**Introduction**

These notes are designed to provide an easy-to-use summary of *Theory of Knowledge for the IB Diploma* by Richard van de Lagemaat.

The notes link to the other *Theory of Knowledge for the IB Diploma* resources available on this website in order to provide a complete teaching resource for the course. Cross-references to the main textbook are given for every resource.
Understanding TOK mark schemes

TOK assessment

It is necessary to fully understand the marking criteria of TOK assessment – if you understand the target, you can work towards providing the theoretical knowledge and skills to reach it. This section will therefore set out what has to be done to meet the IBO’s marking criteria for Theory of Knowledge.

Assessments

1 The TOK class presentation (20 points)
   - 10 minutes (approx.) per student
   - + plan
   - + summary in note form
   - + teacher and student justifications of assessment scores

Group presentations are allowable: max. 5 students per group, but 2–3 seems to work best.

2 The TOK essay (40 points)
   - 1200–1600 words chosen from a list of 10 titles issued annually by the IBO.

Marks for TOK and the extended essay (EE) are combined for conversion into diploma points. The significance of TOK is thus apparent:

<table>
<thead>
<tr>
<th>TOK essay and EE score</th>
<th>Points needed for IB Diploma</th>
</tr>
</thead>
<tbody>
<tr>
<td>E in both or do not submit one</td>
<td>No diploma</td>
</tr>
<tr>
<td>E in TOK or EE</td>
<td>28 points instead of 24</td>
</tr>
</tbody>
</table>

Out of 16 possible diploma-earning TOK and EE mark combinations:
   - five (31.25%) only score 1 IB point
   - three (18.75%) score 0 points.

That means there is a significant chance of not scoring many IB points as a result of TOK and EE efforts. The necessity to know how to score points for TOK thus becomes obvious, especially if university entry depends on IB points scored.
**TOK grade boundaries**

**Note:** These boundaries may change.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Mark Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>48–60 marks</td>
</tr>
<tr>
<td>B</td>
<td>38–47 marks</td>
</tr>
<tr>
<td>C</td>
<td>29–37 marks</td>
</tr>
<tr>
<td>D</td>
<td>19–28 marks</td>
</tr>
<tr>
<td>E</td>
<td>0–18 marks</td>
</tr>
</tbody>
</table>

*diploma requirement goes up from 24 to 28 points*

(Source: IBO November 2009/May 2010 Subject Reports. Theory of Knowledge. Available on the teachers’ area of the IBO website.)
The TOK assessed presentation

Requirements

- 10 minutes per presenter, max. 30 minutes per group (max. 5 students; 2–3 recommended).
- Every group must cover a different topic.
- Use supporting material, e.g. video, PowerPoint, posters, questionnaires, recordings, costumes, props, etc.
- Absolutely not to be an essay/notes read out.

Suggestions:

Give 4–8 weeks’ notice and allow group work time in class.

Plan for 3 practice presentations before the assessed presentation, e.g. 1 per term, year 1.

Schools must record the presentations. Notified schools will need to submit recordings to the IB for review. All schools should keep the recordings until the session ends on the IB set date (mid-September for May exams or mid-March for November exams).

Criteria for earning top TOK presentation points

<table>
<thead>
<tr>
<th>Assessment criterion</th>
<th>Maximum marks</th>
<th>Marking ‘hotspots’</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Understanding knowledge issues</td>
<td>5</td>
<td>States a real-life situation which presents a knowledge issue(s).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A relevant knowledge issue is identified.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The knowledge issue(s) is/are very relevant to the real-life situation considered.</td>
</tr>
<tr>
<td>B Treatment of knowledge issues</td>
<td>5</td>
<td>‘Good’ understanding of knowledge issues (as opposed to ‘adequate’ or ‘some’ understanding – this is very subjective).</td>
</tr>
<tr>
<td>C Knower’s perspective</td>
<td>5</td>
<td>Use of personal arguments.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use of personal examples.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Significance of the topic to the knower (personal involvement) is ‘fully’ demonstrated.</td>
</tr>
<tr>
<td>D Connections</td>
<td>5</td>
<td>Clear presentation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Balanced view of different viewpoints/perspectives.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Links between perspectives are recognised.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Implications (in related areas) of different perspectives are recognised.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quality (not quantity) of connections between viewpoints is important in the marking.</td>
</tr>
</tbody>
</table>
**TOK question constructor**

Make choices in each column: $1 + 2 + 3 + 4$.

<table>
<thead>
<tr>
<th>1 Question</th>
<th>2 Subject</th>
<th>3 Action</th>
<th>4 Object (give a specific real-life example here!)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To what extent can emotion be used to explain/make/justify a belief/decision/ethical issue?</td>
<td>emotion</td>
<td>be used to explain/make/justify</td>
<td>a belief/decision/ethical issue?</td>
</tr>
<tr>
<td>What is it about reason that tells us about sense/perception/truth/certainty/culture/intuition/values/interpretation/evidence/experience/explanation/technology?</td>
<td>reason</td>
<td>that tells us about</td>
<td>sense/perception/truth/certainty/culture/intuition/values/interpretation/evidence/experience/explanation/technology?</td>
</tr>
<tr>
<td>How can sense perception be defined by</td>
<td>sense perception</td>
<td>be defined by</td>
<td></td>
</tr>
<tr>
<td>language</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mathematics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>natural sciences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>human sciences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>history</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the arts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ethics*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Do not choose if 4 is ‘ethical issue’.

**Red** = way of knowing  
**Blue** = area of knowledge

**What the TOK presentation consists of**

**Plan:**
- Form TK/PPD (Presentation planning document) on the back of form TK/PMF (Presentation marking form).
- To be handed to the teacher (not the audience) beforehand.
- Plans how the presentation will progress in bullet form (see below).

**Brief introduction:**
- Identify a real-life situation/contemporary problem.
- Identify personal involvement in the situation – it is hard to separate hard facts from opinions, especially when our analytical viewpoint is biased by our own situation.
- Identify a knowledge issue and explain why it is important to the real-life situation.
- Link to one (or more) identified knowledge issues (these **must** be very relevant to the real-life situation).
Exploration (analysis):
For the identified knowledge area, analyse the identified knowledge claims and link to different perspectives (e.g. arising from areas of knowledge, different ways of knowing, different theoretical approaches, different cultures). The **quality** of the links is more important than the quantity.
To do this:
- recognise the underlying assumption of each knowledge claim/issue
- recognise the implications of different perspectives
- link to real examples
- recognise other knowledge issues raised by the analysis
- include personal arguments and examples
- cite sources
- link all back to the original real-life situation.

**Timing of TOK presentation**
In view of the pressure on students in the last weeks of their IB courses, it is recommended that schools with a 3-term year should schedule presentations in **term 4**, with essays due at the start of **term 5**.
Student TOK presentation planner

1 Introduction planner

- Identify a real-life situation/contemporary problem:

- Identify your personal involvement in the situation and recognise that it is hard to separate hard facts from opinions, especially when our analytical viewpoint is biased by our own situation:

- Identify a knowledge issue:

- Explain why the knowledge issue is important to the real-life situation:

- Link to one or more identified knowledge issues that are very relevant to the real-life situation:
2 Exploration (analysis) planner

For the identified knowledge area, analyse the identified knowledge claims and link to different perspectives (e.g. arising from areas of knowledge, different ways of knowing, different theoretical approaches, different cultures). The quality of the links is more important than quantity.

To do this for each knowledge claim, plan your argument using the following table. Link all the knowledge claim analyses back to the original real-life situation:

Knowledge claim analysis planner

<table>
<thead>
<tr>
<th>Claim</th>
<th>Underlying assumption</th>
<th>Different perspectives</th>
<th>Implications of different perspectives</th>
<th>Link to examples</th>
<th>Other knowledge issues raised by analysis</th>
<th>Personal arguments and examples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

Remember: Cite sources.
The TOK assessed essay

Electronic submission

- Details can be found on the IBO website in the document ‘Theory of Knowledge: Understanding Knowledge Issues’.
- Students upload essays electronically to https://candidates.ibo.org. They log in using their six-character IB code plus a PIN issued by their school’s IB Coordinator.
- The essay is then passed electronically to the teacher for marking and authentication.
- The IB Coordinator then submits it to the IB with their marks. The deadline is about three weeks after the deadline for essay upload.
- The IBO sends it electronically to an examiner for marking.

Timing of TOK essay submission

There is a two-month ‘window’ for submission. Specific dates are set by the IBO but it is approximately as follows:

- May exams: mid-January to mid-March submission of essay
- November exams: mid-July to mid-September submission.

It is suggested that an internal school deadline of the end of term 4 of the IB course is set.

Essay titles

A set list of possible titles is published by the IB in the annually updated ‘Handbook of Procedures for the Diploma Programme’. Students must be careful to stick exactly to the set title.

What to aim for to gain top marks

<table>
<thead>
<tr>
<th>Assessment criterion</th>
<th>Maximum marks</th>
<th>What to aim for</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Understanding knowledge issues</td>
<td>10</td>
<td>- Focuses on knowledge issues relevant to title</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Compares, contrasts and links areas of knowledge with ways of knowing in detail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Sophisticated understanding of knowledge issues and/or ways of knowing</td>
</tr>
<tr>
<td>B Knower’s perspective</td>
<td>10</td>
<td>- Independent thinking about knowledge issues related to title</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Connected to own experience as a knower</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Personal, in-depth exploration of knowledge issues</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Significant self-awareness of self as a knower</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Serious consideration of different perspectives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Varied examples are used effectively</td>
</tr>
</tbody>
</table>
| C | Quality of analysis of knowledge issues | 10 | • Explored with **high degree** of insight  
• Explored with **considerable depth**  
• All main points justified  
• Arguments make sense and are **compelling**  
• Counter-arguments evaluated  
• Underlying assumptions recognised |
|---|---|---|---|
| D | Organisation of ideas | 10 | • **Well structured**  
• Concepts explained and developed **clearly**  
• Actual information supporting arguments is correct  
• Sources of information/ideas acknowledged and traceable  
• Max. 1600 words |

(Adapted from the IBO TOK Essay assessment criteria.)

**Red** = subjective marking criteria in IB TOK mark schemes
Chapter 1: The problem of knowledge (p. 3)

We all have a personal **mental map** of reality:

- ideas of true/false
- reasonable/unreasonable
- right/wrong

These are **value judgements** or **opinions**.

TOK applies **critical analysis** to highlight the limitations of how we think about things.

Map analysis: the paradox of cartography (pp. 5–7)

<table>
<thead>
<tr>
<th>Mercator Projection (traditional world map)</th>
<th>Hobo-Dyer Equal Area Projection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distorts land mass size, so that areas further from the equator seem larger than they are.</td>
<td>Relative sizes of land masses are more accurate (though it distorts their shape).</td>
</tr>
<tr>
<td>Northern hemisphere is at the top so looks more important.</td>
<td>Southern hemisphere is at the top.</td>
</tr>
<tr>
<td>Centred on Europe/Africa.</td>
<td>Centred on Pacific.</td>
</tr>
</tbody>
</table>

**Conclusion:**

- All maps distort reality.
- The map is not the territory; it is just an attempt to represent it.
- Distortion of maps can distort other views/opinions/decisions.

**Discussion:** Fig. 1.3, p. 7

Certainty (p. 8)

Many of the things we think we are certain about may be questionable.

<table>
<thead>
<tr>
<th>Statement</th>
<th>However...</th>
</tr>
</thead>
</table>
| I know that Neil Armstrong landed on the moon in 1969. | • There are hoax theories.  
• Was it really the moon?  
• Other cultures may not recognise the year 1969. |
| I know that strawberries are red. | • What is red?  
• Are strawberries ‘red’ for everyone?  
• Sometimes strawberries are green. |
| I know that if $a > b$ and $b > c$, then $a > c$. | Bigger in what way? Height? Volume? |
I know that murder is wrong. It may not be judged wrong in all circumstances:

- It depends how murder is defined.
- Different cultures may have a different view.

<table>
<thead>
<tr>
<th>Ways of knowing (pp. 8–9)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perception</strong></td>
</tr>
<tr>
<td>• Can our senses deceive us?</td>
</tr>
<tr>
<td>• Are everyone’s senses the same?</td>
</tr>
<tr>
<td><strong>Language</strong></td>
</tr>
<tr>
<td>• How do we know that what we find out in words is true?</td>
</tr>
<tr>
<td>• Are other people reliable sources of knowledge?</td>
</tr>
<tr>
<td><strong>Emotion</strong></td>
</tr>
<tr>
<td>• Intuition/gut feeling is not always 100% reliable.</td>
</tr>
<tr>
<td><strong>Reason</strong></td>
</tr>
<tr>
<td>• Lots of people struggle with logic, especially mathematical logic.</td>
</tr>
</tbody>
</table>

**Note:** Use the acronym ‘PLER’ to help you remember the four ways of knowing.

<table>
<thead>
<tr>
<th>Radical doubt (pp. 9–10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do we exist? Or is life just a dream?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relativism (pp. 10–11)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The relativist argument</strong></td>
</tr>
<tr>
<td>There is no absolute truth so truth may be considered relative to culture or individuals.</td>
</tr>
<tr>
<td>• What is true for some people is false for others.</td>
</tr>
<tr>
<td>• Relativism allows both views to be valid.</td>
</tr>
<tr>
<td><strong>The counter-argument to relativism</strong></td>
</tr>
<tr>
<td>• Truth can be considered to be what someone really believes.</td>
</tr>
<tr>
<td>• <strong>However</strong>, belief does not make it really true. For example, Santa Claus does not actually exist even if someone really believes in him.</td>
</tr>
<tr>
<td>• This means that relativism cannot be true. (Unless you argue that it is true for people who believe in it!)</td>
</tr>
</tbody>
</table>
What should we believe? (pp. 11–13)

There is a problem with the word ‘should’, which implies subjective judgement. TOK is more interested in how you believe.

The role of judgement

Judgement involves assessing evidence and coming to a provisional conclusion.

The danger of gullibility

At what point do you start questioning what you read/hear?

The danger of scepticism

Scepticism may mean you close your mind to new ideas if they do not agree with currently accepted theories.

Discussion: Activity 1.6, p. 13

Reasonable knowledge (pp. 14–15)

Is a claim reasonable? There are two criteria for deciding:

| 1 Evidence | • Is there any supporting evidence?  
|            | • The fact that you cannot prove something is not true does not show that it is true. Thinking that it does make it true is called argument ad ignorantiam.  
|            | • Confirmation bias: people often only notice evidence that supports their beliefs. |
| Discussion: Activity 1.7, p. 14 |
| 2 Coherence | • Does the claim contradict current understanding? The more it contradicts, the stronger the evidence needed to support it.  
|            | • Carl Sagan (astronomer, 1934–96): ‘Extraordinary claims require extraordinary evidence.’ |
| Discussion: Activity 1.8 (questions 2 and 3), p. 15 |
Who cares? Does it really matter what we believe? (pp. 15–16)

Different views:

- **Socrates** (470–399 BCE): ‘The unexamined life is not worth living.’
- **van de Lagemaat** (Coursebook author): ‘If you never examine your beliefs you end up leading a life that is not genuinely your own.’
- **Voltaire** (philosopher, 1694–1778): ‘People who believe absurdities will commit atrocities.’ (Though remember to question the use of the word ‘will’!)
- Beliefs affect actions and can have serious consequences.

Conclusion (p. 16)

A problem of knowledge (**knowledge issues**) exists: what we believe we know may be questionable.

See also:

Linking questions: p. 18

Reading resources:

(Teachers may wish to set their own assignments on these.)

<table>
<thead>
<tr>
<th>Resource</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science’s finest hour</td>
<td>19</td>
</tr>
<tr>
<td>The uncertainty of knowledge</td>
<td>21</td>
</tr>
</tbody>
</table>
Preliminary definition: knowledge = justified true belief

Truth v. belief

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>100% certain truth, beyond any doubt. (It is difficult to be this sure.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belief</td>
<td>This is what most people mean by ‘true’:</td>
</tr>
<tr>
<td></td>
<td>• probable, beyond reasonable doubt (but still not 100% certain)</td>
</tr>
<tr>
<td></td>
<td>• supported by objective evidence</td>
</tr>
<tr>
<td></td>
<td>• may not have experienced it yourself so may have to believe others.</td>
</tr>
</tbody>
</table>

The belief–knowledge continuum (p. 25)

Justification (pp. 26–8)

There are four ways of knowing:

- Perception
- Language
- Emotion
- Reason

Beware: Reliability may be questionable.
**Levels of knowledge (pp. 28–9)**

Just when you think you know about something, you learn about it in more depth and realise your previous knowledge was superficial.

- **Information** → disconnected facts (e.g. cramming facts for an exam but lacking real understanding).
- **Knowledge** → facts connected by logic to help the facts make sense (e.g. problem-solving/arriving at understood knowledge by considering all the facts).

**Second-hand knowledge (p. 30)**

Also known as knowledge by authority or knowledge by testimony.

**Beware:** This may be questionable because it is not first-hand knowledge, and even first-hand knowledge may be biased by ways of knowing (perception, language, emotion, reason).

**Language** enables us to pass on our beliefs and practices to each other in the form of **culture**.

**Culture (p. 31)**

- Cultural beliefs and practices may determine choices.
- Progress in any area of knowledge may require the questioning of cultural beliefs.

**Discussion:** Activity 2.5, p. 31

**School (p. 32)**

- ‘Good’ schools may be considered to be those that encourage students to question rather than just indoctrinating them.

**Discussion:** Activity 2.6, p. 32

**Internet (p. 32)**

- We have little/no control of the content of websites, which may look impressively convincing, even if the content is rubbish.

**Discussion:** Activity 2.7, p. 33
Expert opinion (p. 33)

- We need experts, but they are not always right.
- Remember that experts are only experts in their own field.

Discussion: Activity 2.8, p. 34

News media (p. 34)

- Stories mostly get into the news if they are extraordinary, concerned with the misfortunes of others, or are relevant to local people, and will therefore ‘sell’ newspapers or attract viewers (and hence advertising revenue).
- Many people choose news sources that reflect their prejudices/opinions, thus reinforcing their views.

Discussion: Activity 2.9, p. 36

Beware: Always question the reliability of the sources (avoid authority worship).

See also:

Linking questions: p. 39

Reading resources:

(Teachers may wish to set their own assignments on these.)

Rational and intuitive knowledge p. 40

Brecht's *Galileo* p. 42
**Chapter 3: Ways of knowing – Language (p. 47)**

Language is one of the four ways of knowing:

- Perception
- **Language**
- Emotion
- Reason

Language enables us to tap into the collective experience of the community. It is a form of communication that is:

- governed by arbitrary rules of grammar
- expressed orally as sounds linking to objects or concepts
- intended
- used creatively to communicate vast numbers of ideas.

Problems with language:

- deceit
- manipulation (e.g. propaganda)
- misunderstanding

**The problem of meaning (p. 51)**

We need to understand the **meaning** of language before its **truth** can be assessed.

**Discussion:** Activity 3.5, p. 51

**Theories of meaning (pp. 52–5)**

<table>
<thead>
<tr>
<th>Theory</th>
<th>Problems of meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition theory</strong></td>
<td>• May not adequately express deeper meaning.</td>
</tr>
<tr>
<td>Words can be defined using other words.</td>
<td>• May just raise more problems of interpretation of the words used in the definition.</td>
</tr>
<tr>
<td><strong>Denotation theory</strong></td>
<td>• Abstract words do not stand for any thing in the world, e.g. ‘multiplication’, ‘wisdom’.</td>
</tr>
<tr>
<td>Meaningful words stand for something.</td>
<td>• People’s names would be meaningless after they are dead.</td>
</tr>
<tr>
<td><strong>Image theory</strong></td>
<td>• Different people may unknowingly have different mental images.</td>
</tr>
<tr>
<td>The meaning of a word is the mental image it stands for.</td>
<td></td>
</tr>
<tr>
<td><strong>Know-how</strong></td>
<td>• Different people know how to use the same words in different ways.</td>
</tr>
<tr>
<td>You know the meaning of a word when you know how to use it.</td>
<td></td>
</tr>
</tbody>
</table>
Discussions: Activities 3.7 and 3.8, pp. 54, 55

Problematic meaning (pp. 55–8)

We sometimes do not say exactly what we mean.

<table>
<thead>
<tr>
<th>Problematic meaning types</th>
<th>Problems of meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vagueness</td>
<td>Meaning depends on context.</td>
</tr>
<tr>
<td>e.g. fast, beautiful</td>
<td><strong>Discussion:</strong> Activity 3.9, p. 55</td>
</tr>
<tr>
<td>Ambiguity</td>
<td>Can be used to amuse or mislead.</td>
</tr>
<tr>
<td>Either: words with two different meanings</td>
<td><strong>Discussion:</strong> Activity 3.10, p. 56</td>
</tr>
<tr>
<td>or: phrases that can be read in two ways</td>
<td></td>
</tr>
<tr>
<td>! All the rest of this list may be considered to be different forms of ambiguity.</td>
<td></td>
</tr>
<tr>
<td>Secondary meaning (connotation)</td>
<td>A word may have a number of associations linked to it, varying from person to person, e.g. ‘school’.</td>
</tr>
<tr>
<td>(Note: primary meaning = denotation)</td>
<td>We may use euphemisms to avoid nasty ideas, e.g. ‘passed away’ rather than ‘died’.</td>
</tr>
<tr>
<td><strong>Discussion:</strong> Activity 3.11, p. 57</td>
<td></td>
</tr>
<tr>
<td>Metaphor</td>
<td>Can be confusing.</td>
</tr>
<tr>
<td>The literal meaning of a word or phrase is not the intended meaning, e.g. ‘He has his head in the clouds.’</td>
<td><strong>Discussion:</strong> Activity 3.12, p. 58</td>
</tr>
<tr>
<td>Irony</td>
<td>Can be confusing.</td>
</tr>
<tr>
<td>Saying one thing but meaning the opposite.</td>
<td></td>
</tr>
</tbody>
</table>

Why care about the meaning of words? (pp. 59–60)

Examples:

- The difference between murder and manslaughter can mean a life or death sentence for the accused.
- To reduce unemployment or poverty, the authorities may redefine the words, thus changing statistics.
Language and translation (pp. 61–4)

Translations should be:

- faithful to the original text
- comprehensible
- back-translatable with consistency.

Problems with translation:

- Different languages divide the world up in different ways.
- Word-for-word translations often don’t make sense.
- Different choices of words can cause subtle differences in meaning.
- Context can change the meaning of a word.
- Some words are untranslatable.
- Meaning can be lost in translation.
- Idioms: some expressions/sayings have a meaning other than the direct word meaning, e.g. ‘I was over the moon.’

Discussion: Activity 3.15, p. 62

Labels and stereotypes (pp. 64–7)

Language affects the way we think and hence the judgements we make.

Use of labels (words) to classify things, e.g. apples, sand:

- can be efficient
- may reflect natural classifications or cultural impositions on the world.

Problems:

- Differences that are not immediately apparent may be overlooked.
- Adjectives paint inefficient verbal portraits.
- Labels may develop into stereotypes, e.g. assumptions about members of groups of people.

Discussions: Activities 3.17, 3.18 and 3.19, pp. 65, 66

Language and thought (pp. 68–71)

To what extent does language influence our thinking?

The Sapir–Whorf hypothesis (linguistic determinism)

Edward Sapir (1884–1939), Benjamin Whorf (1879–1941)

Language determines our experience of reality → our perception is limited by language. (However, it can be argued that reality determines language.)
Examples:

- The Inuit are said to have many words for snow, so they see and experience snow-covered landscapes differently from other people.
- The North American Hopi Indians have no words for present, past, future. Whorf therefore came to the conclusion that the Hopi have no concept of abstract time.

Testing the hypothesis:

For:

- Peter Farb (1929–80) interviewed Japanese wives of Americans living in the USA in Japanese and in English. Their responses to the same questions asked and answered in Japanese/English were different.
- Multiplication would be mentally impossible using Roman numerals: a symbol for zero and positional notation are needed to be able to do it.

Against:

- Babies and animals can think without language.
- Some people claim to think in images (which may be an effort to put into words).
- If language determines thought, new words could not arise.

A weaker form of the hypothesis could be: language influences thought.

Language and values (pp. 71–2)

Language is used to persuade/influence.

Discussions: Activities 3.22 and 3.23, p. 72 (3.22 is particularly useful)

Using language to influence and persuade (pp. 73–4)

1 Emotionally laden language

Some words can have negative or positive connotations, which affect the way they are used.

Discussion: Activity 3.24, p. 73

2 Weasel words

Words added to a sentence to protect accuracy, e.g. ‘most dogs bark’.

Discussion: Activity 3.25, p. 74
3 Grammar
Use of passive sentence constructions to protect the speaker, e.g. ‘We bombed the village’ / ‘The village was bombed’.

4 Revealing and concealing
E.g. ‘I have invited a blonde/cellist/athlete/lesbian to the party.’ Each description carries different connotations and is likely to affect the way others may view the person in question.

Discussion: Activity 3.26, p. 74

Language at war (p. 75)
Soldiers are more likely to kill enemies who are dehumanised, e.g. ‘turkey shoot’, ‘Gooks’.
Alternative words are used to make war more acceptable:

<table>
<thead>
<tr>
<th>Warspeak</th>
<th>Real meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>security assistance</td>
<td>arms sales</td>
</tr>
<tr>
<td>neutralise/take out</td>
<td>kill/destroy</td>
</tr>
<tr>
<td>no longer a factor</td>
<td>dead</td>
</tr>
<tr>
<td>inoperative combat personnel</td>
<td>dead soldiers</td>
</tr>
<tr>
<td>service a target</td>
<td>drop bombs on a target</td>
</tr>
<tr>
<td>collateral damage</td>
<td>bombed cities</td>
</tr>
<tr>
<td>friendly fire</td>
<td>accidentally firing on your own troops</td>
</tr>
<tr>
<td>strategic redeployment</td>
<td>retreat</td>
</tr>
<tr>
<td>liberate</td>
<td>invade</td>
</tr>
<tr>
<td>reporting guidelines</td>
<td>censorship</td>
</tr>
<tr>
<td>pre-emptive</td>
<td>unprovoked</td>
</tr>
<tr>
<td>ethnic cleansing</td>
<td>genocide</td>
</tr>
</tbody>
</table>

Language is power; hence the use of ‘spin doctors’ (p. 76).
See also:

Linking questions: p. 78

Reading resources:

(Teachers may wish to set their own assignments on these.)

Dialogue on animal language p. 79
The day a language died p. 83
Chapter 4: Ways of knowing – Perception (p. 85)

Perception is one of the four ways of knowing:

- **Perception**
- Language
- Emotion
- Reason

**Perception** = awareness of the world through our five senses.

**Which sense would you be most willing to lose?**

Humans are very visually oriented, e.g.:

- ‘Seeing is believing.’ (Not: ‘Smelling is believing.’)
- ‘I see what you mean.’ (Not: ‘I smell what you mean.’)
- ‘He has insight.’ (Not: ‘He has insmell.’)

Our sense of smell has a more direct route to the brain than the other senses. It can stimulate emotional and/or sexual response, memories, etc. (The perfume industry cashes in on this.)

**Philosophical views of the basis of knowledge (pp. 86–7, 99–101)**

**Empiricism**

All knowledge is based on perceptual experience.

**Phenomenalism**

(This is a more extreme extension of empiricism.)

Matter is the permanent possibility of sensation. It makes no sense to say that the world exists independently of our experience of it.

Irish philosopher **George Berkeley** (1685–1753): ‘To be is to be perceived.’

It does not mean that if something is not perceived it does not exist. It is just that if we do not perceive it, it may not exist. For example, does your home still exist when you cannot see it?

**Common-sense realism**

Observation does not affect what is observed. If our senses were not reliable we would not have survived as a species.

**Active realism**

Our perception is based on what is ‘out there’, but is filtered by the structure of our sense organs.
**Scientific realism**

The world exists as an independent reality very different from the way we perceive it. Our world has sound, smell, etc. The physical world consists of colourless, soundless atoms whizzing in empty space.

**Rationalism (p. 112)**

Reason is the most important source of new knowledge. We can discover new truths by using reason alone.

**Perceptual illusions (pp. 87–91)**

External stimulus → sense cells stimulated → brain unconsciously filters incoming information → subjective interpretation → personal version of reality.

<table>
<thead>
<tr>
<th>Type of visual illusion (Best explained by illustrations pp. 87–90)</th>
<th>Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context can influence interpretation</td>
<td>Relative position of things results in different judgements, e.g. perspective.</td>
</tr>
<tr>
<td>Figure and ground</td>
<td>What you see is dependent on things you assume are the main subject (figure) or background (ground).</td>
</tr>
<tr>
<td>Visual grouping</td>
<td>The brain takes patterns and fills in missing parts to make a meaningful picture which may not be correct, e.g. pictures in clouds/stars.</td>
</tr>
<tr>
<td>Expectations can cause perceptual error</td>
<td>E.g. it is difficult to spot one’s own writing errors.</td>
</tr>
</tbody>
</table>

**Selectivity of perception (pp. 91–2)**

Incoming perception is filtered to avoid ‘brain overload’.

- We focus on what is ‘important’ at the time.
- It is filtered by our interests (which can change).
- Potential threats can intrude on our focus and make us notice them.

**Discussions:** Activities 4.5 and 4.6, pp. 92, 93
**Seeing and believing (pp. 93–4)**

Beliefs can affect perception. For example:

<table>
<thead>
<tr>
<th>Area of knowledge</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
<td>Nineteenth-century astronomers thought there might be a planet (Vulcan) between Mercury and the sun. Some claimed to have seen it through their telescopes, but it did not exist.</td>
</tr>
<tr>
<td>History</td>
<td>30 January 1972 Bloody Sunday, Northern Ireland. British and Irish Catholic eye-witnesses both claimed the other side attacked first.</td>
</tr>
<tr>
<td>Art</td>
<td>Some artists draw horses with eyelashes top and bottom, but horses only have top lashes.</td>
</tr>
</tbody>
</table>

**Discussion:** Activity 4.7, p. 93

Eye-witness testimony can differ. Every time we remember something we reconstruct it in our minds → reliability is undermined.

**Discussion:** Activity 4.8, p. 94

**Distinguishing appearance from reality (pp. 95–6)**

We may:
1. misinterpret what we see
2. fail to notice something
3. misremember what we have seen.

We should not be too sceptical because:
1. another sense may confirm the evidence
2. we tend to question/test the coherence of illogical perception, e.g. blue flying pigs
3. credibility is reinforced by independent testimony.
Ultimate reality (pp. 96–7)

Our perceptions are filtered by the limitations of our sensory cells (also known as the ‘psychology of perception’):

<table>
<thead>
<tr>
<th>Sense</th>
<th>Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sight</td>
<td>Wavelength of light.</td>
</tr>
<tr>
<td>Sound</td>
<td>Wavelength of sound.</td>
</tr>
<tr>
<td></td>
<td>(Bats also have <strong>echo-location</strong>, or ‘sound vision’.)</td>
</tr>
<tr>
<td>Smell</td>
<td>Only certain kinds of smell stimulate sensory cells in nose.</td>
</tr>
<tr>
<td>Touch</td>
<td>Minimal stimulation necessary in order to fire sensory cells in skin.</td>
</tr>
<tr>
<td>Taste</td>
<td>Only certain chemicals stimulate sensory cells in tongue.</td>
</tr>
</tbody>
</table>

What is really out there? (pp. 97–9)

External stimulus → sense cells stimulated → brain unconsciously filters incoming information → subjective interpretation → personal version of reality.

See also:

**Linking questions:** p. 104

**Reading resources:**

(Teachers may wish to set their own assignments on these.)

- Blind to change: p. 105
- A world without patterns, faces without meaning: p. 108
Neils Bohr (1885–1962) to Einstein: ‘You are not thinking. You are merely being logical.’

Reason is one of the four ways of knowing:
- Perception
- Language
- Emotion
- Reason

Evidence is perceived, then we:
- add premises (assumptions)
- use reasoning
- reach new knowledge.

**Rationalism (p. 112)**
- Reason is the most important source of new knowledge.
- We can discover new truths by using reason alone.
- Our senses can mislead us.

**Discussion:** Activity 5.1, p. 113

**Three types of reasoning**
- deductive
- inductive
- informal

**Deductive reasoning (e.g. a syllogism) (pp. 114–9)**

A general claim about all leads to a specific claim about an individual, for example:

- **Premise**
  - All dogs bark
  - All As are Bs

- **Premise**
  - Fido is a dog
  - Some As are Cs

- **Conclusion**
  - Fido barks
  - Some Bs are Cs

**Problems:**
The reasoning may be valid but the conclusion may not always be true/valid if:
- one or both premises are flawed
• the reasoning used to reach the conclusion is flawed, e.g. Penguins are black and white. Old TV shows are black and white → therefore penguins are old TV shows.

Discussion: Activity 5.2, p. 115

Venn diagrams can be used to visually represent valid reasoning (pp. 116–7).

Discussion: Activity 5.4, pp. 117–8

Inductive reasoning (pp. 119–23)

• Reasoning that goes in the opposite direction to deductive reasoning.
• Constantly used in everyday life.
• Assumes past regularities will apply in the future because they did in the past.
• Helps survival, but we cannot always rely on it as we tend to jump to conclusions on the basis of insufficient evidence.
• Has led to racism/sexism/bias.

Examples:
• All observed humans have eventually died, therefore all humans eventually die.
• That French waiter was rude to me, therefore French people are rude!

Links to areas of knowledge:
Language: puts labels on things → inductive expectations about behaviour
Science: limited number of observations → general laws

Discussion: Activities 5.7, 5.8, 5.9 and 5.10 (answers p. 138), pp. 120, 122

Problems:
Avoidance of hasty generalisation depends on:
• number of observations
• variety of observations
• active searching for exceptions
• coherence: more evidence is needed for surprising conclusions
• subject area: generalisations are more reliable in natural sciences (physics, chemistry, biology) than social sciences (psychology, economics, business).
Informal reasoning: the ten deadly fallacies (pp. 124–9)

1. **Hasty generalisation** (see inductive reasoning problems).

2. **Post hoc ergo propter hoc** (‘after this, therefore on account of this’; see p. 124). The assumption that changing one thing is the cause of a closely timed event. For example, assuming that abolishing capital punishment caused a rise in the number of murders.

3. **Ad hominem** (‘against the man’; see p. 125). Attacking or supporting a person rather than attacking or supporting an argument/principle. For example, ‘You are too young to know what you are talking about.’

**Discussion:** If someone often tells lies should you discount their trial evidence?

4. **Circular reasoning** (vicious circle/begging the question; see p. 125). Assuming the truth of something you are supposed to be proving. For example, ‘I know Mary is a fairy because she said she was and fairies would not lie.’ This assumes that Mary is a fairy in order to argue that she is a fairy.

5. **Special pleading** (p. 126). There is a tendency for people to apply laws of expected behaviour to other people that they do not stick to themselves, e.g. energy conservation, need to limit world population.

**Discussion:** Activity 5.12, p. 126

6. **Equivocation** (p. 126). The same word may be used in different ways. Leads to arguments about meaning, e.g. ‘A hamburger is better than nothing. Nothing is better than good health. Therefore, a hamburger is better than good health.’

7. **Argument ad ignorantiam** (p. 127). Claims something is true because you have no evidence to disprove it, e.g. ‘There is no evidence to disprove she is a witch, so she is a witch.’

**Discussion:** Activity 5.13, p. 127

8. **False analogy** (p. 128). Assumes that because two things are similar in some ways, they are similar in another way, e.g. ‘Problems are like mountains. Because mountains are worn down by rain, our problems can be solved by persistence.’

9. **False dilemma** (binary thinking, p. 128). Assumes only two alternatives exist. (Note: humans may have a tendency towards this.) For example, ‘increasing military expenditure means spending less on schools’ – this suggests that we have only two choices. This way of thinking may have developed because evolution may have depended on fast friend/foe, fight/flight decisions.

10. **Loaded questions** (p. 128). Questions that imply built-in assumptions, e.g. ‘Do you always cheat in exams?’ ‘Yes’ suggests you always cheat in exams; ‘no’ suggests you sometimes cheat in exams.
Activities: 5.15 and 5.16 (useful for class computer search exercise), pp. 130–1

Causes of bad reasoning (p. 131)

- ignorance
- laziness
- pride
- prejudice

We are often tempted to resort to any argument to justify our reasoning → rationalisation.

Reason and certainty (pp. 131–2)

Reminder of the three types of reasoning:

- deductive
- inductive
- informal

All proof must end somewhere – it cannot be infinitely regressive (requiring the evidence of more and more things, successively and indefinitely).

For example, A depends on B, which depends on C, which depends on D… and so on, to infinity.

Three laws of thought are the basis of logical deductive reasoning:

- **Law of identity:** e.g. if A is a banana, then it is a banana.
- **Law of non-contradiction:** e.g. if A is a banana then it cannot be not-a-banana. (Common objection: some things are a mix of two other things, e.g. love–hate relationship – love some things at some times, hate them at other times.)
- **Law of the excluded middle:** e.g. everything is either a banana or not a banana.

Discussion: Activity 5.17 (question 2), p. 132

Can deductive reasoning (the laws of logical reasoning) be doubted? (p. 133–4)

1. It is unsure whether the laws exist or whether we just think they exist.
2. Logic depends on language, which is imprecise.
3. Everything is constantly changing so there is nothing for logic to be true of.

Yes:

- Just because something always seems to happen it does not mean it always will (e.g. laws of physics, behaviour of people).
No:

- It seems advantageous to use past experience to predict the future.

Using inductive reasoning can be just part of what it means to be rational.

**Lateral thinking (p. 135)**

Also known as ‘thinking outside the box’.

- We can become trapped in a ‘prison of consistency’.
- Learning new things requires questioning old ideas.
- **However**, it takes a lot of courage to question things you accepted as true.

**Discussion**: Activity 5.19, p. 135

**Edward de Bono** (1933–): ‘**Vertical thinking** is digging the same hole deeper. **Lateral thinking** is trying elsewhere.’

**Discussion**: Activity 5.20, pp. 136–7 (answers p. 138)

**See also:**

**Linking questions**: p. 140

**Reading resources**:

(Teachers may wish to set their own assignments on these.)

- The triumph of the yell p. 141
- Logic and cultural relativism p. 143
Emotion is one of the four ways of knowing:

- Perception
- Language
- Emotion
- Reason

**The nature of the emotions (p. 146)**

The word ‘emotion’ is derived from the Latin verb *movere* (to move).

**Discussion:** Activity 6.1, p. 146

**The six primary emotions (p. 147):**

- happiness
- sadness
- fear
- anger
- surprise
- disgust

**Discussion:** Activity 6.3, p. 147

**The James–Lange Theory (p. 148)**

1. Emotions are physical: bodily changes come first and cause emotional changes.

**Discussion:** Activity 6.4, p. 148

2. We mimic people’s physical expressions of emotion to empathise with them.

**Discussion:** Activity 6.5, p. 148

**Criticism:** ignores that emotions are also affected by our beliefs.
Social emotions (p. 150)
We have social emotions in the context of our social relationships with others, e.g.:
- contempt
- pride
- embarrassment
- envy
- gratitude
- guilt
- jealousy
- shame
- sympathy.

They are affected by our beliefs.

Emotions regarding the future (p. 150)
We also anticipate beyond the present so have emotions now about the future, e.g.:
- worry
- ambition
- determination
- drive
- passion for a goal (the emotional energy and drive to do things and to create ideas).

Discussion: Activity 6.7, p. 151

Emotions as an obstacle to knowledge (p. 151)
Strong emotion can distort other ways of knowing, e.g.:
- Language → slanted, emotional language
- Reason → passionate belief can lead to distorted reasoning/lack of open-mindedness
- Perception → may be ‘blind’ to certain aspects, e.g. faults

Discussion: Activity 6.8, p. 152

Rationalisations (pp. 152–3)
Strong emotion may result in biased perception/generalisations based on limited experience and/or emotive language. This may lead to the rationalisation of prejudices or invention of bad reasons to justify actions/opinions.

Discussion: Activity 6.9, p. 153
Irrational behaviour (p. 154)
We frequently give in to temptation against all intention or logic, e.g. eating badly when dieting or smoking when trying to stop.

Stoics (p. 154)
To avoid irrational actions, Stoics advocated apathy (without passion) so that decisions could be taken without the interference of emotion.

Emotions as a source of knowledge (p. 155)
Necessity for emotion in order to be able to make decisions

Discussion: Is Mr Spock lacking emotion or in control of emotion? p. 155

A study of a patient who suffered damage to the emotional area of his brain showed no drop in IQ, but he had lost the ability to make decisions. Psychologist Antonio Damasio said that emotion helps narrow down options so we have a manageable number of choices.

Discussion: Activity 6.11, p. 155

The relation between reason and emotion (p. 156)

Discussion: Activity 6.12, p. 156

- There is probably a continuum from reasoned decision-making to emotional decision-making.
- Sometimes emotions are rational, e.g. fear of something dangerous.
- Emotional reactions are sometimes irrational (‘over-the-top’) for the situation.
- It is difficult to switch off emotional reactions. Sometimes we try to rationalise emotional reactions.

Discussion: Activity 6.13, p. 157
Intuition (pp. 158–60)

Associated with a moment of insight (which is not always correct).

Core intuitions: regarding life, the universe, etc.

It can be argued that all knowledge is based on intuition because:

- **reason**: we cannot prove the laws of logic
- **perception**: we cannot be sure that the evidence of our senses is ‘real’.

Discussion: Activity 6.15, p. 159

Romanticism

Emotions are necessary to make sense of the world. Many fundamental beliefs are based on intuition.

Criticisms:

- Different people have conflicting intuition: whose is ‘better’?
- Intuition may be based on prejudice.

Discussion: Activity 6.16, p. 160

Subject-specific intuitions: linked to an area of knowledge (pp. 160–2)

- Intuition based on inadequate knowledge is often flawed.
- Perhaps intuition evolved for a Stone Age environment where fast decisions were needed.
- Education may be necessary to adjust such intuition to the modern world.

Discussion: Activity 6.17, pp. 160–1 (answers on pp. 165–6)

Some subject-specific intuition is not obvious, e.g.:

**Physics**

- Newton’s first law: every object continues in a state of uniform motion unless acted upon by a force. When did you last see an object continuing endlessly in uniform motion?
- A desk seems solid, but physicists suggest it is mostly empty space.

**Biology**

- 100 years ago it was ‘obvious’ that one species could not become another. Now biologists argue for evolution.
Ethics

- Ethics may change over time.
- Ethics can be different in different societies.

**Social intuitions (p. 162)**
Most people think they are good judges of character and can tell when people lie. This is not the case.

**Discussion:** Activity 6.18, p. 163

**Natural and educated intuitions (p. 163)**
Educated experts are more likely to have intuition, but intuition may not be just the result of long periods of intellectual effort. It can come later, at unexpected moments.

**Discussion:** Activity 6.19, p. 164

**How reliable is intuition? (p. 164)**
There is no easy answer!

See also:
**Linking questions:** p. 168

**Reading resources:**
(Teachers may wish to set their own assignments on these.)
- Rethinking thinking p. 169
- Fools for love p. 172
Appendix A: Propositions (p. 174)

**Proposition** = a statement that can be asserted or denied (said to be true or false).

**Four kinds of proposition (pp. 174–5)**

**Analytic propositions**
An analytic proposition is one that is true by definition. There are two main types of analytic proposition:

- **A definitional truth** defines a word, e.g. ‘All bachelors are unmarried men’.

  **Discussion**: Activity 6A.1, p. 175

- **Truths of reason** go through a process of reasoning to justify a conclusion, e.g. in logic or mathematics (see Chapter 7).

**Empirical propositions**
A proposition whose truth or falsity is based on perception, e.g. ‘Pandas eat bamboo’. Most knowledge in natural sciences, social sciences and history is empirical.

**Value-judgements**
A judgement that contains a value word, e.g. good, bad, right, wrong, beautiful, etc.

**Metaphysical propositions**
Statements that are neither analytic, empirical nor a value-judgement, and that concern the nature of ultimate reality. Examples include statements about God, time, death, rebirth and the meaning of life.

**Complications (pp. 176–7)**
The distinction between the four types of proposition is not always clear.

**Factual and verbal disputes**
What looks like a factual dispute may rest on the interpretation of a word or phrase, e.g. ‘too fast’, ‘murder’, ‘manslaughter’. While you can settle a factual dispute by looking at the evidence, you can only resolve a verbal dispute by convincing others to accept your definition of the disputed word.
The nominal fallacy

(An eleventh fallacy to add to the list of ten deadly fallacies – see Chapter 5.)

We sometimes assume we have explained something just because we have used a ‘posh’ or technical term to describe it, e.g. ‘Sleeping pills put people to sleep because they have dormative powers.’ But ‘dormative powers’ just means the ability to put people to sleep, so this actually means that ‘sleeping pills put people to sleep because they have the power to put people to sleep’.

Discussion: Activity 6A.4, p. 178

Facts and values (p. 178)

• Some words can be used factually (empirically) or as value-judgements, e.g. ‘liar’, ‘gossip’, ‘patient’. Many words have positive and negative connotations and this also blurs the dividing line between facts and values.
• Empirical facts may be relevant to the justification of value-judgements, e.g. Bill can swim 100 metres (empirical), so Bill is a good swimmer (value-judgement).

Empirical propositions and metaphysics (pp. 178–9)

• Some empirical facts may be relevant to the justification of metaphysics, e.g. the order of the universe must justify the existence of God.
• If an empirical fact is pushed hard enough, it collapses into a metaphysical one, e.g. ‘I know that my keys are on the table.’ → ‘But how can you be sure you are not dreaming?’ All beliefs ultimately rely on metaphysical beliefs (core intuitions, Chapter 6) about reality.
**Appendix B: Paradigms (p. 180)**

**Paradigm** = a set of interrelated ideas for making sense of one or more aspects of reality, e.g. a scientific theory.

From the Greek, *paradeigma* (‘pattern’).

<table>
<thead>
<tr>
<th>Area of knowledge</th>
<th>Paradigm (theory)</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>The Euclidean paradigm</td>
<td>Euclid (300 BCE) derived the geometry you learn at school from five axioms (five basic rules).</td>
</tr>
<tr>
<td>Human sciences</td>
<td>The blank slate paradigm</td>
<td>The human mind starts as a blank slate and heredity has little to do with the personality that develops.</td>
</tr>
<tr>
<td>History</td>
<td>The Marxist paradigm</td>
<td>History is driven by economic factors and not by great individuals.</td>
</tr>
<tr>
<td>The arts</td>
<td>The realist paradigm</td>
<td>The purpose of art is to copy reality.</td>
</tr>
<tr>
<td>Art</td>
<td>The narrative paradigm</td>
<td>Stories have a beginning, a middle and an end.</td>
</tr>
<tr>
<td>Literature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethics</td>
<td>The utilitarian paradigm</td>
<td>Ethics is about maximising happiness.</td>
</tr>
<tr>
<td>Natural sciences</td>
<td>The Newtonian paradigm</td>
<td>Newton’s Laws.</td>
</tr>
<tr>
<td>Physics</td>
<td>The atomic paradigm</td>
<td>Matter is made up of atoms.</td>
</tr>
<tr>
<td>Chemistry</td>
<td>The evolutionary paradigm</td>
<td>Organisms evolved from other organisms.</td>
</tr>
<tr>
<td>Biology</td>
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</table>

**Cultures** can be considered as paradigms: they can be seen as maps of meaning that help us make sense of reality.

### Paradigms as knowledge filters (pp. 181–2)

Paradigms help organise ideas into meaningful patterns. However, they also act as **knowledge filters** which close our minds to other possibilities. We are often unaware this is happening.

**Discussion:** Activity 6B.1, p. 182
**Paradigm shifts (pp. 182–3)**

A paradigm shift occurs when we change the perspective of our thinking (thinking outside the box) and come up with a new way of looking at something, e.g. ambiguous images (see Chapter 4), jokes.

**Discussion:** Activity 6B.2, p. 183

Great thinkers who helped initiate paradigm shifts:

- Einstein (physics)
- Mendeleyev (chemistry)
- Darwin (biology)
- Keynes (economics)
- Marx (history)
- Freud (psychology)
- Chomsky (linguistics)
- Picasso (art)

**Research and discussion:** Activity 6B.3, p. 183
Mathematics is often seen to be one of the few things that are certain. Context is ignored and thinking is purely abstract.

Discussion: Activity 7.1, p. 189

The mathematical paradigm (pp. 189–91)

Mathematics is the science of rigorous proof.

The three key elements of the formal system model of reasoning (Euclid, 300 BCE) are:

- axioms
- deductive reasoning
- theorems.

Axioms

Axioms (basic assumptions) are:

- consistent
- independent (you cannot derive one axiom/assumption from another)
- simple
- fruitful (many theorems can be proved with the fewest number of axioms).

Euclid’s five axioms (p. 190):

- It shall be possible to draw a straight line joining any two points.
- A finite straight line may be extended without limit in either direction.
- It shall be possible to draw a circle with a given centre and through a given point.
- All right angles are equal to one another.
- There is only one straight line through a given point that is parallel to a given line.

Note: Some mathematicians consider that the final axiom is impossible to prove to infinity.

Deductive reasoning (p. 191)

Premise 1 + premise 2 → conclusion

For example: all humans are mortal + Socrates is human → Socrates is mortal.

In mathematics, axioms are like premises and theorems are like conclusions.

Axiom 1 + axiom 2 → theorem

This can be used to construct mathematical proofs.
Theory of Knowledge for the IB Diploma

Note: See also Chapter 5.

Theorems (p. 191)
Euclid used the five axioms and deductive reasoning to develop theorems:

- Lines perpendicular to the same line are parallel.
- Two straight lines do not enclose an area.
- The sum of angles of a triangle is 180 degrees.
- The angles of a straight line total 180 degrees.

Proofs and conjectures (pp. 192–4)

- Start with axioms (basic assumptions).
- Use deductive reasoning (logic).
- Form a conjecture (a hypothesis that seems to work but still needs proving).
- Try it out with some numbers to see if it is true (a proof).
- Arrive at a theorem (conclusion).

However:

- Proofs only work for the numbers tried out.
- Inductive reasoning (see Chapter 5) does not prove it is true for every set of numbers, e.g. some equations work only for some numbers and not for others.

Goldbach’s conjecture
Every even number is the sum of two primes:

2 = 1 + 1
4 = 2 + 2
6 = 3 + 3
8 = 5 + 3

…and so on…

- It seems to work for all the numbers anyone has tried, but it may not work for all numbers.
- The number of numbers the theory has been tested for is small in relation to untested numbers to infinity.
- Goldbach’s conjecture is one of the great, unproven conjectures in number theory.

Wittgenstein (1889–1951): ‘Where the nonsense starts is with our habit of thinking of a large number as closer to infinity than a small one.’
**Beauty, elegance and intuition (pp. 195–7)**

There may be several proofs of a theorem. Simple proofs are said to be ‘elegant’ or beautiful’.

**Examples:**

Q: What is the total number of games of knock-out tennis that must be played to find a winner if 1,024 players enter a tournament?

A: 1,023

Reasoning: 1,023 people need to lose a game in order to leave one winner.

Conclusion: creative imagination and intuition are important in mathematics.

Q: A string is tied around a ball. How much more string will be needed for the string to go around the ball 1 inch from its surface?

A: About 6 inches

Q: So if the string were tied around the Earth, how much more would be needed to go around the Earth 1 inch from its surface?

A: About 6 inches

Reasoning:

Extra needed $= 2\pi (R+1) - 2\pi (R)$

$= 2\pi$

$= 2 \times 3.142$

$= 6.28$ inches

**Discussion:** Activity 7.5, p. 197

**Mathematics and certainty (pp. 197–201)**

**Discussion:** Activity 7.6, p. 198
## Nature of proposition

<table>
<thead>
<tr>
<th>How is it knowable?</th>
<th>Analytic</th>
<th>Synthetic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>True by definition and independent of experience.</td>
<td>All other propositions that are not analytic.</td>
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</table>

**A priori**  
Independent of experience

- All definitions, e.g. ‘Bachelors are unmarried men’.
- So is mathematics just a string of definitions?
- **Goldbach**’s conjecture would hence be true: if you define an even number as the sum of two primes, then any number is true by definition.

**People who take this line of thinking believe that maths is invented and exists only in the mind.**

**Discussion:** Activity 7.10, p. 202

**Formal term:** **formalism**

**A posteriori**  
Needs experience to be known to be true

- Impossible!
- Not true by definition. Needs experience.
- Empirical knowledge, e.g. ‘There are elephants in Africa’.

**Mill** (1806–72) said mathematics is based on vast numbers of empirical experiences.

**Discussions:** Activities 7.7 and 7.8, p. 199

**Formal term:** **empiricism**  
= least popular view of mathematics
*Note: Problem raised about the word ‘exists’ in formalism and Platonism.

The dilemma of idealisation in Platonism (pp. 202–4)

Mathematical exactness is not possible in the real world: it is a mental fiction. However, as we can make discoveries about mathematics it cannot be mental fiction. Plato tried to resolve this by suggesting that mathematical objects have their own unique way of existing and are:

- more real than physical objects
- timelessly true.

Discussion: Activity 7.11, p. 203

(Formalist) Criticisms of Platonism

1. Plato considered that because the series of natural numbers is infinite, the number of abstract mathematical entities 'out there' is infinite too. This seems to be heading in the direction of mysticism.
2. If mathematical objects have a strange ideal existence, how can physically limited human beings get to know about them?
3. Would mathematics still exist if no living being was there to think about it? Formalists argue that mathematics consists of man-made definitions that cannot exist without man.

Non-Euclidean geometry and the problem of consistency (pp. 205–7)

Mathematicians have questioned Euclid’s axioms.

Riemannian geometry

Mathematician Georg Friedrich Bernard Riemann (1822–66) replaced some of Euclid’s axioms with their opposite – it works if it is assumed that our geometry is on the surface of a sphere.

Theorems deduced from Riemann’s axioms are:

- All perpendiculars to a straight line meet at one point. (Lines of longitude are perpendicular to the equator and meet at the poles.)
- Two straight lines enclose an area. (For example, lines of longitude.)
- The sum of the angles of any triangle is greater than 180 degrees. (This is true between curved lines on the surface of a sphere.)

Discussion: Activity 7.13, p. 207
Note: Einstein’s theory of relativity is based on the theory that space is curved.

Conclusion: Euclidean geometry is a false description of reality.

Gödel's incompleteness theorem (p. 208)
Kurt Gödel (1906–78) proved that it is impossible to prove that a formal mathematical system is free from contradiction.
So even mathematics is unable to give us certainty – it is always possible that one day we will find a contradiction.

Applied mathematics (pp. 208–10)
This is mathematics used to model and solve problems in the real world.

Apollonius of Perga (c. 262–c. 190 BCE)
- Studied the geometry of ellipses.
- It seemed completely useless at the time.
- 2,000 years later it is useful in the study of planetary orbits.

Riemann
- Developed non-Euclidean geometry as an intellectual exercise.
- 30 years later Einstein concluded that space conforms to Riemannian, not Euclidean, geometry.

Einstein
- Mathematical systems are invented. Empirical observation helps decide which systems apply to reality.

Buffon’s needle problem
A problem posed by French mathematician the Comte de Buffon (1707–78).
Suppose you have a large sheet of paper ruled with parallel lines drawn at one unit intervals resting on a flat surface. You then throw a needle which is one unit long at random on to the paper.
Q: What is the probability that the needle will intersect one of the lines?
A: $2/\pi$
Problem: it is a mystery why $\pi$ should show up in this context.
A proof has since been done using calculus.

Discussion: Activity 7.14, p. 209
Conclusions (p. 210)

- Mathematics was defined at the start of the chapter as the science of rigorous proof.
- Gödel’s proof shows that there is no certainty.
- It is therefore uncertain whether mathematics is the best tool for making sense of reality.

See also:

Linking questions: p. 212

Reading resources:

(Teachers may wish to set their own assignments on these.)

Why is math so useful? p. 213
Think maths p. 215
Scientia is the Latin word for knowledge. The extraordinary success of the natural sciences has led some people to see them as the dominant cognitive paradigm, or model of knowledge. However, we should be careful – since scientific beliefs have changed over time, we might wonder how far the natural sciences really do give us certainty.

Discussions: Activities 8.1 and 8.3, pp. 221, 222

Science and pseudo-science (pp. 222–5)

Pseudo-science claims the status of science but without the basis of scientific testing. It includes:

- acupuncture
- astrology
- creationism
- crysotology
- feng shui
- graphology
- homeopathy
- phrenology.

Discussions: Explanations of the terms above, p. 222; Activity 8.4, p. 224

<table>
<thead>
<tr>
<th>Science (p. 225)</th>
<th>Pseudo-science (p. 224)</th>
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<tbody>
<tr>
<td>Testable claims</td>
<td>Claims are not testable</td>
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<tr>
<td><strong>Discussion:</strong> Activity 8.5, p. 225</td>
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<tr>
<td>Precise predictions</td>
<td>Vague statements (impossible to verify)</td>
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<tr>
<td>No exceptions</td>
<td><em>Ad hoc</em> exceptions stated</td>
</tr>
<tr>
<td>Anomalies (contradict laws/theories) may lead to new</td>
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<td>experiments and new laws</td>
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<td><strong>Discussion:</strong> Activity 8.6, pp. 225–6</td>
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Established by a distinctive scientific method, **inductivism** (p. 226):

- observation
- hypothesis
- experiment
- law
- theory (unifies various laws)

Experiments are:

- controllable
- measurable
- repeatable.

Many discoveries are counter-intuitive.

**Discussion**: Activity 8.7, p. 228

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**Observation forms the basis of science** (p. 227)

This is aided by:

- technology
- imagination
- mathematics (statistical data analysis, equations).

However, there can be problems with observation.

**Problems with observation** (pp. 228–30)

**Relevance**

**Discussion**: Activity 8.8, p. 228

Our perception of the problem may exclude relevant factors.

**Expectations**

Our expectations can influence what we think we see. For example, if you look at a cell down a microscope, what you draw is influenced by structure learned in class. It is hard to draw what you actually see.

**Expert seeing**

The use of scientific equipment such as microscopes or telescopes further complicates things. Today experimental telescopes are viewed through a computer, which ‘enhances’ detail the eye cannot see. So is the information just a result of the computer programme?
The observer effect
The act of observation can sometimes affect what we observe. For example, the instrument used to measure something may affect the experiment.

Testing hypotheses (pp. 230–3)

Confirmation bias (pp. 230–1, 245–6)
- People tend to look for evidence that confirms what they believe.
- They may overlook counter-evidence or dismiss it as ‘experimental error’.

Gregor Mendel (1822–84), who laid the foundations of genetics, has been accused by some of only reporting results that favoured his case as his results supported his hypothesis and laws too accurately.

Discussion: Activity 8.10, p. 230

Background assumptions (p. 232)
When we test a hypothesis we make assumptions that may be incorrect.

Many different hypotheses are consistent with a given set of data (p. 232)
- It may be impossible to prove which is true.
- The principle of simplicity directs scientists to choose the simplest hypothesis. This is justified by the orderliness and predictability of nature, but it may not be the correct hypothesis.

The problem of induction (pp. 233–4)
Inductive reasoning goes from the particular to the general (from the observed to the unobserved).

Practical problems
- How many observations are enough?
- Even well-confirmed hypotheses can later turn out to be wrong.
- Most scientists believe they really are discovering the fundamental laws of the universe, yet we have observed only a minute fraction of the universe.

Theoretical problems
- Science is supposed to be an empirical discipline that makes no claims beyond what is observed.
- However, this would stop any hypothesising from the particular to the general.
Falsification (pp. 235–7)

Karl Popper (1902–94) rejected theories that tried to explain everything, e.g. Marx, Freud, Adler.

Alfred Adler (1870–1937) believed that human beings are dominated by feelings of inferiority. For example, a man sees someone drowning. If he jumps in to rescue them, it can be explained that he is trying to show he is not inferior. If he does not try the rescue it can be explained that he is feeling too inferior to do it.

Conjectures and refutations

Popper advocated scientific method based on conjectures and refutations (falsification).

He concluded that it is impossible to test all possible cases to prove a hypothesis.

- Scientists should try to disprove a given hypothesis.
- If it cannot be proved to be false it should be provisionally accepted.
- It can never be absolutely accepted unless all possible situations are tested.
- A better theory may be presented in the future.

Criticisms of Popper (pp. 237–8)

Falsification is no more conclusive than verification, e.g.:

Physics
- Isaac Newton (1643–1727) predicted that attractive forces would collapse the universe.
- He concluded that God held it apart.
- He was wrong: the speed the stars move apart counteracts gravity.

Chemistry
- Dimitri Mendeleyev (1834–1907) came up with the periodic table by arranging elements according to their atomic weights.
- The weights of some elements did not quite fit his model.
- He concluded he had measured incorrectly.
- He was right: isotopes caused the odd masses.

Biology
- Charles Darwin’s (1809–82) theory of evolution required the earth to be hundreds of millions of years old to allow enough time for species to evolve.
- Lord Kelvin (1824–1907), the leading physicist of the day, calculated that the earth was no more than 100 million years old.
- Kelvin’s method was found to be wrong.

Auxiliary hypotheses can rescue a falsified theory (p. 238)

- Theories should not be immediately rejected when falsified, as counter-evidence may be incorrect.
- Scientists tend to think that outstanding problems with ‘good’ theories will eventually be resolved. For instance, Uranus did not behave as predicted by Newtonian laws, so Neptune was predicted (auxiliary hypothesis) and was later found.
• However, when Mercury’s behaviour could not be explained by Newton’s laws, Vulcan was predicted – but was not there. This led to a scientific revolution, and Newtonian laws were replaced by the theory of relativity.

**The rationalist strand in scientific thinking (p. 239)**

When evidence conflicts with a theory:

- **empiricists** tend to reject the theory: experience is the main source of knowledge
- **rationalists** tend to stick with a beautiful theory: reason is the main source of knowledge.

**Popper**: theories cannot be conclusively verified or rejected.

**Science and society (p. 240)**

**Thomas Kuhn** (1922–96), a historian and philosopher of science, introduced the concept of a paradigm to the philosophy of science.

**Paradigm**: an overarching theory shared by scientists from different scientific fields used to make sense of reality. Examples include:

- physics: Newtonian mechanics
- chemistry: atomic theory
- biology: evolutionary theory.

**Normal science (pp. 240, 243)**

- Popper argued that scientists should constantly try to disprove their theories.
- However, scientific experiments often start from basic assumptions (paradigms).
- If you want to achieve anything you cannot constantly question your assumptions.

**Scientific revolutions (pp. 240, 243)**

- Kuhn noted that science has had a series of scientific revolutions or new ways of thinking.
- These pass through times of scientific crisis and doubt and may be only fully accepted as old scientists die.
- However, over time science is cumulative and is probably getting closer to the truth, e.g. Newtonian mechanics is still valid in certain circumstances.

**Discussion**: Activity 8.13, p. 241

**How rational is science? (pp. 242, 244)**

- Ambition, vanity, social status, public recognition, money, promotion, pressure to conform and envy also play a role in science.
- This may influence research undertaken or theories supported.
- Priority disputes occur when different scientists claim to be the first to discover a law or theory.
- Kuhn concludes there is no rational way of deciding between rival paradigms.
- However, just because reason may be fallible does not mean it is ultimately wrong. Evidence will accumulate to support or discredit it.
Science and truth (pp. 245–6)

Scientism

Rudolf Carnap (1891–1970) suggested that science is the only way we can make sense of reality and discover ‘truth’: i.e. it can find all the answers to all the questions.

However, our consideration here has found science to be a fallible human enterprise. It may get closer to the truth but can never give us absolute certainty.

See also:

Linking questions: p. 249

Reading resources:

(Teachers may wish to set their own assignments on these.)

Crystalline truth and crystal balls p. 250
The fallacy of scientific objectivity p. 253
Chapter 9: Areas of knowledge – Human sciences (p. 256)

The human sciences include psychology, economics and anthropology. Human sciences study human behaviour in a systematic way based on observation, and seek to discover laws and theories. Features almost unique to humans include:

- the mirror test: humans (and some chimpanzees) recognise themselves in a mirror
- language
- reason
- free-will
- creativity.

Discussion: Activity 9.1, p. 258

Observation (p. 258)

Problems:

- You cannot observe people’s minds or their actual thinking.
- People tend to overestimate their strengths and underestimate their weaknesses, e.g. in a study of one million US high school students, all ranked themselves above average in their ability to get on with others.

Loaded questions (p. 259)

Some questions have hidden assumptions that encourage a particular answer. If you ask questions with skill you may be able to make people give the answer you want.

Discussion: Activity 9.3, p. 259

The observer effect (p. 261)

Being observed may change people’s behaviour.

Discussion: Activity 9.4, p. 261

Habituation is used to overcome the observer effect: e.g. anthropologists may ‘go native’ so the observed eventually behave normally.
Expectations may influence behaviour, e.g.:

Psychology
- An experiment divided children randomly into two groups: bright and less bright.
- The ‘bright’ group made more progress in the following year (due to higher teacher expectations?).

Discussion: Activity 9.5, p. 263

Economics
- People’s expectations affect the stock market.

Discussion: Activity 9.6, p. 263

Anthropology
- It is claimed that witch doctor spells can make people die (voodoo death).
- One explanation for this is that people in certain cultures are conditioned from birth to expect voodoo to work.

Discussions: Activities 9.7 and 9.8, p. 264

Measurement (pp. 264–7)
Differing use of statistics can change the interpretation of results of experiments.

Discussion: Activity 9.10, p. 267

Some things are not measurable on a common scale so are difficult to compare.

Discussion: Activity 9.11, p. 267
Experiments (pp. 268–70)

Difficulties of conducting experiments in social science

Human scientists operate in a situation where it is impossible to run controlled experiments because:

- there may be too many variables
- the artificiality of experiments may change behaviour
- ethics may prevent experiments that have a negative effect on people.

Human scientists may have to wait for nature to provide the appropriate experimental conditions, e.g. economic history can provide experimental data; we can learn something about normal brain functions by looking at people who have suffered brain damage.

The Milgram experiment

- Actors played the role of unseen (but heard) learners, strapped to a chair with electrodes on their wrists.
- Volunteers acted as teachers. They saw the learners strapped in and were then taken to another room.
- Teachers asked the learners memory test questions.
- Teachers were told to punish false answers with increasing levels of electric shocks, labelled slight shock, strong shock, intense shock, danger.
  - 120 volts → learner complained*
  - 150 volts → learner demanded that experiment be stopped*
  - 270 volts → learner screamed*
  - 330 volts → ominous silence
  (* It was just an actor pretending!)
- If a teacher hesitated, they were a) told by a scientist that it was important to continue the experiment, and b) reassured that they would not be held responsible.
- Result: almost two-thirds of the volunteers continued to 450 volts. Many expressed concern about what they were doing, but still didn’t refuse to continue.
- However, if paired with two other actor-teachers who rebelled, only 10% of volunteers continued to 450 volts.
- This poses serious questions about human nature and our willingness to follow orders.
- Questions about the ethics of the experiment were also raised – the volunteers were misled about what they were doing, and may have suffered from a permanent loss of self-esteem.

Discussions: Activities 9.13 and 9.14, pp. 269, 270
Laws (p. 270)

Human predictability
The idea of human free-will seems to conflict with the idea of human behaviour conforming to predictable laws.

Discussion: Activity 9.15, p. 270

The law of large numbers
- In a large population random variations tend to cancel out anomalies.
- This enables us to predict group behaviour.
- However, the behaviour of an individual cannot be predicted with any certainty.

Discussion: Activity 9.16, p. 271

Trends and laws (p. 271)
- Human sciences do not have a good record of prediction, e.g. demographers do not agree about the size of world population in 50 years’ time.
- In 1973 Paul Ehrlich predicted that there would be 65 million starving Americans by 1990 (which ironically turned out to be the number of Americans who were overweight in 1990)!
- Economic forecasters also often get it wrong. The Phillips curve seemed to work in theory but when applied to reality it broke down.
- The fallacy of post hoc ergo propter hoc (see Chapter 5): just because two things correlate, the first is not necessarily the cause of the second.

Discussion: Activity 9.17, p. 272

The complexity of real-world situations (p. 272)
- In real life there is a complex web of causes, effects and combinations of both.
- Because of free-will people do not always do what you expect them to do.

Summary: the role of laws in human sciences (p. 273)
- The law of large numbers means we can sometimes make accurate predictions about the behaviour of a large population.
- However, predictions based on past trends can be unreliable forecasters of the future.
- The complexity of the real world makes it difficult to unearth reliable simple laws.
The relationship between natural and human sciences (p. 273)

**Ernest Rutherford** (1871–1937): ‘The only possible conclusion the social sciences can draw is: some do, some don’t.’

**Discussion:** Activity 9.18, p. 274

Reductionism (p. 274)

**Basis:**
Social science may one day be supported by advances in natural sciences, such as physics. For example:

Economics → explained by psychology → explained by neuroscience → explained by physics

**Criticisms:**
- The reductive fallacy is the fallacy of saying that just because A is composed of B, it follows that A is nothing but B, e.g. a human being is nothing but a bunch of chemicals.
- There are good reasons for doubting this approach – when simple things are combined the results cannot always be predicted.
- It therefore seems unlikely that we will ever be able to explain the human sciences in terms of physics.

Holism (p. 275)

**Basis:**
The whole is greater than the sum of the parts – that is, the whole contains elements that cannot be analysed by examination of the parts, e.g.:

- parts of a cat do not work unless in a live cat
- groups react differently from individuals.

**Discussion:** Activity 9.19, p. 276

The **Verstehen** position (p. 276)

**Verstehen** = German for ‘understanding’

Social practices (e.g. traffic rules, sports) cannot be determined from the study of atoms and molecules. They can only be understood from inside the group.

**Discussion:** Activity 9.20, p. 277
Since human sciences are explained in terms of meaning (rather than mechanism):

- meaning may depend on context
- unintended consequences of actions need to be taken into account
- it is therefore difficult to generalise into universal laws.

**Criticism:** Some human traits do seem to be universal and independent of culture, e.g. gossiping, joking.

**The problem of ‘confirmation bias’ (p. 278)**

Researchers may just look for evidence to support pre-existing ideas. (See also Chapter 8.)

**Predictions (p. 279)**

- There are too many variables in social science to be able to make accurate predictions.
- Some predictions made by social scientists are valuable in that they may stimulate us to try to prevent possible negative situations in the future.
- *Verstehen:* the purpose of human sciences is to understand, not to explain/predict.

**Discussion:** Activity 9.24, p. 280

**See also:**

**Linking questions:** p. 282

**Reading resources:**

(Teachers may wish to set their own assignments on these.)

- Soft sciences are often harder than hard sciences p. 283
- Is economics a science? p. 286
Appendix to Chapter 9 (p. 288)

The free-will problem

- How can we reconcile the belief that human beings have free-will with our scientific picture of the world?
- The existence of free-will is central to our conception of what it is to be a responsible human being. To deny its existence would reduce us to biological machines.

Determinism (pp. 289–91)

- Some people have nevertheless denied that human beings have free-will.
- According to determinism, every event in the universe has a cause. All our actions can be traced back to factors beyond our control, so free-will is an illusion.
- You do have choices, but the available choices are predetermined by past choices.

Discussion: Activity 9A.1, p. 289

Beware: Determinism is not the same as fatalism (the future is determined no matter what you do – i.e. destiny).

Does every event have a cause? (p. 291)

- In the physical world we believe it does.
- This is not always an empirical belief.
- It is sometimes a metaphysical belief in the nature of ultimate reality: the universe is orderly and needs forces to change it.

Heisenberg’s uncertainty principle

- It is impossible to know both the position and momentum of subatomic particles with complete certainty.
- Some philosophers have interpreted this to mean that events are governed by chance. They then say that this is a physical basis for free-will.
- Criticism: Heisenberg’s uncertainty principle only applies at the subatomic level: anything bigger and it does not apply. Physicists are currently working on linking the quantum (quantum mechanics) and the real (classical mechanics) worlds, but they have not managed it yet.

Capturing a free action (p. 292)

- We feel free to choose so it can be argued that we are free to choose.
- However, it is very difficult to capture and describe a freely chosen action.

Discussion: Activity 9A.3, p. 293
Is the feeling of freedom an illusion? (p. 293)

- Some people think yes: choices are determined by prior events.
- Some people think no: we are completely free to choose.

**Discussion:** Activity 9A.4, p. 294  
**See also:** Is free-will an illusion? p. 296

Is free-will compatible with determinism? (p. 294)

- Some argue that free-will and determinism are compatible (**compatibilism**).
- Compatibilists believe that every event has a cause, but that this still leaves room for free-will. To be free is simply to do what you want.

**Discussion:** Activity 9A.5, p. 294

**Criticisms:**

- The more someone is addicted to something the less they will be able to exercise free-will in the future (e.g. chemical addiction), so past decisions would affect (determine?) current choices.

**Discussions:** Activities 9A.6 and 9A.7, p. 295

- Some choices are determined by ‘the sort of person we are’ and so cannot be called free.
- Although you can do what you want, your wants and desires may be governed by factors beyond your control.

**Discussion:** Activity 9A.8, p. 296

Is free-will an illusion? (p. 296)

**Does determinism undermine ethics?**

Determinism would seem to imply that people cannot help being good or bad – it is determined by their prior experiences. They are therefore not responsible for their actions.

A determinist would justify punishment for crimes by saying that it is society’s way of:

- protecting society*
- reforming criminals (**reform theory**)*
- giving punishment because it is deserved (**retribution theory**).

* compatible with determinism
Discussion: Activity 9A.9, p. 298

Does determinism undermine rationality? (p. 299)

- Determinism does not really allow for weighing up evidence and making judgements.
- Determinism would mean that your judgement is determined by past experience/events.

Big problem:

- If determinism is true, it would mean that we have no free choice in what we say, in the choice of words used: there would be no difference between speech and a dog barking.

Discussion: Activity 9A.10, question 2, p. 299
Chapter 10: Areas of knowledge – History (p. 300)

What is history? (p. 302)

Evidence
History is the study of present evidence (traces) of the past. We encounter two problems when trying to reconstruct the past:

- distant history → too little evidence
- recent history → too much evidence

Discussions: Activities 10.1 and 10.2, p. 301

Significance (p. 303)
Records are made of events the recorder considered to be significant. Subsequent events may make the records more or less interesting to historians. Historians then try to understand the past using these records.

Discussion: Activities 10.3 and 10.4, pp. 303, 304

Why study history? (pp. 304–7)
1 It gives us a sense of identity and an understanding of current affairs → informed opinion.

Discussion: Activity 10.5, p. 305

2 Study of history can be a defence against propaganda, but it can conversely be used as an instrument of social or political manipulation.

Discussions: Figs. 10.3 and 10.4 with following description, pp. 305–6; Activity 10.6, p. 306

3 History enriches our sense of human nature. The study of what humans did in situations in the past can help us understand human nature. It can supplement the study of psychology, sociology and economics.

Beware of sentences that state: ‘History shows that…’ This may lead to self-realising expectations. It makes it seem as if humans will always be like that, so there is no point trying to change.
How can the past be known? (pp. 307–8)

Discussion: Sceptics could argue that God created everything five seconds ago (including historical records!).

The historian G. R. Elton (1921–94) argued that history is more objective than science because it cannot be changed.

However, the past may be objective, but our knowledge of the past is not. Samuel Butler (1835–1902): ‘Though God cannot alter the past, historians can.’

Sources (pp. 308–10)
- Primary sources → written by someone who was there.
- Secondary sources → a second-hand account.

Perceptions may be filtered by:
- the four ways of knowing (perception, language, reason, emotion)
- interests, expectations, culture, education, prejudice, social bias of a particular group, deliberate manipulation of recording.

Discussions: Activities 10.9 and 10.11, pp. 309, 310

Writing history (p. 311) / The problem of bias (p. 313)

History is more than a catalogue of past events: historians try to explain and interpret the past.

Current interests of historians lead to:
- topic choice bias (though this does not necessarily lead to biased treatment of sources)
- influence of hindsight/overview
- confirmation bias (historians may choose information to prove their hypothesis, though note that good historians try to disprove hypotheses)
- national bias – influence of pre-existing cultural and political prejudices (other historians may pick up on this).

All of the above may result in a filtered selection of a filtered selection.

Discussions: Activities 10.12 and 10.14, pp. 312, 314

A pluralistic approach (pp. 314–5)

The ideal could be to write history from different perspectives (cubist history).
Theories of history (p. 315)

The ‘great person’ theory of history (pp. 316–8)

Basis:
This theory suggests that the course of history is mainly determined by a few great individuals. If one of these people had not existed, the course of history would have been different.

Discussion: Activity 10.17, p. 317

Historian R. G. Collingwood (1889–1943) drew attention to the importance of empathy, i.e. going beyond the study of outside events and getting into the minds of the people involved in order to understand why they did what they did, e.g. by the use of ideas from psychoanalysis.

Criticisms:
- It is difficult to empathise with ‘monsters’ of history.
- Why limit yourself to one person’s view?
- It may exaggerate the importance of particular individuals. For example, Leo Tolstoy (1828–1910) argued in *War and Peace* that Napoleon was not in control of events but was just a passive instrument of deeper historical currents.

Discussion: Activity 10.18, p. 317

Economic determinism (pp. 318–9)

Basis:
History is governed by technological and economic factors so we should study great inventions instead of great people.

Karl Marx (1818–83) claimed to have discovered the laws of historical change, which operate with iron necessity and from which the future course of history can be predicted:

Changes in technology → changes how society is organised → determines how individuals think.

Criticisms:
- Marx’s own predictions about where revolutions would occur did not come true.
- The philosopher Karl Popper (1902–94) described Marx’s idea of the future being predictable as not just implausible, but incoherent. His reasoning was that if you can predict the future, you can predict future inventions, which means you would have discovered them now, not in the future – so you are not predicting the future.

The role of chance (p. 319)

Some people think there is no meaning in history and that it is governed by chance. For example, if Hitler had died in a car accident in 1930, history since then would probably have been very different.
See also:

Linking questions: p. 321

Reading resources:

(Teachers may wish to set their own assignments on these.)

Changing the past p. 322
History as ‘some kind of a novel’ p. 325
Chapter 11: Areas of knowledge – The arts (p. 328)

Discussion: Activity 11.1, p. 329

What is art? (p. 330)

Discussion: Activity 11.2, pp. 330–1

Calling something art because of the intentions of the artist (pp. 331–3)

Basis:
- Something is a work of art if the maker intended it to evoke an aesthetic response.
- If something is intended as a work of art, then it should not be made with a practical use in mind.

Criticism:
- Does intending something to be art automatically make it art? Or might it just be junk?

Discussion: Activity 11.3, p. 332

Calling something art because of the quality of the work (pp. 333–6)

Basis:
- The idea of quality is very closely connected with the idea of skill.
- A great work of art is a perfect combination of content (what it shows) and form (how it shows it).
- It may not be beautiful.
- It may even be intended to shock.

Criticism:
- A work of art may be technically excellent but lack originality, e.g. kitsch art – clichéd or mass-produced art, forgeries.
- It may be original but lack technical skill, e.g. Picasso’s Bull’s Head (see p. 335).

Discussion: Activity 11.5, p. 334
Calling something art because of the response of the spectators (p. 336)

Basis:
- A work of art requires people to appreciate it.
- ‘Experts’ may understand the meaning of a work of art better than the artist who made the work.

Discussion: Activity 11.7, p. 337

Criticism:
- The response to a work of art may:
  - change over time (or may be just a fashion)
  - differ between ordinary people and ‘experts’.

Calling something art because it is found in an art gallery (pp. 337–8)

French artist Marcel Duchamp (1887–1968) took everyday objects, renamed them and exhibited them as art called ‘readymades’.

So where does art begin? Is everything art? Or does that devalue the idea of art? Or is everything art if you just look at it differently?

Are aesthetic judgements objective or subjective? (p. 338)

Examples of canonical works (the ‘classics’):
- literature: Oedipus Rex (Sophocles), works of Shakespeare and Goethe
- visual arts: Leonardo, Picasso
- music: Mozart, Beethoven

How far are our judgements about what distinguishes good art from bad objective and how far are they influenced by the culture in which we grow up and our personal tastes?

The paradox of aesthetic judgement (p. 339)

It is accepted that there are standards to judge by, but different people have different tastes which are fully valid for each of them.

Discussion: Activity 11.9, p. 339

Should aesthetic judgements be disinterested? (pp. 339–40)
- If I say, ‘I like this painting’ and you say you don’t like it, these two statements can coexist.
- If I say that the painting is beautiful and you say that it is not beautiful, the two statements contradict each other. To say that something is beautiful implies that other people ought to find it beautiful.
Kant (1724–1804) said that, unlike personal tastes, aesthetic judgements are disinterested. If you like a piece of music because it reminds you of a happy time in your life, you are interested. To be disinterested, we should go beyond our personal tastes and preferences so that we can appreciate a work of art on its merits.

**Note:** Disinterested is not the same as uninterested.

Aesthetic judgement parallel with sport: someone may not like a sportsman but may appreciate that he/she is technically good.

**Are there universal standards in art? (pp. 340–2)**

**Psychological factors**

**Discussion:** Activity 11.10, p. 340

Look at a selection of other paintings:
- Do horizontal lines in paintings always give a feeling of peace?
- Do diagonal lines generally give a disturbing feeling?

Vitaly Komar and Alexander Melamid (Russian artists) conducted research into visual art. They:
- examined the most popular paintings across a wide range of cultures
- found that popular paintings depict landscapes in which the viewer can see without being seen.

Possible explanations:
- Our preference for such landscapes may result from our evolved survival instincts.
- The world is dominated by US culture → globalisation of taste.

Komar and Melamid also found a similar universality in musical taste. Sense of rhythm in music may reflect the human pulse.

**Discussion:** Activity 11.12, p. 343

**Cultural differences (pp. 343–4)**

Comparing art is difficult: some people are inclined to see similarities between things and others to see differences.

**Discussion:** Compare and contrast the styles of the two pictures of Derwent Water, p. 343
Other examples:

- Opera: Chinese and European opera differ greatly.
- Sport: baseball differs from cricket.

Contrasting cultures may not understand the nature of art in other cultures without help.

**Discussion:** Activity 11.13, p. 344

### Art and knowledge (pp. 344–6)

#### Art as imitation

*Mimesis* is Greek for ‘imitation’. The **mimetic theory** suggests that the purpose of art is to copy reality. Example artists include **Michelangelo** (1475–1564) and **Auguste Rodin** (1840–1917).

**Important developments:**

- Fifteenth century: development of perspective
- Nineteenth century: invention of the camera
  - Why try to copy reality in paint when it can be copied at the click of a button?
  - Led to revolutionary changes in the nature of visual art, music and literature.

**Discussion:** Activity 11.14, p. 345

#### Criticisms:

- The ‘copy’ theory does not apply to music.
- Art does not merely copy reality, it creatively interprets it.
- **Paul Klee** (1878–1940), a Swiss painter, said that ‘Art does not reproduce the visible; rather, it makes visible’, i.e. it helps us see things we would not otherwise notice.
- Art can also influence the way we subsequently view the world, e.g. paintings, plays, books, music.

**Discussions:** Activities 11.15 and 11.16, pp. 345, 346

### Art as communication (pp. 346–7)

‘The language of art’ is a form of communication between the artist and the spectator.

- Implies there may be a ‘grammar’ and ‘vocabulary’ of art that needs to be learned to allow understanding.
- Art can arouse in a way that words cannot, e.g. the last movement of Beethoven’s Ninth Symphony.
Art as communication has:

- breadth, e.g. literature can project us beyond personal experience and help us to learn from others
- depth, e.g. ordinary language may not adequately express deep emotions.

Art as education (p. 347)
Art provokes emotions that can influence decisions/actions → links to ethics. It may challenge us to question our assumptions.

Science, art and truth (pp. 349–50)

Similarities and differences: art and science

<table>
<thead>
<tr>
<th>Both</th>
<th>Art</th>
<th>Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Look at the patterns in things.</td>
<td>Expresses patterns in more altruistic, intuitive, imaginative forms.</td>
<td>Expresses patterns in mathematics, logic, formulae, reason.</td>
</tr>
<tr>
<td>May be seen as ‘beautiful’, e.g. Einstein said that the theory of relativity was ‘too beautiful to be false’.</td>
<td></td>
<td>Mathematical ‘beauty’ is no guarantee of truth.</td>
</tr>
<tr>
<td>Does not always need prior knowledge to appreciate.</td>
<td></td>
<td>Usually needs prior knowledge to appreciate.</td>
</tr>
</tbody>
</table>

Discovered or invented? (p. 351)
Most people agree that science is discovered and art is invented. However, some artists feel their work is already there, just waiting to be uncovered, e.g. the sculptor releases the sculpture hidden in the marble.
Science and art as complements (p. 352)

- Science and art could be seen as complementary ways of making sense of the world: science looks at things from outside; art looks at things from inside.
- Subjective experience is important as well as objective, measurable facts.

The arts and truth (pp. 352–3)

The paradox of fiction:

- Fiction can reveal deep truths about the human condition.
- Humans often turn to fiction in search of truth.

Discussion: Activity 11.24, p. 353

- Two scientific theories may be mutually exclusive.
- Two works of art may equally reveal truth.

Discussion: Activity 11.25, p. 353

See also:

Linking questions: p. 355

Reading resources:

(Teachers may wish to set their own assignments on these.)

How much art can the brain take? p. 356
Which side are you on? p. 361
Chapter 12: Areas of knowledge – Ethics (p. 363)

Moral reasoning (p. 364)

Value-judgements
Some people argue that moral values are just reflections of personal taste. For example, ‘I don’t like spinach…’ is on a par with ‘abortion is unacceptable’.

Criticism:
- We accept people’s preferences but expect justification and reasons for value-judgements.

A simple model for moral arguments (p. 365)
Arguments about value-judgements usually:
- refer to a commonly agreed moral principle
- argue that a particular action falls under it
- rest on the truth of the alleged facts
- rely on people being consistent in their judgements.

Discussion: Activity 12.1, p. 365

Consistency (p. 366)
People may:
- not apply rules consistently
- have inconsistent principles.

Discussion: Activity 12.2, p. 366

Facts (p. 366)
- Disputes about principles are often based around disputes about facts.
- Even if the facts are clear, moral judgements may differ.

Discussion: Activity 12.3, p. 366

Disagreements about moral principles (p. 367)
Moral principles may be as different as different languages. If we don’t all share the same underlying moral principles, how can we apply moral reasoning?
Moral relativism (p. 367)

- According to moral relativism, there is no such thing as moral knowledge/universal values.
- Values are culture-based: ethics and morality are just customs or conventions.

Arguments for moral relativism (pp. 367–9)
The diversity argument states that there are too many diverse opinions for there to be objective moral values.

Discussion: Activity 12.4, p. 368

The lack of foundations argument states that appealing to perception and reason does not work for ethical judgements: there is no way to get from an ‘is’ statement to an ‘ought’ statement.

Does relativism imply tolerance? (p. 369)
Relativism seems to encourage tolerance of values other than our own.

Note: One culture imposing its values on another → cultural imperialism.

Criticisms:
If you want to be tolerant of everyone you cannot be a relativist because:

- not all cultures are tolerant of other opinions, so you would have to accept that it is equally acceptable to be intolerant
- it is difficult to be tolerant of some extreme views, e.g. genocide.

Discussion: Activity 12.5, p. 370; Analysis of reading resource, p. 396

Arguments against moral relativism (pp. 370–1)
There are some core values common to all cultures. For example, most have rules about:

- violence
- protection of property
- honesty.

Criticisms:
For much of history, people have had no moral concern for ‘outsiders’ who do not belong to their community. However, in recent times, the idea of ‘the tribe’ is (slowly) expanding to include ‘all humans’.

Discussions: Activities 12.6 and 12.7, p. 371
**Self-interest theory** *(p. 372)*

Even if there is moral knowledge, we are incapable of acting on it because humans are basically selfish.

**The definitional argument**

- You always end up doing what you most want to do because you choose to do it – otherwise you wouldn’t do it.
- Even if you think you are being altruistic, you are just avoiding feelings of guilt so are actually being selfish.

**Criticisms:**

- ‘Selfish’ cannot be used as a criticism if **everyone** is selfish.
- Some people get pleasure from helping others; that does not seem selfish. (But it can be argued that they only do it to make themselves feel good.)

**The evolutionary argument** *(p. 373)*

We have evolved to be naturally selfish and competitive to succeed in the struggle for survival.

**Criticisms:**

- **Edward O. Wilson** *(biologist)*: ‘Cooperative individuals generally survive longer and leave more offspring.’
- Young babies and monkeys have demonstrated empathy, so it seems to be a natural part of our make-up.

**The hidden benefits argument** *(pp. 373–4)*

- We get gratitude, praise, a good reputation and the feel-good factor from helping others, so do it from self-interest.
- If we are nice to others, they may help us when we need it (= self-interest).

**Discussion:** Activity 12.8, p. 374

**Criticisms:**

Some actions do not appear to have any reward, e.g. leaving a tip for a waiter you will never see again.

**The fear of punishment argument** *(p. 375)*

The main thing that prevents us doing things to benefit only ourselves is fear of punishment (whether legal or punishment in the ‘afterlife’).

**Discussion:** Extract on the Montreal police strike, p. 375
Criticisms:

- There is no reason to think that all good things are motivated by fear (although some are).
- If a god thought you were only doing good to avoid punishment after death, would it count as good?
- Personal morals, not fear of punishment, drive some choices and actions – even if you knew you wouldn’t be found out, there are still some things you wouldn’t be willing to do.

Discussions: Activities 12.9 and 12.10, pp. 375, 376

Theories of ethics (p. 376)

Religious ethics
The simplest solution to different views of right/wrong would be to have a book of rules. Some people think that such books are to be found in religion.

Criticism:

- Religious rulebooks guide moral behaviour, but they sometimes lack advice on key areas, are worded ambiguously, or include punishments that are not morally acceptable today.

Plato’s (428–348 BCE) argument:
If something is good because God says it is good:
- would it be bad if God changed His mind
- or is it intrinsically good? (In which case we do not need God to tell us what is good.)

Discussion: Activity 12.11, p. 377

Duty ethics (p. 377)

According to some philosophers, people do their duty according to what is expected.
Every duty is connected to a right, e.g.:
- Duty not to kill → right to life
- Duty not to steal → right to property

Criticism:

- People have conflicting feelings on what is right and wrong.

Kant’s approach to ethics (pp. 378–80)

Immanuel Kant’s (1724–1804) approach:
- If consistently breaking a particular rule would result in chaos, then it should be generalised as a duty rule.
- We engage in **special pleading**: making excuses to justify our own behaviour that we would not find acceptable in someone else.
- We should adopt a **dual conception of ourselves** as not only *me* but also *one among others*. This idea lies behind the **golden rule**, ‘Do as you would be done by’.
- We can be more objective in deciding duty by asking, ‘How would I feel if someone did that to me?’

**Discussion**: Activity 12.13, p. 379

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**Values and dignity (pp. 380–1)**

Kant argued that no individual should be given preferential treatment or discriminated against. It is never right to sacrifice one individual’s life for the greater good:

- It may be the general good, but it is the only life they will have.
- They are not only one among others, they are also a *me*.
- An individual has dignity (they are irreplaceable).
- Something of value can be replaced by something of equal value, but something with dignity is irreplaceable.

**The importance of motives (p. 381)**

The moral value of an action is determined by the **motive** for which it is done:

- To be truly moral our actions should be motivated by **reason** rather than **feeling**.
- There are three reasons for doing things: expected reward, sympathy, duty.
- Kant thought that actions only have moral value if they are done because of duty.

**Criticisms of Kant (pp. 383–4)**

- Sometimes duties conflict.
- Kant’s approach can lead to rule worship, i.e. **moral absolutism** (following rules no matter what the context/situation).
- A judgement may be consistent and based only on reason, but it can ignore feelings and be morally cold, e.g. what outrages most people about Nazi war criminals is not their **inconsistency** but their **inhumanity**.

**Discussion**: Activity 12.15, p. 383

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**Utilitarianism (pp. 385–6)**

The theory of utilitarianism states that we should seek the greatest happiness of the greatest number of people. It was developed by **Jeremy Bentham** (1748–1832) and **John Stuart Mill** (1806–73).

- They tried to establish ethics on a scientific foundation.
- Actions are right in so far as they tend to increase happiness.
- Actions are wrong in so far as they tend to decrease happiness.
- Total Net Happiness (TNH) for an individual = (sum of pleasures) – (sum of displeasures).
- Gross National Happiness (GNH) = sum of individual TNH.
**In favour of utilitarianism (p. 386)**

- It is simple.
- It is democratic – every individual counts towards the GNH.
- It accounts for short- and long-term consequences of our actions.
- It is egalitarian – it can, for example, justify the redistribution of wealth by taxes ($1 paid by a rich person is worth less to them than $1 received by a poor person).

**Discussion:** Activity 12.18, p. 386

**Practical objections to utilitarianism (p. 387)**

- Happiness cannot be objectively measured.
- A constant stream of pleasure may not make for a happy life.
- Consequences of actions are in the future and are difficult to know for certain.

**Discussion:** Activity 12.19, p. 387

**Theoretical objections to utilitarianism (pp. 388–91)**

There are such things as bad pleasures, e.g.:

- malicious pleasures (derived from the suffering of others)
- empty pleasures (do not help us develop our potential, e.g. shopping, eating chocolate).

**Discussion:** Activity 12.20, p. 389

- Kant would say that it is the **motive** and not the pleasure that counts (p. 390).

**Discussions:** Activities 12.21 and 12.22, p. 390

- It does not allow for moral obligations or human rights.

**Rule utilitarianism (p. 391)**

- We should measure the rightness/wrongness of an action by whether it conforms to a rule that promotes general happiness.
- Individual choices would then rest on the question: ‘what would happen to general happiness if I break this rule that aims to give the greatest happiness for the greatest number?’
- Rule utilitarianism is closer to Kant’s duty ethics, except that it is more flexible, e.g. Kant’s rule, ‘never tell lies’ could be reinterpreted as ‘never tell lies unless you can prevent a great deal of suffering by doing so’. 
Discussion: Activity 12.24, p. 392

See also:

Linking questions: p. 395

Reading resources:

(Teachers may wish to set their own assignments on these.)

Relative values: a dialogue p. 396
Against happiness p. 401
Note: This is not a listed Area of Knowledge in the IB course outline.
Chapter 14: Conclusion – Truth and wisdom (p. 439)

What is truth?

Discussion: Summary table of theories, p. 447

- Correspondence theory
- Coherence theory
- Pragmatic theory

Can we know the truth? (p. 447)

- Our picture of the world is always an interpretation.
- We can never be sure that our interpretation is true.

Limitations of our knowledge tools (p. 448)

- Perception: if our senses had evolved differently, our perception of the world would be different.
- Language: there will always be aspects of reality that words cannot describe adequately.
- Emotion: just because you believe something passionately does not guarantee it is true.
- Reason: there may be things that we are not intelligent enough to understand.

Discussion: Activity 14.7, p. 448

Are we getting closer to the truth? (p. 448)

- Perhaps – you might insist that knowledge progresses over time and that we are at least getting closer to the truth.
- But the success of the quest for knowledge in the past is no guarantee that it will continue to be successful in the future.
- How can we be sure that the laws of nature will continue to work in the future?
- Perhaps the ‘great truths’ we have discovered will turn out to be nothing more than anomalies.

Beyond dogmatism and relativism (p. 449)

- Dogmatism = stating your opinions in a strong way and not accepting the views of others.
- Maybe the world could be a better place if people held their views with a little humility.

Discussion: Activity 14.8, p. 449
The lure of relativism (p. 450)

**Relativism** = there is no absolute truth. There is just individual truth (my truth and your truth).

**Criticisms:**
- Just because you are not certain of the truth does not mean it does not exist.
- If you accept everyone’s truth, there are no grounds for evaluating whether something is true or not and everything is reduced to personal preferences.
- The statement ‘There is no truth,’ refutes itself as soon as you ask if it is true.

Degrees of truth (p. 451)

Truth may be seen as an unattainable ideal which we can be nearer to or further away from.

**Discussion:** Activity 14.9, p. 451

The cubist theory of truth (p. 452)

- The more perspectives you have on something, the nearer you are to the truth about it.
- Just because truth varies with perspective does not mean there is no truth at all.
- Different views can enrich our understanding of the truth.

This avoids:
- the error of dogmatism → mistaking a half-truth for the truth
- the error of relativism → thinking that since truth varies with perspective there is no truth at all.

What price truth? (p. 452)

**Is truth a good thing?**

We have so far assumed that truth is a good thing (for example, Socrates linked knowledge to happiness and virtue). However, does the cost of seeking knowledge sometimes outweigh the benefits?

**Discussion:** Activity 14.10, p. 452

Do we naturally seek the truth? (p. 453)

- Children are naturally curious, but they are also naturally willing to believe what they are told.
- People seem to have defence mechanisms to protect them from unwelcome truth, such as:
  - selective attention: seeing what they want to see
  - rationalisation: finding bad reasons to justify prejudices
  - communal reinforcement: only mixing with people who share the same views.
There is no reason to believe that the truth will make us happy. However, the longer we avoid the truth, the bigger the nasty surprises may be later.

**Discussion:** Activity 14.11, p. 454

**Ought we to seek the truth? (pp. 454–5)**

- Time and money spent searching for truth could be better spent, e.g. when people are dying of thirst and starvation.
- New technologies may have huge potential benefits, but also present huge dangers if used badly.

**Discussion:** Activity 14.12, p. 456

**Wisdom (p. 456)**

FIVE key features of wisdom (recognised by Richard van de Lagemaat):

1. **Good judgement (p. 457)**
   This comes with experience plus reflection on experience.

2. **Breadth of vision (p. 457)**
   Narrow specialisation of knowledge may not result in a sense of the whole. TOK puts emphasis on comparing and contrasting claims in different areas of knowledge.

3. **Self-knowledge (p. 458)**
   This makes us question beliefs and avoid prejudice.

4. **Responsibility (p. 459)**
   Almost any statement we accept requires that we are willing to trust others. When we pass on knowledge we should therefore exercise responsibility to:
   - base knowledge claims on evidence
   - be consistent
   - be open to criticism.

5. **Intellectual humility (p. 459)**
   Absolute knowledge is beyond the intellectual and perceptual ability of humans. Socrates and Newton recognised their own relative ignorance (learned ignorance – achieved after a lifetime of thought).

**Discussion:** ‘Trying to make sense of the world is not to reach a destination but to travel with a different point of view.’
See also:

Linking questions: p. 462

Reading resources:

(Teachers may wish to set their own assignments on these.)

Ghosts p. 463
Integrity p. 465