

Notes to activities

Chapter 1

Activity (page 7)

PART A

Read each of the following knowledge claims and determine whether it is certain (that is, beyond reasonable dispute) or absolutely certain (knowledge that cannot be overturned unless reality itself actually changes).

- 1** The names of the days of the week in English are: Sunday, Monday, Tuesday, Wednesday, Thursday, Friday and Saturday.

The claim is absolutely certain. Humans determined the names of the days of the week in English, and these are they.

- 2** The Earth is essentially spherical.

This claim is beyond dispute. The shape of the Earth was calculated mathematically many centuries ago, and the Earth has been observed and photographed from space by many astronauts from several nations.

- 3** If I am standing on Earth and I drop my pen, it will fall to the ground unless stopped by something in its way.

This claim is also beyond dispute. Although we cannot observe gravity itself (at least not with any currently existing technology!), we have long been able to observe the effects of gravity in many contexts, from what happens when we drop our pens to the way in which gravity affects the relationship between and among celestial bodies, such as the Earth and the Moon. We have countless examples of observing what happens when we drop things, and we have a rich understanding of the forces of the Universe and how they work together, into which the theory of gravity fits beautifully.

- 4** The capital city of Malaysia is Kuala Lumpur.

This claim is absolutely certain. The name of the capital city was determined by humans, and the determination of which city in Malaysia would be the capital city was also decided by those people who had the power of choice.

- 5** In June of 2016, citizens of the United Kingdom voted in favour of ‘Brexit’ – a referendum which determined that the United Kingdom would withdraw from the European Union.

This claim is absolutely certain. The date is verifiable by many thousands of public documents, and the vote was recorded publicly. The effects of the decision that the British public made can be seen in the many months of discussions in the British Parliament and the negotiations between the Prime Minister and the leaders of the European Union, all also documented thoroughly in public records.

PART B

Read each of the following syllogisms and determine whether the conclusion (the statement in **bold**) is absolutely certain or false. If the conclusion is false, identify the reason.

- 1** Only cows eat grass. My cat, Max, eats grass; therefore, **my cat Max is a cow**.

This conclusion is not sound. The logic is valid, but the premises are false. It is not true that only cows eat grass – many other kinds of animals and insects eat grass, including, possibly, people’s pet cats!

- 2** Wednesday is the day after Tuesday. Today is Wednesday; therefore, **yesterday was Tuesday**.

This conclusion is sound, so long as today actually IS Wednesday! Humans named the days of the week, and in the series of the days of the week, Tuesday is always followed by Wednesday. If you are reading this on a Wednesday, then this syllogism does result in certain knowledge. If, however, you are reading this section of the book on any other day of the week, then the syllogism is not sound, because the second premise is not, under those conditions, true.

- 3** Iceland is in the northern hemisphere. Reykjavik is a city in Iceland; therefore, **Reykjavik is in the northern hemisphere**.

This conclusion is also sound. The premises are true, and the logic is valid.

- 4** Horses have four legs. My table has four legs; therefore, **my table is a horse**.

This conclusion is not sound. While the first premise is true, at least so long as we are discussing normal horses who have not suffered from a birth defect or debilitating injury requiring an amputation, and while it is also perfectly possible that you have a table which has four legs, the logic is not valid. The fact that two different kinds of things have four legs does not make them the same thing. Lots of things have four legs: chairs, dogs, elephants, tables, horses and beds, but no

logic can take that one feature and somehow lead us to think that the shared feature makes all those things into one thing.

- 5** The American space agency, NASA, would like to send a manned spaceship to Mars. NASA has a project to send a manned spaceship to Mars; therefore, **NASA will send a manned spaceship to Mars.**

This syllogism is problematic throughout. For one thing, it is difficult to say with certainty that NASA would like to send a manned spaceship to Mars. NASA is an agency made up of many thousands of people. NASA itself does not have desires, though the members of NASA and the leadership of NASA may have particular plans or goals involving a manned mission to Mars. Stating that the whole agency has a particular wish is a sloppy claim which is not precise enough to serve as a premise in an argument. The NASA website does describe plans to develop a manned mission to Mars (Dunlop), though the work on a mission to Mars is in very preliminary stages, so the second premise, though fairly accurate, is also not precisely formed. Even if we could say that those two premises were absolutely true, the conclusion is not based in valid logic. The fact that someone has a desire and is working toward a goal does not ensure that the goal will be met. So this syllogism is neither true nor valid.

Activity (page 24)

- 1** What phenomenon does the graph *explain*?

The graph explains the phenomenon of the rise and fall of atmospheric CO₂ over the last (roughly) half a million years and the abrupt and significant change in the pattern since the Industrial Revolution.

- 2** What *evidence* does the graph provide to support that explanation?

The evidence that the graph provides is data about the level of atmospheric CO₂ as gathered from ice cores dating back nearly a half a million years.

- 3** What *interpretation* is offered of the data on the graph?

The interpretation offered in the caption to the graph is that ‘atmospheric CO₂ has increased since the Industrial Revolution’. This is a fairly generic interpretation which does not make any judgements about cause and effect, but which implies a correlation between human behaviour and a significant change in CO₂ levels.

- 4** What *justification* is there for that interpretation?

The justification for that interpretation is the change in the data stream indicating a sharp rise in levels of atmospheric CO₂ since the beginning of the

Industrial Revolution. The level is significantly higher in the years since then than it ever was in the half a million years before the Industrial Revolution. There is, therefore, a strong correlation between the historical event of the Industrial Revolution and the scientific observations of CO₂ levels.

- 5** Does the data on the graph provide *absolute certainty* that global warming is caused by human activity? Why or why not?

The graph does not provide absolute certainty. It demonstrates a correlation that suggests a cause–effect relationship, but it does not provide absolute certainty because, although the chance is very small, there could be some cause which we have not yet discovered. Scientific findings are, as we noted, inductive, and inductive observations cannot lead to absolute certainty. The correlation is very strong, however, due to the huge amount of data, so the conclusion can be seen as logical and convincing.

- 6** Does the data on the graph provide justification beyond reasonable doubt that there is a powerful *correlation* between human activity and global warming? Why or why not?

According to the Union of Concerned Scientists, roughly 97 per cent of scientists worldwide agree that human behaviour has caused a massive increase in atmospheric CO₂ – the same percentage, roughly, of scientists who agree that smoking causes cancer ('Scientists Agree'). Scientists, therefore, have accepted this fact beyond a reasonable doubt. They have, however, come to this conclusion through deep study over many years, and not just on the basis of this graph. So we might say that while the conclusion is justified beyond reasonable doubt, this graph alone does not provide sufficient justification for the conclusion.

- 7** Why can we say that this data is *objective* rather than subjective?

The data is objective because it is simply a representation of facts in the world. Scientists tested glacial ice dating back half a million years and simply recorded the levels of atmospheric CO₂ as demonstrated in the ice cores. No one's opinion or beliefs or desires has any influence on the physical reality of the ice.

Chapter 3

Activity (page 83)

As with any really *good* question in TOK there may be some disagreement. However, a genuine discussion about whether these images represent data or information will be a good TOK discussion to have. The key will be to use the ideas effectively in an analysis and in developing a position.

Note: the graphs and grids below show different levels of data and information. Some of what can be learned from them would be considered data; other things would be information. The learning you might gain from this has to do with what it means to *process* data. Is showing a *relationship* between some data and others a form of processing? Is placing that data into an x - y axis with labelled axes a form of processing?

- The pie chart (A) represents elements of both data and information. Data is often seen as a simple collection of facts and this pie chart certainly has an element of data in so far as the relative percentages of the groups of data is shown. For instance, there is 63 per cent of A compared with 37 per cent of B. The pie chart here is recording a straightforward amount of As and Bs.

There is, however, an element of information as well, because the pie chart is clearly indicating the relative quantities – it shows a relationship between the amount of As and Bs. Firstly, the fact that the chart tells us the percentage is more than the ‘raw’ data in that the nature of a percentage is the amount of something relative to some full amount. Secondly, the fact that the pie chart clearly illustrates that relationship moves beyond the raw data as well. The raw data (the numbers of As and Bs) would require some level of processing to determine how many As there are relative to the total. This processing might be considered information beyond the simple data.

- The trend line or ‘line of best fit’ in this scatter plot (B) clearly indicates a processing of the data and so would be considered information. In the data themselves there would be no ‘trends’, just a lot of data. We must find that trend. The trend line presents a fact that is only identified through processing the data, through processes like the Least Squares Regression. Don’t worry if you don’t know what that means – it is just a way of finding a line that travels through the plots with about as many data points above as there are below the line; the point is it is clearly a processing (a mathematical interpretation of the data) and would therefore count as information.
- The scatter graph (C) is more likely to be seen as simply data. The graph here includes minimal processing, showing only where the data lands on the graph.

As we discussed in relation to the pie chart, the x - y axis might be argued to be a sort of framework placing the data into a relationship with each other, and again this relationship might be a form of processing.

- The league table (D) is the best example of information. The basic data contained in the table includes things like the number of games played, wins or losses and goals scored. Much of what else is presented is framed and processed in a way that adds to what the data provides. There is information about the other teams that one team competes with, about how many ‘points’ have been awarded for the wins and losses and the goal difference. The goal difference or the table points earned might seem like ‘data’, but the fact that it is processed data comes across when we remember that no team actually scores league table points during a game, those points are determined and awarded at a different ‘level’. With goal difference, we must remember that this is a relative fact – that it can only be determined or processed in relation to other facts or information. Maccabi Tel Aviv FC, for instance, had a -7 goal difference at the end of the 2018 UEFA season: obviously the negative 7 number does not correspond to any fact of any game – that figure has been determined as a result of processing through comparison with a set of other facts, not about any of the specific games played by Maccabi Tel Aviv FC, so it is ‘information’.

What is the point of this exercise? In thinking about the differences between data and information, we are reflecting on how we construct knowledge. The idea that ‘information’ is processed data opens the doors to discussions about the influences on that processing and how reliable, certain or justified the outcomes of those processes are. You might push this discussion into other AOKs, for instance. What are the ‘raw’ data used in the sciences or in history or in the arts. What are the influences on how those data are processed and do they lead to reliable information or knowledge?

One question you might ask (in relation to Chapter 8) is whether there is such a thing as ‘unprocessed data’? Even placing the data into the framework of an x - y axis or translating some fact in the world into a number which can then be measured, might be considered a form of processing.

Chapter 10

Activity (page 345)

Claim	Positive or normative?
Appraising staff takes around 60 hours a year.	Positive: The information in this claim is measurable and <i>describes</i> how long these appraisals take
This is an important task for middle managers.	Normative: This claim describes a <i>value</i> , something someone thinks is <i>important</i> . The assumption is that these tasks <i>should</i> be carried out
Men are generally more aggressive than women.	Positive: This claim is measurable, but only if there is an agreed-upon way to measure. There may be <i>hidden</i> biases or prejudices in the methods by which the measurements are taken, but once agreed upon we would say that the claim is positive
Aggression is a good trait in business.	Normative: Here again we have a clear suggestion about what is good, important or valuable Some might argue that this is positive in that it might simply be a way of showing what is or is not effective. However, if the claim is used to show what <i>should</i> be done (i.e. be more aggressive), then this is enough to show that it is normative
Crime costs insurance companies \$12 billion a year.	Positive: The data that would be evidence for this claim would be measurable
We should always lock up criminals after one offence.	Normative: Clearly a statement of what ' <i>should</i> ' be done

<p>Increasing the money supply leads to short-term unemployment.</p>	<p>Positive:</p> <p>This is less straightforward than other positive claims about how we can establish cause (increasing money supply) and effect (short-term unemployment). Cause-and-effect relationships are hard to establish in complex economies, but the intent of this claim is to describe, not make a ‘law’ or a ‘should’ statement</p>
<p>Medium levels of unemployment are a price worth paying for a growing economy.</p>	<p>Normative:</p> <p>This statement provides a <i>perspective</i> on unemployment and implies a ‘should’ statement: we should accept some unemployment in favour of a strong economy in the future</p>

Chapter 12

Activity (page 408)

The first three of these proposed works of art are potentially more difficult to classify than the fourth. The notes below make a case for a certain interpretation, but if your thinking differed from what is given here, and you can explain your thinking with clear justifications and evidence from the objects, then your argument can certainly be as valid as those offered here.

- **Oscar Meyer Weiner advertising jingle:** The first is an advertising jingle from 1965. The advert includes a catchy song, and generally we think of a song as being an example of music as art; however, this song was clearly not created or distributed for the purposes of generating aesthetic experience. The primary purpose of the song was to sell hot dogs to consumers. If we consider the song apart from its commercial function, we must think about whether it provides an aesthetic experience. The tune is catchy and easy to remember; maybe it makes listeners laugh or feel cheerful. We might argue that although there are some artistic elements to the commercial, the fact that it was created specifically to sell a product means that it was not used as we normally think of art as being used. On the other hand, the fact that the song has been preserved on YouTube more than 50 years later (and has nearly 2 million views) suggests that there is something about the aesthetics of the jingle which appeals to people enough to make them want to remember it. If you were to discuss this as a potential work of art in your essay, it would be most effective to point out both the artistic and the inartistic features.
- **T-Mobile dance:** Similar to the Oscar Meyer Weiner jingle, this dance was created with the purpose of promoting T-Mobile as a provider of mobile phone services. We have the same problem, then, in terms of considering whether we can classify the advertisement as art, since it has a clearly stated function beyond the aesthetic. The dance itself, however, might be seen to have more aesthetic value than the Oscar Meyer jingle. The dance is complex, it involves a wide range of styles of both dance and music, and it clearly engages audience members. People in the train station stopped what they were doing to watch, and many of them used their phones to video the dance for later viewing. The commercial is not as old as the Oscar Meyer commercial, but it has persisted in the public view for nearly a decade, and has more than 41 million views. It seems unlikely that 41 million viewers are watching the ad in order to think about changing mobile providers; they are likely watching it for its aesthetic qualities. Again, if you were going to discuss this dance in your TOK essay, your argument would be most effective if you can explain why the decision to qualify this advertisement as art has some complexities, rather than just calling it art and leaving it at that!
- **Totem pole/Photograph of totem pole:** Totem poles are created by First Nation people of the Pacific Northwest in North America. They are created in

order ‘to represent and commemorate ancestry, histories, people or events’ (‘Totem Poles’). Based on that description, it might be tempting to say that the totem pole is not art but is rather an historical artefact. We will see, later in the chapter, however, how artists do sometimes use their art both to comment on history and to preserve history. The representation and commemoration of history is done through purely aesthetic means, which means that the makers used strongly artistic methods which differ dramatically from, say, a written record. From that perspective, totem poles can certainly be seen as fitting into a worldwide tradition of art. The photograph of the totem pole would seem to serve a primarily or solely artistic purpose. The photographer has taken care to align the wings of the totem pole with the line of trees at the bottom of the hills, suggesting both that the totem pole is of the earth and that it helps to support the mountains. The colours have been arranged so that they both complement and contrast each other, with the brown of the grains in the flatland contrasting to the blue and green of the mountains and the white of the snow. The totem itself contains all of those colours, which might be seen to imply that the totem is a part of all the world around it. These are elements of a strongly aesthetic work; we have little problem classifying both photo and totem as art.

- **Concept graphic:** This painting of animals in clothes is clearly a work of art (whether you like it or not, and whether it is a good work of art or not is another issue entirely, which will be explored later in the chapter). The images are entirely imaginary – none of the four-legged animals depicted in the graphic stand up on two feet, and none of them wear human clothing. The dog is shown with human arms. The work serves no other function than to appeal to the aesthetic, and so there is no difficulty with the categorization of this work.

Activity (page 421)

When you looked at the image of the pomegranates, you might have been likely first to think of the fact that pomegranates are fruit. Perhaps you considered the colours that were used in the photograph and the arrangement of the fruit in the frame of the photo. Perhaps the fruit looks inviting.

If, however, you know the myth of Persephone and the story of the Garden of Eden from the Christian Bible, you might be able to think in a different way about the image in the photo.

In the story of Persephone, who was abducted by Hades, king of the underworld, she is bound forever to the underworld as Hades’ wife because she ate some pomegranate seeds. (The number of seeds she ate differs from version to version.) The pomegranate seeds therefore symbolize permanence in marriage. They are also a symbol of sexual awakening, because the many seeds inside pomegranates are easily associated with the generation of life.

In the story of the Garden of Eden, Adam and Eve are ejected from the paradise of the garden for disobeying God's command that, although they may partake of everything else in the garden, they may not eat from the fruit of the tree of knowledge. The Bible does not stipulate a particular type of fruit. The apple is commonly associated with that fruit, but so is the pomegranate. The knowledge that Adam and Eve gained was, at least in part, a sexual awakening (Eve was tempted by a serpent – a serpent being a common phallic symbol) – so the pomegranate serves as an appropriate symbol for the tree of knowledge.

Activity (page 427)

The interpretation offered below depends on knowledge of some traditional symbols and of the Biblical story of the Garden of Eden. If your interpretation does not rely on the same knowledge, it is still a valid interpretation so long as it is tied, like this one, to details of the painting and so long as your explanation of what the details mean is logical.

The details – the evidence – on which the following interpretation relies are:

- the presence of trees
- the colours orange, yellow, brown, and black
- the shape that the trees make
- the bright light at the back of the painting.

The first important detail that stands out in this painting is the trees. Trees can always suggest a connection to the Garden of Eden and the tree of knowledge, so we must keep that in mind. The oranges, yellows and browns which fill the painting tell us that the season is autumn. Autumn is the season of ageing and approaching death; the intermittent appearance of black tree trunks suggests the coming of death, black being a traditional symbol of night and death. The painting would seem to be about the coming of winter, and ought to seem somewhat hopeless, but instead it is lit brightly from that bright light coming from the back of the picture. Light is typically associated with knowledge and hope – it is a sign of enlightenment. The trees form a sort of tunnel as they recede from us toward the back of the painting, and the light is at the end – the light at the end of the tunnel suggests that a better world is out there. The painting seems to remind us that after autumn and winter comes spring; after the eviction from Eden comes hope of a better life.