

OCR Advanced Subsidiary GCE in Critical Thinking (H050)

OCR Advanced GCE in Critical Thinking (H450)

Specification

QAN AS GCE: 100/4775/X

QAN Advanced GCE: 100/4776/1

Key Features

- Innovative subject – no large body of content to deliver, but a range of skills.
- Develops and extends good practice established with the previous OCR AS Critical Thinking.
- Enhances candidates' achievement in their other subjects.
- Supports enrichment programmes.
- Suitable for delivery within programmes for the gifted and talented.

Support and In-Service Training for Teachers

- A full programme of In-Service training meetings arranged by OCR Training and Customer Support Division (telephone 01223 552950).
- Specimen assessment materials.
- Past question papers and mark schemes, available from the Publications Department.
- A report on the examination, compiled by senior examining personnel after each examination session.
- Teacher Support Pack.
- e-community.
- OCR endorsed text book.

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Specification Summary

Critical Thinking can be defined as a form of reflective reasoning which analyses and evaluates information and arguments by applying a range of intellectual skills in order to reach clear, logical and coherent judgements within a given context.

Courses based on these specifications should enable candidates to:

- develop an understanding of the principles, concepts and techniques of Critical Thinking;
- develop the skills of communication, problem solving, analysis and evaluation;
- develop a framework for moral, social and ethical decision-making;
- develop a capacity for methodical and critical thought which will serve as an end in itself as well as a basis for further study.

Units of Assessment

All units are externally assessed with the assessment set and marked by OCR. Candidates must take Units 1 and 2 for the AS GCE award and all four units for the full Advanced GCE award.

Unit	Level	Unit Title	Mode of Assessment	Duration	Weighting	
					AS GCE %	Advanced GCE %
1 F491	AS	Credibility of Evidence	Written Examination	1 hour 15 minutes	40	20
2 F492	AS	Assessing and Developing Argument	Written Examination	1 hour 45 minutes	60	30
3 F493	A2	Resolution of Dilemmas	Written Examination	1 hour 15 minutes	-	20
4 F494	A2	Critical Reasoning	Written Examination	1 hour 45 minutes	-	30

Units 1 and 2 are available every January and June from January 2006.

Units 3 and 4 are available every January and June from June 2006.

Question Papers

AS

Unit 1 has structured questions based on one or more stimulus passages. Candidates should attempt **all** questions.

Unit 2 has twenty multiple choice questions and structured questions based on one or more stimulus passages. Candidates should attempt **all** questions.

A2

Unit 3 has structured questions based on two or more stimulus passages and material. This unit also requires candidates to produce a piece of extended writing. Candidates should attempt **all** questions.

Unit 4 has twenty multiple choice questions. This unit also requires candidates to answer structured questions and to produce a piece of extended writing in response to an extended stimulus passage. Candidates should attempt **all** questions.

Content

These specifications seek to bring together the skills involved in thinking and arguing in a critical and logical way. The aim is to provide candidates with a framework which can be applied in a practical manner to a range of materials, situations, problems and issues. There is not an obvious major body of content to deliver, but rather a range of skills which candidates should be enabled to acquire.

Candidates doing this course should learn to:

- understand and apply the language of reasoning;
- understand and apply different patterns of reasoning;
- recognise and evaluate special kinds of reasoning;
- judge the credibility of sources;
- assess arguments;
- develop and present relevant arguments;
- recognise and apply basic logical ideas.

1 Introduction

1.1 Rationale

Critical Thinking can be defined as a form of reflective reasoning which analyses and evaluates information and arguments by applying a range of intellectual skills in order to reach clear, logical and coherent judgements within a given context.

The Advanced Subsidiary GCE specification gives an introduction to the concepts, principles and techniques which underlie Critical Thinking and expands their application to a range of contexts. It provides a discrete package of material providing those candidates, who do not wish to progress to A2, with a knowledge and understanding of Critical Thinking applicable to the study of a range of academic and vocational subjects.

The A2 part of the Advanced GCE specification incorporates greater depth of understanding, analysis and evaluation across a wider range of contexts. It provides a foundation for further study of academic and vocational subjects, as well as forming part of a general education, or an enrichment programme, at Advanced Level. Candidates will find Critical Thinking skills of great benefit in preparation for a wide range of careers, including the fields of law, academic research (e.g. in the disciplines of science, arts or humanities), social science, journalism, medicine, business, accounting and engineering.

Courses based on these specifications should enable candidates to:

- develop an understanding of the principles, concepts and techniques of Critical Thinking;
- develop the skills of communication, problem solving, analysis and evaluation;
- develop a framework for moral, social and ethical decision-making;
- develop a capacity for methodical and critical thought which will serve as an end in itself as well as a basis for further study.

OCR has taken great care in the preparation of this specification and assessment material to avoid bias of any kind.

1.2 Certification Title

These specifications will be shown on a certificate as:

OCR Advanced Subsidiary GCE in Critical Thinking.

OCR Advanced GCE in Critical Thinking.

1.3 Level of Qualification

This qualification is approved by the regulatory authorities (QCA, ACCAC and CCEA) as part of the National Qualifications Framework at Level 3.

1.4 Recommended Prior Learning

There is no recommended prior learning for candidates who are taking courses leading to this qualification.

Candidates entering this course should have achieved at least a general educational level equivalent to National Curriculum Level 4. It is advised that at the start of the course candidates should have achieved GCSE English Language Grade C or above, or an equivalent standard.

1.5 Relationship to Other Qualifications

There is no overlap with other qualifications.

1.6 Restrictions on Candidate Entries

Candidates who enter for this GCE specification **may not** also enter for any other GCE specification with the certification title Critical Thinking in the same examination series.

Every specification is assigned to a national classification code indicating the subject area to which it belongs.

Centres should be aware that candidates who enter for more than one GCE qualification with the same classification code will have only one grade (the highest) counted for the purpose of the School and College Performance Tables.

The classification code for this specification is 7830.

1.7 Code of Practice Requirements

This specification complies in every respect with the revised Code of Practice requirements for courses starting in September 2005.

1.8 Status in Wales and Northern Ireland

This specification has been approved by ACCAC for use by centres in Wales and by CCEA for use by centres in Northern Ireland.

Candidates in Wales and Northern Ireland should not be disadvantaged by terms, legislation or aspects of government that are different from those in England[†]. Where such situations might occur, including in the external assessment, the terms used have been selected as neutral, so that candidates may apply whatever is appropriate to their own situation.

OCR will provide specifications, assessments and supporting documentation only in English.

Further information on the provision of assessment materials in Welsh and Irish may be obtained from the Information Bureau at OCR (telephone 01223 553998).

[†] Including the Channel Islands

2 Specification Aims

Critical Thinking can be defined as a form of reflective reasoning which analyses and evaluates information and arguments by applying a range of intellectual skills in order to reach clear, logical and coherent judgements within a given context.

This specification gives candidates opportunities to:

- understand the importance of examining knowledge and beliefs critically;
- recognise, analyse and evaluate their own and others' beliefs and knowledge claims in a variety of contexts;
- recognise and evaluate assumptions;
- evaluate reasoning of different kinds, including common and important species of reasoning;
- make connections and synthesise information and arguments;
- generate their own arguments and express them clearly.

This Critical Thinking specification provides opportunities for candidates to: demonstrate and apply a wide range of thinking skills (especially reasoning skills) in a range of contexts; develop an ability to transfer these skills and make connections; integrate ideas and develop concepts; use arguments; make judgements and evaluate evidence; and examine questions from a broad standpoint.

3 Assessment Objectives

This specification requires candidates to:

AO1 Analyse critically the use of different kinds of reasoning in a wide range of contexts;

AO2 Evaluate critically the use of different kinds of reasoning in a wide range of contexts;

AO3 Develop and communicate relevant and coherent arguments clearly and accurately in a concise and logical manner.

4 Scheme of Assessment

4.1 Nature of Assessment

The assessment will be conducted in accordance with the GCSE, GCE, VCE and GNVQ Code of Practice. All units are externally assessed with the assessment set and marked by OCR.

4.2 Units

Unit	Level	Unit Title	Mode of Assessment	Duration	Weighting	
					AS GCE %	Advanced GCE %
1 F491	AS	Credibility of Evidence	Written Examination	1 hour 15 minutes	40	20
2 F492	AS	Assessing and Developing Argument	Written Examination	1 hour 45 minutes	60	30
3 F493	A2	Resolution of Dilemmas	Written Examination	1 hour 15 minutes	-	20
4 F494	A2	Critical Reasoning	Written Examination	1 hour 45 minutes	-	30

Candidates must take Units 1 and 2 for the AS GCE award and all four units for the full Advanced GCE award.

4.2.1 Availability of Units

Unit	Level	Unit Title	January	June
1	AS	Credibility of Evidence	✓	✓
2	AS	Assessing and Developing Argument	✓	✓
3	A2	Resolution of Dilemmas	✓ (from 2007)	✓
4	A2	Critical Reasoning	✓ (from 2007)	✓

The first assessment of AS units will be in January 2006.

The first assessment of A2 units will be in June 2006.

4.2.2 Re-sits

Candidates may re-sit units as many times as they wish prior to certification.

After certification, a candidate must re-sit all the units relating to a particular award if they wish to receive a new grade. A candidate can however re-sit an AS unit after certification of the AS and use the result towards the Advanced GCE grade.

4.3 Entries and Certification

Please note that centres must be registered with OCR in order to make any entries, including estimated entries. It is recommended that centres apply to OCR to become a registered centre well in advance of making their first entries. Centres should be aware that a minimum of ten candidates for summer examinations is normally required.

In addition to unit entries:

- to claim the Advanced Subsidiary GCE qualification candidates must be entered for the certification code **H050**;
- to claim the Advanced GCE qualification candidates must be entered for the certification code **H450**.

Certification of AS GCE will be available from January 2006 and Advanced GCE from June 2006.

4.3.1 Transition Arrangements for candidates who hold AS Critical Thinking (3821)

Candidates holding the previous OCR AS GCE Critical Thinking (3821) may combine this with the new A2 Critical Thinking (i.e. Units 3 and 4) to certificate for the new full A Level (H450). The last opportunity for candidates to take advantage of this arrangement will be January 2008.

4.4 Question Papers

4.4.1 Advanced Subsidiary GCE

There are two compulsory question papers for the AS qualification:

Unit 1 – Credibility of Evidence (1 hour 15 minutes) (80 marks)

Unit 1 has structured questions based on one or more stimulus passages. Candidates should attempt **all** questions.

Unit 2 – Assessing and Developing Argument (1 hour 45 minutes) (120 marks)

Unit 2 has twenty multiple choice questions and questions based on one or more stimulus passages. Candidates should attempt **all** questions.

4.4.2 A2

In addition to the AS, there are two further compulsory question papers to make up the full Advanced GCE qualification:

Unit 3 – Resolution of Dilemmas (1 hour 15 minutes) (80 marks)

Unit 3 has structured questions based on two or more stimulus passages. This unit also requires candidates to produce a piece of extended writing. Candidates should attempt **all** questions.

Unit 4 – Critical Reasoning (1 hour 45 minutes) (110 marks)

Unit 4 has twenty multiple choice questions. This unit also requires candidates to answer structured questions and to produce a piece of extended writing in response to an extended stimulus passage. Candidates should attempt **all** questions.

4.5 Weighting of Assessment Objectives

In Critical Thinking the three assessment objectives are inter-dependent. It is not, therefore, feasible to assess them discretely. Accordingly, the weightings indicated in the tables below are approximate.

Assessment Objectives		Weighting		
		AS	A2	Advanced GCE
AO1	Analyse critically the use of different kinds of reasoning in a wide range of contexts.	30%	28%	29%
AO2	Evaluate critically the use of different kinds of reasoning in a wide range of contexts.	35%	35%	35%
AO3	Develop and communicate relevant and coherent arguments clearly and accurately in a concise and logical manner.	35%	37%	36%

4.5.1 Assessment Objectives by Unit

	AO1	AO2	AO3	Unit totals
Unit 1	1	11	8	20
Unit 2	14	6.5	9.5	30
Unit 3	2	6.5	11.5	20
Unit 4	12	11	7	30
Total	29	35	36	100%

4.6 Assessment of Written Communication

Candidates are expected to:

- select and use a form and style of writing appropriate to purpose and to complex subject matter;
- organise relevant information clearly and coherently, using specialist vocabulary when appropriate;
- ensure text is legible, and spelling, grammar and punctuation are accurate, so that meaning is clear.

Assessment Objective 3 requires candidates to develop and communicate relevant and coherent arguments clearly and accurately in a concise and logical manner.

Quality of written communication will be assessed in written answers in the examination papers. In Units 1, 2 and 4 additional marks will be available for quality of written communication. In Unit 3 assessment of quality of written communication will be subsumed within Assessment Objective 3.

4.7 Differentiation

In the question papers differentiation will be achieved by setting questions which are designed to assess candidates at the appropriate levels of ability and which are intended to allow all candidates to demonstrate what they know, understand and can do.

4.8 Awarding of Grades

A candidate's raw mark for each unit will be converted into a uniform mark. The sum of the uniform marks will determine the candidate's grade for the qualification. Candidates achieving less than the minimum mark for grade E will be unclassified.

4.9 Uniform Marks

The AS will be graded on a Uniform Mark Scale out of 300. The Advanced GCE will be graded on a Uniform Mark Scale out of 600. The uniform mark thresholds for each of the units are shown below:

Entry Code	Max. mark available	A	B	C	D	E
F491	120	96	84	72	60	48
F492	180	144	126	108	90	72
F493	120	96	84	72	60	48
F494	180	144	126	108	90	72

The overall uniform mark grade thresholds for the AS are as follows

Max	A	B	C	D	E	U
300	240	210	180	150	120	0

The overall uniform mark grade thresholds for the Advanced GCE are as follows:

Max	A	B	C	D	E	U
600	480	420	360	300	240	0

4.10 Performance Descriptions

4.10.1 AS Performance Descriptions

The performance descriptions for AS indicate the level of attainment characteristic of A/B and E/U boundary candidates. They should be interpreted in relation to the content outlined in the AS specification; they are not designed to define that content. They give a general indication of the learning outcomes and levels of attainment likely to be shown by a representative candidate performing at each boundary. In practice most candidates will show uneven profiles across the attainments listed, with strengths in some areas compensating in the award process for weaknesses or omissions elsewhere.

The requirement for all AS and A level specifications to assess candidates' quality of written communication will be met through Assessment Objective 3.

AS	AO1	AO2	AO3
Assessment Objectives	Candidates should be able to: analyse critically the use of different kinds of reasoning in a wide range of contexts.	Candidates should be able to: evaluate critically the use of different kinds of reasoning in a wide range of contexts.	Candidates should be able to: develop and communicate relevant and coherent arguments clearly and accurately in a concise and logical manner.
A/B boundary performance descriptions	Candidates characteristically: apply the language of reasoning in an appropriate and precise way to the context demonstrate a secure understanding of the overall structure of the argument identify subtle and complex arguments accurately, for example, distinguishing intermediate from main conclusion and/or recognising a counter argument where present.	Candidates characteristically: recognise and evaluate particular types of reasoning, using appropriate methods identify flaws in reasoning, explaining accurately what is wrong recognise and clearly articulate assumptions that are necessary for the argument to work evaluate critically the credibility of evidence using a range of appropriate criteria where appropriate interpret and clarify key terms and ideas.	Candidates characteristically: communicate an effective argument clearly, accurately and coherently using appropriate language present their own relevant further arguments with exemplification and a measure of persuasion, for example giving a counter and/or supporting argument that focuses on the correct conclusion.

AS	AO1	AO2	AO3
<p>E/U boundary performance descriptions</p>	<p>Candidates characteristically:</p> <p>display some evidence of applying the language of reasoning at a basic level to the context</p> <p>recognise the gist of the argument and/or some of the reasons.</p>	<p>Candidates characteristically:</p> <p>comment on some obvious features of reasoning, such as comparisons, causes and examples</p> <p>identify obvious errors in reasoning with some understanding of what is wrong</p> <p>recognise that there are gaps in the reasoning without necessarily expressing the assumptions clearly or accurately</p> <p>make superficial comments about the sources of evidence with statements that tend to be narrative and descriptive</p> <p>make simplistic observations about the terms and ideas used.</p>	<p>Candidates characteristically:</p> <p>convey a basic argument; they may present straightforward examples and/or objections</p> <p>construct their own arguments without necessarily recognising the precise conclusion of the stimulus.</p>

4.10.2 A2 Performance Descriptions

The performance descriptions for A2 indicate the level of attainment characteristic of A/B and E/U boundary candidates. They should be interpreted in relation to the content outlined in the A2 specification; they are not designed to define that content. They give a general indication of the learning outcomes and levels of attainment likely to be shown by a representative candidate performing at each boundary. In practice most candidates will show uneven profiles across the attainments listed, with strengths in some areas compensating in the award process for weaknesses or omissions elsewhere.

The requirement for all AS and Advanced GCE specifications to assess candidates' quality of written communication will be met through Assessment Objective 3.

A2	AO1	AO2	AO3
Assessment objectives	Candidates should be able to: analyse critically the use of different kinds of reasoning in a wide range of contexts.	Candidates should be able to: evaluate critically the use of different kinds of reasoning in a wide range of contexts.	Candidates should be able to: develop and communicate relevant and coherent arguments clearly and accurately in a concise and logical manner.
A/B Boundary performance descriptions	Candidates characteristically: apply the language of reasoning in an appropriate and precise way demonstrate a secure understanding of the overall structure of a range of argument types identify subtle and complex arguments accurately.	Candidates characteristically: recognise and evaluate particular types of reasoning, using appropriate methods use terminology accurately to identify flawed/questionable reasoning, explaining precisely what is wrong recognise, articulate clearly and evaluate the impact of any assumptions on the argument evaluate critically and precisely the credibility of sources of evidence and the impact of their judgements on the persuasiveness/strength of the argument where appropriate, interpret and clarify key terms and ideas, commenting on the impact of the lack of clarity on the argument and on the effect of the clarification.	Candidates characteristically: communicate effective complex arguments clearly, accurately, coherently and fluently, using appropriate language present their own relevant arguments in a way which is clear, precise, accurate and persuasive by selecting appropriate issues and combining different points of view where appropriate, recognise contrasting points of view and identify the reasoning underpinning those points of view, identifying and evaluating clearly and precisely the arguments on each side.

A2	AO1	AO2	AO3
E/U Boundary performance descriptions	<p>Candidates characteristically:</p> <p>apply the language of reasoning in an appropriate and precise way</p> <p>in the context of a range of arguments, recognise the overall gist of the argument and/or some of the reasons.</p>	<p>Candidates characteristically:</p> <p>recognise and begin to evaluate particular types of reasoning, although methods used might be simple or not invariably appropriate</p> <p>use some terminology to identify flawed/questionable reasoning, demonstrating some understanding of what is wrong</p> <p>recognise and begin to articulate assumptions. Comment, in a simplistic way, on the impact of the assumptions on the argument</p> <p>make sensible comments on the credibility of sources of evidence, without necessarily explaining the full impact of their comments on the persuasiveness/ strength of the argument</p> <p>where appropriate, interpret and clarify terms and ideas.</p>	<p>Candidates characteristically:</p> <p>communicate a complex argument clearly in an unsophisticated way</p> <p>present their own relevant arguments clearly by selecting appropriate issues and combining different points of view</p> <p>where appropriate, recognise contrasting points of view and identify simple reasons underpinning those different points of view. Begin to evaluate the reasoning on both sides, although in a simplistic way.</p>

4.11 Synoptic Assessment

Synoptic assessment accounts for 20% of the total Advanced GCE marks and is in Unit 3 and in Unit 4 Section B.

Advanced GCE Critical Thinking involves the explicit drawing together and application of the knowledge, understanding and skills acquired and developed in different parts of the course. The questions set use a range of resources, including text, data and illustration, and require candidates to draw together skills from throughout the course and to demonstrate the transfer of skills. Candidates are required to marshal evidence, select appropriate material, interpret and evaluate material and evidence in the context of the question, and generate further argument. They need to be able to integrate information, data, concepts, opinion, reasoning and argument within the context of the task set in the question.

5 Specification Content

5.1 Introduction

These specifications seek to bring together the skills involved in thinking and arguing in a critical and logical way. The aim is to provide candidates with a framework which can be applied in a practical manner to a range of materials, situations, problems and issues. There is not an obvious major body of content to deliver, but rather a range of skills which candidates should be enabled to acquire.

Sections 5.2 and 5.3 define the course content at AS and A2 respectively. The ticks alongside the content breakdown indicate which unit focuses on a particular part of the specification. However, the synoptic nature of Critical Thinking (especially at A2) means that skills may be drawn on in units other than the one where they are specifically identified. Courses should be designed to show interrelationships between the concepts and skills listed.

Sections 5.2 and 5.3 are intended to provide a structure for course design, which will assist understanding of the subject, and to provide a framework for teaching and learning activities. Teachers will wish to use their professional judgment in determining a scheme of work. It is advised that delivery of Sections 5.2 and 5.3 is approached with reference to the Glossary of Terms (Appendix A) and the *Teacher Support Pack*.

5.2 Advanced Subsidiary

Not all of the AS content will necessarily be assessed in any one examination.

5.2.1 Language of Reasoning

Candidates are required to:	Unit			
	1	2	3	4
Understand and apply the language of reasoning: <ul style="list-style-type: none"> • argument • reasons • conclusion (intermediate conclusion, hypothetical conclusion, main conclusion) • counter-argument (reasoning from different points of view) • assumptions, inference and implication 	✓	✓	✓	✓

Guidance for Teachers

Candidates need to study the language which is characteristic of reasoning (e.g. words like *therefore*, *because*, *so*, *if .. then*, *must*, *reason*, *conclusion*, *evidence*, *opinion*, *inference*, *support*, *prove*, *refute*, *fallacy*) and to learn how we know that someone is engaged in reasoning and argument (as distinct from quarrelling, explaining, reporting or some kinds of formalised debate (e.g. Parliamentary) which may involve ridiculing opponents rather than reasoning).

Candidates should be able to use linguistic clues (called 'argument indicators') to decide if reasoning is present. The 'therefore' test (which asks whether it makes sense to insert the word 'therefore' between two sentences) is also useful in deciding when reasoning is being presented.

Candidates should be able to understand the distinction between arguments and explanations and the distinctive use of language involved.

Candidates should also be able to understand specialist, or semi-technical, notions which can be useful in argument and candidates should learn how to use some of these as the occasion arises (words like *consistent*, *contradiction*, *converse*, *counter-example*, *imply*, *hypothetical*, *necessary and sufficient conditions*).

Candidates should understand that these words are called 'semi-technical' because although they are everyday words, the tradition of logic and philosophy has clarified and redefined them in ways which make them more useful than their everyday counterparts in understanding and evaluating arguments. Although their meanings are different from everyday usage, they are easily explained in ordinary English and do not require any technical vocabulary or symbolism from formal logic.

5.2.2 Patterns of Reasoning

Candidates are required to:	Unit			
	1	2	3	4
Understand and apply different patterns of reasoning as well as different standards for evaluating arguments e.g. <ul style="list-style-type: none"> • side by side reasoning • chain of reasoning • joint reasoning • drawing more than one conclusion 	✓	✓	✓	✓

Guidance for Teachers

Candidates should learn how to be able to analyse the structure of an argument. Arguments can have very different structures: for example, some might have more than one conclusion, some might include a counter-argument. They will also need to be able to identify when an author provides information that could be described as no more than ‘scene-setting’. In addition, they should be able to distinguish between reasons that support the conclusion and evidence that might support a reason. Candidates will also need to be able to both identify and consider the significance of hypothetical reasoning.

In addition to being able to analyse arguments, candidates will need to be able to evaluate the relationship between reasoning and the conclusion. Specifically, they will need to be able to consider the extent to which an author’s reasoning supports their conclusion (or what conclusion could be drawn if an author hasn’t drawn one, or as an alternative). This means that they will need to be able to evaluate the strength or weakness of the reasoning, using the criteria of relevance, credibility issues, truth, and alternative explanations. They must also be able to evaluate the role of definitions and principles in argument.

It will be useful for candidates to see that different demands are made on arguments in different contexts. For example, in a criminal court, the verdict (conclusion) must be based on evidence that proves beyond reasonable doubt that this verdict has to be given. In most of the arguments that candidates will come across, however, such a demanding criterion for the conclusion will not be used. Candidates will need to consider such things as whether or not any evidence provided is consistent with (rather than ‘proves’) the conclusion and what sort of evidence would be needed to either weaken or strengthen the conclusion.

5.2.3 Clarifying Expressions and Ideas

Candidates are required to:	Unit			
	1	2	3	4
Clarify expressions and ideas: <ul style="list-style-type: none"> • definitions • stipulating meaning • ambiguity • vagueness • inconsistency • conflation • the need for examples 	✓	✓	✓	✓

Guidance for Teachers

Candidates should be able to interpret and clarify terms and ideas whose meaning is unclear, vague, imprecise or ambiguous and do this in a way which is appropriate to the audience and context.

The process of reasoning often encounters a need for clarification. Terms may be used, or claims may be made, whose meaning is unclear, vague, imprecise or ambiguous. For example, if someone argues that ‘natural foods’ are best for us, they might be asked to clarify what they mean, by:

- giving clear examples of such foods and clear examples of foods which are not natural,
- explaining in general terms how this term is normally used, or
- stating clearly what their meaning is.

To take another example, when discussing poverty it is important to be clear what the criteria are for regarding someone as poor in that context. Knowing when and what kind of clarification is necessary is an important skill; sometimes adequate clarification may be supplied with the aid of a dictionary or textbook, sometimes the history of ideas will be necessary, sometimes good examples will do.

5.2.4 Different Claims and Special Kinds of Reasoning

Candidates are required to:	Unit			
	1	2	3	4
Recognise and evaluate different kinds of claims: <ul style="list-style-type: none"> • acceptability of context • facts, evidence and data (significance, relevance, selectiveness and reasonableness) • value judgements • definitions, criteria or principles (A2 especially) 	✓	✓	✓	✓
Recognise and evaluate special kinds of reasoning: <ul style="list-style-type: none"> • analogy • principles (including ethical principles e.g. duty) • causal explanations • decision-making and justifying decisions • using counter-examples • basic suppositional/hypothetical reasoning 	✓	✓	✓	✓

Guidance for Teachers

Recognise and evaluate different kinds of claims

Candidates should be able to recognise and evaluate different kinds of claims.

Reasons and conclusions differ in many ways. For example, some present facts, evidence or data, others express value judgements and others state definitions, criteria or principles.

Candidates should be able to recognise and evaluate these different kinds of claims.

Consider the following example:

"Many people claim that violence on television has no effect on people's behaviour. I am sure this is false, but if it were true that would still be no reason for censorship because people should be free to watch what they choose. Freedom means being able to do what you want to do."

It is clear that there is reference here to evidence, but also a value claim is made and a definition is given; these should be assessed differently. On the one hand it is proper to ask for evidence that television violence does or does not affect people's behaviour, and candidates may need to consider what kind of evidence is appropriate to such claims. On the other hand, defending (or attacking) the claim that people should be free to watch what they please requires reference to moral, legal and political principles, and again candidates may need to consider what these might be. A definition of the term 'freedom' is given in this argument and such definitions are different again from statements of evidence and value judgements; they need to be evaluated either in terms of accuracy (is this normal usage?) or in terms of their utility (is it a good definition for the purpose in hand?). Again candidates should be able to discuss what sort of considerations are relevant.

Recognise and evaluate special kinds of reasoning

Candidates should be able to recognise and evaluate special kinds of reasoning. Arguments might use principles as part of the reasoning (either implicitly or explicitly) or reason towards a principle. Candidates need to be aware of how a principle can work within an argument by, for example, requiring consistency in its application.

They will also need to be able to understand the significance of analogies and hypothetical reasoning in arguments. This significance can be both in terms of the limits and power of such reasoning. Counter-examples also need to be seen in these terms, especially when an author has made a claim that involves 'only' or 'all'.

5.2.5 Credibility

Candidates are required to:	Unit			
	1	2	3	4
Judge the credibility of sources: <ul style="list-style-type: none"> • distinction between credibility and truth • consistency • the role of expertise in making judgements • reputation • corroboration • degrees of certainty • nature of the claim itself • vested interest • justification for a claim • primary and secondary sources • use of language • direct and circumstantial evidence • observation or inferred judgement 	✓		✓	

Guidance for Teachers

The content assessed within Unit 1 Credibility of Evidence is designed to give candidates an introduction to judging credibility skillfully. Many of our beliefs are based on what other people tell us, in writing, on television or by word of mouth. Accordingly candidates should understand how to decide who to believe. The criteria to apply depend upon the case.

Candidates should be able to use the criteria given below and other criteria in deciding which sources and authorities are credible/reliable and on what grounds.

- Whether there is **corroboration** of the claim from independent sources (as when it was claimed that 'cold fusion' had been produced).
- The source's **reputation** for reliability (for example, contrast the BBC and the *Sun* newspaper).
- Whether the source has the **ability to observe** what it is claimed has happened.
- Whether the source has a **vested interest** (for example someone accused of war crimes who denies any responsibility).
- Whether the source is **neutral** within the context in which the evidence is being assessed.
- Whether the source has the relevant **expertise/training** (such as specialist technical expertise or when a police officer gives evidence in court).
- The **nature of the claim** itself (as when someone claims to have witnessed a miracle).
- Whether the source can provide **credible reasons** for the claim they make (as when someone claims to have encountered 'aliens' from another planet).

Candidates should be able to use the criteria in deciding which sources and authorities are credible/reliable and on what grounds.

5.2.6 Assessing Arguments

Candidates are required to:	Unit			
	1	2	3	4
Assess arguments: <ul style="list-style-type: none"> • analogy • principles • causal explanations • decision-making and justifying decisions • using counter-examples • basic suppositional/hypothetical reasoning • strengths and weaknesses • flaws (e.g. <i>ad hominem</i>), appeals (e.g. to authority), circular argument, alleged inconsistency, alleged generalisation, necessary and sufficient conditions, <i>post hoc</i>, restricting the options, slippery slope, straw man, <i>tu quoque</i> • assumptions 	✓	✓	✓	✓

Guidance for Teachers

There are many aspects of arguments that candidates will need to assess. They will need to be able to assess the relevance and adequacy of analogies (including finding strengths in some of them). They will need to be able to consider how principles are used as part of arguments and to consider their relevance and the degree of consistency of application. They should be able to assess the way in which an author uses evidence by considering issues such as relevance and the possibility of alternative explanations for it. The significance of counter-examples needs to be understood, either in terms of an author's use of them or what happens to an argument if they can be given.

There is a long list of weaknesses in argument that can be described as flaws. Candidates will need to be able to recognise these as they appear in arguments. Many of these flaws have terms that are used to describe them: *ad hominem*, straw man, *post hoc*, and so on. Though candidates do not need to reproduce the technical terms, they are often useful reminders of what to look for when evaluating arguments.

Candidates will need to be able to identify assumptions that an author must make in their argument. This is a very important skill in that it provides a valuable route to assessing an argument. For example, an author might have to assume something that is a problem for the consistency of their argument, though they have not stated it. However, candidates need to see that assumptions are merely (unstated) statements that an author must believe to be true for their argument to follow. In this sense, they are neutral. It is the identification of a problem in an author's assumptions that provides the source of evaluation.

5.2.7 Basic Statistical Representations

Candidates are required to:	Unit			
	1	2	3	4
Understand, and interpret the significance of basic forms of statistical and numerical representations appropriate to informed citizens e.g. <ul style="list-style-type: none"> • read and interpret graphs and charts • percentages • mean, median and mode • simple probability • rates 		✓	✓	✓

5.2.8 Candidate's own Argument

Candidates are required to:	Unit			
	1	2	3	4
Develop and present relevant arguments <ul style="list-style-type: none"> • use evidence to support reasons • generate and assess counter-arguments • generate conclusions from claims 	✓	✓	✓	✓

Guidance for Teachers

It is one thing to understand and evaluate other people's arguments, but it is quite another thing to apply the same standards of rigour to one's own ideas. It is clear that good critical thinking entails doing this, so for this part of the specification candidates should practise using the language of reasoning, being clear about reasons and conclusions, judging the credibility of sources, questioning assumptions, and evaluating claims and inferences, but all with respect to their own arguments, explanations and decisions. The skills described above are probably most easily learned in the context of considering other people's reasoning, but they also need to be applied to the candidate's own reasoning and to be displayed (with the same depth of analysis) in producing good reasoning.

5.3 A2

A2 differs from AS by the greater challenge presented through the nature and depth of material studied, the greater complexity of the reasoning involved, the wider range of arguments and argument types, the variety of contexts and issues encountered, and the complexity of the concepts dealt with. A2 level will extend beyond the AS, therefore, in terms of complexity and higher-level skills as reflected in the assessment objectives.

Not all of the A2 content will necessarily be assessed in any one examination.

At AS candidates are expected implicitly to demonstrate understanding and application of the specification content; at A2 they are required to demonstrate explicitly that they can apply the AS content. In addition to the requirements for AS, at A2:

At A2, where relevant, candidates may be required to evaluate the use of images, symbols and other non-verbal stimuli in reasoning, for example those in news reporting, advertising, and political and similar cartoons.

5.3.1 Reasoning

Candidates are required to:	Unit	
	3	4
Understand and apply the language of reasoning: <ul style="list-style-type: none"> • validity • syllogism 	✓	✓
Clarify expressions and ideas: <ul style="list-style-type: none"> • sufficiency of definition • equivocation 	✓	✓
Recognise and evaluate different kinds of claim: <ul style="list-style-type: none"> • definition of criteria and principles 	✓	✓
Recognise and evaluate special kinds of reasoning: <ul style="list-style-type: none"> • sustained counter-argument • sustained suppositional/ hypothetical reasoning • deductive validity • identify and evaluate ethical arguments, making reference to principles (need, desert and right); or ethical values and approaches to decision making (elitism; egalitarianism, deontological and consequential ethics; prudentialism; egoism; altruism; hedonism) 	✓	✓

Guidance for Teachers

Understand and apply the language of reasoning

Explanations aim to *account* for something or to say what *caused* something. For example:

"Napoleon must have died of arsenic poisoning whilst in exile on St Helena. Arsenic can be administered in small doses which will not be noticed, but will eventually kill the victim. Arsenic poisoning leaves traces of arsenic in human hair, and reliable tests recently showed that Napoleon's hair contained abnormally large amounts of arsenic. It had been thought that he died of cancer, but his symptoms included nausea, chills, weakness and increasing corpulence, which cancer specialists say are not symptoms of cancer. However, these are typical symptoms of arsenic poisoning according to specialists."

This is typical of explanatory reasoning (the *must* shows the intended conclusion). The reasoning considers possible alternative explanations (in this case, just one) and shows that the evidence conflicts with the alternative hypothesis, but supports the favoured one. For explanatory reasoning to be successful it must consider reasonable alternatives, and find evidence which rules out other possible explanations and supports the favoured explanation.

These are the tests to apply when judging the reasoning used in explanations. Candidates will only be required to consider relatively simple explanatory arguments.

In rational decision-making about a course of action or policy, it is important to consider:

- objectives;
- alternative courses of action or policies;
- likely consequences of each (including contrasting risks and likelihoods of each); and
- ethical or other values.

For example, an argument in favour of banning cigarette advertising would presumably aim to reduce the number of people whose health was at risk from smoking (the *objective*); it would need to consider the consequences of such a ban (for example, that the cigarette manufacturers would save money and would thus be able to reduce prices, perhaps making increased smoking more likely) and the possibility of achieving the same objective more effectively by some other means and, perhaps, questions about the freedom of the individual.

In both these cases (explanations and decision making), as with other kinds of reasoning there may of course be assumptions lying in the background which candidates will need to consider. Similarly there may be a need for clarification, or a need to judge the credibility of sources of information.

Recognise and evaluate special kinds of reasoning

Candidates will not be required to demonstrate detailed knowledge of the principles and approaches to decision making listed. They will be required to select and apply ethical principles or approaches in a decision making exercise (Unit 3) or in evaluating a text containing an extended argument (Unit 4).

5.3.2 Assessing Arguments

In addition to the requirements for AS, at A2:

Candidates are required to:	Unit	
	3	4
Assess arguments: recognise classic errors in the form of an argument i.e. excluded middle, converse, imply/entail, valid/invalid evaluate rhetorical and persuasive language	✓	✓
Recognise and apply basic logical ideas: recognise and apply some basic logical ideas, i.e. contradiction, (in)consistency, circularity, counter-example, necessary and sufficient conditions, generalisation		✓
Understand, interpret and draw conclusions from forms of statistical and numerical representation appropriate to informed citizens	✓	✓
Develop and present relevant arguments: establish continuum of choice establish and apply the criteria for judgement e.g. economic, cultural, ethical, religious, public opinion, risk, scientific evidence, law, consequences reach a reasoned judgement	✓	✓

Guidance for Teachers

Understand, interpret and draw conclusions from forms of statistical and numerical representation appropriate to informed citizens

It is not a requirement that candidates' knowledge of forms of statistical and numerical representation will be extended beyond those listed at AS. However the material presented will demand a greater sophistication in its analysis.

Develop and present relevant arguments

Units 3 and 4 assess candidates' ability to recognise and evaluate explanatory arguments and arguments justifying decisions about a course of action.

In Unit 3 Resolution of Dilemmas candidates are required to apply a decision-making framework to resolving a real-life issue. This framework has application to many aspects of candidates' own lives, for example decisions such as 'Should I go to university or get a job?' The notion of constructing a continuum of choices available can be applied to many situations where it is necessary to reach a decision or resolve a dilemma.

6 Further Information

6.1 Opportunities for Teaching

6.1.1 *Spiritual, Moral, Ethical, Social and Cultural Issues*

This specification provides opportunities for candidates to develop their spiritual, moral, ethical, social and cultural understanding throughout the course. In particular, the A2 units Resolution of Dilemmas and Critical Reasoning provide opportunities to develop candidates' understanding and skills in the following areas:

- conflict resolution;
- ability to take seriously arguments and perspectives different to their own.

6.1.2 *Health, Safety and Environmental Issues*

OCR has taken account of the 1988 Resolution of the Council of the European Community and the Report, *Environmental Responsibility: An Agenda for Further and Higher Education*, 1993, in preparing this specification and associated specimen assessments.

This specification can support environmental education and health and safety issues consistent with current EU agreements through delivery of the content outlined in Section 5.

6.1.3 *The European Dimension*

OCR has taken account of the 1988 Resolution of the Council of the European Community in preparing this specification and associated specimen assessments.

This specification can provide opportunities to consider issues in the European context through delivery of the content outlined in Section 5.

6.1.4 *Key Skills*

This specification provides opportunities for the development of the Key Skills of Communication, Application of Number, Information Technology, Working With Others, Improving Own Learning and Performance and Problem Solving.

Through classwork, coursework and preparation for external assessment, candidates may produce evidence for Key Skills at Level 3. However, the extent to which this evidence fulfils the requirements of the QCA Key Skills specifications at this level will be dependent on the style of teaching and learning adopted throughout the course. In some cases, the work produced may meet the evidence requirements of the Key Skills specifications at a higher or lower level.

Detailed guidance on the Key Skills evidence that a candidate might produce during the programme can be found on the OCR website www.ocr.org.uk.

6.2 Arrangements for Candidates with Special Needs

For candidates who are unable to complete the full assessment or whose performance may be adversely affected through no fault of their own, teachers should consult the *Inter-Board Regulations and Guidance Booklet for Special Arrangements and Special Consideration*.

In such cases, advice should be sought from the OCR Special Requirements team (telephone 01223 552505) as early as possible during the course.

6.3 Support and In-service Training for Teachers

To support teachers using this specification, OCR will make the following materials and services available:

- a full programme of In-Service training meetings arranged by the Training and Customer Support Division (telephone 01223 552950);
- Teacher support material, specimen question papers and mark schemes, available from the Publications department (telephone 0870 770 6622);
- past question papers and mark schemes, available from the Publications department after the first assessments (telephone 0870 770 6622);
- a report on the examination, compiled by senior examining personnel after each examination session.

7 Resource List

The following list of suggested titles is not intended to be exhaustive but details some of the texts available at the time of preparation of the specification (2004).

Teachers will need to use their professional judgement in assessing the suitability of the material contained in this list. It should be noted that the content of these resources does not necessarily match the specification closely.

7.1 Textbooks

Butterworth J, and Thwaites G. *Thinking Skills*, Cambridge University Press. ISBN 0 521 52149 1

Van den Brink-Budgen, R. *Critical Thinking for Students*, How to Books Ltd (Edition 2000) ISBN: 1 857 03634 4

7.2 Suggested Background Reading

Bowell T and Kemp G. *Critical Thinking: A Concise Guide*, Routledge, London, 2002

Copi IM and Burgess-Jackson K. *Informal Logic*, 2nd edition, Macmillan, New York, 1992

Ennis RH. *Critical Thinking*, Prentice Hall, 1995

Fisher A. *The Logic of Real Arguments*, Cambridge University Press, Cambridge, 1988

Fisher A. *Critical Thinking: An Introduction*, Cambridge University Press, Cambridge 2001

Govier T. *A Practical Study of Argument*, Wadsworth, Belmont, CA, 1985A R

LeBlanc G. *Thinking Clearly: A Guide to Critical Reasoning*, ISBN 0-393-31877-X 1998

Paul RW and Elder L. *Critical Thinking*, Pearson Education 2002

Phelan P and Reynolds P. *Argument and Evidence: Critical Analysis for the Social Sciences*, Routledge, London, 1995.

Shand J. *Arguing Well*, Routledge 2000

Thomson A. *Critical Reasoning in Ethics: A Practical Introduction*, Routledge, London

Thomson A. *Critical Reasoning: A Practical Introduction*, 2nd edition Routledge, London, 2002

Warburton N. *Thinking from A to Z*, Routledge, 1996 ISBN: 0415096863

Weston A. *A Rulebook for Argument*, Hackett

7.3 Suggested Resources

OCR teacher support materials for Critical Thinking are obtainable from OCR Publications, telephone 0870 770 6622, or downloadable from www.ocr.org.uk.

7.4 ICT and Internet-based Resources

www.datanation.com/fallacies/index.com

Mission Critical: <http://www2.sjsu.edu/depts/itl/graphics/main.html>

7.4.1 *Argument mapping software*

Reason!Able: trial copy downloadable from www.goreason.com.

VisualConcept software and MagNotes: details are obtainable from www.visual-concept.co.uk and www.cmcsite.com.

Appendix A: Glossary of Terms

Argument

In Critical Thinking, the term 'argument' refers to a set of claims, some of which are presented as reasons for accepting some further claim - the conclusion. Normally some basic claims are put forward as reasons which support further claims - the conclusions. There is an everyday sense of 'argument' which means roughly 'quarrel' but this is a quite different usage.

Argument Indicators

These are the words commonly used to show that reasons are being presented in support of a conclusion; they are words like *therefore...*, *so...*, *thus...*, *hence...*, *consequently...*, *which proves that...*, *I conclude that...*, *it follows that...* (where the dots are the conclusion) and *because...*, *since...*, *the reasons are...*, *the evidence is...*, (where the dots indicate). Many other phrases in the English language play a similar role.

Assumption

A belief is commonly called an assumption when it is clearly accepted or 'taken for granted' by a speaker or writer but is *not stated or made explicit* by them; for example, someone engaging in a discussion about miracles may fail to mention that he believes in the existence of an omnipotent god, but this may be obvious from other things he says. This is the most important usage of assumption in the context of this specification.

In ordinary usage, an *explicit* claim made by a speaker or writer is sometimes called an assumption, either: because we wish to note that the speaker or writer *has given no reasons for accepting it* or because we wish to challenge the claim.

Thus, if someone was arguing the case for believing in miracles and clearly and explicitly based their case on the claim that there is an omnipotent god, one might say: 'but this is only an assumption; why should I accept it?' or 'but this is only an assumption; I don't believe it at all.'

Belief

This term refers to the claims/sentences that an individual person holds to be true or right. There are many different kinds of beliefs, including scientific claims ('the Earth goes around the Sun'), religious beliefs ('God created Man in His own image'), moral principles ('it is wrong to break promises'), prudential beliefs ('it is better to buy a house than to rent in the UK'); and many others. If an individual A believes a claim P, P may be true or false - indeed many individuals hold many beliefs which are false; furthermore, beliefs may be harmless or pernicious, plausible or not, and some may even be meaningless or vacuous.

Conclusion

If reasons are presented for accepting some other belief, C, then C is called a conclusion (of that argument). If reasons are given for one conclusion, which is then used as a reason for a further conclusion and so on - in a chain of reasoning - the last is called the **main conclusion** and the earlier ones in the chain are called **intermediate conclusions**.

A conclusion does not necessarily come at the end of a piece of reasoning; it may be stated at the beginning, then argued for. The conclusion of a piece of reasoning might be a factual claim ('so he must be the murderer'), a recommendation ('so you ought to buy this car'), an interpretation ('so Iago should be seen as a treacherous villain'), a decision ('so I shall take the job') etc.

Consistent/Inconsistent

Two claims are consistent provided they could both be true or correct at the same time. They are inconsistent if they CANNOT both be true or correct at the same time. Thus, 'Mount Everest is 29,000 feet high' is consistent with 'Mount Everest is in Nepal' but is inconsistent with 'Mount Everest is 15,000 metres high'. The Ten Commandments are consistent with each other but not with 'Do whatever you want to do regardless of others'. People are consistent provided the things they say could be true or correct together; they are inconsistent if this is not the case. Sometimes inconsistency is fairly obvious, as in the Mount Everest example above, but sometimes it is deeply buried in what people say and believe.

Contradiction

Strictly speaking someone contradicts themselves if they say or believe 'A is true' and 'A is false' at the same time, for example, 'Mount Everest is 29,000 feet high' and 'Mount Everest is not 29,000 feet high'. Sometimes contradictions are very evident in what a person says or believes (as in the Everest example) but often they are deeply buried. If an author contradicts himself, he is clearly **inconsistent** (since his claims cannot both be true), but inconsistent claims could both be false, so inconsistency does not necessarily imply a contradiction. However, these two terms are commonly used to mean much the same (see OED).

Converse

The term converse is usually used to refer to the 'opposite' (in a certain sense) of a hypothetical. The converse of any hypothetical 'If A then B' is simply the hypothetical 'If B then A'. Thus the converse of 'If fire is burning then oxygen is present' is 'If oxygen is present then fire is burning'. Notice that in this example although the initial hypothetical is true, its converse is not. Sometimes the converse of a true hypothetical is true and sometimes not.

Counter-Example

General claims may be challenged by finding counter-examples. Suppose someone claims that 'all politicians are dishonest'; if we can find one or more politicians who are honest then these are counter-examples to the general claim and it is shown to be mistaken. Whether counter-examples greatly weaken a general claim depends on the case; in this case, the proponent of the original claim might just say 'OK, nearly all politicians are dishonest' and this may serve his purpose just as well. To challenge this further claim would require quite a few more counter-examples. In another example, consider the general principle that 'it is always wrong to break a promise'; if you can then describe a situation in which it seems right to break a promise this will be a counter-example to the general principle. For example, if breaking a promise will save the lives of many innocent people in a war situation, this might well be the right thing to do and this would be a counter-example to the general principle.

Entails

In contexts where a case is being argued or discussed, this term is often used to mean something like 'is a logically inescapable consequence'. For example, a company's Finance Director might say of his company's finances, 'The planned investment programme will entail heavy borrowing' meaning 'We don't have sufficient cash to finance this investment ourselves and the only way to finance it will be by heavy borrowing.' In everyday contexts, 'entails' is often used more loosely - so that there is a substantial overlap between the common usage of 'entails' and 'implies' (see **Imply/Implication**).

Fallacy

The central usage of this term is to refer to a pattern of reasoning which is mistaken and which people commonly use. For example, it is surprisingly common for people to argue 'A came after B so B caused A' (as in 'I got my cold after Mary so I must have caught it from her'). Another such pattern is what is called the 'ad hominem fallacy', where you argue against what someone says not by addressing their claims but by attacking them (as in 'We should not listen to the complaints of prisoners because they are convicted criminals'). It can be quite difficult to recognise when a piece of reasoning is genuinely a fallacy. The term fallacy is also more loosely used to refer to any error in reasoning.

Flaws

An argument may be regarded as having a flaw, if it gives weak support, or no support, to its conclusion. This may be because there is a mistake in logic in moving from the reasons to the conclusion, or because the reasons support the conclusion only if an assumption is implausible.

Hypothetical

This is a sentence which has the general form 'if A then B' where A and B are sentences. For example, 'If you work hard at this course then you will get a good grade' is a hypothetical statement; so is the sentence 'if we continue to damage the ozone layer there will be far more cases of skin cancer'. There are many equivalent ways of expressing hypothetical statements in the English language, for example, 'suppose we continue to damage the ozone layer; in that case there will be far more cases of skin cancer', or 'unless we stop damaging the ozone layer, there will be far more cases of skin cancer'; there are many others too.

Imply/Implication

There is an everyday sense of these words which means roughly 'suggests' or 'leads me to believe', as when the detective says, 'the evidence implies that Smith was present at the murder'. However, the word 'imply' is often used more strictly to mean 'if...then...'. For example, if someone says, 'the presence of fire implies that there must be oxygen present', they could equally well say, 'if there is fire then oxygen must be present'. In general, to say that 'A implies B' is to say something like 'if A then B', either strictly as in the oxygen example or more loosely as in the detective example. To say that 'A entails B' is usually to say 'A implies B' in this strict usage of 'implies'. (See **Entails**).

Inference

Any argument reaches a conclusion on the basis of some reasons. An inference is the 'step' from reasons to conclusion, the 'move' from one to the other. Thus, if someone argues, 'Some people have solved their own unemployment problem by great ingenuity in searching for a job or by willingness to work for less so all the unemployed could do this', the inference is the move from 'some people have ...' to 'all the unemployed could do this'. Though the reason presented in this argument has often been true, the inference as to the argument's conclusion is much more questionable.

Knowledge

In its everyday usage this term is used in several ways. One usage refers to knowing some fact (as in 'Baljit knows that chemotherapy will make her hair fall out' or 'Baljit knows that the Earth is 93 million miles from the Sun'); another refers to knowing *how* to do something (as in 'Baljit knows *how* to ride a bicycle'); another refers to *being acquainted* with an object, place or person (as in 'Baljit knows New York').

If someone claims to know the fact, for example, that 'The Earth is 93 million miles from the Sun', then this is something they take to be true. If they are not sure about its truth they will tend not to say they 'know' it, but will probably say they 'suspect it is true' or it is their 'opinion' or some such alternative to 'know'.

Of course, people *claim* to know things which are in fact false and in that case the rest of us would say they don't really *know* it. For a person to *know*, for example, that AIDS is caused by a virus, they would have to accept this, they would have to have a good reason to accept it and it would have to be *true*.

Necessary and Sufficient Conditions

To say that 'A is a necessary condition for B' is to say that 'if A is not the case, B will not be the case either'. Thus, if a teacher says 'a good musical ear is a necessary condition for learning to play the violin', this is the same as saying 'if you do not have a good musical ear, you will not be able to learn to play the violin'. To say that 'A is a sufficient condition for B' is to say that 'if A is the case, then B will be the case also'. Thus, if a lawyer says, 'being born in the UK of British parents is a sufficient condition for obtaining a British passport' this is the same as saying, 'if you are born in Britain of British parents you can have a British passport'. Clearly, although a good musical ear is necessary for learning to play the violin, it is not sufficient (you will need lots of practice too). Equally clearly, although being born in the UK of British parents is sufficient to get a British passport, it is not necessary, since other people can qualify for British passports too.

Principles

General principles have implications which go beyond the case in point. There are different kinds of principle, e.g. legal rules, medical ethics, moral guidelines, business or working practices. Principles may be used in an argument as reasons, conclusions, or assumptions.

Reasons

Arguing a case consists of giving reasons for a conclusion. The reasons are presented as supporting the conclusion. If someone offers reasons for a conclusion they present themselves as both believing the reasons and believing that they support the conclusion.

Sufficient Conditions

See Necessary and Sufficient Conditions.

Supposition (and Suppositional Reasoning)

A supposition is a sentence which begins with the word 'suppose' or some synonym. For example, someone who is thinking about current experiments on genetically modified crops might say, 'Suppose these experiments do risk dangerous contamination of other crops,...'. Such a sentence does not commit the speaker to the view that these experiments do carry a dangerous risk; he or she is simply speculating about what would be the case **if** this were so. Reasoning from such starting points is often called 'what if' reasoning, or hypothetical reasoning, or suppositional reasoning. This kind of reasoning is very common in theoretical contexts. The police have to use it too, for example asking 'What if Smith really was in Amsterdam at the time of the murder...?'

Valid/Invalid

'Valid' is often used as a very general term of approval, as in 'The Headteacher's policy on truancy is perfectly valid.' but it also has a very specific meaning in the context of argument appraisal where it is short for 'deductively valid'. Consider the argument 'If Smith's fingerprints are on the gun then he is the murderer. His fingerprints are clearly detectable on the gun. So he must be the murderer'. In this argument, **if** the two reasons are true, then the conclusion **must** be true; it is **impossible** for the reasons to be true and the conclusion false. Such an argument is called 'deductively valid' or 'valid' for short. Validity in this sense is a matter of the relationship between the reasons and their conclusion. In this usage, reasons and conclusion may be true or false (but not valid) and arguments as a whole are valid or not (but not true or false). An argument is said to be invalid if it is not valid.