

FOR THE
IB DIPLOMA

SECOND
EDITION

Theory of Knowledge

Skills for Success

John Sprague

SAMPLE CHAPTER

Contents

Introduction iv

Chapter 1 Knowing about knowledge 4

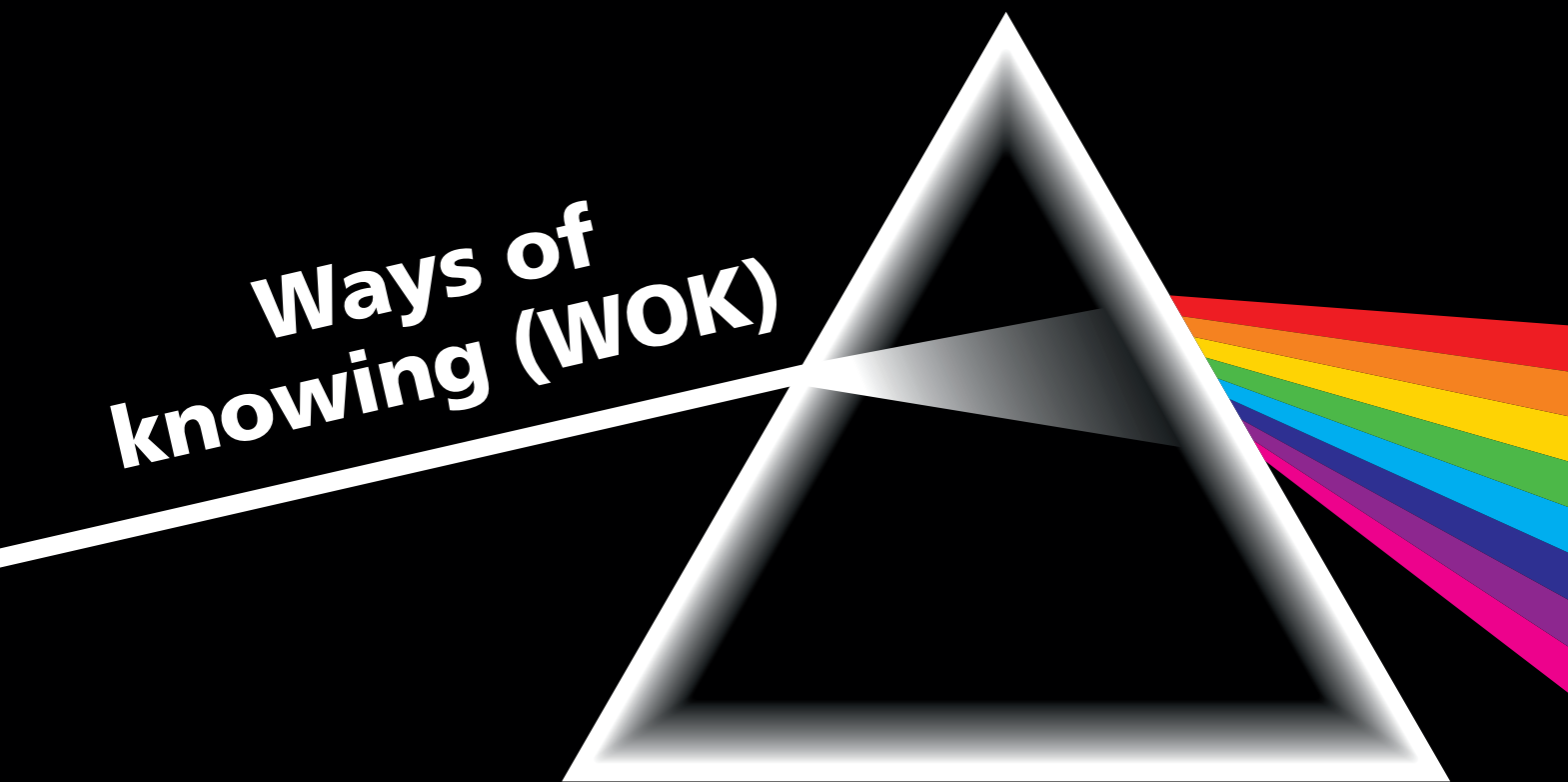
Chapter 2 The knowledge framework 16

Chapter 3 Knowledge and the knower 54

Chapter 4 Assessment 70

Glossary 129

Index 130



**Ways of
knowing (WOK)**

mathematics **the**
the natural
sciences
Areas of **religious**
knowledge (AOK) **knowledge**
systems
the arts **ethics**
the human



emotion

faith

imagination

intuition

language

memory

reason

sense perception

history

**indigenous
knowledge
systems**

sciences

1

Knowing about knowledge

TOK is not like any other IB course. Whereas students in other subjects are expected to focus on developing knowledge within a discipline, in TOK, students are asked to take a step back from the subject and think about what it is that they are ‘doing’ when they are studying, for example, history or maths.

It is a little bit like sport: when playing football or cricket or baseball, when you are actually engaged with the game while on the pitch or on the field, you do not consciously think about the rules (other than remembering to follow them). You are not reflecting on them, wondering about how they arose or whether they are the right rules; you are just getting on with playing the game. If you wish, you can later step back from playing the game and think about the rules themselves: Why are they like that? What other games follow similar rules?

This is similar to the relationship between TOK and subject questions. For example, as a historian you might ask:

What is the date of this castle wall?

As a TOK student you might ask:

How reliable are the dating techniques used to date this castle, or this castle wall?

As a biologist or medical researcher you might ask:

What is the effect of this drug on the growth of a tumour?

As a TOK student you might ask:

What is the best way to test the effect of this drug, knowing that sometimes personal bias might influence how researchers conduct their experiments?

We don’t mean to suggest that historians and biologists don’t also ask these questions. They certainly do! Being a ‘good’ historian or biologist means that you have asked these questions. Many times when we realize that a historian or a biologist has somehow broken the rules of developing knowledge in that discipline, we say that they are ‘irresponsible’.

Often, however, this type of reflecting on the methods of your subject doesn’t happen while you are learning the basics in school. This is why so many students return from college and say that they finally understand what TOK is all about and how much they appreciate having taken it during their IB.

This shift out from under the rules of a subject to reflecting on and exploring the rules themselves is a tricky move, but success in TOK requires that you do your best to understand it.

Despite this approach being central to the course, it is often a genuine challenge for students to learn to identify it and understand how it is quite different from the other approaches they are using in their subjects.

Second-order knowledge

Second-order knowledge is a term that is not used in the subject guide, but it nevertheless describes the distinctive feature of the course and it is often the biggest challenge for students. In the context of assessment, getting this right cannot be understated. The question you answer in your exhibition and the prescribed titles will be examples of questions about ‘second-order’ knowledge. Knowing what this means will help you avoid the number one danger for all students: developing ‘first order’ descriptions rather than second-order analyses.

Harvard classicist Mark Schiefsky offers the following definitions of first- and second-order knowledge:

First-order knowledge is knowledge about the world, whether theoretical or practical in orientation; it may be a knowledge of how things are, or a knowledge of how to do or make things.

By **second-order knowledge** I mean knowledge that derives from reflection on first-order knowledge: for example, a method for generating new procedures. Second-order knowledge ... sets out a conception or norm for what knowledge is in a particular domain. The idea of mathematical proof is a paradigmatic second-order concept, since it involves a specification of the conditions under which mathematical assertions can be accepted as true.

Source: www.edition-open-access.de/studies/1/12/index.html

ACTIVITY

Identify the different elements of the definitions above which you think show the main differences between first- and second-order knowledge. Make a table listing these differences and refer to it often during the TOK course, looking for the different elements as you progress.

Make a note of anything you don't understand and write out any questions about the material you have. Read the rest of this section and if you still have questions, make sure you ask your teacher.

As indicated here, first-order knowledge is knowledge about the world that a subject expert might have, and which makes claims from *within* that subject. This sort of knowledge is what you are developing and being tested on nearly every day in your subject classes.

However, it is the second-order knowledge that you need to be firmly focused on in your TOK classrooms and assessment. This sort of knowledge is knowledge about how the subject experts make their own knowledge. It is knowledge about rules used in the development of the first-order knowledge by a community of experts.

Here are some examples of first-order knowledge claims (although not all of them are necessarily true) that you might see within your subject-specific classrooms:

Table 1.1 First-order knowledge claims

| AOK | First-order knowledge claim |
|-------------------|---|
| Arts – Literature | The ‘Red Wheelbarrow’ is about Williams’ emotional state at a particular time |
| Languages | Bullfighting is crucial to Spanish identity |
| History | The Second World War was caused by the economic situation in Germany at the time |
| Economics | A socialized health care system helps individuals avoid the financial burden of illness |
| Biology | Photosynthesis slows down during the winter |
| Chemistry | Tennessine was first discovered in 2010 |
| Mathematics | The largest known prime number is over 17 million digits long |
| Arts – Music | Beethoven’s opening sketches in his Ninth Symphony foreshadow the development of the entire composition |
| Politics | Even in liberal countries, some material is only available legally to adults |

In each of these cases, the knowledge claim is first order because it is a claim about objects or concepts in the world; it depends on using the methods and processes that the relevant subject teaches.

Second-order knowledge claims, on the other hand, do not propose answers to questions ‘within’ the subject, but are claims about the methods used by experts in the field as they investigate the world. They relate to the processes (the *methods and tools* of the subject) of constructing knowledge, and about what counts as knowledge in that field (the *scope* of the subject), and not to the knowledge itself or the different views (or *perspectives*) which experts in the same discipline might take.

For example, I might make the first-order claim that UFOs do not exist. I would, however, be making a second-order knowledge claim if I stated that the testimony of my Uncle Bob is not reliable enough to persuade me that UFOs exist. The first claim is about things in the world; the second is about the rules of creating knowledge about those things.

Below is a list of possible knowledge claims related to the first-order claims and questions in Table 1.1. Each is only one possible knowledge claim.

Table 1.2 Second-order knowledge claims

| AOK | Second-order knowledge claim |
|-------------------|--|
| Arts – Literature | To be a reliable interpreter of art, one must have been trained at university |
| Languages | Some concepts in a language cannot be fully understood unless you have grown up in that culture |
| History | Historians sometimes use their own values as lenses to explore the past |
| Economics | Different economic models suggest different outcomes in relation to policy changes |
| Biology | Technology needs to produce data that is reliable |
| Chemistry | The Periodic Table models how elements are related to one another in terms of atomic weight |
| Mathematics | Mathematics makes extensive use of deductive argument |
| Arts – Music | Being educated in music teaches you to search for and appreciate patterns and development in musical structure |
| Politics | Some knowledge is inappropriate for certain people |

Hopefully in each of the examples above you will be able to see how the focus of the inquiry has shifted from knowledge about the world to knowledge about knowledge.

Knowledge questions

One way of maintaining a clear second-order approach is to make good use of **knowledge questions**.

IN PRACTICE

At no point in the formal assessment will you be asked to develop a knowledge question for yourself. The prescribed titles will *already* be formulated in the form of a knowledge question and the 35 IA prompts are also already knowledge questions. Your task in each of these assessments is to develop a response to these questions. However, being able to develop knowledge questions is an excellent way of developing your general TOK skills *and* being able to formulate knowledge questions relevant to your prescribed title will help you answer it effectively.

The TOK subject guide lists dozens of knowledge questions under each of the optional themes and AOKs. In addition to this, each IB subject guide for all the other IB subjects has knowledge questions as well.

Many of the assessment objectives of the TOK course are focused around the concept of knowledge questions. Here are examples from page 00 of the subject guide:

Having completed the TOK course, students should be able to:

- demonstrate TOK thinking through the critical examination of knowledge questions
- identify and explore links between knowledge questions and the world around us
- identify and explore links between knowledge questions and areas of knowledge.

Understanding just what constitutes a knowledge question is therefore important for making sense of the theory of knowledge course, and for succeeding in the TOK assessment.

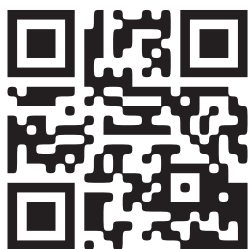
The subject guide offers a three-part definition of 'knowledge questions' on page 00. It says good knowledge question are:

- about knowledge
- contestable
- draw on TOK concepts.

But what does each of these mean?

■ Knowledge questions are about knowledge

The section above is about the differences between first-order knowledge claims and second-order knowledge claims. The point here is the same as above, namely that whereas first-order questions are directly aimed at constructing knowledge within a discipline, *knowledge questions* are aimed at asking about things like the processes involved in the construction of knowledge, or how knowledge is transferred between individuals and communities or about the nature of knowledge in a particular knowledge.



ACTIVITY

Table 1.3 shows the second-order knowledge claims from Table 1.2 above. If you consider each knowledge claim to be an answer to a question, what do you think the question would be? The question you develop is likely going to be a 'knowledge question'.

Use the QR code to see some possible responses to this activity.

| AOK | Second-order knowledge claim | Second-order knowledge question |
|-------------------|--|---------------------------------|
| Arts – Literature | To be a reliable interpreter of art, one must have been trained at university | |
| Languages | Some concepts in a language cannot be fully understood unless you have grown up in that culture | |
| History | Historians sometimes use their own values as lenses to explore the past | |
| Economics | Different economic models suggest different outcomes in relation to policy changes | |
| Biology | Technology needs to produce data that is reliable | |
| Chemistry | The Periodic Table models how elements are related to one another in terms of atomic weight | |
| Mathematics | Mathematics makes extensive use of deductive argument | |
| Arts – Music | Being educated in music teaches you to search for and appreciate patterns and development in musical structure | |
| Politics | Some knowledge is inappropriate for certain people | |

TOK TRAP

Ethical questions are some of the most interesting and engaging questions in TOK, but they often are a pitfall. You must be careful not to fall into a straightforward *ethical* debate, but instead ask second-order knowledge questions in relation to

ethical debates. In just the same way that solving a mathematical equation would not be 'doing TOK', neither is solving an ethical dilemma 'doing TOK'.

See more about this trap in the ethics section of Chapter 2 The knowledge framework.

Knowledge questions are contestable

In addition to being about knowledge, a good knowledge question is an open question: one that is obviously debatable and cannot be answered simply with 'yes', 'no' or 'maybe'. The question should require an analysis that shows the complexity behind the knowledge issues involved. Some good knowledge questions do seem to call for yes/no/maybe answers, but when these are clearly contestable, then they are appropriate for TOK. So, a question like, 'Is an objective description of human behaviour possible?' calls for a definitive answer, but there is clearly a deep debate here.

A question like, ‘Does the scientific method use observation?’ is not contestable. It is about knowledge, but there is no debate. The answer is yes (though it might be more complicated than this) and if you don’t agree, then you simply have misunderstood facts about the scientific method.

Remember: an open question will help avoid descriptive analyses, and descriptive analyses are generally not successful in TOK assessment.

■ Knowledge questions should draw on TOK concepts

The TOK course is structured around a number of concepts: the AOKs, the core theme, the optional themes, the knowledge framework and the twelve key concepts. It is a good idea then to put those concepts to good use when framing your knowledge questions and your subsequent second-order analysis.

Many good TOK analyses reference elements of the TOK specification and place them in relation to one another. The prescribed titles will be comparative in nature, and you can try to develop comparisons across topics in your exhibition too.

Maintaining a second-order approach

Following on from the final characteristic of knowledge questions outlined above, the remainder of this chapter explores a number of conceptual frameworks that you can use to structure your second-order thinking and knowledge questions.

■ The knowledge framework

The TOK course offers four elements in what is called the knowledge framework (see Chapter 2 for a full description of these). We will be making reference to these elements throughout the book and the student book uses them as the primary structure. The elements are:

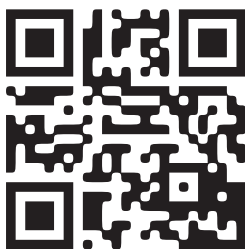
- Scope
- Methods and tools
- Perspectives
- Ethics.

■ Course concepts

The TOK course also offers a series of knowledge concepts that are meant to help students create and maintain a clearly second-order approach. The student coursebook offers a clear explanation and analysis of each. Use these concepts and ideas as often as you can throughout your work in TOK and you won’t go wrong.

The 12 course concepts are:

| | | |
|-------------|----------------|----------------|
| Certainty | Interpretation | Power |
| Culture | Justification | Responsibility |
| Evidence | Objectivity | Truth |
| Explanation | Perspective | Values |



ACTIVITY

Create a table like the one below and see if you can use the course concepts above to develop questions about the discipline-based knowledge presented in the second column.

Use the QR code to see some possible responses.

| AOK | First-order knowledge claim | Second-order question using one of the 12 course concepts |
|-------------------|---|---|
| Arts – Literature | The 'Red Wheelbarrow' is about Williams' emotional state at a particular time | |
| Languages | Bullfighting is crucial to Spanish identity | |
| History | The Second World War was caused by the economic situation in Germany at the time | |
| Economics | A socialized health care system helps individuals avoid the financial burden of illness | |
| Biology | Photosynthesis slows down during the winter | |
| Chemistry | Tennessine was first discovered in 2010 | |
| Mathematics | The largest known prime number is over 17 million digits long | |
| Arts – Music | Beethoven's opening sketches in his Ninth Symphony foreshadow the development of the entire composition | |
| Politics | Even in liberal countries, some material is only available legally to adults | |

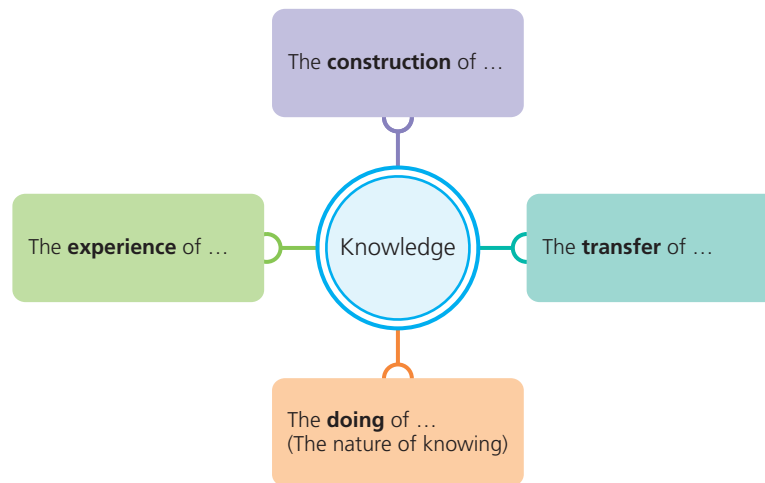
Further elements of knowledge

Another suggestion would be to continually remind yourself of the need to focus on the following elements of knowledge:

- the construction of knowledge
- the transfer of knowledge
- the nature of knowledge
- the experience of knowledge.

If you are genuinely exploring one of these four aspects of knowledge, then you are probably still developing a clearly second-order analysis. These are not thought of as being discrete aspects or distinct from one another; there is quite a bit of overlap as you will see.

These elements are not 'official IB concepts' but concepts which students have found helpful in helping them to think about what counts as being 'about knowledge'.



Elements of knowledge

■ The construction of knowledge

This refers to the generally accepted methods and standards of how knowledge is created by people working in the field. Think of this in relation to the ‘scope’ and ‘methods and tools’ elements of the knowledge framework.

Each AOK has its own understanding on what constitutes a genuine knowledge claim within a field. For example, when constructing knowledge in the sciences, the testimony of a single individual is not enough: the rules of knowledge construction mean that many people must have observed the event and it must, in principle, be observable again.

Another example would be to think about the constraints on ‘hunches’ or ‘intuition’ in the building of scientific knowledge. We might have a *hunch* that some fact is true, but our personal intuition cannot, by itself, justify the knowledge. So, in developing knowledge claims in science (construction of knowledge), we have to test our own intuition using accepted methods within the field.

■ The transfer of knowledge

This refers to the ways in which individuals come to know things which ‘the community’ already knows. This is different from the psychological phenomena of ‘learning’ something. Psychologists apply first-order investigations into how human beings learn things, and will discuss processes like memorizing, retaining and accessing facts.

The transfer of knowledge in the TOK sense has more to do with one’s own personal engagement with the traditions and methods of the wider community of knowers and an *acceptance* of that knowledge. As a personal knower, you have to, as it were, join a community and follow their rules as you construct knowledge according to their rules and procedures.

For example, you might want to learn a new language, but coming to understand the importance or emotive content of certain concepts within a language might require full immersion and may involve years living within a culture, and some concepts might never be fully appreciated by a second-culture speaker. For example, the Danish *hygge*, the Portuguese *saudade* or the German *gemütlich*.

■ The nature of knowledge

This refers to elements most clearly explored by the scope element of the knowledge framework. Experts in various AOKs ask certain types of questions. The natural sciences, for example, are called ‘natural’ for a specific reason: they explore the workings of the natural world. Whereas the ‘human’ sciences will focus on developing knowledge about *human beings* and how they behave. (This is not to imply that human beings are not ‘natural’!)

The interplay between physics and mathematics is interesting because the nature of those two AOKs seem quite distinct – physics tries to describe forces and events in the world, while mathematics is the science of the logical relationships between numbers and quantities – but they are also intimately related.

Similarly, you might suggest that the nature of artistic knowledge or aesthetic judgement is to uncover subjective facts about the viewer, as opposed to facts about the object of the art itself.

■ The experience of knowledge

Finally, it is clear that some forms of knowledge might be called ‘ability’ knowledge, meaning that rather than suggesting that something is true or false, we also say that we know *how* to do things. You know how to tie your shoes in the morning, but would probably find it a genuine challenge to describe this to someone. You might know how to ride a bike, but knowing this is quite different from knowing a series of facts *about* bicycle riding. You might know how to juggle, but only learned through the doing of it; the reading of a book was helpful but was not enough. This type of knowing does not necessarily fit well with the knowledge framework, but it is certainly a reasonable topic for investigation. You might, for example, explore what you have to know how to do if you want to be an anthropologist or an artist. Many resources devoted to TOK, however, neglect this form of knowledge, focusing instead on propositional knowledge.

While working in TOK, you must continually think to yourself, ‘Is my discussion genuinely about knowledge?’ Making sure that your discussion fits into one of these four categories is one helpful way of staying on track.

TOK TRAP

Often students will want to explore a particular feature of how individuals come to acquire knowledge – the psychological processes or ‘ways of knowing’ involved in accessing the world and in constructing knowledge about it. In the *Theory of Knowledge for the IB Diploma* coursebook by Hodder and the accompanying Teacher book, we refer to the ways of knowing as ‘sources of knowledge’. These might include processes like sense perception, memory, emotion, reason, intuition, imagination, language or faith.

These used to be a major feature of the TOK course, so you might hear about them in the TOK world, but they are not specifically named in the current

TOK course. There are many reasons for this, but the main one was that their use limited the second-order discussions students were having.

They can still be useful to discuss, however, particularly in relation to the methods and tools element of the knowledge framework. Using them in your analysis, however, comes with some risks, so you must use them wisely.

In the context of some wider knowledge question, the ways of knowing can be quite helpful. A perfectly good TOK investigation might explore things like how optical illusions will fool us (sense perception) or how our emotional drives and commitments might make

it hard to develop rational analyses, or how various things will lower the reliability of our memory.

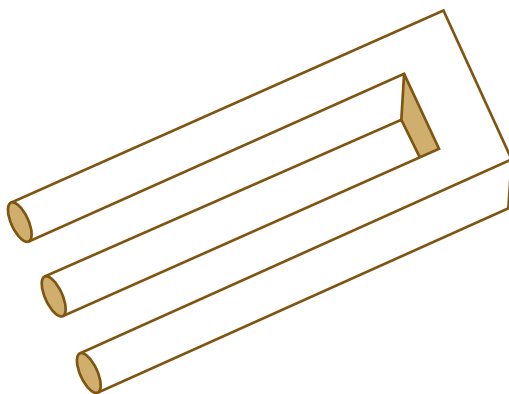
Often, however, students will focus their analysis on the ways of knowing, not the wider knowledge questions, and treat these ways of knowing in isolation. There are a number of problems with this approach:

- First, you must be careful not to suggest that the influence of one of these ways of knowing is as easily traceable as your question might suggest. 'How does emotion affect memory?', for example, might be a good start to a second-order investigation, but what often happens is that a student will simply 'speculate' that people remembering things will have been influenced by emotion in some way or another and give plausible instances of it happening. One common example is to describe a decision-making process of a person and *speculate* that they were influenced by their emotions. This is an extremely difficult claim to make *unless we have clear evidence that this was the case*. Our own speculation or guess that it probably happened is not enough to make your analysis credible.

In other words, the claim about the influence of emotions is an empirical hypothesis and unless the student has done the research, it will be mere speculation.

IN PRACTICE

Always avoid speculation in a TOK analysis. You must be credible for your analysis to be successful. This might mean having to do a bit of research to find evidence that someone *actually* did what you say they did.



How many prongs does this fork have?

- Second, working with ways of knowing in this way often leads students to suggest that analysing the effect of any one of them is a *fait accompli*. Some students try to argue that reason will *always* lead to some particular conclusion, or emotion *always* leads you to do this or that. The effects of these ways of knowing are not like boarding a train: they do not always necessarily lead to some particular destination.
- Exploring optical illusions like the two- or three-pronged fork in the context of sense perception should be part of a larger question about whether scientists, for example, can trust their observations and the effect of this on the reliability of scientific knowledge or the safe guards built into the scientific method. An exploration of the effect of emotion on memory should be explored in the context of the reliability of eye-witness testimony in history. Whether faith dilutes our reason, might be explored in the larger question of how religious knowledge systems use notions such as justification in their arguments. In other words, you should be looking at what 'effects' the limits of the ways of knowing you are working with have on the construction of knowledge in an AOK.

Lots of interesting things being said about the reliability of WOKs ...

Look, illusions! →

Emotions – boo! →
Reason – yay!

Eyewitnesses are rubbish →

Language, right? →

Rational faith! →

How do these help you understand claims made within AOKs?

Can scientists trust their observations?

Does the scientific method guard effectively against prejudice?

Can historians rely on testimony?

Can language be used neutrally when describing human behaviour?

How is justification used in theological arguments?

Don't stop with ways of knowing