is to encourage reflection upon what the student has learned both inside and outside the classroom. For even a broad and intensive curriculum can be studied as though the subject were in watertight compartments and unrelated to ordinary experience. No matter how good the curriculum is in its parts, we have not done fully right by our students if we deny them the chance to make an integrated sense of their high school life and the virtues and limitations of their learning and to bring it to the critical light. TOK makes a start in this direction.
>
> (Alec Peterson, the first Director General of the IB)

Nothing else in the IB is designed exclusively around the kinds of questions that are used for TOK. What does it mean to know anything at all? And, more specifically, what does it mean to know something in the sciences or history, in mathematics or the arts? Are these the same kinds of knowledge? Why or why not? How does the knowledge in the religion, politics and morality compare to other kinds of knowledge? Are there such things as ethical facts? Is it possible to live a good life in a corrupt society? Does the strength of science rely on trust? How can a bad person write a good book?

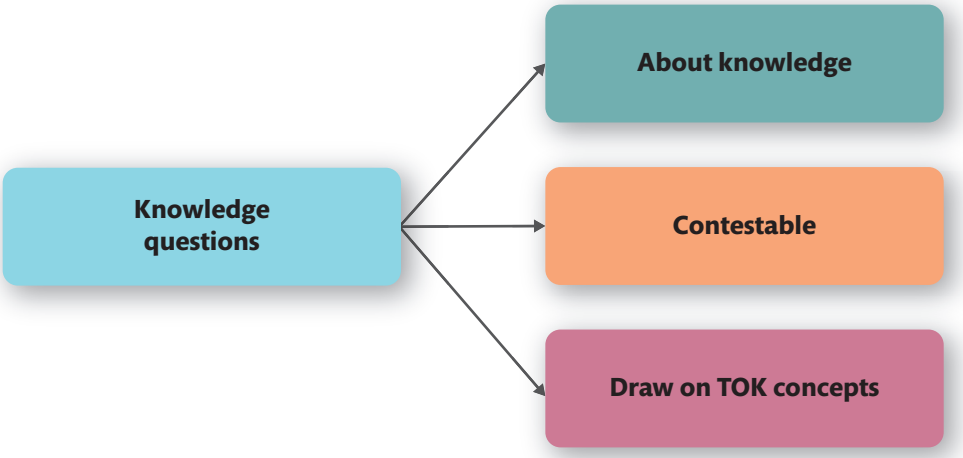
Can you ever prove that something is beautiful? Do our feelings count as knowledge? Is it scientific knowledge if only one person knows it? Can the human sciences sometimes be harder than the natural sciences? Why did Einstein say that the more mathematics is about reality, the less certain it is?

The 'answers' or responses to such open questions – knowledge questions – provide what is called a 'second-order' understanding of your subjects in school and perhaps as well to beyond the classroom.

Knowledge Questions

The heart of TOK is made up of knowledge questions. Such higher order or 'second order' questions drive its instruction and assessment. Take away those questions that manifest the spirit of inquiry and the subject as it should be virtually disappears.

Teacher: See this chemistry book, it weighs almost 1.5 kg and costs almost 100 dollars. Did you ever stop to think that everything in it is the answer to a question someone once asked? Did you ever think that this book is a triumph of what we have come to know so far about the world of chemistry?



In TOK there are five areas of knowledge to explore, each with its own knowledge questions about its scope, perspective, methods, and ethics known as the knowledge framework. There are the themes to explore, each with its own questions. There is the exhibition assessment of three objects explored through a question about their relevance to the real world. And, finally, there is the essay, a 1600-word response to a prescribed title, itself a knowledge question. The quality of your essay may well depend on the chain of questions you ask of the prescribed title as you anaylse or explore its meaning.

My teacher put it this way. "Interrogate the title. Ask it questions. Make it speak to you. You are in charge. Make it reveal itself through your questions". I had to look up the meaning of *interrogate*. Now I know. (Verb: ask questions of someone or something, closely, aggressively, or formally.) Good word. Useful.

Below is an example of a prescribed title for a TOK essay followed by questions that you might ask before writing the essay itself.

Prescribed title: Why do experts disagree given the same set of facts?

Student analysis: *Who would be asking this question? And why? What makes it a knowledge question? What is it getting at? What does it remind me of? Did we talk about this in TOK? Or my other classes? What are the key words? What does this question have to do with different ways of knowing? What areas of knowledge are relevant? What examples come to mind? How many different ways of thinking about this are there? What is at stake in the question? What assumptions are folded in? What is my point of view? What would a different perspective look like? What are the implications?*

At first there may be uneasiness or even anxiety when you realise that there is no one right answer to a knowledge question, but the transfer to TOK thinking can just

as well bring a thrilling freedom to interpret the meaning of the question itself on your own.

It's easy to generalise from what one student said during a return visit on Alumni Day. "TOK really helped me at my university. I was so grateful for your class. It gave me permission to ask questions. It gave me permission to think."

As we learn in TOK, questions can perform many functions. They can be an honest search for facts or clarification, or they can be complex with hidden meanings or disguised assertions or implied demands.

And sometimes the very act of asking a question especially '*How do you know?*' can be seen to be subversive or rude. Try this tonight. Try asking your parents – not your teacher! – '*How do you know?*' three or four times and see what happens.

Yet the questions that can lead to discovery and new knowledge, that reflect curiosity, puzzlement, scepticism, or doubt – questions that advance a discussion – are the best part of the TOK experience. Prestige is often reserved for who can ask the best question, rather than come up with the fastest answer.

Since a question is often taken for what it is by context and tone and who is asking it and why, imagine how this social norm can affect the production of knowledge in research or discussion in the classroom. Who gets to ask? Who gets to answer?

Still, in life outside the classroom people exchange views all the time with probing questions – sometimes calmly, sometimes dramatically – and offer arguments for their points of view. It's the call and response of any field with competing claims: from scientific propositions to theories of artistic excellence, from the ethics of war to the virtues of child-rearing. What do you mean? How do you know? What is your evidence. Who said so? What if? This is the way of knowing, the way of knowledge creation.

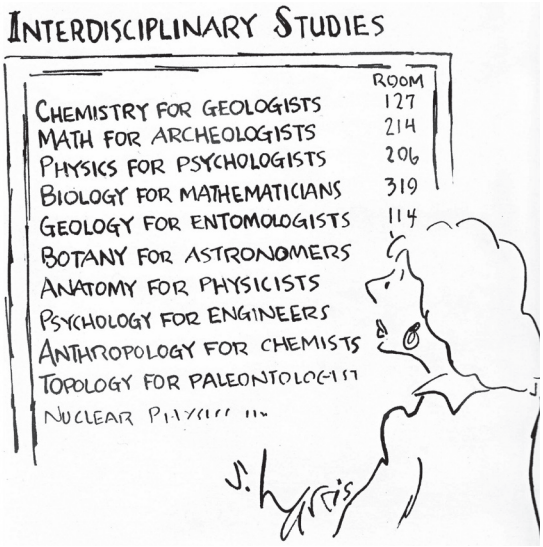
Such dialogues are going on right now in every walk of life: in corporations, in governments, in schools and courtrooms, in laboratories and hospitals, in tribal councils, museums and sports. Sometimes as a dialogue with yourself. And, hopefully in your classrooms. Perhaps, also, in your own family.

Areas of knowledge

It is crucial to your success in TOK that you understand what *a discipline* means, since the course is organised in large part around the areas of knowledge, or *disciplines*. While TOK prescribes five areas of knowledge, any one of them may contain many disciplines such as physics, chemistry, or biology in the natural sciences, or psychology, anthropology, or economics, among others, in the human sciences. Even within those disciplines there are specialties.

Info box

Disciplines in the professional world are often called *subjects* or *courses* in school.



In order to get a feel for what a discipline is in the professional world, it is good to remind ourselves that this very minute, real people are making their living as scholars within their chosen fields of study (their disciplines) – in research, in teaching, in creation and consulting and publication. In that sense, disciplines are dynamic, not just collections of knowledge and methods and rules to follow. Indeed, it is not too far-fetched to think of a discipline as a culture or community of knowers or, metaphorically, a club.

Central to any discipline are shared standards of professional conduct, written and unwritten rules that direct and constrain the work of their members. Recall that the TOK knowledge framework asks you to study each area of knowledge from an ethical perspective. As just one example, the American Historical Association has affirmed the following core values that historians must honor in the course of their work.

> Historians should practice their craft with integrity. They should honor the historical record. They should document their sources. They should acknowledge their debts to the work of other scholars. They should respect and welcome divergent points of view even as they argue and subject those views to critical scrutiny. They should remember that their collective enterprise depends on mutual trust. And they should never betray that trust.
>
> (The American Historical Association)

Would you expect that historical associations in other countries would hold to the same or similar ethical principles? Why or why not?

Figure 1 Alberto Giacometti, a major 20th-century artist, was once a member of the Surrealist movement who was known for his thin, pinched bronze figures. He was no longer welcome as a Surrealist when he returned to figurative sculpture in violation of the Surrealist Manifesto.

While there is always an accepted body of knowledge within any discipline as well as a code of conduct, there are also people working at the cutting edge, thinking new thoughts, debating the issues of the day, and publishing discoveries or refinements hoping to contribute to the progress in the field and perhaps recognition. So it is not surprising that some people get prizes (such as the Nobel prizes), money, fame, authority, and some do not. Some work in the trenches of everyday activity, while others make the discoveries and breakthroughs. Some are in and some are out; some are lucky, some are not. Some get to ask the questions and give the answers while others do not. Yet, at the same time, all scholars and practitioners use questions, doubts, theories, facts, imagination, intuition, reason, passion, patience, power, evidence, and intellectual honesty as they try to make sense of the world and pass it on.

Not always relayed to students is that disputes within disciplines are endless. Should graphic novels be counted as literature? Should anthropology belong to the sciences or to the humanities? Is basket weaving an art? Where do algorithims belong?

To stay with the discipline of history, historians can sometimes differ quite strongly, not just about such interpretations, but even about the basic facts of what happened in the past. This may be troubling to non-historians, especially if they imagine that history consists of a universally agreed-upon account of stable facts and known certainties. But universal agreement is not a condition to which historians typically aspire. Instead, they understand that disagreements are vital to the creative side of their profession and can in fact contribute to some of their most original and valuable insights.

Within TOK, what is important for students – as well as the wider population – is to realise that historians celebrate intellectual communities governed by mutual respect and constructive criticism. The main value of such communities is reasoned discourse – the continuous back and forth among those holding diverse points of view who learn from each other as they pursue topics of mutual interest. A commitment to such discourse – balancing fair and honest criticism with openness to different ideas – makes the exchange of views, opinions, and knowledge useful wherever those exchanges take place, from scholarly books and articles to social media and face-to-face encounters.

Can you find echoes of TOK and the IB mission in the values and principles of the American Historical Association? Do these values also resonate with other Areas of Knowledge? (see www.historians.org/jobs-and-professional-development/statements-standards-and-guidelines-of-the-discipline)

Your knower profile

With TOK, it is hoped that you will gain a thoughtful awareness of the nature of different kinds of knowledge in the world as well as the grounds for your personal belief systems. And, more, that you will become aware that knowledge, seemingly so certain and final in your textbooks is the answer to a question someone once asked – in curiosity, wonder, or doubt.

But your books are only a partial inventory of what Chapter 1.1 **Knowledge and the knower** calls 'the end of a seemingly endless stream of claims to knowledge offered up by family and friends, the school environment and from whatever other sources with which we choose to engage or are exposed to'. In coming to understand your own knower profile – what kind of knower are you? – this calls for even more questions; sometimes about knowledge, but just as importantly, about your own self? We can begin with these words from Albert Einstein: 'If most of us are ashamed of shabby clothes and shoddy furniture, why are we not more ashamed of shabby ideas and shoddy beliefs?' One question then to ask is: What should I believe? Am I fully in charge of the furniture of my mind?

It's not as unclear as some might suppose to ask, 'Who am I?' As you contemplate the next step in life with your IB Diploma, the fact is that the response to this question and others of a similar kind will shape your character and values and make their way into all the ways you present in writing, thinking and speaking. The self you present will shine right through because of what you believe and why. Self-knowledge as such is not directly taught in school, so you must play the larger part of 'know thyself' as Socrates implored. Perhaps our knowledge framework will help here.

Scope – What did you once believe but now no longer do? Why? What does that tell you about yourself? What would you really like to know that you don't know now? What difference does it make in your life to believe or not believe something? How might it make you a different person? What do you think about the Hindu prediction that whatever you give attention to, grows in your life?

Perspectives – How do you navigate the tri-focal perspectives of yourself as an individual, as a member of a species, and as a member of different groups? What does it mean to say, 'We all have many names'? Do you see differing perspectives as a treasure house or competition? What do you think John Stuart Mill meant when he said, 'He who knows only his own position knows little of that'?

Methods and tools – How do you use social media to educate yourself? As a knower in a dispute, what is your first line of defence? Can we count on our feelings or intuition to give us knowledge? How do you use writing or language to shape your thoughts? How do questions shape your thoughts? What do you mean when you say, 'I know' and why should anyone believe you?

Ethics – How wide is the net you use to cast your ethical concerns? What opinions do you hold of those who other people call 'losers' in this world? Do you know any good people? Have you ever gone a full day without telling a lie? Is it worse to lie or to be lied to? What did Dietrich Bonhoeffer mean when he said, 'When regard for truth has broken down or even slightly weakened, all things remain doubtful'? What ethical issues does Chat GBT present to students, teachers and examiners?

The IB student

Beyond scoring high on exams (itself a marvel), is a person beginning to weave in all the above as the contours of someone who knows how knowledge is created and justified, how it is organised and 'at work in the world', and how to make their own knowledge work for a better world. They know all this because they have understood the theory and practice of being a **knower**.

TOK is a tremendously ambitious addition to an already exacting IB subject programme, yet we see it as pivotal and necessary for the observance of what it means to be truly educated. To try to strengthen the intellect in its reflective, creative and critical forms has a natural base: it is natural to try to make sense of our experience. To begin to see knowledge as a whole is to begin to live in a larger world; when the world is larger, we can think with more imagination, understanding and resolve to do better by our mission and values.

As Alec Peterson said at the start of this chapter, we have not done fully right by our students if we deny them the opportunity – and help – in making holistic sense of their high school life; so many years of school up until now, and so many yet to go. Our TOK book is both a guide, a companion, and a map for this journey.

Here is one TOK teacher's 'splendid instance' as she prepared her students for the last day of class.

> Students come to us at the beginning of the year who have studied something of great human significance in art, literature, the sciences, maths, and history — all the IB subjects. Experience is then deepened with the exposure to new, challenging, and relevant ideas from other places, other groups or a voice not earlier heard. They internalize a feeling for more than one way of seeing the world. They find their voices in discussion with others. They know the limitations of any single voice. They are immersed in a community of intercultural and interdisciplinary thought. They have begun to master the skills of integrating these diverse perspectives because they know what counts as a good question and the beginning of a good answer. And they know that a question can be asked with admiration and awe as well as from challenge and confrontation. They are comfortable with ambiguity and prepared to live in a world of uncertainty. They sense when action or restraint in judgment is called for; they are comfortable in disagreement and poised in conflict.
>
> This is our splendid instance, a portrait of a young person with empathy, with openness to growth, glad for the stimulation of new ideas, and with an appreciation of differences as a treasure house. All of this has become part of their instinctive responses to challenges and novel situations. They are ready to take the next step. They are ready to graduate.

Much is possible!

How to use this book

Throughout the book, you will see a number of features to support and enhance your learning.

Knowledge framework

Each chapter follows the four elements of the knowledge framework: scope, perspectives, methods and tools, and ethics. Helpful progress bars show you where in the framework you are.

Activities

Throughout the book you will find individual and class activities to help you put your learning into practice.

Activity 1 The political leader profile

Create a political leader profile using the same ten-attribute structure (but not necessarily the same content) as the IB learner profile. Which attributes would you include and why?

Now create a profile for the ideal citizen. Again, note down some justifications for your choices.

We will address your responses to these tasks later in the chapter.

Things to think about

At the end of each section you will find a things to think about box. These boxes will help you reflect and build on your learning so far. Some of these things to think about will also be labelled as 'challenge' to take your understanding even further.

Things to think about

- Use the QR code to visit the political compass website. Track your own political views on two axes and compare with plots for various prominent political individuals. Do you recognise an affinity with those located near you on the graph?
- What are the differences, if any, between claiming, 'I know God exists' and 'I believe God exists'?
- **Challenge** London taxi drivers are of interest to cognitive scientists and neurologists because the structure of their brain is somewhat different from the brain structure of non-cabbies. In particular, the taxi drivers have a bigger posterior hippocampus – an area of the brain known to be involved in spatial memory. This is an interesting case of a cultural phenomenon – learning the Knowledge changes neural structure and circuitry suggesting that the evolution of human thought processes is parallel to the evolution of culture (and is not driven primarily by genetics). Do you think this idea is plausible? Investigate this issue by checking out some of the sources at the end of the chapter. What are the implications if it is true?

Knowledge questions

You will also find knowledge questions at the end of each section to help you become accustomed to the style and format.

Knowledge questions

- How is the practice of politics distinct from the discipline of political science?
- In what ways is factual evidence sometimes used, abused, dismissed, and ignored in politics?
- Is being knowledgeable an important quality in a political leader?
- Why have political leaders sometimes tried to control or eradicate specific bodies of knowledge?
- With regards to politics, do we know as much as we think we know?
- How might knowledge reflect or perpetuate existing power structures?

Vocab boxes

Vocab boxes introduce and explain key terms.

Exhibition thoughts boxes

Exhibition thoughts boxes give you a reminder about the organisation of the virtual exhibition objects discussed in the chapter.

Exhibition thoughts

- In the **Scope** section of this chapter, we organised our treatment of objects around the IA prompt #17: *Why do we seek knowledge?*
- In the **Perspectives** section, the deliberations on the tensions between insiders and outsiders to religious experience might be the spark for an exhibition addressing IA prompt #20: *What is the relationship between personal experience and knowledge?*
- For **Methods and tools**, the focus could be on the limits to knowledge with IA prompt #18: *Are some things unknowable?* Or perhaps on the efforts to establish public verifiability for religious knowledge with prompt #8: *To what extent is certainty attainable?*
- Under **Ethics**, one suggestion is to focus on the role of authority in establishing acceptable moral standards – IA prompt #22: *What role do experts play in influencing our consumption or acquisition of knowledge?*

Info boxes

Info boxes give you more information about something that has been mentioned on the page.

Case study and Specific exemplar boxes

Case study boxes give you a summary of an important issue discussed in the chapter. Specific exemplar boxes show you precise examples.

V

Norm: there are two different senses of this word. The first sense is descriptive: a norm is normal – something that usually occurs: 'Having supper at six is the norm in Sweden.' The second meaning is imperative – a norm is something that *ought* to occur: 'It is a norm to drive on the right in Sweden.' A norm in this second sense is a sort of rule and is often used in a social context. The term *normative* is derived from this second, imperative, sense of the word.

Info box

Robust

Knowledge is **robust** if it can withstand change. The London cabbie's knowledge is robust because short of a bad head injury or a missile attack on London the cabbie's knowledge can get a passenger from A to B. The rideshare app driver's knowledge of London depends critically on a complex system being in place and functioning correctly. If the system changes, the rideshare app driver may not be able to get a passenger from A to B. The rideshare app driver's knowledge is easier to come by but at the cost of robustness.

Case study: 1946 Faroese independence referendum

A consultative referendum took place on 14 September 1946 in the Faroe Islands in order to decide whether the islands should remain united with Denmark or become an independent state. The questions and results were as follows.

1. Do you want the government's proposal established? [the proposal was home rule within Denmark]
2. Do you want separation between Denmark and the Faroe Islands?

Place an X next to one of the questions.

Result: Votes in favour of 1: 5,499; Votes in favour of 2: 5,660; Spoilt ballots: 481; Turnout: 67.6%

Due to the consultative status of the referendum and the close result, there was argument as to how to proceed. Eventually, a general election was called, the parties opposing independence won a majority, and within two years home rule was declared within a union with Denmark.

What lessons can be learned from this case study about the advantages and limitations of referendums as a political tool?

What might be the problems with calling a referendum within the context of a representative democracy?

Virtual exhibition objects

Throughout the optional theme chapters are virtual exhibitions to give you ideas and inspiration for your exhibition.

Knowledge and the knower

1.1

Scope

At first glance, it seems quite straightforward. We all possess some knowledge, and are aware of ourselves as knowers. When we are small, we know rather little; when we grow, we come to know more. When you enrolled for the IB diploma programme, you may even have wondered why the IB should consider a course about knowledge itself to be necessary.

While your childhood development describes a path towards increasing independence made possible through sustained acquisition of knowledge, your personal growth has been forged by the influence of various communities to which you have belonged – arranged around family, friends, school, religion, ethnicity, language facility, and many more. As an adult, community affiliations will continue to exert great influence on your knowledge. All of this plays out against the wider backdrop of the sum of human knowledge, to which countless individuals and groups have contributed throughout the history of our species.

Activity 1

Write down the following.

- Three things that you know that many other people also know.
- Three things that only you (or only you and a few other people) know.
- Three fields of knowledge about which much is known but you know rather little.

Reflect on your responses to these three categories.

What can you learn from this exercise about the magnitude of your knowledge compared with all of the knowledge that exists? What are some of the possible ways to feel about this? How does it make you feel, and why?

Are there significant differences between the kinds of knowledge that can be shared compared to those that can't? What about knowledge that could be shared but isn't?

A key recurring tension in TOK is the relationship between the autonomy of the individual as a knower and the social aspects of knowing. One of the goals of this chapter is to set the scene for exploration in the rest of the book of the diverse contexts in which this relationship occurs.

Another goal is to explore how the attributes of the IB learner profile might assist us individually and collectively in the pursuit of knowledge. As an IB student who is familiar with the learner profile, you probably find it unsurprising – even obvious – that one attribute of a successful learner should be the personal accumulation of knowledge. What else could you have been doing in all of those lessons over the years? And what about your experiences in life beyond the classroom? School is supposed to equip you not only with facts but also with the skills necessary for acquiring, evaluating, and building on them. So perhaps we can embark on a deeper investigation of knowledge and what it means to know, by making a provisional distinction between things that we know to be the case (such as that Bangkok is the capital of Thailand, or that the atomic number of nitrogen is 7) and things that we know how to do (such as searching for an answer to a question on the internet, or using a burette in order to undertake a titration). The former type of knowledge is sometimes referred to as *propositional*, as it can be

expressed in language for everyone to examine; the latter type can be referred to as *procedural*, as it involves an ability to perform a task. As you set out on this inquiry into knowledge and knowing, bear in mind all ten characteristics or aspirations of the learner profile and consider their contributions to the journey.

IB learners strive to be:

- inquirers
- knowledgeable
- thinkers
- communicators
- principled
- open-minded
- caring
- risk-takers
- balanced
- reflective.

The exhibition task in the TOK course requires you to identify three objects and discuss them in the context of knowledge. Here, we are going to set up a virtual exhibition of three objects to discuss in a knowledge context.

Virtual exhibition object 1

Sporting tournaments are always accompanied by fevered attempts to predict the results. Indeed, some people are of the view that the build-up is at least as exciting as the event itself. During the 2010 football World Cup in South Africa, an uncannily accurate forecaster became a celebrity, by correctly predicting the winning team in all seven of the matches played by Germany. This celebrity was Paul, who happened to be an octopus. Before each match, Paul was provided with two boxes, each of which contained a tempting snack and was labelled with the flag of one of the competing nations. Whichever box he opened first was taken to be his prediction. Paul accumulated many followers in Germany until his accurate prediction of German defeat in the semi-final prompted some to suggest he could find himself on someone's dinner plate.

Match	Paul's prediction	Stage	Result
Germany *vs* Australia	Germany	Group match	4–0
Germany *vs* Serbia	Serbia	Group match	0–1
Germany *vs* Ghana	Germany	Group match	1–0
Germany *vs* England	Germany	Round of 16	4–1
Germany *vs* Argentina	Germany	Quarter-final	4–0
Germany *vs* Spain	Spain	Semi-final	0–1
Germany *vs* Uruguay	Germany	Third place play-off	3–2

Can we say that Paul knew who was going to win each match? It would be hard to argue for this; a more convincing explanation involves luck. Do you think a lucky 'guess' can be considered to be knowledge? Can we even claim that Paul was guessing? In any case, even the most committed human beings struggle to assemble the knowledge needed before matches to make sustained accurate predictions. How could Paul possibly have factored in knowledge about the individual players, the record of past encounters between the teams, the conditions in which the match would be played, etc.? More fundamentally, how could he understand that flags attached to snack boxes represented countries, or even what flags or countries were? Many would add that there is a considerable element of chance involved in sport, and hence

truly knowing in advance is not possible. A genuine prediction of a result would seem to require believing that it will happen, and it's not clear that octopuses possess the capacity to hold anything that we might classify as a belief. A 'common sense' response to this scenario seems the only reasonable one: Paul was not really predicting anything because his choices were not informed by relevant information, and they were probably not connected to any mental state that we could accept as a belief.

Figure 1 Paul the octopus in his tank

If knowing is about having beliefs and being able to provide good grounds for them, it follows that Paul did not know anything about the World Cup. This seems fair enough. But does it then mean that octopuses really don't know anything at all? It turns out that, for invertebrates, octopuses have extremely well-developed brains and nervous systems, although the way they are structured is rather different to ours. This makes them particularly interesting subjects for investigation. Paul was singled out by his keepers for the prediction business because he seemed to respond intelligently to his environment. There are well-documented cases of octopuses discriminating between different people by squirting water consistently at only some of them (is this an octopus's version of an insult or a compliment?). They can repurpose objects like coconut shells as shelters, and display sustained curiosity with inanimate objects. It has also been said that they have a knack of escaping from tanks when no one is paying attention to them.

While we do not know what it is like to be an octopus because we have no direct access to its inner life (if indeed it has anything that can be described in this way), we can see that octopuses do respond to their environments in ways that seem purposeful and well adjusted. Rather than exploring knowledge as something requiring beliefs and good grounds for them, perhaps we should focus on actions and responses as indicators of a creature being knowledgeable – without worrying about what goes on inside an octopus's brain. More boldly, we could regard these actions and responses as instances of knowledge in themselves. It seems likely that, in the event of humans doing things that roughly correspond to those that octopuses quite routinely seem to do (including learning), we would accept that those things at the very least required knowledge or demonstrated skills that count as knowledge in themselves. Perhaps then, we could think of knowledge in terms of solving problems and the actions that provide responses to them.

In TOK, successful inquiry is predicated on an initial open-mindedness that permits us to draw tentative or speculative distinctions for the purpose of analysis. On more detailed reflection, these distinctions may or may not bring our understanding

forward, and then we can elaborate or dispose of them. Here we have made a start in two distinct directions in our exploration of knowledge and knowing.

	Knowledge in the form of	Paying attention to
1	Claims	Beliefs and evidence
2	Skills/abilities	Actions/responses

Claim: a statement that asserts something to be true

Activity 2

Using each of the two ways of thinking about what we mean by knowledge, and looking at the table above, what conclusion do you draw about the capacity of an octopus to know? More generally, what might be the advantages and difficulties of insisting that knowledge must be, or must arise from, a certain kind of belief?

Does the second interpretation suggest that all living things have knowledge? For example, what about plants that respond to light and gravity, or yeast that switches to alcohol production in the absence of oxygen? If not, why not? If so, is this interpretation still helpful as a description of knowledge? If not, might it be possible to tighten it up somehow?

Virtual exhibition object 2

Among the many achievements of the Flemish cartographer, Gerardus Mercator, the most well known is his ground-breaking map of the world, published in 1569. In the heyday of European expansion and exploration around the world, accurate navigation was limited by the technology of the time. Mercator's contribution was to develop a map that always allows a navigator to steer to a constant compass bearing in order to reach the desired destination. There is no way to produce a flat map of a globe without deviating in some way from the reality of the world, and in Mercator's case the simplification of navigation came at the expense of accurate representation of area – the further a territory is from the equator, the greater its size appears on the map (see Figure 2).

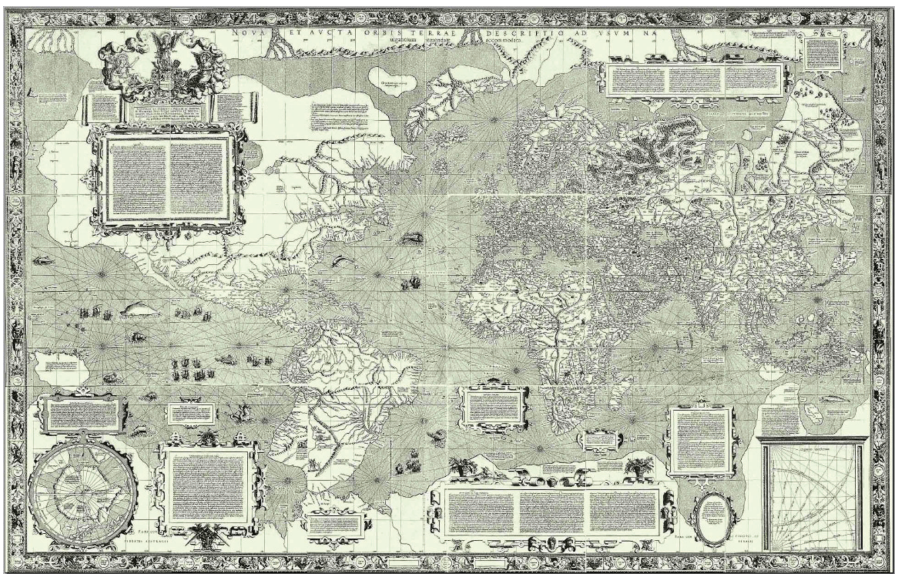


Figure 2 Mercator's map of the world, 1569

Are you familiar with maps of the world that use different projections? There are many alternatives now, and the reason why Mercator's projection has lost advocates in modern cartography is that the original trade-off has shifted. The global positioning system (GPS) and other items of modern technology have undermined the reliance on simple maps as a primary means of navigation, and hence the disadvantage of size distortion is no longer offset by the practicalities of the map. We are left with a map that misleads observers in ways that have an impact on their understanding of the relative importance and power of various regions of the world.

Mercator assembled the best available geographical knowledge about the world available to him in the 16th century and offered this knowledge in the form of a map. Here is a third way of thinking about knowledge: while Mercator literally produced a representation of the world, we can try thinking of knowledge in general as a representation of some aspect of the world.

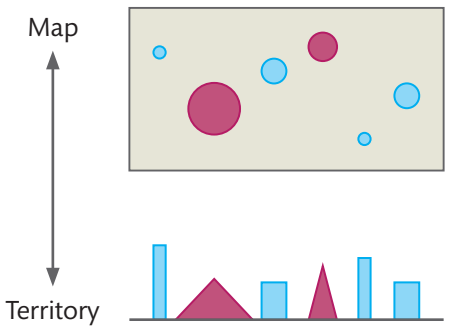


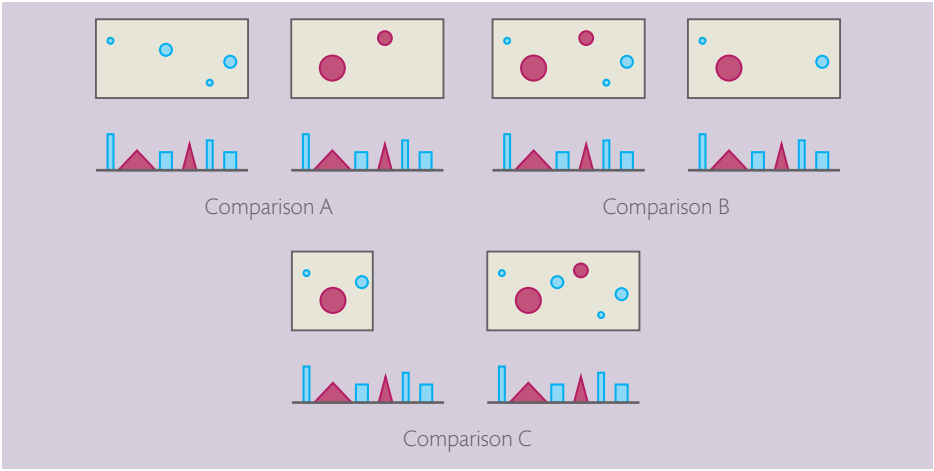
Figure 3 The map is to the territory as knowledge is to the world.

Figure 3 shows an overhead map (top) of a cityscape (the territory) shown in sideview (bottom). The relationship of the city to the map is the same relationship that we find between the world and the knowledge that describes it.

This metaphorical approach can be quite successful. It reminds us that the map and the territory are distinct things, and the map can never be completely correct or else it would have become the territory itself and hence lost its value as a tool. There can be alternative maps that emphasise different aspects of the (same) world. Maps can leave out things about the world that are unknown at the time, or add features speculatively about unknown things. As new discoveries are made, they can be added to the map or used to correct errors. Maps are often designed to solve particular problems (such as navigation). The aspects of a map that distort the world may be there by necessity or by deliberate design in order to solve the problem for which the map was created.

Activity 3

Consider the variants below on the map/territory figure. In what significant way do the two members of each pair of maps differ from each other? Can you 'translate' these differences in the maps such that they illustrate features of knowledge? What examples of knowledge can you think of?



Our inquiries have now raised the following three ways of thinking about knowledge.

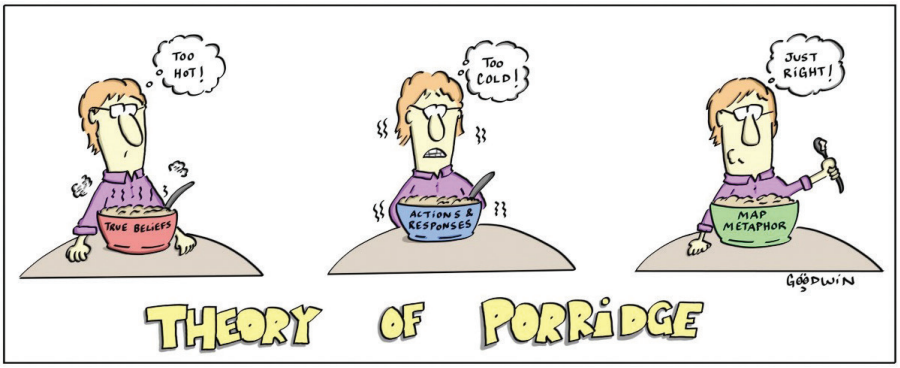
	Knowledge in the form of	**Paying attention to**
1	Claims	Beliefs and evidence
2	Skills/abilities	Actions/responses
3	Metaphorical maps of the world	Representations

Take a moment to revisit the provisional distinction introduced at the start of the chapter – *knowing that* and *knowing how*. How does this distinction relate to the three ways of thinking about knowledge?

If we insist that, in order to count as knowledge, beliefs must correspond exactly with the state of the world, the first way of thinking seems to set a very high bar for knowledge. While we might agree that Paul's predictions do not merit the knowledge label, it does not seem reasonable to suggest that Mercator was ignorant just because his map was not 100 per cent accurate. This sets us on the road to the conclusion that each of us knows very little indeed! The second conception carries with it the danger that, by focusing on actions, we include behaviours that are more readily described as adaptations or instincts as knowledge, and end up stuck with a description of knowledge that is too broad to be useful. Arguably the third conception is troubling because it allows for knowledge that is false in some respect. 'False knowledge' sounds like a weird idea.

Activity 4

Are the three conceptions of knowledge in the table above entirely distinct, or is there some overlap? Does one of them strike you as having more potential as we progress through this book? Or do you think that each of them will provide enlightenment as we go along? Is it okay to keep switching from one description to another, or is that a kind of argumentative 'cheating'? Does the map metaphor provide middle ground between those approaches to knowledge that are either unrealistically ambitious or unhelpfully inclusive?



Whatever your responses to the questions in Activity 3, let's remember all three conceptions for now.

Virtual exhibition object 3

The last object in our virtual exhibition is the best-selling jazz album of all time by any solo artist – a recording of the concert given by the pianist Keith Jarrett on 24 January 1975 at the Opera House in Cologne, Germany. On this recording, Jarrett is not playing a pre-existing piece; he is improvising throughout, yet his ability to generate this music spontaneously rests on a rich foundation of knowledge about harmony, melody, rhythm, and musical styles. Jarrett has a sophisticated internal map of musical theory, but that seems insufficient on its own to explain what he has achieved with 'real time' improvisation. There are many people who have comprehensive and deep musical knowledge and yet are not able to do what Jarrett does.

Figure 4 The Köln Concert, Keith Jarrett

Activity 5

Try to employ one or more of the three conceptions of knowledge in order to explain how a musician can give a concert of this kind. What roles, if any, do beliefs, actions, and representations play?

Consider the following quotations from Jarrett himself.

> When I'm out there and there's just a piano, it's like my body knows exactly what to do – it's just like my left hand knows how to play. And if I tell it what to play, I'm stopping it. Not only am I stopping it but I'm stopping it from playing something better than I can think of.
>
> (www.youtube.com/watch?v=fDbOKHOuy9M; after 1 min)

> I myself am a pawn to this whole thing [...] I am either going to be in there inside the process of improvising or I'm going to be on the outside wondering what it is and coming up with a theory and an answer.
>
> (www.youtube.com/watch?v=a-kznTN66Ho; after 7 min 30 sec)

Activity 6

Do you think Jarrett is expressing something worth noting about the relationship between *knowing that* and *knowing how* in the context of improvisation? How could it be that his musical performance is diminished by his effort to understand the process by which it is achieved? Even memorisation of a scored piece of music can be undermined by paying too much attention to individual notes and chords. If you are a musician, have you had any such experience?

Perhaps the scenarios in which one kind of knowledge can be successful only by subduing another are more widespread. Golfers, snooker players, cricket bowlers, darts players, and baseball pitchers are all susceptible to a condition known as the yips, in which the motor skills needed to perform a particular repeated action (such as a golf swing or a baseball pitch) suddenly desert the player. The exact causes are disputed, but one explanation involves a conflict between performing the action and systematic knowledge of what is required in order to achieve it. Sporting actions of these kinds become automatic through repetition, and this permits the player to focus on their immediate strategy in the game (hitting the ball long to avoid a bunker, exploiting a weakness in a batsman's defence in order to dismiss him) rather than the mechanics of the action. When something goes wrong, the player starts to rely on analysis of their internal map of all the components of the action that are required, in order to understand where the problem lies; but this only worsens the problem and the result is an inability to perform the action to any successful degree at all.

> [T]he yips are restricted to a quite specific range of sporting activities. They afflict only those actions that are triggered by the players themselves, as opposed to those that are responses to someone else. It is specifically when you need to initiate a sporting action that you are in danger of thinking about the movements you must perform.
>
> (Papineau, 2017, p. 49)

Finding out the nature of knowledge and what it means to know is not a straightforward task. There seem to be different kinds of knowledge, different ways of describing them, and some controversy as to how they interact. But with the

assistance of three objects (the octopus, the map, and the album) we have flagged some distinctions and applied some concepts in order to try to find out the nuances and subtleties. Rather than using the first definition you find, success in this course involves taking a balanced approach to analysis, with ideas that can be refined or rejected according to circumstances.

Things to think about

- Mercator's projection is only one of many. Research some other projections and their effects on accuracy – do they add any further insight into the nature of knowledge conceived as a map of reality?
- The metaphor of the map might work well in principle for thinking about knowledge but, in a world in which map-reading and interpretation are increasingly delegated to technology, do you think the metaphor will become ever less powerful for TOK students? Does this question resonate with you? Why or why not?

Knowledge questions

- Why are the criteria for what counts as knowledge not obvious?
- What criteria can we use to distinguish between knowledge, belief, and opinion?
- Are there situations where *knowing how* is more important than *knowing that*?

Perspectives

People hold different beliefs about many things. Sometimes, this just amounts to disagreement about individual and specific claims, and often this kind of dispute can be resolved by reference to other facts or experiences about which there is agreement. There are times when we are just wrong, can be corrected, and are willing to accept the correction.

For example: 'Barack Obama was the 45th president of the United States.' 'No, he wasn't – here is the complete list; count them.'

But not every belief can be so easily verified or abandoned. For example, you will have an opinion about the success of your school as a place for learning. We can call this opinion your personal point of view. This view will have been formed through your experiences at school, and also shaped by a number of factors external to the school itself yet important to your own identity. Before proceeding, consider what some of these factors might be.

Now read through the following two passages about the nature of education and schooling.

Passage A

Education can benefit from the application of concepts and methods from the business world. Students can be viewed as consumers of education, and their performance measured, quantitatively as far as possible, in terms of 'value added'. Teachers and schools can be made accountable in terms of their success in administering this extra value to students, leading to

an effective results-driven and competitive market in educational opportunity. Computers and related technologies have advanced to the point where they are more effective than humans in delivering curriculum content and adjusting learning experiences according to the needs of individual students. The role of the teacher needs to be downgraded to managing the environment in which technology takes centre stage, or perhaps removed altogether along with schools themselves as institutions for learning.

Passage B

Education and business are fields with distinct differences. Students need to be treated as whole persons with individual goals and interests that inform their intellectual development. Students can learn to take full account of these attributes and become self-directed and balanced citizens only with guidance from experienced adults. 'Well-being' should be understood as extending far beyond material concerns. Objective measurement of students' performance relative to each other is difficult and is often best measured qualitatively. Not only is the teacher key to effective learning, but schools as long-established institutions provide the nucleus of learning communities and safe spaces in which socialisation can take place, with teachers in *loco parentis*. Accordingly, teachers and schools continue to function as effective institutions for learning.

Activity 7

What is your opinion on passages A and B? Does one passage seem more convincing than the other to you? Or are you in the middle somewhere, or possibly somewhere else entirely?

You might be hesitant or deeply convinced by your view, but this doubt or conviction will come from a combination of the influences of factors such as your direct experiences, your interests, and components of your social background including culture, gender, age, or religious and political preferences. Identify how aspects of your own life and background in these categories might have had an impact on your point of view on this topic.

These factors work together to identify the 'location' from which you witness the world as a whole. We will refer to this matrix of circumstances as your *perspective*, and it shapes and explains the views that you hold. Let's set this in the context of the two views above.

Activity 8

Can we describe the perspectives that are likely to give rise to the positions above on the topic of the relationship between education and business? Think about the concepts, practices, and values that are implicit, and about what experiences, interests, and social backgrounds might lead to them.

'He would think/say that because he…'. In attempting to identify these perspectives, to what extent is there a danger of stereotyping? How serious are the dangers of reaching conclusions about someone's point of view on the basis of their perspective?