

Syllabus changes (including Cambridge Pre-U) Version 2.0 June 2014

This major annual update provides advance notification of changes to syllabuses.

Please share the relevant pages with subject staff.

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Including:

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Cambridge O Level
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Cambridge Pre-U

Important information

This is version 2.0 of the Syllabus Changes. We've highlighted any updates at the front of each section.

Teacher support

We offer a wide range of support resources to help teachers plan and deliver our programmes and qualifications. We offer a customised support package for each Cambridge syllabus. Learn more at www.cie.org.uk/qualifications

Teaching and learning resources

- Schemes of work provide teachers with a medium-term plan with ideas on how to deliver the course.
- Endorsed textbooks produced by leading publishers. We have quality checked these materials to make sure that they match the syllabus well.
- Resource lists to help support teaching, including textbooks and websites.

Exam preparation resources

- Past question papers and mark schemes so teachers can give your learners the opportunity to practise answering different questions.
- Example candidate responses to help teachers to see the level of performance needed to achieve key grades and understand exactly what examiners are looking for.
- Principal examiner reports describing learners' overall performance on each part of the papers. The reports give insight into common misconceptions shown by learners, which teachers can address in lessons.

Support for teachers

Professional development

Face-to-face training

We hold workshops around the world to support teachers in delivering Cambridge syllabuses and developing their skills.

Online training

We offer self-study and tutor-led online training courses via our virtual learning environment. A wide range of syllabus-specific courses and skills courses is available. We also offer training via video conference and webinars.

Qualifications

We offer a wide range of practice-based qualifications at Certificate and Diploma level, providing a framework for continuing professional development.

Learn more

Learn more about support available for each syllabus at www.cie.org.uk/qualifications

Visit our online resource bank and community forum at teachers.cie.org.uk

Useful links

Customer Services www.cie.org.uk/help

LinkedIn <http://linkd.in/cambridgeteacher>

Twitter [@cie_education](https://twitter.com/cie_education)

Facebook www.facebook.com/cie.org.uk

Contents for Cambridge Primary and Cambridge Secondary 1

Please share the relevant pages with subject staff.

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Finding your way round

Select the relevant subject to learn more about changes highlighted by these icons:

-  New syllabus
-  Revisions to syllabus
-  Change to availability
-  Advanced notice of withdrawal
-  Regulated by Ofqual (UK only)

Updated information

Information is now included on Cambridge ICT Starters (Initial Steps, Next Steps, On Track) on page 4. Changes are marked by black vertical lines.

Syllabus changes

Cambridge International Diploma

Cambridge ICT Starters 	
Cambridge International Diploma Cambridge ICT Starters (Initial Steps, Next Steps, On Track)	<p>From January 2015</p> <p>Small changes to syllabus content</p> <p>A number of minor revisions are being made to the syllabus to bring the computing terminology up to date and to make the wording of some sections clearer.</p> <p>The updated syllabus will be available on our public website at www.cie.org.uk in November 2014.</p> <p>The only changes being made to the assessment are those reflecting the minor revisions to syllabus wording. There will be no changes to the structure of the assessment.</p>

Contents for Cambridge English language and literature

Please share the relevant pages with subject staff.

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Finding your way round

Select the relevant subject to learn more about changes highlighted by these icons:

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Updated information

We have updated the information on Cambridge IGCSE English as a Second Language (speaking endorsement) (0510) and Cambridge IGCSE English as a Second Language (count-in speaking) (0511) on pages 6 and 7. Changes are marked by black vertical lines.

Syllabus changes

Cambridge IGCSE

English as a Second Language 	
<p>Cambridge IGCSE English as a Second Language, Syllabus 0510 (speaking endorsement)</p>	<p>From November 2014</p> <p>Changes to previously published syllabus document for 2014, 2015 and 2016</p> <p>The arrangements for the recording of the Component 5 Speaking test have been updated. The recording will no longer be paused after the warm-up period of the test. It must be recorded throughout.</p> <p>From June 2015</p> <p>This syllabus has been renamed Cambridge IGCSE English as a Second Language (speaking endorsement). It retains the same structure, choice of components and balance of Reading, Writing and Speaking and Listening assessment objectives. No major changes in teaching or resources are required.</p> <ul style="list-style-type: none"> • Listening components now include a new multiple-matching task and a three-option multiple-choice task. The Extended component total marks for Listening will be increased to 40 (previously 36 marks). The Core component total marks for Listening will remain at 30. Guidance for the maximum number of words required is given for some questions. • The assessment objectives for Listening and Reading have been reworded to ensure coverage of the full range of learners' abilities. The revisions are designed to include testing inference, implied meaning, opinion and attitude. • In the Speaking component, examining candidates individually is encouraged as best practice. Examining candidates in pairs is discouraged. <p>Full details are contained in the 2015 syllabus and 2015 specimen papers available on our public website at www.cie.org.uk</p> <p>From June 2016</p> <p>In the Speaking component, examining candidates in pairs will not be permitted.</p>

English as a Second Language  	
<p>Cambridge IGCSE English as a Second Language, Syllabus 0511 (count-in speaking)</p>	<p>From November 2014</p> <p>Changes to previously published syllabus document for 2014, 2015 and 2016</p> <p>The arrangements for the recording of the Component 5 Speaking test have been updated. The recording will no longer be paused after the warm-up period of the test. It must be recorded throughout.</p> <p>From June 2015</p> <p>This syllabus has been renamed Cambridge IGCSE English as a Second Language (count-in speaking). It retains the same structure, choice of components and balance of Reading, Writing and Speaking and Listening assessment objectives. No major changes in teaching or resources are required.</p> <ul style="list-style-type: none"> • Listening components now include a new multiple-matching task and a three-option multiple-choice task. The Extended component total marks for Listening will be increased to 40 (previously 36 marks). The Core component total marks for Listening will remain at 30. Guidance for the maximum number of words required is given for some questions. • The assessment objectives for Listening and Reading have been reworded to ensure coverage of the full range of learners' abilities. The revisions are designed to include testing inference, implied meaning, opinion and attitude. • In the Speaking component, examining candidates individually is encouraged as best practice. Examining candidates in pairs is discouraged. <p>Full details are contained in the 2015 syllabus and 2015 specimen papers available on our public website at www.cie.org.uk</p> <p>From June 2016</p> <p>In the Speaking component, examining candidates in pairs will not be permitted.</p>

First Language English



Cambridge IGCSE
 First Language English,
 Syllabus 0500

From March 2015

In addition to the June and the November exam series, this syllabus is also available for examination in March **for India only**.

From 2015

This syllabus has been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.

Changes to syllabus content

- The syllabus aims and assessment objectives have been revised. Speaking and listening assessment objectives are now named 'SL'.
- Grade descriptions have been updated and moved to Section 4.
- Syllabus content for the Core and Extended tiers has been updated.

Changes to assessment

- Candidates are given approximate word counts for their answers rather than page lengths.
- For Papers 1 and 2, each question is categorised. Papers 1 and 2 have been revised to align the Core and Extended tiers:
 - Paper 1 now includes a second reading passage, Passage B. The combined word count for both passages ranges from 800 to 950 words.
 - For Papers 1 and 2, Passages A and B may be on a similar topic but are not necessarily 'linked by a common theme'. The word counts for Passage A and Passage B have been specified.
 - Paper 1, Question 1 (Comprehension) has fewer sub-questions and is now worth 20 marks.
 - For Paper 1, Question 2 and Paper 2, Question 1 (Extended responses), candidates respond using a specified text type for a range given in the syllabus.
 - For Paper 2, Question 2 (Language), candidates comment on a specified number of choices of words and phrases.
 - For Papers 1 and 2, candidates answer three questions on two passages. A new Question 3 (Summary) has been added for Paper 1. Question 3 for both Papers 1 and 2 is structured in two parts – notes (content points) and summary writing. For Paper 1, this question is awarded a total of 15 marks, with 10 marks for reading and 5 marks for writing. For Paper 2, this question is awarded a total of 20 marks, with 15 marks for reading and 5 marks for writing.
 - For Papers 1 and 2, Questions 1 and 2 are in response to Passage A and Question 3 is in response to Passage B.
- For Paper 3, Section 1 (Directed Writing), the word count for the passage(s) ranges from 650 to 750 words. Candidates respond in the form of a discursive/argumentative letter or article.
- For Paper 3, Section 2 (Composition), candidates answer one question from a choice of two descriptive and two narrative titles. The two discursive/argumentative tasks have been removed.

First Language English (continued)  	
Cambridge IGCSE First Language English, Syllabus 0500	<ul style="list-style-type: none"> In Component 4 (Coursework Portfolio), Assignment 2 is called 'descriptive and/or narrative', removing the reference to 'imaginative'. Specific guidance is provided to Centres on the text to be used for Assignment 3. Instructions for marking and moderating Components 4, 5 and 6 have been clarified. In particular, the instructions for Component 5 (Speaking and Listening Test) and Component 6 (Speaking and Listening Coursework) clarify that all candidates are to be recorded for the Speaking and Listening Test and for the individual and pair-based activities in the Speaking and Listening Coursework. <p>Administration of the syllabus</p> <p>For information on administering this syllabus visit the Help area of our public website at www.cie.org.uk/help</p>

First Language English  	
Cambridge IGCSE First Language English, Syllabus 0522	<p>From June 2015</p> <p>This syllabus has been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> The syllabus aims and assessment objectives have been revised. Speaking and listening assessment objectives are now named 'SL'. Grade descriptions have been updated and moved to Section 4. Syllabus content for the Core and Extended tiers has been updated. <p>Changes to assessment</p> <ul style="list-style-type: none"> Candidates are given approximate word counts for their answers rather than page lengths. For Papers 1 and 2, each question is categorised. Papers 1 and 2 have been revised to align the Core and Extended tiers: <ul style="list-style-type: none"> Paper 1 now includes a second reading passage, Passage B. The combined word count for both passages ranges from 800 to 950 words. For Papers 1 and 2, Passages A and B may be on a similar topic but are not necessarily 'linked by a common theme'. The word counts for Passage A and Passage B have been specified. Paper 1, Question 1 (Comprehension) has fewer sub-questions and is now worth 20 marks. For Paper 1, Question 2 and Paper 2, Question 1 (Extended responses), candidates respond using a specified text type from a range given in the syllabus. For Paper 2, Question 2 (Language), candidates comment on a specified number of choices of words and phrases.

First Language English (continued)  	
<p>Cambridge IGCSE First Language English, Syllabus 0522</p>	<ul style="list-style-type: none"> - For Papers 1 and 2, candidates answer three questions on two passages. A new Question 3 (Summary) has been added for Paper 1. Question 3 for both Papers 1 and 2 is structured in two parts – notes (content points) and summary writing. For Paper 1, this question is awarded a total of 15 marks, with 10 marks for reading and 5 marks for writing. For Paper 2, this question is awarded a total of 20 marks, with 15 marks for reading and 5 marks for writing. - For Papers 1 and 2, Questions 1 and 2 are in response to Passage A and Question 3 is in response to Passage B. <ul style="list-style-type: none"> • For Paper 3, Section 1 (Directed Writing), the word count for the passage(s) ranges from 650 to 750 words. Candidates respond in the form of a discursive/argumentative letter or article. • For Paper 3, Section 2 (Composition), candidates answer one question from a choice of two descriptive and two narrative titles. The two discursive/argumentative tasks have been removed. • In Component 4 (Coursework Portfolio), Assignment 2 is called 'descriptive and/or narrative', removing the reference to 'imaginative'. Specific guidance is provided to Centres on the text to be used for Assignment 3. • Instructions for marking and moderating Components 4, 5 and 6 have been clarified. In particular, the instructions for Component 5 (Speaking and Listening Test) and Component 6 (Speaking and Listening Coursework) clarify that all candidates are to be recorded for the Speaking and Listening Test and for the individual and pair-based activities in the Speaking and Listening Coursework. <p>Availability to private candidates</p> <p>Specific components of this syllabus are available to private candidates. Private candidates can opt for either Paper 1 or Paper 2 and must opt for Paper 3 and Component 5.</p> <p>Administration of the syllabus</p> <p>For information on administering this syllabus visit the Help area of our public website at www.cie.org.uk/help</p>

Literature (English)   	
<p>Cambridge IGCSE Literature (English), Syllabus 0476</p>	<p>From June 2014</p> <p>Details of set texts are contained in the relevant syllabus.</p> <p>Last examination: November 2014</p> <p>This syllabus is being withdrawn. The last exam series is November 2014. From June 2015 this syllabus is replaced by Cambridge IGCSE Literature (English) (0486).</p>

Literature (English)   	
<p>Cambridge IGCSE Literature (English), Syllabus 0486</p>	<p>From June 2014 Details of set texts are contained in the relevant syllabus.</p> <p>From March 2015 In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2015 This syllabus has been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to aspects of the set text papers Component numbering, weighting and options:</p> <ul style="list-style-type: none"> • All candidates take Component 1 which carries 50% of the overall weighting. This covers prose and poetry set texts. This will be combined with: <ul style="list-style-type: none"> – a closed text drama component (50%) OR – an open text drama component (25%) + unseen component (25%) OR – an open text drama component (25%) + coursework component (25%). <p>‘Closed’/‘open’ text:</p> <ul style="list-style-type: none"> • Component 1 is a closed text component, i.e. candidates may not take their books into the examination. • Poems (or extracts from poems) referred to will now be printed on the question paper for all poetry questions. • There is a choice of closed and open text components for drama texts. <p>Question types and number of questions on set texts:</p> <ul style="list-style-type: none"> • On each set text there will be two questions: one passage-based and one essay question. • ‘Empathic’ tasks will no longer feature on the question papers. (‘Empathic’ tasks may still be used in coursework.) • For the requirements of individual components, see the syllabus. <p>Cambridge International Level 1/Level 2 Certificate in Literature (English) (0476) has been withdrawn. All Centres in the UK are now entitled to enter for syllabus 0486.</p> <p>Details of set texts are contained in the relevant syllabus.</p> <p>From 2016 Details of set texts are contained in the relevant syllabus.</p>

World Literature	
<p>Cambridge IGCSE World Literature, Syllabus 0408</p>	<div style="text-align: right;">    </div> <p>From June 2014</p> <p>Following a pilot period, this syllabus is available to all Centres for first assessment in June 2014.</p> <p>This syllabus involves the study of world literature texts in English translation (or written originally in English).</p> <p>There are three components:</p> <p>Paper 1: Coursework Portfolio (50%). Candidates submit two written assignments and one oral assignment on world literature texts. Assignments are set and marked by teachers and externally moderated by Cambridge.</p> <p>Paper 2: Unseen (25%). Candidates write a critical appreciation of previously unseen poetry or prose.</p> <p>Paper 3: Set Text (25%). Candidates answer extract-based and essay questions on a set world literature text.</p> <p>Full details are contained in the 2014 syllabus on our public website at www.cie.org.uk</p> <p>You can learn more about this new syllabus at www.cie.org.uk/new</p>

Cambridge O Level

Literature in English 	
<p>Cambridge O Level Literature in English, Syllabus 2010</p>	<p>From June 2014 Details of set texts are contained in the relevant syllabus.</p> <p>From June 2015 This syllabus has been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to aspects of the set text papers Component structure: There will be two compulsory components, timetabled separately.</p> <ul style="list-style-type: none"> • Component 1: Prose and Poetry. Candidates answer two questions, each on a different text. • Component 2: Drama. Candidates answer two questions. (These may both be on one text, or on two different texts.) <p>Duration, component marks, and component weighting:</p> <ul style="list-style-type: none"> • Component 1: 1 hour 30 minutes (50 marks; 50% weighting) • Component 2: 1 hour 30 minutes (50 marks; 50% weighting). <p>Question types:</p> <ul style="list-style-type: none"> • There will be a choice of passage-based and essay questions on each prose and drama text. On poetry texts, all poems mentioned in the questions will now be printed on the question paper. • ‘Empathic’ questions will no longer be set. <p>Details of set texts are contained in the relevant syllabus.</p> <p>From June 2016 Details of set texts are contained in the relevant syllabus.</p>

Cambridge International AS and A Level

English Language NEW 	
<p>Cambridge International AS and A Level English Language, Syllabus 9093 Note: from June 2014, this syllabus replaces Cambridge International AS Level English Language (8693)</p>	<p>From June 2014</p> <p>We are introducing a new AS and A Level qualification in English Language for first assessment in June 2014.</p> <p>The current AS Level syllabus 8693 was examined for the last time in November 2013. It is replaced by Papers 1 and 2 of syllabus 9093. These will be very similar to Papers 1 and 2 of syllabus 8693.</p> <p>The main changes are as follows:</p> <ul style="list-style-type: none"> • Paper 1 is called 'Passages'. It has an increased duration of 2 hours 15 minutes. There are still three questions on the paper, but one of these will now be compulsory. • Paper 2 is called 'Writing'. Section A is headed 'Imaginative Writing' (i.e. narrative/descriptive) and Section B is headed 'Writing for an Audience' (i.e. discursive/argumentative). There are three questions in each section. Candidates answer one question from each section. <p>From 2014 candidates can achieve an A Level in English Language over different exam series, or in one single exam series. Candidates who sat syllabus 8693 in 2013 who wish to sit Papers 3 and 4 (i.e. the A Level papers) of syllabus 9093 in 2014 will be able to gain an A Level.</p> <p>In addition to Paper 1 and Paper 2, A Level candidates will take:</p> <ul style="list-style-type: none"> • Paper 3: Text Analysis (2 hours 15 minutes). Candidates answer a directed writing task relating to a passage or passages, and compare the style and language of texts printed on the question paper. • Paper 4: Language Topics (2 hours 15 minutes). Candidates write two essays in relation to set topic areas, such as English as a global language or child language acquisition. <p>Full details are contained in the relevant syllabus.</p> <p>You can learn more about this new syllabus at www.cie.org.uk/new</p> <p>From March 2016</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p>

Language and Literature in English 	
<p>Cambridge International AS Level Language and Literature in English, Syllabus 8695</p>	<p>From June 2014</p> <p>Paper 2 has been renamed 'Writing'. Section A is headed 'Imaginative Writing' (i.e. narrative/descriptive) and Section B is headed 'Writing for an Audience' (i.e. discursive/argumentative). There are three questions in each section. Candidates answer one question from each section.</p>

Literature in English 	
<p>Cambridge International AS and A Level Literature in English, Syllabus 9695</p>	<p>From June 2016</p> <p>This syllabus has been revised. Teachers are advised to read the whole syllabus document before planning their teaching programme.</p> <p>The main changes include:</p> <ul style="list-style-type: none"> On Paper 5, Shakespeare and other pre-20th Century Texts, candidates will continue to answer two questions: one question from Section A (Shakespeare) and one question from Section B. However, candidates will now be required to answer at least one passage-based question (b) from the question paper as a whole. So, if candidates answer an essay question (a) on Shakespeare in Section A, they will be required to choose a passage-based question (b) in Section B. Paper 6 has been renamed 1900 to the Present. In Component 8, Coursework, quotations are now excluded from the 3000 word limit. The instruction is revised as follows: A minimum of 2000 and a maximum of 3000 words should be submitted in total (excluding quotations). <p>Availability by exam series</p> <p>In 2016, assessments will be based on the revised syllabus only.</p> <ul style="list-style-type: none"> Candidates can carry forward the result of their Cambridge International AS Level assessments in 2015 to complete the Cambridge International A Level in 2016. The Cambridge International A Level assessments in the 2016 exam series are based on the revised syllabus. Assessments for candidates retaking Cambridge International AS Level or A Level in 2016 are based on the revised syllabus. <p>You can learn more about this revised syllabus at www.cie.org.uk/new</p>

Cambridge Pre-U Principal Subjects

Literature in English	
<p>Cambridge International Level 3 Pre-U Certificate Literature in English (Principal), Syllabus 9765</p>	<div style="text-align: right;">    </div> <p>From November 2014 The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016 This syllabus has been revised. Significant changes to the syllabus are indicated by black vertical lines either side of the text. Teachers are advised to read the whole syllabus document before planning their teaching programme.</p> <p>The specimen papers have been refreshed, using content from past question papers and mark schemes.</p>

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Syllabus changes

Cambridge IGCSE

Additional Mathematics 	
Cambridge IGCSE Additional Mathematics, Syllabus 0606	From March 2015 In addition to the June and the November exam series, this syllabus is also available for examination in March for India only .

Mathematics   	
Cambridge IGCSE Mathematics, Syllabus 0580	From March 2015 In addition to the June and the November exam series, this syllabus is also available for examination in March for India only . From 2015 Changes to syllabus content This syllabus has been revised and restructured. The Core curriculum (C) and the Extended curriculum (E) are presented on facing pages and additional notes and examples have been added where appropriate. The following content has been removed: <ul style="list-style-type: none"> Shear (H) and stretch (S) transformations of the plane (37, Supplement). Content now includes clarification of the following: <ul style="list-style-type: none"> Find the Lowest Common Multiple (LCM) and Highest Common Factor (HCF) of two numbers (C1.1); of two or more numbers (E1.1). The meaning and rules of indices (C1.7 and C2.4, E1.7 and E2.4). The nth term of linear sequences, simple quadratic and cubic sequences (C2.7 and E2.7); exponential sequences and simple combinations of these (E2.7). Calculate lengths of similar figures (C3.4 and E3.4). Positive and fractional scale factors for enlargements (C7.2 and E7.2); negative scale factors (E7.2). Convert recurring decimals to fractions (E1.5). The following new content has been added: <ul style="list-style-type: none"> Knowledge of compound interest formula (E1.16). Use exponential growth and decay in relation to population and finance (E1.17). Draw and interpret graphs representing exponential growth and decay problems (E2.10). Find the gradient of parallel and perpendicular lines (E5.6).

Mathematics (with coursework) 	
Cambridge IGCSE Mathematics (with coursework), Syllabus 0581	Last examination: November 2014 This syllabus is being withdrawn. The last exam series is November 2014.

Cambridge International AS and A Level

Mathematics 	
Cambridge International AS and A Level Mathematics, Syllabus 9709	From March 2016 In addition to the June and the November exam series, this syllabus is also available for examination in March for India only .

Cambridge Pre-U Short Courses

Further Mathematics  	
Cambridge International Level 3 Pre-U Certificate Further Mathematics (Short Course), Syllabus 1348	From June 2016 This syllabus has been reviewed, but there are no significant changes. Teachers are advised to read the whole syllabus carefully before planning their teaching programme. We have reviewed and clarified the syllabus content and provided some additional detail in the content of the following syllabus sections: <ul style="list-style-type: none"> • 'roots of polynomial equations' (p.12 of the syllabus) • 'differential equations' (p.14 of the syllabus). The specimen papers have been refreshed.

Mathematics (Statistics with Pure Mathematics)  	
Cambridge International Level 3 Pre-U Certificate Mathematics (Statistics with Pure Mathematics) (Short Course), Syllabus 1347	From June 2016 This syllabus has been reviewed, but there are no significant changes. Teachers are advised to read the whole syllabus carefully before planning their teaching programme. The numbering of the assessment objectives (AO) has been updated to bring them into line with the other Cambridge Pre-U mathematics qualifications. AO1 and AO2 have swapped order but the weighting and relationship between the AOs and components has not changed. The specimen papers have been refreshed.

Cambridge Pre-U Principal Subjects

Further Mathematics   	
<p>Cambridge International Level 3 Pre-U Certificate Further Mathematics (Principal), Syllabus 9795</p>	<p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>This syllabus has been revised. Significant changes are indicated by black vertical lines either side of the text. Teachers are advised to read the whole syllabus carefully before planning their teaching programme.</p> <p>Changes to syllabus content</p> <p>We have revised and clarified the syllabus content.</p> <p>Additional detail in the content of the following syllabus sections has been provided:</p> <ul style="list-style-type: none"> • ‘roots of polynomial equations’ (p.13 of the syllabus) • ‘differential equations’ (p.15 of the syllabus). <p>In the mechanics section we have replaced ‘relative motion’ with ‘equilibrium of a rigid body’.</p> <p>The specimen papers have been refreshed.</p>

Mathematics	
Cambridge International Level 3 Pre-U Certificate Mathematics (Principal), Syllabus 9794	<div style="text-align: right;">    </div> <p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>This syllabus has been revised. Significant changes are indicated by black vertical lines either side of the text. Teachers are advised to read the whole syllabus carefully before planning their teaching programme.</p> <p>Changes to syllabus content</p> <p>We have revised and clarified the syllabus content.</p> <p>Additional detail in the content of the following syllabus sections has been provided:</p> <ul style="list-style-type: none"> • ‘algebra’ (p.13 of the syllabus) • ‘coordinate geometry’ (p.14 of the syllabus) • ‘logarithms and exponentials’ (p.15 of the syllabus) • ‘differentiation’ (p.15 of the syllabus) • ‘complex numbers’ (p.17 of the syllabus). <p>Changes to scheme of assessment</p> <ul style="list-style-type: none"> • The percentage range of the assessment objectives (AO) has been revised under the relationship between the scheme of assessment and assessment objectives section in the syllabus. • In Papers 1 and 2 the balance of AO1 and AO3 has been changed slightly to make the ranges for both papers identical. • In Paper 3 the balance of all the AOs has been changed slightly. • The specimen papers have been refreshed.

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Finding your way round

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-  New syllabus
-  Revisions to syllabus
-  Change to availability
-  Advanced notice of withdrawal
-  Regulated by Ofqual (UK only)

Updated information

We have updated the information on Cambridge IGCSE Biology (0610), Cambridge IGCSE Chemistry (0620), Cambridge IGCSE Physics (0625), Cambridge O Level Marine Science (5180) and Cambridge International AS and A Level Chemistry (9701) on pages 23–50, 51–56, 58–67, 70 and 77–83. Changes are marked by black vertical lines.

Syllabus changes

Cambridge IGCSE

Agriculture 	
<p>Cambridge IGCSE Agriculture, Syllabus 0600</p>	<p>From November 2014</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • There are small insertions of material in Section 5, Crop Protection – addition of weeds (section (a)), weed control (section (b)) and herbicides (section (i)). • There are no other significant changes to the content. <p>Changes to assessment</p> <ul style="list-style-type: none"> • The presentation of the weighting of the assessment objectives has been changed and they have been renamed, but the assessment is unchanged. • A table is included showing the marks for the assessment objectives within the components. <p>Clarification of requirements for the coursework practical exercises</p> <ul style="list-style-type: none"> • For clarification on the coursework practical exercises requirements please see Section 7.2 in the 2015 syllabus available on our public website at www.cie.org.uk <p>From November 2015</p> <p>Clarification of requirements for the coursework practical exercises</p> <ul style="list-style-type: none"> • Section 7.2 has been revised to clarify the requirements for the coursework practical exercises.
Biology   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<p>From March 2015</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2016</p> <p>In 2016 and beyond, assessments will be based on the revised syllabus only.</p> <p>This syllabus has been revised. Some changes are significant. Teachers are strongly advised to read the whole of the syllabus document before planning their teaching programme.</p> <p>Changes to assessment</p> <ul style="list-style-type: none"> • The Coursework option has been withdrawn. • A new Multiple Choice paper has been introduced for Extended candidates.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<ul style="list-style-type: none"> • Core candidates now take Paper 1: Multiple Choice (Core), Paper 3: Theory (Core) and either Paper 5: Practical Test or Paper 6: Alternative to Practical. • Extended candidates now take Paper 2: Multiple Choice (Extended), Paper 4: Theory (Extended) and either Paper 5: Practical Test or Paper 6: Alternative to Practical. <p>Changes to syllabus content</p> <p>The content has been revised and updated:</p> <ol style="list-style-type: none"> 1. The wording of some learning outcomes has been changed for clarification. 2. New learning outcomes have been added to the syllabus content. 3. Some learning outcomes have moved from Core to Supplement and others from Supplement to Core. 4. Some learning outcomes have been removed from the syllabus content. 5. The description of the practical assessment in Section 7 has been revised. <p>Details of the changes (1 to 3 in the list above) are supplied below.</p> <p>1.1 Characteristics of living organisms</p> <p>Descriptions of movement, respiration, sensitivity, growth, reproduction, excretion and nutrition have been revised. Simple definitions have been retained in the Core and more developed definitions have been added to the Supplement.</p> <p>1.2 Concept and use of a classification system</p> <p>Core</p> <ul style="list-style-type: none"> • State that organisms can be classified into groups by the features that they share. • Define <i>species</i> as a group of organisms that can reproduce and produce fertile offspring. <p>Supplement</p> <ul style="list-style-type: none"> • Explain that classification systems aim to reflect evolutionary relationships. • Explain that classification is traditionally based on studies of morphology and anatomy. • Explain that the sequences of bases in DNA and of amino acids in proteins are used as a more accurate means of classification. • Explain that organisms which share a more recent ancestor (are more closely related) have base sequences in DNA that are more similar than those that share only a distant ancestor.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<p>1.3 Features of organisms</p> <p>Core</p> <ul style="list-style-type: none"> List the features in the cells of all living organisms, limited to cytoplasm, cell membrane and DNA as genetic material. List the main features used to place animals and plants into the appropriate kingdoms. List the main features used to place organisms into groups within the animal kingdom, limited to: <ul style="list-style-type: none"> the main groups of vertebrates: mammals, birds, reptiles, amphibians, fish the main groups of arthropods: myriapods, insects, arachnids, crustaceans. <p>Supplement</p> <ul style="list-style-type: none"> List the features in the cells of all living organisms, limited to ribosomes for protein synthesis and enzymes involved in respiration. List the main features used to place all organisms into one of the five kingdoms: Animal, Plant, Fungus, Prokaryote, Protocist. List the main features used to place organisms into groups within the plant kingdom, limited to ferns and flowering plants (dicotyledons and monocotyledons). List the features of viruses, limited to protein coat and genetic material. <p>2.1 Cell structure and organisation</p> <p>Core</p> <ul style="list-style-type: none"> Describe and compare the structure of a plant cell with an animal cell, as seen under a light microscope, limited to cell wall, nucleus, cytoplasm, chloroplasts, vacuoles and location of the cell membrane. State the functions of the structures seen under the light microscope in the plant cell and in the animal cell. <p>Supplement</p> <ul style="list-style-type: none"> State that the cytoplasm of all cells contains structures, limited to ribosomes on rough endoplasmic reticulum and vesicles. State that almost all cells, except prokaryotes, have mitochondria and rough endoplasmic reticulum. Identify mitochondria and rough endoplasmic reticulum in diagrams and images of cells. State that aerobic respiration occurs in mitochondria. State that cells with high rates of metabolism require large numbers of mitochondria to provide sufficient energy.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<p>2.2 Levels of organisation</p> <p>Core</p> <ul style="list-style-type: none"> • Relate the structure of the following to their functions: <ul style="list-style-type: none"> – palisade mesophyll cells – photosynthesis – nerve cells – conduction of impulses – sperm and egg cells – reproduction. • State examples of tissues, organs and organ systems from sections 6 to 16. • Identify the different levels of organisation in drawings, diagrams and images of familiar material. <p>Supplement</p> <ul style="list-style-type: none"> • Identify the different levels of organisation in drawings, diagrams and images of unfamiliar material. <p>2.3 Size of specimens</p> <p>Supplement</p> <ul style="list-style-type: none"> • Calculate magnification and size of biological specimens using millimetres and micrometres as units. <p>3.1 Diffusion</p> <p>Core</p> <ul style="list-style-type: none"> • State that substances move into and out of cells by diffusion through the cell membrane. <p>Supplement</p> <ul style="list-style-type: none"> • State that the energy for diffusion comes from the kinetic energy of random movement of molecules and ions. • Investigate the factors that influence diffusion, limited to surface area, temperature, concentration gradients and distance. <p>3.2 Osmosis</p> <p>Core</p> <ul style="list-style-type: none"> • State that water diffuses through partially permeable membranes by osmosis. • State that water moves in and out of cells by osmosis through the cell membrane. • Investigate and describe the effects on plant tissues of immersing them in solutions of different concentrations. • State that plants are supported by the pressure of water inside the cells pressing outwards on the cell wall.

Biology (continued)	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<div style="text-align: right;">    </div> <p>Supplement</p> <ul style="list-style-type: none"> Define <i>osmosis</i> as the net movement of water molecules from a region of higher water potential (dilute solution) to a region of lower water potential (concentrated solution), through a partially permeable membrane. Explain the effects on plant tissues of immersing them in solutions of different concentrations by using the terms <i>turgid</i>, <i>turgor pressure</i>, <i>plasmolysis</i> and <i>flaccid</i>. Explain the importance of water potential and osmosis on animal cells and tissues. Explain how plants are supported by the turgor pressure within cells, in terms of water pressure acting against an inelastic cell wall. <p>3.3 Active Transport</p> <p>Core</p> <ul style="list-style-type: none"> Define <i>active transport</i> as the movement of particles through a cell membrane from a region of lower concentration to a region of higher concentration using energy from respiration. <p>Supplement</p> <ul style="list-style-type: none"> Discuss the importance of active transport as a process for movement across membranes e.g. ion uptake by root hairs and uptake of glucose by epithelial cells of villi and kidney tubules. Explain how protein molecules move particles across a membrane during active transport. <p>4 Biological molecules</p> <p>Core</p> <ul style="list-style-type: none"> Describe the use of: <ul style="list-style-type: none"> – DCPIP test for vitamin C. <p>Supplement</p> <ul style="list-style-type: none"> Explain that different sequences of amino acids give different shapes to protein molecules. Relate the shape and structure of protein molecules to their function, limited to the active site of enzymes and the binding site of antibodies. Describe the structure of DNA as: <ul style="list-style-type: none"> – two strands coiled together to form a double helix – each strand contains chemicals called bases – cross-links between the strands are formed by pairs of bases – the bases always pair up in the same way: A with T, and C with G (full names are not required).

Biology (continued)	
Cambridge IGCSE Biology, Syllabus 0610	<div style="text-align: right;">    </div> <p>5 Enzymes</p> <p>Core</p> <ul style="list-style-type: none"> Describe why enzymes are important in all living organisms in terms of reaction speed necessary to sustain life. Describe enzyme action with reference to the complementary shape of an enzyme and its substrate and the formation of a product (knowledge of the term <i>active site</i> is not required). <p>Supplement</p> <ul style="list-style-type: none"> Explain enzyme action with reference to the active site, enzyme-substrate complex, substrate and product. Explain the specificity of enzymes in terms of the complementary shape and fit of the active site with the substrate. Explain the effect of changes in temperature on enzyme activity in terms of kinetic energy, shape and fit, frequency of effective collisions and denaturation. Explain the effect of changes in pH on enzyme activity in terms of shape and fit and denaturation. <p>6.1 Photosynthesis</p> <p>Core</p> <ul style="list-style-type: none"> State the word equation for photosynthesis: carbon dioxide + water → glucose + oxygen, in the presence of light and chlorophyll. <p>Supplement</p> <ul style="list-style-type: none"> Explain that chlorophyll transfers light energy into chemical energy in molecules, for the synthesis of carbohydrates. Outline the subsequent use and storage of the carbohydrates made in photosynthesis. Identify and explain the limiting factors of photosynthesis in different environmental conditions. Use hydrogencarbonate indicator solution to investigate the effect of gas exchange of an aquatic plant kept in the light and in the dark. <p>6.2 Leaf structure</p> <p>Core</p> <ul style="list-style-type: none"> Identify chloroplasts, cuticle, guard cells and stomata upper and lower epidermis, palisade mesophyll, spongy mesophyll, vascular bundles, xylem and phloem in leaves of a dicotyledonous plant. <p>Supplement</p> <ul style="list-style-type: none"> Explain how the internal structure of a leaf is adapted for photosynthesis.

Biology (continued)	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<div style="text-align: right; margin-bottom: 10px;">    </div> <p>7.1 Diet</p> <p>Core</p> <ul style="list-style-type: none"> • Explain how age, gender and activity affect the dietary needs of humans including during pregnancy and whilst breast-feeding. • Describe the effects of malnutrition in relation to starvation, constipation, coronary heart disease, obesity and scurvy. <p>Supplement</p> <ul style="list-style-type: none"> • Explain the causes and effects of vitamin D and iron deficiencies. • Explain the causes and effects of protein-energy malnutrition e.g. kwashiorkor and marasmus. <p>7.2 Alimentary canal</p> <p>Core</p> <ul style="list-style-type: none"> • Define <i>mechanical digestion</i> as the breakdown of food into smaller pieces without chemical change to the food molecules. • Define <i>chemical digestion</i> as the breakdown of large, insoluble molecules into small, soluble molecules. • Describe diarrhoea as the loss of watery faeces. • Outline the treatment of diarrhoea using oral rehydration therapy. • Describe cholera as a disease caused by a bacterium. <p>Supplement</p> <ul style="list-style-type: none"> • Explain that the cholera bacterium produces a toxin that causes secretion of chloride ions into the small intestine causing osmotic movement of water into the gut, causing diarrhoea, dehydration and loss of salts from blood. <p>7.3 Mechanical digestion</p> <p>Core</p> <ul style="list-style-type: none"> • Identify the types of human teeth (incisors, canines, premolars, molars). • Describe the structure of human teeth, limited to enamel, dentine, pulp, nerves and cement as well as the gums. • Describe the functions of the types of human teeth in mechanical digestion of food. • State the causes of dental decay in terms of a coating of bacteria and food on teeth, the bacteria respiring sugars in the food, producing acid which dissolves the enamel and dentine. • Describe the proper care of teeth in terms of diet and regular brushing.

Biology (continued)	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<div style="text-align: right;">    </div> <p>7.4 Chemical digestion</p> <p>Core</p> <ul style="list-style-type: none"> • State the functions of enzymes as follows: <ul style="list-style-type: none"> – amylase breaks down starch to simpler sugars – protease breaks down protein to amino acids – lipase breaks down fats to fatty acids and glycerol. • State the functions of the hydrochloric acid in gastric juice, limited to killing bacteria in food and giving an acid pH for enzymes. <p>Supplement</p> <ul style="list-style-type: none"> • Describe the digestion of starch in the alimentary canal: <ul style="list-style-type: none"> – amylase is secreted into the alimentary canal and breaks down starch to maltose – maltose is broken down by maltase to glucose on the membranes of the epithelium lining the small intestine. • Describe pepsin and trypsin as two protease enzymes that function in different parts of the alimentary canal: <ul style="list-style-type: none"> – pepsin in the stomach – trypsin in the small intestine. • Explain the functions of the hydrochloric acid in gastric juice, limited to the low pH: <ul style="list-style-type: none"> – denaturing enzymes in harmful microorganisms in food – giving the optimum pH for pepsin activity. • Outline the role of bile in neutralising the acidic mixture of food and gastric juices entering the duodenum from the stomach, to provide a suitable pH for enzyme action. • Outline the role of bile in emulsifying fats to increase the surface area for the chemical digestion of fat to fatty acids and glycerol by lipase. <p>7.5 Absorption</p> <p>Core</p> <ul style="list-style-type: none"> • State that water is absorbed in both the small intestine and the colon, but that most absorption of water happens in the small intestine. <p>Supplement</p> <ul style="list-style-type: none"> • Explain the significance of villi and microvilli in increasing the internal surface area of the small intestine. <p>8.3 Transpiration</p> <p>Core</p> <ul style="list-style-type: none"> • State that water is transported from the roots to leaves through the xylem vessels.

Biology (continued)	
Cambridge IGCSE Biology, Syllabus 0610	<div style="text-align: right;">    </div> <p>Supplement</p> <ul style="list-style-type: none"> • Explain how water vapour loss is related to the large surface area of cell surfaces, interconnecting air spaces and stomata. • Explain the mechanism by which water moves upwards in the xylem in terms of a transpiration pull that draws up a column of water molecules, held together by cohesion. • Explain the effects of variation of temperature and humidity on transpiration rate. <p>8.4 Translocation</p> <p>Supplement</p> <ul style="list-style-type: none"> • Define <i>translocation</i> in terms of the movement of sucrose and amino acids in phloem: <ul style="list-style-type: none"> – from regions of production (source) – to regions of storage OR to regions where they are used in respiration or growth (sink). • Explain that some parts of a plant may act as a source and a sink at different times during the life of a plant. <p>9.1 Transport in animals</p> <p>Supplement</p> <ul style="list-style-type: none"> • Describe the single circulation of a fish. • Describe the double circulation of a mammal. • Explain the advantages of a double circulation. <p>9.2 Heart</p> <p>Core</p> <ul style="list-style-type: none"> • Name and identify the structures of the mammalian heart, limited to the muscular wall, the septum, the left and right ventricles and atria, one-way valves and coronary arteries. • State that blood is pumped away from the heart into arteries and returns to the heart in veins. • State that the activity of the heart may be monitored by ECG, pulse rate and listening to sounds of valves closing. • Describe coronary heart disease in terms of the blockage of coronary arteries and state the possible risk factors as diet, stress, smoking, genetic predisposition, age and gender. <p>Supplement</p> <ul style="list-style-type: none"> • Name and identify the atrioventricular and semilunar valves in the mammalian heart. • Explain the relative thickness <ul style="list-style-type: none"> – of the muscle wall of the left and right ventricles – of the muscle wall of the atria compared to that of the ventricles.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<ul style="list-style-type: none"> • Explain the importance of the septum in separating oxygenated and deoxygenated blood. • Describe the functioning of the heart in terms of the contraction of muscles of the atria and ventricles and the action of the valves. • Explain the effect of physical activity on the heart rate. • Discuss the roles of diet and exercise in the prevention of coronary heart disease. • Describe ways in which coronary heart disease may be treated, limited to drug treatment with aspirin and surgery (stents, angioplasty and by-pass). <p>9.3 Blood and lymphatic vessels</p> <p>Core</p> <ul style="list-style-type: none"> • Name the main blood vessels to and from the: <ul style="list-style-type: none"> – heart, limited to vena cava, aorta, pulmonary artery and pulmonary vein – lungs, limited to pulmonary artery and pulmonary vein – kidney, limited to renal artery and renal vein. <p>Supplement</p> <ul style="list-style-type: none"> • Outline the lymphatic system in terms of lymphatic vessels and lymph nodes. • Describe the function of the lymphatic system in the circulation of body fluids and the protection of the body from infection. <p>9.4 Blood</p> <p>Supplement</p> <ul style="list-style-type: none"> • Identify lymphocyte and phagocyte white blood cells, as seen under the light microscope, on prepared slides and in diagrams and photomicrographs. • State the functions of: <ul style="list-style-type: none"> – lymphocytes – antibody production – phagocytes – phagocytosis. • Describe the process of clotting as the conversion of fibrinogen to fibrin to form a mesh. • State the roles of blood clotting as preventing blood loss and preventing the entry of pathogens. • Describe the transfer of materials between capillaries and tissue fluid (details of roles of water potential and hydrostatic pressure are not required).

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<p>10 Diseases and immunity</p> <p>Core</p> <ul style="list-style-type: none"> • Define <i>pathogen</i> as a disease-causing organism. • Define <i>transmissible disease</i> as a disease in which the pathogen can be passed from one host to another. • State that the pathogen for a transmissible disease may be transmitted either through direct contact, e.g. through blood or other body fluids, or indirectly, e.g. from contaminated surfaces or food, from animals, or from the air. • State that the body has defences: <ul style="list-style-type: none"> – mechanical barriers, limited to skin and hairs in the nose – chemical barriers, limited to mucus and stomach acid – cells, limited to phagocytosis and antibody production by white blood cells – which can be enhanced by vaccination. • Explain the importance of hygienic food preparation, good personal hygiene, waste disposal and sewage treatment in controlling the spread of disease. <p>Supplement</p> <ul style="list-style-type: none"> • State that antibodies lock on to antigens leading to direct destruction of pathogens, or marking of pathogens for destruction by phagocytes. • Explain how each pathogen has its own antigens, which have specific shapes, so specific antibodies which fit the specific shapes of the antigens are needed. • Define <i>active immunity</i> as defence against a pathogen by antibody production in the body. • Explain that active immunity is gained after an infection by a pathogen, or by vaccination. • Explain the process of vaccination: <ul style="list-style-type: none"> – harmless pathogen given which has antigens – antigens trigger an immune response by lymphocytes which produce antibodies – memory cells are produced that give long-term immunity. • Explain the role of vaccination in controlling the spread of diseases. • Explain that <i>passive immunity</i> is short-term defence against a pathogen by antibodies acquired from another individual, e.g. mother to infant. • State that memory cells are not produced in passive immunity. • Explain the importance of passive immunity for breast-fed infants. • State that some diseases are caused by the immune system targeting and destroying body cells, limited to Type 1 diabetes.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<p>11 Gas exchange in humans</p> <p>Core</p> <ul style="list-style-type: none"> List the features of gas exchange surfaces in humans, limited to large surface area, thin surface, good blood supply and good ventilation with air. Name and identify the lungs, diaphragm, ribs, intercostal muscles, larynx, trachea, bronchi, bronchioles, alveoli and associated capillaries. State the differences in composition between inspired and expired air, limited to oxygen, carbon dioxide and water vapour. <p>Supplement</p> <ul style="list-style-type: none"> Name and identify the internal and external intercostal muscles . State the functions of the cartilage in the trachea. Explain the role of the ribs, the internal and external intercostal muscles and the diaphragm in producing volume and pressure changes in the thorax leading to the ventilation of the lungs. Explain the differences in composition between inspired and expired air. Explain the link between physical activity and rate and depth of breathing in terms of the increased carbon dioxide concentration in the blood, detected by the brain, causing an increased rate of breathing. Explain the role of goblet cells, mucus and ciliated cells in protecting the gas exchange system from pathogens and particles. <p>12.1 Respiration</p> <p>Core</p> <ul style="list-style-type: none"> State that respiration involves the action of enzymes in cells. <p>12.2 Aerobic respiration</p> <p>Core</p> <ul style="list-style-type: none"> Define <i>aerobic respiration</i> as the chemical reactions in cells that use oxygen to break down nutrient molecules to release energy. State the word equation for aerobic respiration as glucose + oxygen → carbon dioxide + water. Investigate the uptake of oxygen by respiring organisms, such as arthropods and germinating seeds. <p>Supplement</p> <ul style="list-style-type: none"> Investigate the effect of temperature on the rate of respiration of germinating seeds.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<p>12.3 Anaerobic respiration</p> <p>Core</p> <ul style="list-style-type: none"> Define <i>anaerobic respiration</i> as the chemical reactions in cells that break down nutrient molecules to release energy without using oxygen. State that anaerobic respiration releases much less energy per glucose molecule than aerobic respiration. <p>Supplement</p> <ul style="list-style-type: none"> State that lactic acid builds up in muscles and blood during vigorous exercise causing an oxygen debt. Outline how the oxygen debt is removed during recovery, limited to: <ul style="list-style-type: none"> aerobic respiration of lactic acid in the liver continuation, after exercise, of fast heart rate to transport lactic acid in blood from muscles to the liver continuation, after exercise, of deeper breathing supplying oxygen for aerobic respiration of lactic acid. <p>13 Excretion in humans</p> <p>Core</p> <ul style="list-style-type: none"> State that carbon dioxide is excreted through the lungs. State that the kidneys excrete urea and excess water and salts. Explain that the volume and concentration of urine produced is affected by water intake, temperature and exercise. <p>Supplement</p> <ul style="list-style-type: none"> Describe the role of the liver in the assimilation of amino acids by converting them to proteins, including plasma proteins, e.g. fibrinogen. Define <i>deamination</i> as the removal of the nitrogen-containing part of amino acids to form urea. Explain the need for excretion, limited to toxicity of urea and carbon dioxide. <p>14.1 Nervous control in humans</p> <p>Core</p> <ul style="list-style-type: none"> Describe a nerve impulse as an electrical signal that passes along nerve cells called neurons. Describe a simple reflex arc in terms of receptor, sensory neurone, relay neurone, motor neurone and effector. Describe a reflex action as a means of automatically and rapidly integrating and coordinating stimuli with the responses of effectors (muscles and glands). Define a <i>synapse</i> as a junction between two neurones.

Biology (continued)	
Cambridge IGCSE Biology, Syllabus 0610	<div style="text-align: right;">    </div> <p>Supplement</p> <ul style="list-style-type: none"> Describe the structure of a synapse, including the presence of neurotransmitter containing vesicles, the synaptic cleft and neurotransmitter receptor molecules. Describe how an impulse triggers the release of a neurotransmitter from vesicles into the synaptic gap and how the neurotransmitter diffuses across to bind with receptor molecules, in the membrane of the neurone after the synaptic gap, causing the impulse to continue. State that in a reflex arc the synapses ensure that impulses travel in one direction only. State that many drugs, e.g. heroin act upon synapses. <p>14.2 Sense organs</p> <p>Core</p> <ul style="list-style-type: none"> Identify the structures of the eye, limited to cornea, iris, pupil, lens, retina, optic nerve and blind spot. Describe the function of each part of the eye, limited to: <ul style="list-style-type: none"> – cornea – refracts light – iris – controls how much light enters pupil – lens – focuses light onto retina – retina – contains light receptors, some sensitive to light of different colours – optic nerve – carries impulses to the brain. Explain the pupil reflex in terms of light intensity and pupil diameter only. <p>Supplement</p> <ul style="list-style-type: none"> Explain the pupil reflex in terms of light intensity and antagonistic action of circular and radial muscles in the iris. Explain accommodation to view near and distant objects in terms of contraction and relaxation of the ciliary muscles, tension in the suspensory ligaments, shape of the lens and refraction of light. State the distribution of rods and cones in the retina of a human. Outline the function of rods and cones, limited to greater sensitivity of rods for night vision and three different kinds of cones absorbing light of different colours for colour vision. Identify the position of the fovea. <p>14.3 Hormones in humans</p> <p>Core</p> <ul style="list-style-type: none"> Identify specific endocrine glands and their secretions, limited to adrenal glands and adrenaline, pancreas and insulin, testes and testosterone and ovaries and oestrogen.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<ul style="list-style-type: none"> • Describe adrenaline as the hormone secreted in 'fight or flight' situations and its effects, limited to increased breathing and pulse rate and widened pupils. • State the functions of insulin, oestrogen and testosterone. <p>Supplement</p> <ul style="list-style-type: none"> • Discuss the role of the hormone adrenaline in the chemical control of metabolic activity, including increasing the blood glucose concentration and pulse rate. • Compare nervous and hormonal control systems in terms of speed and longevity of action. <p>14.4 Homeostasis</p> <p>Core</p> <ul style="list-style-type: none"> • Describe the maintenance of a constant internal body temperature in humans in terms of insulation, sweating, shivering and the role of the brain (limited to blood temperature receptors and coordination). <p>Supplement</p> <ul style="list-style-type: none"> • Explain that homeostasis is the control of internal conditions within set limits. • Outline the symptoms and treatment of Type 1 diabetes (detail of β cells is not required). • Describe the maintenance of a constant internal body temperature in humans in terms of vasodilation and vasoconstriction of arterioles supplying skin surface capillaries. <p>14.5 Tropic responses</p> <p>Core</p> <ul style="list-style-type: none"> • Investigate gravitropism and phototropism in shoots and roots. <p>Supplement</p> <ul style="list-style-type: none"> • Explain phototropism and gravitropism of a shoot as examples of the chemical control of plant growth. • Explain the role of auxin in controlling shoot growth, limited to: <ul style="list-style-type: none"> – auxin made in shoot tip (only) – auxin spreads through the plant from the shoot tip – auxin is unequally distributed in response to light and gravity – auxin stimulates cell elongation. • Describe the use in weedkillers of the synthetic plant hormone 2,4-D. <p>15.2 Medicinal drugs</p> <p>Core</p> <ul style="list-style-type: none"> • State that some bacteria are resistant to antibiotics which reduces the effectiveness of antibiotics. • State that antibiotics kill bacteria but do not affect viruses.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<p>Supplement</p> <ul style="list-style-type: none"> Explain how development of resistant bacteria such as MRSA can be minimised, limited to using antibiotics only when essential and ensuring treatment is completed. <p>15.3 Misused drugs</p> <p>Core</p> <ul style="list-style-type: none"> State that tobacco smoking can cause chronic obstructive pulmonary disease (COPD), lung cancer and heart disease. <p>Supplement</p> <ul style="list-style-type: none"> Explain how heroin affects the nervous system, limited to its effect on the function of synapses. Discuss the evidence for the link between smoking and lung cancer. Discuss the use of hormones to improve sporting performance, limited to testosterone and anabolic steroids. <p>16.1 Asexual reproduction</p> <p>Core</p> <ul style="list-style-type: none"> Identify examples of asexual reproduction from information provided. <p>Supplement</p> <ul style="list-style-type: none"> Discuss the advantages and disadvantages of asexual reproduction: <ul style="list-style-type: none"> to a population of a species in the wild to crop production. <p>16.2 Sexual reproduction</p> <p>Core</p> <ul style="list-style-type: none"> Define <i>fertilisation</i> as the fusion of gamete nuclei. <p>Supplement</p> <ul style="list-style-type: none"> State that the nuclei of gametes are haploid and that the nucleus of the zygote is diploid. Discuss the advantages and disadvantages of sexual reproduction: <ul style="list-style-type: none"> to a population of a species in the wild to crop production. <p>16.3 Sexual reproduction in plants</p> <p>Core</p> <ul style="list-style-type: none"> Identify and draw, using a hand lens if necessary, the sepals, petals, stamens, filaments and anthers, carpels, style, stigma, ovary and ovules, of an insect-pollinated flower. Distinguish between the pollen grains of insect-pollinated and wind-pollinated flowers. State that fertilisation occurs when the pollen nucleus fuses with the nucleus in an ovule.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<p>Supplement</p> <ul style="list-style-type: none"> Define <i>self-pollination</i> as the transfer of pollen grains from the anther of a flower to the stigma of the same flower or different flower on the same plant. Define <i>cross-pollination</i> as transfer of pollen grains from the anther of a flower to the stigma of a flower on a different plant of the same species. Discuss the implications to a species of self-pollination and cross-pollination in terms of variation, capacity to respond to changes in the environment and reliance on pollinators. Describe the growth of the pollen tube and its entry into the ovule followed by fertilisation (details of production of endosperm and development are not required). <p>16.4 Sexual reproduction in humans</p> <p>Core</p> <ul style="list-style-type: none"> State the functions of the umbilical cord, placenta, amniotic sac and amniotic fluid. Outline the growth and development of the fetus in terms of increasing complexity in the early stages and increasing size towards the end of pregnancy. Describe the ante-natal care of pregnant women, limited to special dietary needs and the harm from smoking and alcohol consumption. Outline the processes involved in labour and birth, limited to: <ul style="list-style-type: none"> – breaking of the amniotic sac – contraction of the muscles in the uterus wall – dilation of the cervix – passage through the vagina – tying and cutting the umbilical cord – delivery of the afterbirth. <p>Supplement</p> <ul style="list-style-type: none"> Explain the adaptive features of sperm, limited to flagellum, mitochondria and enzymes in the acrosome. Explain the adaptive features of egg cells, limited to energy stores and the jelly coat that changes at fertilisation. Describe the function of the placenta and umbilical cord in relation to exchange of dissolved nutrients, gases and excretory products and providing a barrier to toxins and pathogens (structural details are not required). State that some toxins, e.g. nicotine, and pathogens, e.g. rubella virus, can pass across the placenta and affect the fetus.

Biology (continued)	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<div style="text-align: right;">    </div> <p>16.6 Methods of birth control in humans</p> <p>Core</p> <ul style="list-style-type: none"> • Outline the following methods of birth control: <ul style="list-style-type: none"> – natural, limited to abstinence, monitoring body temperature and cervical mucus – chemical, limited to IUD, IUS, contraceptive pill, implant and injection – barrier, limited to condom, femidom, diaphragm. <p>Supplement</p> <ul style="list-style-type: none"> • Outline the use of hormones in contraception and fertility treatments. • Outline <i>in vitro</i> fertilisation (IVF). • Discuss the social implications of contraception and fertility treatments. <p>16.7 Sexually transmitted infections (STIs)</p> <p>Core</p> <ul style="list-style-type: none"> • Define <i>sexually transmitted infection</i> as an infection that is transmitted via body fluids through sexual contact. • State that human immunodeficiency virus (HIV) is an example of an STI. • Explain how the spread of STIs is controlled. • Describe the methods of transmission of HIV. • State that HIV infection may lead to AIDS. <p>Supplement</p> <ul style="list-style-type: none"> • Outline how HIV affects the immune system, limited to decreased lymphocyte numbers and reduced ability to produce antibodies. <p>17.2 Chromosomes, genes and proteins</p> <p>Supplement</p> <ul style="list-style-type: none"> • Explain that the sequence of bases in a gene is the genetic code for putting together amino acids in the correct order to make a specific protein (knowledge of the details of nucleotide structure is not required). • Explain that DNA controls cell function by controlling the production of proteins (some of which are enzymes), antibodies and receptors for neurotransmitters. • Explain how a protein is made, limited to: <ul style="list-style-type: none"> – the gene coding for the protein remains in the nucleus – mRNA molecules carry a copy of the gene to the cytoplasm – the mRNA passes through ribosomes – the ribosome assembles amino acids into protein molecules

Biology (continued)	
Cambridge IGCSE Biology, Syllabus 0610	<div style="text-align: right;">    </div> <p>– the specific order of amino acids is determined by the sequence of bases in the mRNA (knowledge of the details of transcription or translation is not required).</p> <ul style="list-style-type: none"> • Explain that all body cells in an organism contain the same genes, but many genes in a particular cell are not expressed because the cell only makes the specific proteins it needs. • Define a <i>haploid nucleus</i> as a nucleus containing a single set of unpaired chromosomes, e.g. in gametes. • Define a <i>diploid nucleus</i> as a nucleus containing two sets of chromosomes, e.g. in body cells. • State that in a diploid cell, there is a pair of each type of chromosome and in a human diploid cell there are 23 pairs. <p>17.3 Mitosis</p> <p>Supplement</p> <ul style="list-style-type: none"> • State that the exact duplication of chromosomes occurs before mitosis. • State that during mitosis the copies of chromosomes separate, maintaining the chromosome number (details of stages of mitosis are not required). • Describe stem cells as unspecialised cells that divide by mitosis to produce daughter cells that can become specialised for specific functions. <p>17.4 Meiosis</p> <p>Supplement</p> <ul style="list-style-type: none"> • Define <i>meiosis</i> as reduction division in which the chromosome number is halved from diploid to haploid resulting in genetically different cells (details of stages are not required). • Explain how meiosis produces variation by forming new combinations of maternal and paternal chromosomes (specific details are not required). <p>17.5 Monohybrid inheritance</p> <p>Core</p> <ul style="list-style-type: none"> • Interpret pedigree diagrams for the inheritance of a given characteristic. • Use Punnett squares in crosses which result in more than one genotype to work out and show the possible different genotypes. <p>Supplement</p> <ul style="list-style-type: none"> • Explain how to use a test cross to identify an unknown genotype. • Define a <i>sex-linked characteristic</i> as a characteristic in which the gene responsible is located on a sex chromosome and that this makes it more common in one sex than in the other. • Describe colour blindness as an example of sex linkage.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<ul style="list-style-type: none"> • Use genetic diagrams to predict the results of monohybrid crosses involving co-dominance or sex linkage and calculate phenotypic ratios. <p>18.1 Variation</p> <p>Core</p> <ul style="list-style-type: none"> • Define <i>variation</i> as differences between individuals of the same species. • Distinguish between phenotypic variation and genetic variation. • Record and present the results of investigations into continuous and discontinuous variation. • State that mutation is the way in which new alleles are formed. <p>Supplement</p> <ul style="list-style-type: none"> • State that phenotypic variation is caused by both genetic and environmental factors. • State that discontinuous variation is mostly caused by genes alone e.g. A, B, AB and O blood groups in humans. • Define <i>gene mutation</i> as a change in the base sequence of DNA. • Describe the symptoms of sickle-cell anaemia. • Explain how a change in the base sequence of the gene for haemoglobin results in abnormal haemoglobin and sickle-shaped red blood cells. • Use genetic diagrams to show how sickle-cell anaemia is inherited. • State that people who are heterozygous ($Hb^S Hb^A$) for the sickle-cell allele have a resistance to malaria. <p>18.2 Adaptive features</p> <p>Core</p> <ul style="list-style-type: none"> • Define <i>adaptive feature</i> as an inherited feature that helps an organism to survive and reproduce in its environment. • Interpret images or other information about a species to describe its adaptive features. <p>Supplement</p> <ul style="list-style-type: none"> • Define <i>adaptive feature</i> as the inherited functional features of an organism that increase its fitness. • Define <i>fitness</i> as the probability of an organism surviving and reproducing in the environment in which it is found. • Explain the adaptive features of hydrophytes and xerophytes to their environments.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<p>18.3 Selection</p> <p>Core</p> <ul style="list-style-type: none"> • Describe natural selection with reference to: <ul style="list-style-type: none"> – variation within populations – production of many offspring – competition for resources – struggle for survival – reproduction by individuals that are better adapted to the environment than others – passing on of their alleles to the next generation. • Describe selective breeding with reference to: <ul style="list-style-type: none"> – selection by humans of individuals with desirable features – crossing these individuals to produce the next generation – selection of offspring showing the desirable features. <p>Supplement</p> <ul style="list-style-type: none"> • Define the <i>process of adaptation</i> as the process, resulting from natural selection, by which populations become more suited to their environment over many generations. • State the differences between natural and artificial selection. • Outline how selective breeding by artificial selection is carried out over many generations to improve crop plants and domesticated animals. <p>19.1 Energy flow</p> <p>Supplement</p> <ul style="list-style-type: none"> • Describe the flow of energy through living organisms including light energy from the sun and chemical energy in organisms and its eventual transfer to the environment. <p>19.2 Food chains and food webs</p> <p>Core</p> <ul style="list-style-type: none"> • State that energy is transferred between organisms in a food chain by ingestion. • Construct simple food chains. • State that consumers may be classed as primary, secondary and tertiary according to their position in a food chain. • Interpret food chains and food webs in terms of identifying producers and consumers. • Use food chains and food webs to describe the impacts humans have through over-harvesting of food species and through introducing foreign species to a habitat.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<p>Supplement</p> <ul style="list-style-type: none"> Describe how energy is transferred between trophic levels. Define <i>trophic level</i> as the position of an organism in a food chain, food web, pyramid of numbers or pyramid of biomass. Explain why the transfer of energy from one trophic level to another is inefficient. Identify producers, primary consumers, secondary consumers, tertiary consumers and quaternary consumers as the trophic levels in food webs, food chains, pyramids of numbers and pyramids of biomass. Discuss the advantages of using a pyramid of biomass rather than a pyramid of numbers to represent a food chain. <p>19.3 Nutrient cycles</p> <p>Core</p> <ul style="list-style-type: none"> Describe the carbon cycle, limited to photosynthesis, respiration, feeding, decomposition, fossilisation and combustion. Discuss the effects of the combustion of fossil fuels and the cutting down of forests on the carbon dioxide concentrations in the atmosphere. Describe the water cycle, limited to evaporation, transpiration, condensation and precipitation. <p>Supplement</p> <ul style="list-style-type: none"> State the roles of microorganisms in the nitrogen cycle, limited to decomposition, nitrification, nitrogen fixation and denitrification (generic names of individual bacteria e.g. <i>Rhizobium</i>, are not required). <p>19.4 Population size</p> <p>Supplement</p> <ul style="list-style-type: none"> Define <i>community</i> as all of the populations of different species in an ecosystem. Identify the lag, exponential (log), stationary and death phases in the sigmoid population growth curve for a population growing in an environment with limited resources. Explain the factors that lead to each phase in the sigmoid curve of population growth, making reference, where appropriate, to the role of limiting factors. <p>20.1 Biotechnology and genetic engineering</p> <p>Core</p> <ul style="list-style-type: none"> State that bacteria are useful in biotechnology and genetic engineering due to their rapid reproduction rate and their ability to make complex molecules.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<p>Supplement</p> <ul style="list-style-type: none"> • Discuss why bacteria are useful in biotechnology and genetic engineering, limited to: <ul style="list-style-type: none"> – lack of ethical concerns over their manipulation and growth – genetic code shared with all other organisms – presence of plasmids. <p>20.2 Biotechnology</p> <p>Core</p> <ul style="list-style-type: none"> • Describe the role of anaerobic respiration in yeast during production of ethanol for biofuels. <p>Supplement</p> <ul style="list-style-type: none"> • Investigate and explain the use of lactase to produce lactose-free milk. <p>20.3 Genetic engineering</p> <p>Core</p> <ul style="list-style-type: none"> • Define <i>genetic engineering</i> as changing the genetic material of an organism by removing, changing or inserting individual genes. • State examples of genetic engineering: <ul style="list-style-type: none"> – the insertion of humans genes into bacteria to produce human insulin – the insertion of genes into crop plants to confer resistance to herbicides – the insertion of genes into crop plants to confer resistance to insect pests – the insertion of genes into crop plants to provide additional vitamins. <p>Supplement</p> <ul style="list-style-type: none"> • Outline genetic engineering using bacterial production of a human protein as an example, limited to: <ul style="list-style-type: none"> – isolation of DNA making up a human gene using restriction enzymes, forming sticky ends – cutting of bacterial plasmid DNA with same restriction enzymes, forming complementary sticky ends – insertion of human DNA into bacterial plasmid DNA using DNA ligase to form a recombinant plasmid – insertion of plasmid into bacteria (specific detail is not required) – replication of bacteria containing recombinant plasmid which make a human protein as they express the gene. • Discuss the advantages and disadvantages of genetically modifying crops, such as soya, maize and rice.

Biology (continued)	
Cambridge IGCSE Biology, Syllabus 0610	<div style="text-align: right;">    </div> <p>21.1 Food supply</p> <p>Core</p> <ul style="list-style-type: none"> Describe the negative impacts to an ecosystem of large-scale monocultures of crop plants. Describe the negative impacts to an ecosystem of intensive livestock production. <p>Supplement</p> <ul style="list-style-type: none"> Discuss the social, environmental and economic implications of providing sufficient food for an increasing human global population. <p>21.2 Habitat destruction</p> <p>Core</p> <ul style="list-style-type: none"> Describe the reasons for habitat destruction, limited to: <ul style="list-style-type: none"> – increased area for food crop growth, livestock production and housing – extraction of natural resources – marine pollution. State that through altering food webs and food chains, humans can have a negative impact on habitats. <p>Supplement</p> <ul style="list-style-type: none"> Explain the undesirable effects of deforestation on the environment. <p>21.3 Pollution</p> <p>Core</p> <ul style="list-style-type: none"> State the sources and effects of pollution of water (rivers, lakes and the sea) by chemical waste, discarded rubbish, untreated sewage and fertilisers. <p>Supplement</p> <ul style="list-style-type: none"> Explain the process of eutrophication of water in terms of: <ul style="list-style-type: none"> – increased availability of nitrate and other ions – increased growth of producers – increased decomposition after death of producers – increased aerobic respiration by decomposers – reduction in dissolved oxygen – death of organisms requiring dissolved oxygen in water. Discuss the effects of non-biodegradable plastics in the environment, in both aquatic and terrestrial ecosystems. Explain how increases in carbon dioxide and methane concentrations in the atmosphere cause an enhanced greenhouse effect that leads to climate change.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<ul style="list-style-type: none"> • Describe the negative impacts of female contraceptive hormones in the water courses, limited to reduced sperm count in men and feminisation of aquatic organisms. <p>21.4 Conservation</p> <p>Core</p> <ul style="list-style-type: none"> • Define a <i>sustainable resource</i> as one which is produced as rapidly as it is removed from the environment so that it does not run out. • Explain the need to conserve non-renewable resources, limited to fossil fuels. • State that some resources can be maintained, limited to forests and fish stocks. • State that products can be reused or recycled, limited to paper, glass, plastic and metal. • Outline how sewage is treated to make the water that it contains safe to return to the environment or for human use. • Explain why organisms become endangered or extinct, limited to climate change, habitat destruction, hunting, pollution and introduced species. • Describe how endangered species can be conserved, limited to monitoring and protecting species and habitats, education, captive breeding programmes and seed banks. <p>Supplement</p> <ul style="list-style-type: none"> • Define the term <i>sustainable development</i> as development providing for the needs of an increasing human population without harming the environment. • Explain how forests and fish stocks can be sustained using education, legal quotas and re-stocking. • Explain that sustainable development requires: <ul style="list-style-type: none"> – management of conflicting demands – planning and co-operation at local, national and international levels. • Explain the risks to a species if the population size drops, reducing variation (knowledge of genetic drift is not required). • Explain reasons for conservation programmes, to include: <ul style="list-style-type: none"> – reducing extinction – protecting vulnerable environments – maintaining ecosystem functions, limited to nutrient cycling and resource provision, e.g. food, drugs, fuel and genes.

Biology (continued)   	
<p>Cambridge IGCSE Biology, Syllabus 0610</p>	<p>Learning outcomes removed from the syllabus content</p> <p>II:5 Enzymes</p> <p>Supplement</p> <ul style="list-style-type: none"> Describe the role of enzymes in the germination of seeds, and their uses in biological washing products and in the food industry (including pectinase and fruit juice). Outline the use of microorganisms and fermenters to manufacture the antibiotic penicillin and enzymes for use in biological washing powders. Describe the role of the fungus <i>Penicillium</i> in the production of antibiotic penicillin. <p>II:6.1 Nutrients</p> <p>Core</p> <ul style="list-style-type: none"> Describe the deficiency symptoms for: <ul style="list-style-type: none"> – vitamins (C and D only) – mineral salts (calcium and iron only). <p>Supplement</p> <ul style="list-style-type: none"> Describe the use of microorganisms in the food industry, with reference to yoghurt and single cell protein. Describe the uses, benefits and health hazards associated with food additives, including colouring. <p>II:6.2.2 Leaf structure</p> <p>Core</p> <ul style="list-style-type: none"> Describe the significance of these features in terms of functions, to include: <ul style="list-style-type: none"> – distribution of chloroplasts – photosynthesis – stomata and mesophyll cells – gas exchange – vascular bundles (xylem and phloem) – transport and support. <p>II:6.3.4 Mechanical and physical digestion</p> <p>Core</p> <ul style="list-style-type: none"> Describe the process of chewing. Describe the role of longitudinal and circular muscles in peristalsis. <p>Supplement</p> <ul style="list-style-type: none"> Describe how fluoride reduces tooth decay and explain arguments for and against the addition of fluoride to public water supplies.

Biology (continued)	
Cambridge IGCSE Biology, Syllabus 0610	<div style="text-align: right;">    </div> <p>II:6.3.6 Absorption</p> <p>Supplement</p> <ul style="list-style-type: none"> State the role of the hepatic portal vein in the transport of absorbed food to the liver. <p>II:6.3.7 Assimilation</p> <p>Core</p> <ul style="list-style-type: none"> Describe the role of the liver in the metabolism of glucose (glucose → glycogen) and amino acids (amino acids → proteins and destruction of excess amino acids). Describe the role of fat as an energy storage substance. <p>Supplement</p> <ul style="list-style-type: none"> Define <i>deamination</i> as removal of the nitrogen-containing part of amino acids to form urea, followed by release of energy from the remainder of the amino acid. State that the liver is the site of breakdown of alcohol and other toxins. <p>II:7.1.2 Transpiration</p> <p>Supplement</p> <ul style="list-style-type: none"> Discuss the adaptations of the leaf, stem and root to three contrasting environments, to include pond, garden and desert, with emphasis on local examples (where appropriate) and the factors described in the core. <p>II:7.1.3 Translocation</p> <p>Supplement</p> <ul style="list-style-type: none"> Describe translocation throughout the plant of applied chemicals, including systemic pesticides. Compare the role of transpiration and translocation in the transport of materials from sources to sinks, within plants at different seasons. <p>II:7.2 Transport in humans</p> <p>Core</p> <ul style="list-style-type: none"> Describe the double circulation in terms of a low pressure circulation to the lungs and a high pressure circulation to the body tissues and relate these differences to the different functions of the two circuits. <p>II:10.1 Nervous control in humans</p> <p>Core</p> <ul style="list-style-type: none"> State that muscles and glands can act as effectors. Describe the action of antagonistic muscles to include the biceps and triceps at the elbow joint.

Biology (continued)	
Cambridge IGCSE Biology, Syllabus 0610	<div style="text-align: right;">    </div> <p>II:10.2 Hormones</p> <p>Supplement</p> <ul style="list-style-type: none"> Discuss the use of hormones in food production. <p>III:1.1 Asexual reproduction</p> <p>Core</p> <ul style="list-style-type: none"> Describe asexual reproduction in bacteria, spore production in fungi and tuber formation in potatoes. <p>III:1.2.1 Sexual reproduction in plants</p> <p>Core</p> <ul style="list-style-type: none"> Candidates should expect to apply their understanding of the flowers they have studied to unfamiliar flowers. Name the agents of pollination. Investigate and describe the structure of a non-endospermic seed in terms of the embryo (radicle, plumule and cotyledons) and testa, protected by the fruit. Outline the formation of a seed (limited to embryo, cotyledons, testa and role of mitosis) and fruit (produced from the ovary wall). State that seed and fruit dispersal by wind and by animals provides a means of colonising new areas. Describe, using examples, seed and fruit dispersal by wind and by animals. <p>III:1.4 Methods of birth control</p> <p>Core</p> <ul style="list-style-type: none"> Outline the following methods of birth control: <ul style="list-style-type: none"> natural (abstinence, rhythm method) chemical (contraceptive pill, spermicide) mechanical (condom, diaphragm, femidom, IUD) surgical (vasectomy, female sterilisation). <p>III:1.5 Sexually transmitted diseases</p> <p>Core</p> <ul style="list-style-type: none"> Describe the symptoms, signs, effects and treatment of gonorrhoea. Describe the methods of transmission of HIV and the ways in which HIV/AIDS can be prevented from spreading. <p>III:2 Growth and development</p> <p>Core</p> <ul style="list-style-type: none"> Define <i>development</i> in terms of increase in complexity.

Chemistry	
Cambridge IGCSE Chemistry, Syllabus 0620	<div style="text-align: right;">    </div> <p>From March 2015</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2016</p> <p>In 2016 and beyond, assessments will be based on the revised syllabus only.</p> <p>This syllabus has been revised. Some changes are significant. Teachers are advised to read the whole of the syllabus document before planning their teaching programme.</p> <p>Changes to assessment</p> <ul style="list-style-type: none"> • The Coursework option has been withdrawn. • A new Multiple Choice paper has been introduced for Extended candidates. • Core candidates now take Paper 1: Multiple Choice (Core), Paper 3: Theory (Core) and either Paper 5: Practical Test or Paper 6: Alternative to Practical. • Extended candidates now take Paper 2: Multiple Choice (Extended), Paper 4: Theory (Extended) and either Paper 5: Practical Test or Paper 6: Alternative to Practical. • Paper 6 has been reduced from 60 marks to 40 marks. It will continue to be weighted as 20% of the total marks for the qualification. <p>Changes to syllabus content</p> <p>The content has been revised and updated:</p> <ol style="list-style-type: none"> 1. The wording of some learning outcomes has been changed for clarification. 2. New learning outcomes have been added to the syllabus content. 3. Some learning outcomes have moved from Core to Supplement and others from Supplement to Core. 4. Some learning outcomes have been removed from the syllabus content. 5. The description of the practical assessment in Section 7 has been revised. <p>Details of the changes (1 to 3 in the list above) are supplied below.</p> <p>1 The particulate nature of matter</p> <p>Supplement</p> <ul style="list-style-type: none"> • Explain changes of state in terms of the kinetic theory. • Describe and explain Brownian motion in terms of random molecular bombardment. • State evidence for Brownian motion.

Chemistry (continued)	
Cambridge IGCSE Chemistry, Syllabus 0620	<div style="text-align: right;">    </div> <p>3.1 Atomic structure and the Periodic Table</p> <p>Supplement</p> <ul style="list-style-type: none"> Understand that isotopes have the same properties because they have the same number of electrons in their outer shell. <p>3.2.3 Molecules and covalent bonds</p> <p>Core</p> <ul style="list-style-type: none"> Describe the formation of single covalent bonds in ... NH₃ ... as the sharing of pairs of electrons leading to the noble gas configuration. <p>Supplement</p> <ul style="list-style-type: none"> Explain the differences in melting point and boiling point of ionic and covalent compounds in terms of attractive forces. <p>4.1 Stoichiometry</p> <p>Core</p> <ul style="list-style-type: none"> Define <i>relative atomic mass</i>, A_r, as the average mass of naturally occurring atoms of an element on a scale where the ¹²C atom has a mass of exactly 12 units. <p>5. Electricity and chemistry</p> <p>Core</p> <ul style="list-style-type: none"> Define electrolysis as the breakdown of an ionic compound, molten or in aqueous solution, by the passage of electricity. Describe the electrode products and the observations made during the electrolysis of: <ul style="list-style-type: none"> – dilute sulfuric acid. <p>Supplement</p> <ul style="list-style-type: none"> Construct ionic half-equations for reactions at the cathode. Describe the transfer of charge during electrolysis to include: <ul style="list-style-type: none"> – the movement of electrons in the metallic conductor – the removal or addition of electrons from the external circuit at the electrodes – the movement of ions in the electrolyte. Describe, in outline, the manufacture of <ul style="list-style-type: none"> – ... hydrogen ... from concentrated aqueous sodium chloride. <p>6.1 Energetics of a reaction</p> <p>Core</p> <ul style="list-style-type: none"> Interpret energy level diagrams showing exothermic and endothermic reactions.

Chemistry (continued)	
Cambridge IGCSE Chemistry, Syllabus 0620	<div style="text-align: right;">    </div> <p>Supplement</p> <ul style="list-style-type: none"> • Draw and label energy level diagrams for exothermic and endothermic reactions using data provided. • Calculate the energy of a reaction using bond energies. <p>7.1 Physical and chemical changes</p> <p>Core</p> <ul style="list-style-type: none"> • Identify physical and chemical changes, and understand the differences between them. <p>7.2 Rate (speed) of reaction</p> <p>Core</p> <ul style="list-style-type: none"> • Interpret data obtained from experiments concerned with rate of reaction. <p>7.3 Reversible reactions</p> <p>Core</p> <ul style="list-style-type: none"> • Understand that some chemical reactions can be reversed by changing the reaction conditions. (Limited to the effects of heat and water on hydrated and anhydrous copper(II) sulfate and cobalt(II) chloride.) (Concept of equilibrium is not required.) <p>7.4 Redox</p> <p>Supplement</p> <ul style="list-style-type: none"> • Define <i>oxidising agent</i> as a substance which oxidises another substance during a redox reaction. Define <i>reducing agent</i> as a substance which reduces another substance during a redox reaction. • Identify oxidising agents and reducing agents from simple equations. <p>8.1 The characteristic properties of acids and bases</p> <p>Core</p> <ul style="list-style-type: none"> • Describe the characteristic properties of acids as ... and effect on ... methyl orange. • Describe the characteristic properties of bases as ... and effect on ... methyl orange. <p>8.4 Identification of ions and gases</p> <p>Core</p> <ul style="list-style-type: none"> • Describe the following tests to identify: <ul style="list-style-type: none"> <i>aqueous cations:</i> ... chromium (III), <i>cations:</i> use of the flame test to identify lithium, sodium, potassium and copper(II).

Chemistry (continued)	
Cambridge IGCSE Chemistry, Syllabus 0620	<div style="text-align: right;">    </div> <p><i>anions:</i> bromide ... sulfite (by reaction with dilute acids and then aqueous potassium manganate (VII)).</p> <p><i>gases:</i> and sulfur dioxide (using aqueous potassium manganate (VII)).</p> <p>9.4 Transition elements</p> <p>Supplement</p> <ul style="list-style-type: none"> • Know that transition elements have variable oxidation states. <p>9.5 Noble gases</p> <p>Core</p> <ul style="list-style-type: none"> • Describe the noble gases, in Group VIII or 0, as being unreactive monoatomic gases and explain this in terms of electronic structure. <p>10.3 Extraction of metals</p> <p>Core</p> <ul style="list-style-type: none"> • Know that aluminium is extracted from the ore bauxite by electrolysis. • Discuss the advantages and disadvantages of recycling metals, limited to iron/steel and aluminium. <p>Supplement</p> <ul style="list-style-type: none"> • Describe in outline, the extraction of aluminium from bauxite including the role of cryolite and the reactions at the electrodes. <p>10.4 Uses of metals</p> <p>Core</p> <ul style="list-style-type: none"> • Name the uses of copper related to its properties (electrical wiring and in cooking utensils). <p>Supplement</p> <ul style="list-style-type: none"> • Describe the idea of changing the properties of iron by the controlled use of additives to form steel alloys. <p>11.1 Water</p> <p>Supplement</p> <ul style="list-style-type: none"> • Discuss the implications of an inadequate supply of water, limited to safe water for drinking and water for irrigating crops. <p>11.2 Air</p> <p>Core</p> <ul style="list-style-type: none"> • State the source of each of these pollutants <ul style="list-style-type: none"> – lead compounds from leaded petrol. • State the adverse effect of these common pollutants on buildings and on health and discuss why these pollutants are of global concern.

Chemistry (continued)	
Cambridge IGCSE Chemistry, Syllabus 0620	<ul style="list-style-type: none"> • State the conditions required for the rusting of iron. <p>11.4 Carbon dioxide and methane</p> <p>Core</p> <ul style="list-style-type: none"> • State that carbon dioxide and methane are greenhouse gasses and explain how they may contribute to climate change. <p>12 Sulfur</p> <p>Core</p> <ul style="list-style-type: none"> • Name some sources of sulfur. • Name the use of sulfur in the manufacture of sulfuric acid. • State the uses of sulfur dioxide as a bleach in the manufacture of wood pulp for paper and as a food preservative (by killing bacteria). <p>Supplement</p> <ul style="list-style-type: none"> • Describe the properties and uses of dilute and concentrated sulfuric acid. <p>14.1 Names of compounds</p> <p>Supplement</p> <ul style="list-style-type: none"> • Name and draw the structural formulae of the esters which can be made from unbranched alcohols and carboxylic acids, each containing up to four carbon atoms. <p>14.2 Fuels</p> <p>Core</p> <ul style="list-style-type: none"> • Describe the properties of molecules within a fraction. <p>14.3 Homologous series</p> <p>Supplement</p> <ul style="list-style-type: none"> • Recall that the compounds in a homologous series have the same general formula. <p>14.6 Alcohols</p> <p>Supplement</p> <ul style="list-style-type: none"> • Outline the advantages and disadvantages of these two methods of manufacturing ethanol. <p>14.7 Carboxylic acids</p> <p>Supplement</p> <ul style="list-style-type: none"> • Describe the reaction of a carboxylic acid with an alcohol in the presence of a catalyst to give an ester.

Chemistry (continued)   	
Cambridge IGCSE Chemistry, Syllabus 0620	<p>14.8.1 Polymers</p> <p>Core</p> <ul style="list-style-type: none"> Define polymers as large molecules built up from small units (monomers). <p>14.8.2 Synthetic polymers</p> <p>Core</p> <ul style="list-style-type: none"> Name some typical uses of plastics and of man-made fibres such as nylon and <i>Terylene</i>. Describe the pollution problems caused by non-biodegradable plastics. <p>Supplement</p> <ul style="list-style-type: none"> Explain the differences between condensation and addition polymerisation. <p>14.8.3 Natural polymers</p> <p>Core</p> <ul style="list-style-type: none"> Name proteins and carbohydrates as constituents of food. <p>Learning outcomes removed from the syllabus content</p> <p>14.8(b) Natural macromolecules</p> <p>Supplement</p> <ul style="list-style-type: none"> Describe fats as esters possessing the same linkage as <i>Terylene</i> but with different units. Describe soap as a product of hydrolysis of fats.

Combined Science 	
Cambridge IGCSE Combined Science, Syllabus 0653	<p>From June 2015</p> <p>Some of the content in Section 5 Syllabus content has been clarified and/or extended. Changes to content are indicated in the syllabus by black vertical lines either side of the text.</p> <p>From June 2016</p> <ul style="list-style-type: none"> Changes to content are indicated in the syllabus by black vertical lines either side of the text. The format of the Periodic Table has been changed to reflect current practice. The question papers for examination in 2016 will contain this version of the Periodic Table.

Co-ordinated Sciences 	
Cambridge IGCSE Co-ordinated Sciences, Syllabus 0654	<p>From June 2015</p> <p>Some of the content in Section 5 Syllabus content has been clarified and/or extended. Changes to content are indicated in the syllabus by black vertical lines either side of the text.</p> <p>From June 2016</p> <ul style="list-style-type: none"> • Changes to content are indicated in the syllabus by black vertical lines either side of the text. • The format of the Periodic Table has been changed to reflect current practice. The question papers for examination in 2016 will contain this version of the Periodic Table.
Environmental Management 	
Cambridge IGCSE Environmental Management, Syllabus 0680	<p>From March 2015</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p>
Physical Science 	
Cambridge IGCSE Physical Science, Syllabus 0652	<p>From November 2014</p> <p>The assessment objectives are now known as AO1, AO2 and AO3.</p> <p>From November 2016</p> <ul style="list-style-type: none"> • Minor changes to content are indicated in the syllabus by black vertical lines either side of the text. • The format of the Periodic Table has been changed to reflect current practice. The question papers for examination in 2016 will contain this version of the Periodic Table.

Physics	
Cambridge IGCSE Physics, Syllabus 0625	<div style="text-align: right;">    </div> <p>From March 2015</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2016</p> <p>In 2016 and beyond, assessments will be based on the revised syllabus only.</p> <p>This syllabus has been revised. Some changes are significant. Teachers are advised to read the whole of the syllabus document before planning their teaching programme.</p> <p>Changes to assessment</p> <ul style="list-style-type: none"> • The Coursework option has been withdrawn. • A new Multiple Choice paper has been introduced for Extended candidates. • Core candidates now take Paper 1: Multiple Choice (Core), Paper 3: Theory (Core) and either Paper 5: Practical Test or Paper 6: Alternative to Practical. • Extended candidates now take Paper 2: Multiple Choice (Extended), Paper 4: Theory (Extended) and either Paper 5: Practical Test or Paper 6: Alternative to Practical. • Paper 5: Practical test will now typically consist of four exercises, only three of which will require the use of apparatus. Candidates are expected to spend about 20 minutes on each of the practical exercises. <p>Changes to syllabus content</p> <p>The content has been revised and updated:</p> <ol style="list-style-type: none"> 1. The wording of some learning outcomes has been changed for clarification. 2. New learning outcomes have been added to the syllabus content. 3. Some learning outcomes have moved from Core to Supplement and others from Supplement to Core. 4. Some learning outcomes have been removed from the syllabus content. 5. The description of the practical assessment in Section 7 has been revised. <p>Details of the changes (1 to 3 in the list above) are supplied below.</p> <p>1.1 Length and time</p> <p>Core</p> <ul style="list-style-type: none"> • Obtain an average value for a small distance and for a short interval of time by measuring multiples (including the period of a pendulum). <p>Supplement</p> <ul style="list-style-type: none"> • Understand that a micrometer screw gauge is used to measure very small distances.

Physics (continued)	
Cambridge IGCSE Physics, Syllabus 0625	<div style="text-align: right;">    </div> <p>1.2 Motion</p> <p>Core</p> <ul style="list-style-type: none"> • Demonstrate understanding that acceleration and deceleration are related to changing speed including qualitative analysis of the gradient of a speed-time graph. <p>Supplement</p> <ul style="list-style-type: none"> • Define and calculate acceleration using $\frac{\text{change of velocity}}{\text{time taken}}$. • Calculate speed from the gradient of a distance-time graph. • Calculate acceleration from the gradient of a speed-time graph. • Understand deceleration as a negative acceleration. <p>1.3 Mass and weight</p> <p>Core</p> <ul style="list-style-type: none"> • State that weight is a gravitational force. • Distinguish between mass and weight. • Recall and use the equation $W = mg$. <p>1.4 Density</p> <p>Core</p> <ul style="list-style-type: none"> • Recall and use the equation $\rho = \frac{m}{V}$. • Describe the determination of the density of an irregularly shaped solid by the method of displacement. • Predict whether an object will float based on density data. <p>1.5.1 Effects of forces</p> <p>Core</p> <ul style="list-style-type: none"> • Plot and interpret extension-load graphs and describe the associated experimental procedure. • Recognise that if there is no resultant force on a body it either remains at rest or continues at constant speed in a straight line. • Understand friction as the force between two surfaces which impedes motion and results in heating. • Recognise air resistance as a form of friction. <p>1.5.2 Turning effect</p> <p>Core</p> <ul style="list-style-type: none"> • Understand that increasing force or distance from the pivot increases the moment of a force. • Calculate moment using the product force \times perpendicular distance from the pivot.

Physics (continued)	
Cambridge IGCSE Physics, Syllabus 0625	<div style="text-align: right;">    </div> <ul style="list-style-type: none"> Apply the principle of moments to the balancing of a beam about a pivot. <p>Supplement</p> <ul style="list-style-type: none"> Apply the principle of moments to different situations. <p>1.5.5 Scalars and vectors</p> <p>Supplement</p> <ul style="list-style-type: none"> Understand that vectors have a magnitude and direction. <p>1.6 Momentum</p> <p>Supplement</p> <ul style="list-style-type: none"> Understand the concepts of momentum and impulse. Recall and use the equation momentum = mass × velocity, $p = mv$. Recall and use the equation for impulse $Ft = mv - mu$. Apply the principle of the conservation of momentum to solve simple problems in one dimension. <p>1.7.1 Energy</p> <p>Core</p> <ul style="list-style-type: none"> Identify changes in kinetic, gravitational potential, chemical, elastic (strain), nuclear and internal energy that have occurred as a result of an event or process. Recognise that energy is transferred during events and processes, including examples of transfer by forces (mechanical working), by electrical currents (electrical working), by heating and by waves. <p>Supplement</p> <ul style="list-style-type: none"> Apply the principle of conservation of energy to examples involving multiple stages. Explain that in any event or process the energy tends to become more spread out among the objects and surroundings (dissipated). <p>1.7.2 Energy resources</p> <p>Core</p> <ul style="list-style-type: none"> Describe how electricity or other useful forms of energy may be obtained from: <ul style="list-style-type: none"> – wind. <p>Supplement</p> <ul style="list-style-type: none"> Understand that the Sun is the source of energy for all our energy resources except geothermal, nuclear and tidal. <p>1.7.3 Work</p> <p>Core</p> <ul style="list-style-type: none"> Demonstrate understanding that work done = energy transferred.

Physics (continued)	
Cambridge IGCSE Physics, Syllabus 0625	<p>1.8 Pressure</p> <p>Core</p> <ul style="list-style-type: none"> Recall and use the equation $p = F/A$. <p>2.1.2 Molecular model</p> <p>Core</p> <ul style="list-style-type: none"> Describe qualitatively the molecular structure of solids, liquids and gases in terms of the arrangement, separation and motion of the molecules. <p>Supplement</p> <ul style="list-style-type: none"> Explain pressure in terms of the change of momentum of the particles striking the walls creating a force. <p>2.1.3 Evaporation</p> <p>Supplement</p> <ul style="list-style-type: none"> Explain the cooling of a body in contact with an evaporating liquid. <p>2.2.1 Thermal expansion of solids, liquids and gases</p> <p>Supplement</p> <ul style="list-style-type: none"> Explain, in terms of the motion and arrangement of molecules, the relative order of the magnitude of the expansion of solids, liquids and gases. <p>2.2.2 Measurement of temperature</p> <p>Supplement</p> <ul style="list-style-type: none"> Describe and explain how the structure of a liquid-in-glass thermometer relates to its sensitivity, range and linearity. <p>2.2.3 Thermal capacity (heat capacity)</p> <p>Supplement</p> <ul style="list-style-type: none"> Give a simple molecular account of an increase in internal energy. Recall and use the equation thermal capacity = mc. Define specific heat capacity. Recall and use the equation change in energy = $mc\Delta T$. <p>2.2.4 Melting and boiling</p> <p>Core</p> <ul style="list-style-type: none"> Describe condensation and solidification in terms of molecules. <p>Supplement</p> <ul style="list-style-type: none"> Define specific latent heat. Recall and use the equation energy = ml.

Physics (continued)	
Cambridge IGCSE Physics, Syllabus 0625	<div style="text-align: right;">    </div> <p>2.3.1 Conduction</p> <p>Supplement</p> <ul style="list-style-type: none"> Give a simple molecular account of conduction in solids including lattice vibration and transfer by electrons. <p>2.3.2 Convection</p> <p>Core</p> <ul style="list-style-type: none"> Recognise convection as an important method of thermal transfer in fluids. <p>2.3.3 Radiation</p> <p>Core</p> <ul style="list-style-type: none"> Recognise that thermal energy transfer by radiation does not require a medium. Describe the effect of surface colour (black or white) and texture (dull or shiny) on the emission, absorption and reflection of radiation. <p>Supplement</p> <ul style="list-style-type: none"> Show understanding that the amount of radiation emitted also depends on the surface temperature and surface area of a body. <p>3.1 General wave properties</p> <p>Core</p> <ul style="list-style-type: none"> Demonstrate understanding that waves transfer energy without transferring matter. <p>Supplement</p> <ul style="list-style-type: none"> Describe how wavelength and gap size affects diffraction through a gap. Describe how wavelength affects diffraction at an edge. <p>3.2.1 Reflection of light</p> <p>Supplement</p> <ul style="list-style-type: none"> Recall that the image in a plane mirror is virtual. <p>3.2.2 Refraction of Light</p> <p>Supplement</p> <ul style="list-style-type: none"> Recall and use $n = \frac{1}{\sin c}$. Describe and explain the action of optical fibres particularly in medicine and communications technology. <p>3.2.3 Thin converging lens</p> <p>Core</p> <ul style="list-style-type: none"> Describe the nature of an image using the terms enlarged/same size/diminished and upright/inverted.

Physics (continued)	
Cambridge IGCSE Physics, Syllabus 0625	<div style="text-align: right;">    </div> <p>Supplement</p> <ul style="list-style-type: none"> Show understanding of the terms real image and virtual image. <p>3.2.4 Dispersion of light</p> <p>Core</p> <ul style="list-style-type: none"> Give a qualitative account of the dispersion of light as shown by the action on light of a glass prism including the seven colours of the spectrum in their correct order. <p>Supplement</p> <ul style="list-style-type: none"> Recall that light of a single frequency is described as monochromatic. <p>3.3 Electromagnetic spectrum</p> <p>Core</p> <ul style="list-style-type: none"> Describe typical properties and uses of radiations in all the different regions of the electromagnetic spectrum. <p>Supplement</p> <ul style="list-style-type: none"> State that the speed of electromagnetic waves in a vacuum is 3.0×10^8 m/s and is approximately the same in air. <p>3.4 Sound</p> <p>Core</p> <ul style="list-style-type: none"> State that the approximate range of audible frequencies for a healthy human ear is 20 Hz to 20 000 Hz. Show an understanding of the term ultrasound. <p>Supplement</p> <ul style="list-style-type: none"> State typical values of the speed of sound in gases, liquids and solids. <p>4.1 Simple phenomena of magnetism</p> <p>Core</p> <ul style="list-style-type: none"> Describe the forces between magnets, and between magnets and magnetic materials. Distinguish between magnetic and non-magnetic materials. Describe methods of magnetisation, to include stroking with a magnet, use of d.c. in a coil and hammering in a magnetic field. Draw the pattern of magnetic field lines around a bar magnet. Describe an experiment to identify the pattern of magnetic field lines including the direction. <p>Supplement</p> <ul style="list-style-type: none"> Explain that magnetic forces are due to interactions between magnetic fields. Describe methods of demagnetisation, to include hammering, heating and use of a.c. in a coil.

Physics (continued)	
Cambridge IGCSE Physics, Syllabus 0625	<div style="text-align: right;">    </div> <p>4.2.1 Electric charge</p> <p>Core</p> <ul style="list-style-type: none"> State that charging a body involves the addition or removal of electrons. <p>Supplement</p> <ul style="list-style-type: none"> State that the direction of an electric field at a point is the direction of the force on a positive charge at that point. Describe simple field patterns, including the field around a point charge, the field around a charged conducting sphere and the field between two parallel plates (not including end effects). <p>4.2.2 Current</p> <p>Core</p> <ul style="list-style-type: none"> State that current in metals is due to a flow of electrons. <p>4.2.4 Potential difference</p> <p>Supplement</p> <ul style="list-style-type: none"> Recall that 1 V is equivalent to 1 J/C. <p>4.2.5 Resistance</p> <p>Supplement</p> <ul style="list-style-type: none"> Sketch and explain the current-voltage characteristic of an ohmic resistor and a filament lamp. <p>4.2.6 Electrical working</p> <p>Core</p> <ul style="list-style-type: none"> Understand that electric circuits transfer energy from the battery or power source to the circuit components then into the surroundings. <p>4.3.1 Circuit diagrams</p> <p>Core</p> <ul style="list-style-type: none"> Draw and interpret circuit diagrams containing...heaters, thermistors, light-dependent resistors... galvanometers... <p>4.3.2 Series and parallel circuits</p> <p>Supplement</p> <ul style="list-style-type: none"> Calculate the combined e.m.f. of several sources in series. <p>4.4 Digital electronics</p> <p>Supplement</p> <ul style="list-style-type: none"> Explain and use the terms analogue and digital in terms of continuous variation and high/low states. Use truth tables to describe the action of individual gates and simple combinations of gates.

Physics (continued)	
<p>Cambridge IGCSE Physics, Syllabus 0625</p>	<div style="text-align: right;">    </div> <p>4.5 Dangers of electricity</p> <p>Core</p> <ul style="list-style-type: none"> • State that a fuse protects a circuit. • Explain the use of fuses and circuit breakers and choose appropriate fuse ratings and circuit-breaker settings. • Explain the benefits of earthing metal cases. <p>4.6.1 Electromagnetic induction</p> <p>Core</p> <ul style="list-style-type: none"> • Show understanding that a conductor moving across a magnetic field or a changing magnetic field linking with a conductor can induce an e.m.f. in the conductor. • State the factors affecting the magnitude of an induced e.m.f. <p>Supplement</p> <ul style="list-style-type: none"> • State and use the relative directions of force, field and induced current. <p>4.6.2 a.c. generator</p> <p>Core</p> <ul style="list-style-type: none"> • Distinguish between direct current (d.c.) and alternating current (a.c.). <p>Supplement</p> <ul style="list-style-type: none"> • Describe and explain a rotating-coil generator and the use of slip rings. • Relate the position of the generator coil to the peaks and zeros of the voltage output. <p>4.6.3 Transformer</p> <p>Core</p> <ul style="list-style-type: none"> • Understand the terms step-up and step-down. <p>4.6.4 The magnetic effect of a current</p> <p>Supplement</p> <ul style="list-style-type: none"> • State that the direction of a magnetic field line at a point is the direction of the force on the N pole of a magnet at that point. <p>4.6.6 d.c. motor</p> <p>Core</p> <ul style="list-style-type: none"> • State that a current-carrying coil in a magnetic field experiences a turning effect and that the effect is increased by: <ul style="list-style-type: none"> – increasing the current – increasing the strength of the magnetic field.

Physics (continued)	
Cambridge IGCSE Physics, Syllabus 0625	<div style="text-align: right;">    </div> <p>Supplement</p> <ul style="list-style-type: none"> Relate this turning effect to the action of an electric motor including the action of a split-ring commutator . <p>5.1.2 Nucleus</p> <p>Core</p> <ul style="list-style-type: none"> State the charges of protons and neutrons. <p>Supplement</p> <ul style="list-style-type: none"> State the meaning of nuclear fission and nuclear fusion. Balance equations involving nuclide notation. <p>5.2.2 Characteristics of the three kinds of emission</p> <p>Core</p> <ul style="list-style-type: none"> Identify α, β and γ-emissions by recalling: <ul style="list-style-type: none"> – their nature – their relative ionising effects – their relative penetrating abilities. <p>Supplement</p> <ul style="list-style-type: none"> Give and explain examples of practical applications of α, β and γ-emissions. <p>5.2.3 Radioactive decay</p> <p>Core</p> <ul style="list-style-type: none"> State that during α- or β-decay the nucleus changes to that of a different element. <p>5.2.4 Half-life</p> <p>Supplement</p> <ul style="list-style-type: none"> Calculate half-life from data or decay curves from which background radiation has not been subtracted. <p>5.2.5 Safety precautions</p> <p>Core</p> <ul style="list-style-type: none"> Recall the effects of ionising radiations on living things. <p>Learning outcomes removed from the syllabus content</p> <p>4.2.1 Electric charge</p> <p>Core</p> <ul style="list-style-type: none"> Describe an electric field as a region in which an electric charge experiences a force.

Physics (continued)	
Cambridge IGCSE Physics, Syllabus 0625	<div style="text-align: right;">    </div> <p>4.3 Action and use of circuit components</p> <p>Core</p> <ul style="list-style-type: none"> Describe the action of a capacitor as an energy store and show understanding of its use in time delay circuits. <p>Supplement</p> <ul style="list-style-type: none"> Describe the action of a transistor as an electrically operated switch and show understanding of its use in switching circuits. <p>4.4 Digital electronics</p> <p>Supplement</p> <ul style="list-style-type: none"> State that logic gates are circuits containing transistors and other components. <p>4.6 Cathode-ray oscilloscopes</p> <p>4.6 (a) Cathode rays</p> <p>Core</p> <ul style="list-style-type: none"> Describe the production and detection of cathode rays. Describe their deflection in electric fields. State that the particles emitted in thermionic emission are electrons. <p>4.6 (b) Simple treatment of cathode-ray oscilloscope</p> <p>Supplement</p> <ul style="list-style-type: none"> Describe (in outline) the basic structure and action of a cathode-ray oscilloscope (detailed circuits are not required). Use and describe the use of a cathode-ray oscilloscope to display waveforms.

Cambridge O Level

Agriculture 	
Cambridge O Level Agriculture, Syllabus 5038	<p>From November 2014</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • There are small insertions of material in Section 5, Crop Protection – addition of weeds (section (a)), weed control (section (b)) and herbicides (section (i)). • There are no other significant changes to the content. <p>Changes to assessment</p> <ul style="list-style-type: none"> • The presentation of the weighting of the assessment objectives has been changed and they have been renamed, but the assessment is unchanged. <p>A table is included showing the marks for the assessment objectives within the components.</p> <p>Clarification of requirements for the coursework practical exercises</p> <ul style="list-style-type: none"> • For clarification on the coursework practical exercises requirements please see Section 7.2 in the 2015 syllabus available on our public website at www.cie.org.uk <p>From November 2015</p> <p>Clarification of requirements for the coursework practical exercises</p> <ul style="list-style-type: none"> • Section 7.2 has been revised to clarify the requirements for the coursework practical exercises.
Biology 	
Cambridge O Level Biology, Syllabus 5090	<p>From June 2014</p> <p>The assessment objectives are now known as AO1, AO2 and AO3.</p> <p>From June 2015</p> <p>In practical work, candidates will be expected to use SI units or, where appropriate, units approved by the BIPM for use with the SI (e.g. minute). A list of SI units and units approved for use with the SI may be found in the SI brochure at http://www.bipm.org. The use of imperial/customary units such as the inch and degree Fahrenheit is not acceptable and should be discouraged. In all examinations, where data is supplied for use in questions, candidates will be expected to use units supplied, and should not attempt conversion to other systems of units unless this is a requirement of the question (see p.10 in the 2015 syllabus).</p>

Chemistry 	
Cambridge O Level Chemistry, Syllabus 5070	<p>From June 2014</p> <p>The assessment objectives are now known as AO1, AO2 and AO3.</p> <p>From June 2015</p> <p>In practical work, candidates will be expected to use SI units or, where appropriate, units approved by the BIPM for use with the SI (e.g. minute). A list of SI units and units approved for use with the SI may be found in the SI brochure at http://www.bipm.org. The use of imperial/customary units such as the inch and degree Fahrenheit is not acceptable and should be discouraged. In all examinations, where data is supplied for use in questions, candidates will be expected to use units supplied, and should not attempt conversion to other systems of units unless this is a requirement of the question (see p.10 in the 2015 syllabus).</p> <p>Changes to syllabus content</p> <p>Changes have been made to the practical requirements of the syllabus and to the Qualitative Analysis notes to reflect recommendations made by the Europeans Chemicals Agency on the use of chemicals. Changes have been made to the theory syllabus to reflect the changes in the practical syllabus. Changes to content are indicated in the syllabus by black vertical lines either side of the text.</p> <p>From June 2016</p> <p>The Periodic Table has been updated.</p> <p>One learning outcome has been added in order to clarify the requirements of the syllabus: 7.2 (d) 'describe the meanings of the terms hydrated, anhydrous, and water of crystallisation'.</p>

Combined Science 	
Cambridge O Level Combined Science, Syllabus 5129	<p>From June 2014</p> <p>The assessment objectives are now known as AO1 and AO2.</p> <p>From June 2015</p> <p>Some of the content in Section 5 Syllabus content has been clarified and/or extended. Changes to content are indicated in the syllabus by black vertical lines either side of the text.</p> <p>From June 2016</p> <ul style="list-style-type: none"> • Changes to content are indicated in the syllabus by black vertical lines either side of the text. • The format of the Periodic Table has been changed to reflect current practice. The question papers for examination in 2016 will contain this version of the Periodic Table.

Marine Science NEW 	
Cambridge O Level Marine Science, Syllabus 5180	<p>From November 2014</p> <p>This new syllabus is available for first assessment in November 2014 for the Maldives only.</p> <p>From November 2015</p> <p>From November 2015 this syllabus is available to all Centres in Zones 3, 4 and 5.</p> <p>In all examinations, where question papers include data, candidates will be expected to use units that are consistent with the units supplied and should not attempt conversion to other systems of units unless this is a requirement of the question (see p.10 in the 2015 syllabus).</p>

Physics 	
Cambridge O Level Physics, Syllabus 5054	<p>From June 2014</p> <p>The assessment objectives are now known as AO1, AO2 and AO3.</p> <p>From June 2015</p> <p>In practical work, candidates will be expected to use SI units or, where appropriate, units approved by the BIPM for use with the SI (e.g. minute). A list of SI units and units approved for use with the SI may be found in the SI brochure at http://www.bipm.org. The use of imperial/customary units such as the inch and degree Fahrenheit is not acceptable and should be discouraged. In all examinations, where data is supplied for use in questions, candidates will be expected to use units supplied, and should not attempt conversion to other systems of units unless this is a requirement of the question (see p.10 in the 2015 syllabus).</p> <p>From June 2016</p> <p>The definitions previously identified by asterisks in Section 7.1 are now explicitly identified in Section 5 Syllabus content.</p> <p>Some of the content has been clarified and/or extended. Significant changes to the content are indicated in the syllabus by black vertical lines either side of the text.</p>

Cambridge International AS and A Level

Biology	
Cambridge International AS and A Level Biology, Syllabus 9700	<div style="text-align: right;">   </div> <p>From March 2016</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2016</p> <p>This syllabus has been revised and reorganised. Teachers are advised to read the whole syllabus before planning their teaching programme. The main changes are outlined below.</p> <p>Changes to syllabus content</p> <p>The content has been revised and reorganised:</p> <ol style="list-style-type: none"> 1. The wording of some learning outcomes has been changed for clarification. 2. The applications learning outcomes (topics Q to U previously) have been moved and integrated into other topics alongside the relevant theory. 3. New learning outcomes have been added to the syllabus content. 4. Some learning outcomes have been removed from the syllabus content. 5. Some learning outcomes have moved from AS Level to A Level and others from A Level to AS Level. <p>Details of the changes (3 to 5 in the list above) are supplied below.</p> <p>New learning outcomes</p> <p>1.2 (c) state that ATP is produced in mitochondria and chloroplasts and outline the role of ATP in cells</p> <p>1.2 (f) outline the key features of viruses as non-cellular structures (limited to protein coat and DNA/RNA)</p> <p>3.1 (b) state that enzymes function inside cells (intracellular enzymes) and outside cells (extracellular enzymes)</p> <p>3.2 (b) explain that the maximum rate of reaction (V_{max}) is used to derive the Michaelis-Menten constant (K_m) which is used to compare the affinity of different enzymes for their substrates</p> <p>4.1 (c) outline the process of cell signalling involving the release of chemicals that combine with cell surface receptors on target cells, leading to specific responses</p>

Biology (continued)		 
Cambridge International AS and A Level Biology, Syllabus 9700	4.2	(b)(c) b) investigate simple diffusion using plant tissue and non-living materials, such as glucose solutions, Visking tubing and agar (d)(f) c) calculate surface areas and volumes of simple shapes (e.g. cubes) to illustrate the principle that surface area to volume ratios decrease with increasing size d) investigate the effect of changing surface area to volume ratio on diffusion using agar blocks of different sizes f) explain the movement of water between cells and solutions with different water potentials and explain the different effects on plant and animal cells
	5.1	(a)(d) a) describe the structure of a chromosome, limited to DNA, histone proteins, chromatids, centromere and telomeres d) outline the significance of telomeres in permitting continued replication and preventing loss of genes
	5.2	(b) observe and draw the mitotic stages visible in temporary root tip squash preparations and in prepared slides of root tips of species such as those of <i>Vicia faba</i> and <i>Allium cepa</i>
	6.1	(a) describe the structure of nucleotides, including the phosphorylated nucleotide ATP (structural formulae are not required)
	7.2	(b) explain how hydrogen bonding of water molecules is involved with movement in the xylem by cohesion-tension in transpiration pull and adhesion to cellulose cell walls
	10.2	(b)(c) b) explain in outline how bacteria become resistant to antibiotics with reference to mutation and selection c) discuss the consequences of antibiotic resistance and the steps that can be taken to reduce its impact
	11.1	(c)(f) c) describe and explain the significance of the increase in white blood cell count in humans with infectious diseases and leukaemias f) explain, with reference to myasthenia gravis, that the immune system sometimes fails to distinguish between self and non-self
	12.1	(c)(d) c) explain that ATP is synthesised in substrate-linked reactions in glycolysis and in the Krebs cycle d) outline the roles of the co-enzymes NAD, FAD and co-enzyme A in respiration
	12.2	(h)(j) h) carry out investigations to determine the effect of factors, such as temperature and substrate concentration, on the rate of respiration of yeast using a redox indicator (e.g. DCPIP or methylene blue) j) distinguish between respiration in aerobic and anaerobic conditions in mammalian tissue and in yeast cells, contrasting the relative energy released by each (a detailed account of the total yield of ATP from the aerobic respiration of glucose is not required)

Biology (continued)			
Cambridge International AS and A Level Biology, Syllabus 9700	12.2 (m)	carry out investigations, using simple respirometers, to measure the effect of temperature on the respiration rate of germinating seeds or small invertebrates	
	13.2 (d)	carry out an investigation to determine the effect of light intensity or light wavelength on the rate of photosynthesis using a redox indicator (e.g. DCPIP) and a suspension of chloroplasts (the Hill reaction)	
	14.1 (c)(d)(j)(l)	c) outline the roles of the nervous system and endocrine system in co-ordinating homeostatic mechanisms, including thermoregulation, osmoregulation and the control of blood glucose concentration d) describe the deamination of amino acids and outline the formation of urea in the urea cycle. (biochemical detail of the urea cycle is not required) j) describe the three main stages of cell signalling in the control of blood glucose by adrenaline as follows: <ul style="list-style-type: none"> • hormone-receptor interaction at the cell surface (see 4.1c) • formation of cyclic AMP which binds to kinase proteins • an enzyme cascade involving activation of enzymes by phosphorylation to amplify the signal l) explain how urine analysis is used in diagnosis with reference to glucose, protein and ketones	
	14.2 (a)(b)	a) explain that stomata have daily rhythms of opening and closing and also respond to changes in environmental conditions to allow diffusion of carbon dioxide and regulate water loss by transpiration b) describe the structure and function of guard cells and explain the mechanism by which they open and close stomata	
	15.1 (i)(j)(k)	i) describe the roles of neuromuscular junctions, transverse system tubules and sarcoplasmic reticulum in stimulating contraction in striated muscle j) describe the ultrastructure of striated muscle with particular reference to sarcomere structure k) explain the sliding filament model of muscular contraction including the roles of troponin, tropomyosin, calcium ions and ATP	
	15.2 (a)	describe the rapid response of the Venus fly trap to stimulation of hairs on the lobes of modified leaves and explain how the closure of the trap is achieved	
	16.1 (a)	explain what is meant by homologous pairs of chromosomes	
	16.2 (f)(g)	f) outline the effects of mutant alleles on the phenotype in the following human conditions: albinism, sickle cell anaemia, haemophilia and Huntington's disease g) explain the relationship between genes, enzymes and phenotype with respect to the gene for tyrosinase that is involved with the production of melanin	

Biology (continued)		 
Cambridge International AS and A Level Biology, Syllabus 9700	16.3 (a)(b)	a) distinguish between structural and regulatory genes and between repressible and inducible enzymes b) explain genetic control of protein production in a prokaryote using the <i>lac</i> operon
	17.1 (c)	use the <i>t</i> -test to compare the variation of two different populations
	17.2 (d)(e)	d) use the Hardy–Weinberg principle to calculate allele, genotype and phenotype frequencies in populations and explain situations when this principle does not apply e) describe how selective breeding (artificial selection) has been used to improve the milk yield of dairy cattle
	17.3 (b)	discuss the molecular evidence that reveals similarities between closely related organisms with reference to mitochondrial DNA and protein sequence data
	18.1 (d)(e)(f)	d) use suitable methods, such as frame quadrats, line transects, belt transects and mark-release-recapture, to assess the distribution and abundance of organisms in a local area e) use Spearman’s rank correlation and Pearson’s linear correlation to analyse the relationships between the distribution and abundance of species and abiotic or biotic factors f) use Simpson’s Index of Diversity (<i>D</i>) to calculate the biodiversity of a habitat, using the formula $D = 1 - \left(\sum \left(\frac{n}{N} \right)^2 \right)$ and state the significance of different values of <i>D</i>
	18.2 (d)	explain why viruses are not included in the three domain classification and outline how they are classified limited to type of nucleic acid (RNA or DNA) and whether these are single stranded or double stranded
	18.3 (a)(f)(g)	a) discuss the threats to the biodiversity of aquatic and terrestrial ecosystems f) use examples to explain the reasons for controlling alien species g) discuss the roles of non-governmental organisations, such as the World Wide Fund for Nature (WWF) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), in local and global conservation
	19.1 (i)	explain, in outline, how microarrays are used in the analysis of genomes and in detecting mRNA in studies of gene expression
	19.2 (a)(b)(g)	a) define the term bioinformatics b) outline the role of bioinformatics following the sequencing of genomes, such as those of humans and parasites, e.g. <i>Plasmodium</i> (details of methods of DNA sequencing are not required) g) outline the use of PCR and DNA testing in forensic medicine and criminal investigations

Biology (continued)		 
Cambridge International AS and A Level Biology, Syllabus 9700	Learning outcomes removed from the syllabus content A Level only learning outcomes are indicated in bold.	
	G (i)	outline the roles of nitrate ions and of magnesium ions in plants
	H (h)	explain how tobacco smoking contributes to atherosclerosis and coronary heart disease (CHD)
	(i)	evaluate the epidemiological and experimental evidence linking cigarette smoking to disease and early death
	(j)	discuss the difficulties in achieving a balance between preventions and cure with reference to coronary heart disease, coronary by-pass surgery and heart transplant surgery
	K (a)	define the terms <i>habitat</i> , <i>niche</i> , <i>population</i> , <i>community</i> and <i>ecosystem</i> and be able to recognise examples of each
	(b)	explain the terms <i>autotroph</i> , <i>heterotroph</i> , <i>producer</i> , <i>consumer</i> and <i>trophic level</i> in the context of food chains and food webs
	(c)	explain how energy losses occur along food chains and discuss the efficiency of energy transfer between trophic levels
	(d)	describe how nitrogen is cycled within an ecosystem, including the roles of nitrogen-fixing bacteria (e.g. <i>Rhizobium</i>) and nitrifying bacteria (<i>Nitrosomonas</i> and <i>Nitrobacter</i>)
	N (b)	define the term <i>excretion</i> and explain the importance of removing nitrogenous waste products and carbon dioxide from the body
	(l)	explain what is meant by the term <i>endocrine gland</i>
	(m)	[PA] describe the cellular structure of an islet of Langerhans from the pancreas and outline the role of the pancreas as an endocrine gland
	(o)	outline the need for, and the nature of, communication systems within flowering plants to respond to changes in the internal and external environment
	Q (d)	describe the reasons why one named species has become endangered, and use this information in the context of other endangered species
	R (b)	explain the advantages of treating diabetics with human insulin produced by gene technology
	S (a)	outline the use of microorganisms in the extraction of heavy metals from low grade ores
	(b)	explain what is meant by the terms <i>batch culture</i> and <i>continuous culture</i>
	(c)	compare the advantages and disadvantages of batch and continuous culture with reference to the production of secondary metabolites (e.g. penicillin), enzymes (e.g. protease) and biomass (e.g. mycoprotein)

Biology (continued)				
Cambridge International AS and A Level Biology, Syllabus 9700	T	(a) [PA] describe and explain the structural features of a named, wind-pollinated plant (b) compare the outcomes of self-pollination and cross-pollination in terms of genetic variation (c) [PA] describe the structure of the fruit in maize and explain the function of the endosperm (d) explain the significance of the grains of cereal crops in the human diet		
	U	(a) [PA] explain the histology of the mammalian ovary and testis (e) discuss and evaluate the biological, social and ethical implications of the use of contraception		
	AS Level material moved to A Level only			
	18.1	(a) define the terms species, ecosystem and niche		
	A Level material moved to AS Level			
	3.2	(d) investigate the effect of immobilising an enzyme in alginate on its activity as compared with its activity when free in solution		
	11.2	(b)(c) b) outline the hybridoma method for the production of monoclonal antibodies c) outline the use of monoclonal antibodies in the diagnosis of disease and in the treatment of disease		
	Changes to assessment			
	<ul style="list-style-type: none"> Assessment objectives: There has been a change in the weighting of the assessment objectives (AO) so that AO1 (Knowledge with understanding) is now 40% instead of 45% and AO2 (Handling information and solving problems) is now 37% instead of 32%. Additionally there have been some minor changes to the descriptions of these assessment objectives. The mathematical requirements for this syllabus have changed. 			
	Availability by exam series			
In 2016, assessments will be based on the revised syllabus only . <ul style="list-style-type: none"> Candidates can carry forward the result of their Cambridge International AS Level assessments in 2015 to complete the Cambridge International A Level in 2016. The Cambridge International A Level assessments in the 2016 exam series are based on the revised syllabus. Assessments for candidates retaking Cambridge International AS Level or A Level in 2016 are based on the revised syllabus. You can learn more about this revised syllabus at www.cie.org.uk/new				

Chemistry	
Cambridge International AS and A Level Chemistry, Syllabus 9701	<div style="text-align: right;">   </div> <p>From March 2016</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2016</p> <p>This syllabus has been revised and reorganised. Teachers are advised to read the whole syllabus before planning their teaching programme. The main changes are outlined below.</p> <p>Changes to syllabus content</p> <p>Content has been revised and reorganised:</p> <ol style="list-style-type: none"> The wording of some of the learning outcomes has been changed for clarification. The applications learning outcomes (topics 11.1 to 11.3 previously) have been integrated into other topics alongside the relevant theory. New learning outcomes have been added to the syllabus content. Some learning outcomes have been removed from the syllabus content. Some learning outcomes have moved from AS Level to A Level and others from A Level to AS Level. <p>Details of the changes (3 to 5 in the list above) are supplied below.</p> <p>New learning outcomes (2016 references)</p> <p>A Level learning outcomes are indicated in bold.</p> <p>2.3 (b) describe and sketch the shapes of s and p orbitals</p> <p>4.3 (a) describe, in simple terms, the lattice structure of a crystalline solid which is:</p> <ol style="list-style-type: none"> simple molecular, as in iodine and the fullerene allotropes of carbon (C₆₀ and nanotubes only) giant molecular, as in silicon(IV) oxide and the graphite, diamond and graphene allotropes of carbon <p>5.3 (a)(b) a) explain that entropy is a measure of the ‘disorder’ of a system, and that a system becomes more stable when its energy is spread out in a more disordered state</p> <p>(c)(d) b) explain the entropy changes that occur:</p> <ol style="list-style-type: none"> during a change in state e.g. (s) → (l); (l) → (g); (s) → (aq) during a temperature change during a reaction in which there is a change in the number of gaseous molecules <p>c) predict whether the entropy change for a given process is positive or negative</p> <p>d) calculate the entropy change for a reaction, ΔS^\ominus, given the standard entropies, S^\ominus, of the reactants and products</p>

Chemistry (continued)		 
Cambridge International AS and A Level Chemistry, Syllabus 9701	5.4	(a)(b) a) define standard Gibbs free energy change of reaction by means of the equation $\Delta G^{\ominus} = \Delta H^{\ominus} - T\Delta S^{\ominus}$ (c)(d) b) calculate ΔG^{\ominus} for a reaction using the equation $\Delta G^{\ominus} = \Delta H^{\ominus} - T\Delta S^{\ominus}$ c) state whether a reaction or process will be spontaneous by using the sign of ΔG^{\ominus} d) predict the effect of temperature change on the spontaneity of a reaction, given standard enthalpy and entropy changes
	6.3	(i) use the Nernst equation, $E = E^{\ominus} + (0.059/z) \log \frac{[\text{oxidised species}]}{[\text{reduced species}]}$ to predict quantitatively how the value of an electrode potential varies with the concentrations of the aqueous ions; examples include $\text{Cu(s)} + 2\text{e}^{-} \rightleftharpoons \text{Cu}^{2+}(\text{aq})$, $\text{Fe}^{3+}(\text{aq}) + \text{e}^{-} \rightleftharpoons \text{Fe}^{2+}(\text{aq})$, $\text{Cl}_2(\text{g}) + 2\text{e}^{-} \rightleftharpoons 2\text{Cl}^{-}(\text{aq})$
	7.3	(a) state what is meant by partition coefficient; calculate and use a partition coefficient for a system in which the solute is in the same molecular state in the two solvents
	8.1	(g) for a multi-step reaction: (i) suggest a reaction mechanism that is consistent with the rate equation and the equation for the overall reaction (ii) predict the order that would result from a given reaction mechanism (and vice versa)
	8.2	(c) explain qualitatively the effect of temperature change on a rate constant and hence the rate of reaction
	8.3	(b) explain that catalysts can be homogenous or heterogeneous
	10.1	(e) state the variation in the solubilities of the hydroxides and sulfates
	12.1	(b) sketch the general shape of a d orbital
	12.2	(a) cobalt(II) has been added
	12.2	(b) b) (i) define the term <i>ligand</i> as a species that contains a lone pair of electrons that forms a dative bond to a central metal atom/ion including monodentate, bidentate and polydentate ligands
	12.2	(b) (iv) state what is meant by co-ordination number and predict the formula and charge of a complex ion, given the metal ion, its charge, the ligand and its co-ordination number

Chemistry (continued)			
Cambridge International AS and A Level Chemistry, Syllabus 9701	12.4	(a)(b)	a) describe the types of stereoisomerism shown by complexes, including those associated with bidentate ligands: (i) cis-trans isomerism , e.g. cis- and trans-platin $\text{Pt}(\text{NH}_3)_2\text{Cl}_2$ (ii) optical isomerism , e.g. $[\text{Ni}(\text{NH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_3]^{2+}$ b) describe the use of cisplatin as an anticancer drug and its action by binding to DNA in cancer cells, preventing cell division
	12.5	(a)(b) (c)(d)	a) describe and explain ligand exchanges in terms of competing equilibria (also see Section 7) b) state that the stability constant, K_{stab} , of a complex ion is the equilibrium constant for the formation of the complex ion in a solvent from its constituent ions or molecules c) deduce expressions for the stability constant of a ligand substitution d) explain ligand exchange in terms of stability constants, K_{stab} , and understand that a large K_{stab} is due to formation of a stable complex ion
	14.1	(b)(c)	b) understand and use systematic nomenclature of simple aliphatic organic molecules with functional groups detailed in 14.1(a), up to six carbon atoms (six plus six for esters and amides, straight chains only) c) understand and use systematic nomenclature of simple aromatic molecules with one benzene ring and one or more simple substituents, for example 3-nitrobenzoic acid, 2, 4, 6-tribromophenol
	15.2	(c)(e) (f)	c) describe and explain the inductive effects of alkyl groups on the stability of cations formed during electrophilic addition e) deduce the repeat unit of an addition polymer obtained from a given monomer f) identify the monomer(s) present in a given section of an addition polymer molecule
	15.3	(c)	outline the use of infra-red spectroscopy in monitoring air pollution (see also Section 22.2)
	15.4	(a)	(iii) Friedel-Crafts alkylation and acylation
		(e)	apply knowledge relating to position of substitution in the electrophilic substitution of arenes (see the <i>Data Booklet</i>)
	19.1	(c)	recognise that some carboxylic acids can be further oxidised: (i) the oxidation of methanoic acid, HCO_2H , with Fehling's and Tollens' reagents (ii) the oxidation of ethanedioic acid, $\text{HO}_2\text{CCO}_2\text{H}$, with warm acidified manganate(VII)
	21.1	(b)	describe the characteristics of condensation polymerisation: (ii) in polyamides as exemplified by polypeptides, proteins, nylon 6, nylon 6,6 and Kevlar

Chemistry (continued)			
Cambridge International AS and A Level Chemistry, Syllabus 9701	21.3	(e)	describe how polymers have been designed to act as: (i) non-solvent based adhesives, e.g. epoxyresins and superglues (ii) conducting polymers, for e.g. polyacetylene
	21.4	(a)–(c)	a) recognise that polyalkenes are chemically inert and can therefore be difficult to biodegrade b) recognise that a number of polymers can be degraded by the action of light c) recognise that polyesters and polyamides are biodegradable by hydrolysis
	22.1	(a)(b)	a) explain and use the terms <i>R_f value</i> in thin layer chromatography and <i>retention time</i> in gas/liquid chromatography from chromatograms b) interpret gas/liquid chromatograms in terms of the percentage composition of a mixture
	22.2	(a)	analyse an infra-red spectrum of a simple molecule to identify those functional groups that are included in this specification (see the <i>Data Booklet</i> for functional groups required in the syllabus)
	22.4	(a)(b)	a) analyse a carbon-13 NMR spectrum of a simple molecule to deduce: (i) the different environments of the carbon atoms present (ii) the possible structures for the molecule b) predict the number of peaks in a carbon-13 NMR spectrum from a given molecule
	22.5	(a)–(e)	a) analyse and interpret proton NMR spectra of a simple molecule to deduce: (i) the different types of proton present using chemical shift values (ii) the relative numbers of each type of proton present from relative peak areas (iii) the number of non-equivalent protons adjacent to a given proton from the splitting pattern, using the $n + 1$ rule (iv) the possible structures for the molecule b) predict the chemical shifts and splitting patterns of the protons in a given molecule c) describe the use of tetramethylsilane, TMS, as the standard for chemical shift measurements d) state the need for deuterated solvents, e.g. CDCl_3 , when obtaining an NMR spectrum e) describe the identification of O-H and N-H protons by proton exchange using D_2O
	23.1	(a)(b)	a) state that most chiral drugs extracted from natural sources often contain only a single optical isomer b) state reasons why the synthetic preparation of drug molecules often requires the production of a single optical isomer, e.g. better therapeutic activity, fewer side effects

Chemistry (continued)	
Cambridge International AS and A Level Chemistry, Syllabus 9701	<div style="text-align: right;">   </div> <p>23.2 (a)–(c) a) for an organic molecule containing several functional groups:</p> <p style="padding-left: 20px;">(i) identify organic functional groups using the reactions in the syllabus</p> <p style="padding-left: 20px;">(ii) predict properties and reactions</p> <p>b) devise multi-stage synthetic routes for preparing organic molecules using the reactions in this syllabus</p> <p>c) analyse a given synthetic route in terms of type of reaction and reagents used for each step of it, and possible by-products</p> <ul style="list-style-type: none"> • The <i>Data Booklet</i> has been updated. • The Periodic Table has been updated. <p>Learning outcomes removed from the syllabus content</p> <p>A Level learning outcomes are indicated in bold.</p> <p>4 (g) relate the uses of ceramics, based on magnesium oxide, aluminium oxide and silicon(IV) oxide, to their properties (suitable examples include furnace linings, electrical insulators, glass, crockery)</p> <p>6 (b) explain, including the electrode reactions, the industrial processes of:</p> <p style="padding-left: 20px;">(i) the electrolysis of brine, using a diaphragm cell</p> <p style="padding-left: 20px;">(ii) the extraction of aluminium from molten aluminium oxide/cryolite</p> <p style="padding-left: 20px;">(iii) the electrolytic purification of copper</p> <p>9.2 (e) explain the use of magnesium oxide as a refractory lining material</p> <p>9.3 Group IV – these learning outcomes have been removed</p> <p>9.4 (g) outline a method for the manufacture of chlorine from brine by a diaphragm cell</p> <p>9.6 (c) describe the Haber process for the manufacture of ammonia from its elements, giving essential operating conditions, and interpret these conditions (qualitatively) in terms of the principles of kinetics and equilibria</p> <p style="padding-left: 20px;">(j) state the main details of the Contact process for sulfuric acid production</p> <p style="padding-left: 20px;">(k) describe the use of sulfur dioxide in food preservation</p> <p>11.1 (b) explain the importance of amino acid sequence (primary structure) in determining the properties of proteins</p> <p style="padding-left: 20px;">(d) describe and explain the structural integrity of enzymes in relation to denaturation and non-competitive inhibition</p> <p style="padding-left: 20px;">(e) given information, use core chemistry to explain how small molecules interact with proteins and how they can modify the structure and function of biological systems (for example, as enzyme inhibitors or cofactors, disrupting protein-protein interactions, blocking ion channels)</p>

Chemistry (continued)		 
Cambridge International AS and A Level Chemistry, Syllabus 9701	<p>(f) describe the double helical structure of DNA in terms of a sugar-phosphate backbone and attached bases (Candidates will be expected to know the general structure in terms of a block diagram but will not be expected to recall the detailed structures of the components involved. Where these are required they will be given in the question paper.)</p> <p>(h) explain in outline how DNA encodes for the amino acid sequence of proteins with reference to mRNA, tRNA and the ribosome in translation and transcription</p> <p>(i) explain the chemistry of DNA mutation from provided data</p> <p>(j) discuss the genetic basis of disease (for example, sickle cell anaemia) in terms of altered base sequence, causing alterations in protein structure and function</p> <p>(k) explain how modification to protein/enzyme primary structure can result in new structure and/or function</p> <p>(l) outline, in terms of the hydrolysis of ATP to ADP + P_i, the provision of energy for the cell</p> <p>(m) understand why some metals are essential to life and, given information and with reference to the chemistry of the core syllabus, be able to explain the chemistry involved (for example, iron in haemoglobin (section 9.5 (g) and 11.1(e) and (j)), sodium and potassium in transmission of nerve impulses (section 3, ion solvation and section 5, energetics), zinc as an enzyme cofactor (section 10.1, nucleophilic attack, 11.1(e)))</p> <p>(n) recognise that some metals are toxic and discuss, in chemical terms, the problems associated with heavy metals in the environment entering the food chain, for example mercury</p> <p>11.2 (b) explain, in simple terms, the technique of DNA fingerprinting and its applications in forensic science, archaeology and medicine</p> <p>(c) describe the importance to modern medicine, and the challenges, of separating and characterising the proteins in cells</p> <p>(e) show awareness of the use of NMR and X-ray crystallography in determining the structure of macromolecules and in understanding their function</p> <p>(j) draw conclusions given appropriate information and data from environmental monitoring (for example, PCBs in the atmosphere, isotopic ratios in ice cores)</p> <p>11.3 (b) discuss the challenges of drug delivery and explain in simple terms how materials may be developed to overcome these problems</p> <p>(e) show awareness of nanotechnology and, given information and data, be able to discuss the chemistry involved with reference to the core syllabus</p>	

Chemistry (continued)	
Cambridge International AS and A Level Chemistry, Syllabus 9701	<div style="text-align: right;">   </div> <p>(f) discuss how a knowledge of chemistry can be used to overcome environmental problems (for example, ground water contamination, oil spillage, CFCs)</p> <p>(g) discuss how a knowledge of chemistry can be used to extend the life of existing resources, to identify alternative resources and to improve the efficiency of energy production and use</p> <p>A Level material moved to AS Level material</p> <p>10.4 (c) deduce the presence of a $\text{CH}_3\text{CH}(\text{OH})-$ group in an alcohol from its reaction with alkaline aqueous iodine to form tri-iodomethane</p> <p>10.5 (e) describe the reaction of $\text{CH}_3\text{CO}-$ compounds with alkaline aqueous iodine to give tri-iodomethane</p> <p>AS Level material moved to A Level only material</p> <p>3 (h) understand, in simple terms, the concept of electronegativity and apply it to the acidities of chlorine-substituted ethanoic acids</p> <p>10.6 (b)(iii) describe the reactions of carboxylic acids in the formation of acyl chlorides</p> <p>10.7 (f) describe the formation of amides from the reaction between RNH_2 and $\text{R}'\text{COCl}$</p> <p>(h) describe amide hydrolysis on treatment with aqueous alkali or acid</p> <p>Changes to assessment</p> <ul style="list-style-type: none"> Assessment objectives: There has been a change in the weighting of the assessment objectives (AO) so that AO1 (Knowledge with understanding) is now 42% instead of 46%; AO2 (Handling, applying and evaluating information) is now 35% instead of 30%; and AO3 (Experimental skills and investigations) is now 23% instead of 24%. Additionally there have been some minor changes to the descriptions of these assessment objectives. Paper 4 (A Level Structured Questions): The assessment of core and applications topics has been integrated in the question paper. There will no longer be a Section A and Section B. Paper 5 (Planning, Analysis and Evaluation): The mark scheme has been adjusted. <p>Availability by exam series</p> <p>In 2016, assessments will be based on the revised syllabus only.</p> <ul style="list-style-type: none"> Candidates can carry forward the result of their Cambridge International AS Level assessments in 2015 to complete the Cambridge International A Level in 2016. The Cambridge International A Level assessments in the 2016 exam series are based on the revised syllabus. Assessments for candidates retaking Cambridge International AS Level or A Level in 2016 are based on the revised syllabus. <p>You can learn more about this revised syllabus at www.cie.org.uk/new</p>

Marine Science 	
Cambridge International AS and A Level Marine Science, Syllabus 9693	From June 2015 In all examinations, where question papers include data, candidates will be expected to use units that are consistent with the units supplied, and should not attempt conversion to other systems of units unless this is a requirement of the question (see p.7 in the 2015 syllabus). Further information regarding the allocation of marks between assessment objectives A and B across the papers is provided in the syllabus.

Physical Science 	
Cambridge International AS Level Physical Science, Syllabus 8780	From June 2016 The following syllabus content has been deleted: <ul style="list-style-type: none"> • C3(e) • C7(a) ionic radius • C7(b) ionic radius • C9(d)(ii) • C10(c) – but see C11(d) • C10(h) – but see C5 and C11 • C12(c) – but see C3 • C12(d) – but see C3 • Work done on/by a gas $W = p\Delta V$ (Data Booklet). The following changes have been made to the qualitative analysis notes: <ul style="list-style-type: none"> • reactions of aqueous cations – the tests on lead(II), $Pb^{2+}(aq)$, have been removed; the test on manganese(II), $Mn^{2+}(aq)$ has been added • reactions of anions – the tests on chromate(VI), $CrO_4^{2-}(aq)$, have been removed • tests for gases – the test for sulfur dioxide, SO_2, now reads: turns acidified potassium manganate(VII) from purple to colourless.

Physics	
Cambridge International AS and A Level Physics, Syllabus 9702	<div style="text-align: right;">   </div> <p>From March 2016</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2016</p> <p>This syllabus has been revised and reorganised. Teachers are advised to read the whole syllabus before planning their teaching programme. The main changes are outlined below.</p> <p>Changes to syllabus content</p> <p>The content has been revised and reorganised:</p> <ol style="list-style-type: none"> 1. The wording of some learning outcomes has been changed for clarification. 2. The applications learning outcomes (topics 28 to 30 previously) have been moved and integrated into other topics alongside the relevant theory. 3. New learning outcomes have been added to the syllabus content. 4. Some learning outcomes have been removed from the syllabus content. 5. Some learning outcomes have moved from AS Level to A Level. <p>Details of the changes (3 to 5 in the list above) are supplied below.</p> <p>New/updated learning outcomes (2016 references)</p> <p>A Level learning outcomes are indicated in bold.</p> <p>4.3 (b) apply the principle of conservation of momentum to solve simple problems, including elastic and inelastic interactions between bodies in both one and two dimensions (knowledge of the concept of coefficient of restitution is not required)</p> <p>6.3 (c) distinguish between gravitational potential energy and elastic potential energy</p> <p>7.1 (a) define the radian and express angular displacement in radians</p> <p>8.2 (a) understand that, for a point outside a uniform sphere, the mass of the sphere may be considered to be a point mass at its centre</p> <p>11.3 (a) compare relative advantages and disadvantages of thermistor and thermocouple thermometers as previously calibrated instruments</p> <p>14.4 (a)–(c) a) understand that when a source of waves moves relative to a stationary observer, there is a change in observed frequency b) use the expression $f_o = f_s v / (v \pm v_s)$ for the observed frequency when a source of sound waves moves relative to a stationary observer c) appreciate that Doppler shift is observed with all waves, including sound and light</p>

Physics (continued)			
Cambridge International AS and A Level Physics, Syllabus 9702	17.3 (a)	understand that, for any point outside a spherical conductor, the charge on the sphere may be considered to act as a point charge at its centre	
	18.1 (a)	define capacitance and the farad, as applied to both isolated conductors and to parallel plate capacitors	
	19.1 (b)(e)	b) understand that the charge on charge carriers is quantised e) derive and use, for a current-carrying conductor, the expression $I = Anvq$, where n is the number density of charge carriers	
	20.1 (e)	understand the effects of the internal resistance of a source of e.m.f. on the terminal potential difference	
	21.3 (a)	understand that an output device may be required to monitor the output of an op-amp circuit	
	22.3 (c)	derive the expression — for the Hall voltage, where t = thickness	
	24.2 (b)	understand the sources of energy loss in a practical transformer	
	25.5 (a)–(d)	a) appreciate that, in a simple model of band theory, there are energy bands in solids b) understand the terms valence band, conduction band and forbidden band (band gap) c) use simple band theory to explain the temperature dependence of the resistance of metals and of intrinsic semiconductors d) use simple band theory to explain the dependence on light intensity of the resistance of an LDR	
	26.1 (g)(h)	g) show an understanding of the nature and properties of α -, β - and γ -radiations (both β^- and β^+ are included) h) state that (electron) antineutrinos and (electron) neutrinos are produced during β^- and β^+ decay	
	26.2 (a)–(f)	a) appreciate that protons and neutrons are not fundamental particles since they consist of quarks b) describe a simple quark model of hadrons in terms of up, down and strange quarks and their respective antiquarks c) describe protons and neutrons in terms of a simple quark model d) appreciate that there is a weak interaction between quarks, giving rise to β decay e) describe β^- and β^+ decay in terms of a simple quark model f) appreciate that electrons and neutrinos are leptons	
	26.3 (b)	understand the significance of the terms mass defect and mass excess in nuclear reactions	

Physics (continued)			
Cambridge International AS and A Level Physics, Syllabus 9702	Learning outcomes removed from the syllabus content or moved from AS to A Level (2015 references) A Level learning outcomes are indicated in bold.		
	6	(j)	show an understanding of the concept of internal energy
	9	(b)	relate the difference in the structures and densities of solids, liquids and gases to simple ideas of the spacing, ordering and motion of molecules
		(c)	describe a simple kinetic model for solids, liquids and gases [now A Level 12.1(a)]
		(d)	describe an experiment that demonstrates Brownian motion and appreciate the evidence for the movement of molecules provided by such an experiment [now A Level 10.2(a)]
		(e)	distinguish between the structure of crystalline and non-crystalline solids with particular reference to metals, polymers and amorphous materials
	10	(i)	distinguish between the processes of melting, boiling and evaporation
		(g)	demonstrate knowledge of the force-extension graphs for typical ductile, brittle and polymeric materials, including an understanding of ultimate tensile stress
	15	(i)	show an understanding that polarisation is a phenomenon associated with transverse waves
	19	(j)	sketch the temperature characteristic of a thermistor (thermistors will be assumed to be of the negative temperature coefficient type) [now A Level 19.4(b)]
	20	(k)	explain the use of thermistors and light-dependent resistors in potential dividers to provide a potential difference that is dependent on temperature and illumination respectively [now A Level 20.3(d)]
	25	(a)	show an understanding of the main principles of determination of e by Millikan's experiment
		(b)	summarise and interpret the experimental evidence for quantisation of charge
	27	(g)	represent simple nuclear reactions by nuclear equations of the form ${}^{14}_7\text{N} + {}^4_2\text{He} \rightarrow {}^{17}_8\text{O} + {}^1_1\text{H}$ [now A Level 26.3(c)]
		(h)	show an appreciation of the spontaneous and random nature of nuclear decay [now A Level 26.4(b)]
		(j)	infer the random nature of radioactive decay from the fluctuations in count rate [now A Level 26.4(a)]
29	(a)	explain in simple terms the need for remote sensing (non-invasive techniques of diagnosis) in medicine	
30	(o)	understand that, in a mobile-phone system, the public switched telephone network (PSTN) is linked to base stations via a cellular exchange	
	(p)	understand the need for an area to be divided into a number of cells, each cell served by a base station	

Physics (continued)  	
Cambridge International AS and A Level Physics, Syllabus 9702	<p>(q) understand the role of the base station and the cellular exchange during the making of a call from a mobile phone handset</p> <p>(r) recall a simplified block diagram of a mobile phone handset and understand the function of each block</p> <p>Changes to assessment</p> <ul style="list-style-type: none"> • Paper 1 (Multiple Choice): The duration of this question paper has been increased from 1 hour to 1 hour and 15 minutes. All other aspects of this assessment remain the same. • Paper 2 (AS Level Structured Questions): The duration of this question paper has been increased from 1 hour to 1 hour and 15 minutes. All other aspects of this assessment remain the same. • Paper 3 (Advanced Practical Skills): The generic mark scheme has been adjusted. • Paper 4 (A Level Structured Questions): The assessment of core and applications content has been integrated in the question paper. There will no longer be a Section A and Section B. • Paper 5 (Planning, analysis and evaluation): The generic mark scheme has been adjusted. • Data and Formulae sheets: Minor changes have been made. <p>Availability by exam series</p> <p>In 2016, assessments will be based on the revised syllabus only.</p> <ul style="list-style-type: none"> • Candidates can carry forward the result of their Cambridge International AS Level assessments in 2015 to complete the Cambridge International A Level in 2016. The Cambridge International A Level assessments in the 2016 exam series are based on the revised syllabus. • Assessments for candidates retaking Cambridge International AS Level or A Level in 2016 are based on the revised syllabus. <p>You can learn more about this revised syllabus at www.cie.org.uk/new</p>

Cambridge Pre-U Principal Subjects

Biology	
Cambridge International Level 3 Pre-U Certificate Biology (Principal), Syllabus 9790	<div style="text-align: right;">    </div> <p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>Some content of the syllabus has been amended or clarified. Full details are contained in the syllabus.</p> <p>Changes to syllabus content (2016 references)</p> <ul style="list-style-type: none"> • 1.1 (a), (c) and (e) and Practical (ii) • 1.2 (b) and (c) • 1.3 (d) • 1.4 (b) and (i) • 1.6 (f) and (k) • 1.7 (d) • 2.2 (g) • 2.3 (e) and (f) • 3.1 (e), (f), (i) and (j) • 3.2 (a) and (c) • 3.3 (k) • 3.4 (c) • 3.5 (c) and (j) • 4.1 (g) • 4.2 (b) and (j) • 5.1 (c) • 6.4.3 (b) <p>The material that was previously contained in Appendix 1: Practical assessment has been transferred into the syllabus content to create Section 6.</p> <p>Deletions to syllabus content</p> <p>A number of statements have been deleted from the content of the previous syllabus (from 2013).</p> <ul style="list-style-type: none"> • 1.3(b) describe the contribution of Meselson and Stahl in revealing, from various hypotheses, which model correctly describes DNA replication • 1.4(h) outline the use of reverse transcriptase inhibitors and protease inhibitors for treatment of HIV infection • 1.6(n) describe the causes and outline the symptoms of hereditary haemochromatosis (HH) as an example of a recessive genetic condition (reference should be made to HFE protein)

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Biology (continued)	
Cambridge International Level 3 Pre-U Certificate Biology (Principal), Syllabus 9790	<div style="text-align: right;">    </div> <ul style="list-style-type: none"> • 1.7(b) explain why promoters and other control sequences may have to be transferred as well as the desired gene • 2.1(a) outline the Miller-Urey experiment that showed that complex organic molecules (including amino acids) can form from simple inorganic molecules when subjected to the conditions once thought to have prevailed on Earth four billion years ago when life is thought to have originated • 2.2(n) discuss the scientific method with reference to the contributions of Crick, Watson, Wilkins and Franklin in formulating and testing hypotheses in identification of DNA structure • 2.4(e) understand the term binomial nomenclature and why Latin and Greek are used for biological nomenclature • 2.4(g) explain the difficulties of including viruses in classifications of organisms • 3.3(g) explain dementia and research into its possible causes, symptoms and treatments including stem cells • 3.6(a) outline the structure of the human male and female urinogenital systems • 4.1(f) explain the effect of vascular wilt diseases of plants (including Panama disease of bananas) <p>Changes to scheme of assessment</p> <ul style="list-style-type: none"> • The weighting of the assessment objectives (AO) has changed to: <ul style="list-style-type: none"> – AO1:40%, AO2:40% and AO3:20% – AO2 has been renamed Application of knowledge and problem solving. • Paper 2 has been divided into two shorter question papers. Paper 2 Data Analysis and Planning (previously section A) and Paper 3 Case Study and Synoptic Essay (previously sections B and C). An additional 15 minutes of examination time has been added. The new Paper 2 is 1 hour and 15 minutes long and the Paper 3 is 1 hour 45 minutes long.

Chemistry	
Cambridge International Level 3 Pre-U Certificate Chemistry (Principal), Syllabus 9791	<div style="text-align: right;">    </div> <p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>Changes to syllabus content (2016 references)</p> <ul style="list-style-type: none"> • Directional electrophilic substitution, including mechanisms, has been added to the syllabus. • The Periodic Table has been updated. • The <i>Data booklet</i> has been updated to include IR and carbon-13 NMR spectral data. • The following syllabus content has been updated: <ul style="list-style-type: none"> – A4.4 Infra-red <ul style="list-style-type: none"> (b) predict relative frequencies of bond vibrations based on bond strength and atomic masses (recall of Hooke's law is not required), and hence appreciate that IR stretching frequency increases in the order: single bonds (except those to hydrogen), double bonds, triple bonds, bonds to hydrogen (c) interpret and predict IR spectra for simple organic functional groups, recognising the bond stretch regions as specified in the Data Booklet – A4.5 Carbon -13 NMR <ul style="list-style-type: none"> (a) appreciate that carbon-13 chemical shift values fall in characteristic ranges as given in the Data Booklet (b) interpret and predict decoupled carbon-13 NMR spectra, considering the number of peaks in each of the approximate divisions only. <p>Content added to the syllabus</p> <p>B3.10 Aromatic Chemistry</p> <p>(b) describe the electrophilic substitution mechanism of the π bond reacting with electrophiles, limited to NO_2^+ (nitration), Br^+ (bromination), R^+ (Friedel-Crafts alkylation), and RCO^+ (Friedel-Crafts acylation)</p> <p>(d) recall that NO_2, COOH, CHO and CRO groups are 1, 3, 5 directors and $-\text{R}$, $-\text{OH}$, $-\text{OR}$, $-\text{NH}_2$, $-\text{NR}_2$ and $-\text{X}$ groups are 2, 4 directors, and appreciate that this distinction is important when synthesising polysubstituted aromatic compounds</p> <p>Clarified content</p> <p>The wording of some learning outcomes has been updated and clarified:</p> <p>B1.6 Equilibrium</p> <p>(b) describe weak acids and alkalis in terms of equilibria; describe the Brønsted-Lowry theory of acids, including conjugate pairs; describe the Lewis theory of acids and bases; understand the difference between mono-, di- and triprotic (tribasic) acids</p>

Chemistry (continued)	
Cambridge International Level 3 Pre-U Certificate Chemistry (Principal), Syllabus 9791	<div style="text-align: right;">    </div> <p>(i) explain the electrolysis of a molten compound using inert electrodes; predict the products of the electrolysis of an aqueous electrolyte, given relevant electrode potentials; construct half-equations for the reactions occurring at each electrode during electrolysis</p> <p>(n) understand and be able to use standard notation to construct and interpret conventional cell diagrams, e.g. $\text{Zn(s)} \mid \text{Zn}^{2+}(\text{aq}) \parallel \text{Cu}^{2+}(\text{aq}) \mid \text{Cu(s)}$; $\text{Pt} \mid \text{H}_2(\text{g}) \mid 2\text{H}^+(\text{aq}) \parallel \text{MnO}_4^-(\text{aq}) + 8\text{H}^+(\text{aq}), \text{Mn}^{2+}(\text{aq}) + 4\text{H}_2\text{O}(\text{l}) \mid \text{Pt}$; be able to relate cell diagrams to pictorial diagrams of cells</p> <p>B1.7 Gases and kinetics</p> <p>(j) understand that only first-order reactions have a constant half life; use the equation for the concentration-time dependence for first-order reactions (Equation 8 in the <i>Data Booklet</i>) to calculate the first-order rate constant and half lives from provided data</p> <p>A2.1 The periodic table</p> <p>(c) appreciate that some elements exist as different allotropes; recall the allotropes of oxygen; describe the structure and properties of the allotropes of carbon, including buckminsterfullerene and graphene</p> <p>(f) deduce unfamiliar half-equations and construct redox equations from the relevant half-equations</p> <p>A3.1 Preliminaries</p> <p>Candidates should be able to:</p> <p>(a) interpret and use the terms:</p> <ul style="list-style-type: none"> • <i>molecular formula</i>, as the actual number of atoms of each element in a molecule, e.g. $\text{C}_3\text{H}_8\text{O}$ for propan-1-ol, not $\text{C}_3\text{H}_7\text{OH}$; • <i>general formula</i>, as the simplest algebraic formula of a member of a homologous series, e.g. $\text{C}_n\text{H}_{2n+2}$ for an alkane; • <i>structural formula</i>, as the minimal detail that shows the arrangement of atoms in a molecule, e.g. $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ for propan-1-ol, not $\text{C}_3\text{H}_7\text{OH}$; • <i>displayed formula</i>, as the relative positioning of atoms and the bonds between them [see syllabus for example] • <i>skeletal (or partial skeletal) formula</i>, as the simplified organic formula, shown by removing hydrogen atoms from alkyl chains, leaving just a carbon skeleton and associated functional groups [see syllabus for example]. <p>(j) understand and use curly arrows to represent movement of electron pairs in reaction mechanisms.</p> <p>A3.2 Functional group level</p> <p>(f) understand that reaction within a level simply swaps one heteroatom for another, e.g. hydrolysis; that moving a carbon atom up a level requires an oxidizing agent, that moving a carbon atom down a level requires a reducing agent or carbanion equivalent; that hydrolysis ultimately yields the functional group after which the level is named (note that not all heteroatoms hydrolyse under typical conditions, e.g. $-\text{NH}_2$, $-\text{SH}$, F)</p>

Chemistry (continued)	
Cambridge International Level 3 Pre-U Certificate Chemistry (Principal), Syllabus 9791	<div style="text-align: right;">    </div> <p>B4.6 NMR of other spin $\frac{1}{2}$ nuclei</p> <p>(d) understand the meaning of the term <i>labile proton</i> and appreciate that labile protons have no characteristic chemical shift; know how to identify the presence of labile protons in a proton NMR spectrum by the disappearance of signals following addition of D_2O</p> <p>Practical assessment</p> <p>Part of what was Appendix 1: Practical assessment has been transferred into the syllabus content to create Section 5.</p> <p>Clarifications in this section now include:</p> <p>C5.1.1</p> <p>Systematic analysis will not be required. It will be assumed that candidates will be familiar with:</p> <ul style="list-style-type: none"> the reactions of the following cations: NH_4^+, Mg^{2+}, Al^{3+}, Ca^{2+}, Cr^{3+}, Mn^{2+}, Fe^{2+}, Fe^{3+}, Cu^{2+}, Zn^{2+}, Ba^{2+} the reactions of the following anions: CO_3^{2-}, NO_3^-, NO_2^-, SO_4^{2-}, SO_3^{2-}, Cl^-, Br^-, I^- tests for the following gases: NH_3, CO_2, Cl_2, H_2, O_2, SO_2, as detailed in the qualitative analysis notes. <p>and</p> <p>Candidates should not attempt tests, other than those specified, on substances, except when it is appropriate to test for a gas, or when the question requires candidates to make their own choice of tests (see Section 5.1.3).</p> <p>Data Booklet</p> <p>To correspond with C5.1.1 the following changes have been made to the Qualitative Analysis Notes in the <i>Data Booklet</i>:</p> <p>Under 1 Reactions of aqueous cations, the tests on lead(II), $Pb^{2+}(aq)$ have been removed.</p> <p>Under 2 Reactions of anions, the tests on chromate(VI), $CrO_4^{2-}(aq)$ have been removed.</p> <p>Under 3 Tests for gases, the test for sulfur dioxide, SO_2, now reads: turns acidified potassium manganate(VII) from purple to colourless</p> <p>Changes to scheme of assessment</p> <p>Paper 1 Multiple Choice will test both Part A and Part B of the syllabus. Details of the new scheme of assessment can be found on p.5 of the syllabus.</p> <p>Changes to wording of assessment objectives</p> <p>AO2 'Analysis and application' has been renamed 'Application of knowledge and problem solving'. This better reflects the skills being assessed in this AO. Some wording within the assessment objectives has been modified.</p>

Physics	
Cambridge International Level 3 Pre-U Certificate Physics (Principal), Syllabus 9792	<div style="text-align: right;">    </div> <p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>This syllabus has been revised. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to syllabus content</p> <p>New content (2016 references)</p> <p>1(m) understand the effect of kinetic friction and static friction</p> <p>1(n) use $F_k = \mu_k N$ and $F_s = \mu_s N$, where N is the normal contact force and μ_k and μ_s are the coefficients of kinetic friction and static friction, respectively</p> <p>4(c) understand that a heat engine is a device that is supplied with thermal energy and converts some of this energy into useful work</p> <p>12(g) analyse graphs of the variation with time of potential difference, charge and current for a capacitor discharging through a resistor</p> <p>12(h) define and use the time constant of a discharging capacitor</p> <p>12(i) analyse the discharge of a capacitor using equations of the form $x = x_0 e^{-t/\tau}$</p> <p>15(h)* understand that two events which are simultaneous in one frame of reference may not be simultaneous in another, explain this in terms of the fundamental postulates of relativity and distinguish this from the phenomenon of time dilation</p> <p>17(p) recall that matter is classified as baryons and leptons and that baryon numbers and lepton numbers are conserved in nuclear transformations</p> <p>Mathematics content (Part A)</p> <p>A29 show an understanding of systematic and random errors</p> <p>A30 show an understanding of precision and accuracy</p> <p>Clarified content (2016 references)</p> <p>6(j) Malus' law has been explicitly included in the content</p> <p>15(e)* Candidates are no longer required to interpret the constancy of the speed of light from Einstein's special principle of relativity</p> <p>15(f)* and 15(g)* These two learning outcomes require candidates to understand and use the time dilation formula and the length contraction formula.</p>

Physics (continued)   	
<p>Cambridge International Level 3 Pre-U Certificate Physics (Principal), Syllabus 9792</p>	<p>19(f)* The understanding required regarding Einstein's thoughts on quantum theory have been clarified as follows:</p> <p>understand why Einstein thought that quantum theory undermined the nature of reality by being:</p> <ul style="list-style-type: none"> (i) indeterministic (initial conditions do not uniquely determine the future) (ii) non-local (for example, wave-function collapse) (iii) incomplete (unable to predict precise values for properties of particles) <p>Deleted content (2015 references)</p> <p>5.7 Deduce, using numerical methods, the maximum power transfer from a source of emf is achieved when the load resistance is equal to the internal resistance</p> <p>7.6 Understand amplitude modulation as an example of superposition and use the terms signal and carrier wave</p> <p>14.10 Explain how electric and magnetic fields are used as a velocity selector in a mass spectrometer and derive, recall and use $v = -$</p> <p>19.3 *Recognise and use $\dots \Delta E \Delta t \geq -$ as a form of the Heisenberg uncertainty principal and interpret it</p> <p>*Learning outcomes assessed in Section 2 of Paper 3, Written Paper</p> <p>Data and formulae list</p> <p>Formula for capacitor discharge has been added.</p> <p>Formula for length contraction has been added.</p> <p>$\Delta E \Delta t \geq -$ has been deleted.</p> <p>Changes to scheme of assessment</p> <p>AO3 is assessed in the written papers which increases its overall weighting across the qualification to 20%.</p> <p>In Paper 1, content from both syllabus Sections A and B is assessed (except *sections).</p> <p>The pre-release material for Paper 2 can be based on any content in the syllabus (except *sections).</p> <p>Changes to duration of papers</p> <p>The duration of Paper 1 has increased by 15 minutes to 1 hour and 30 minutes.</p>

Sports Science  	
<p>Cambridge International Level 3 Pre-U Certificate Sports Science (Principal), Syllabus 9793</p>	<p>Last examination: June 2015</p> <p>This syllabus is being withdrawn. The last exam series is June 2015.</p>

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Syllabus changes

Cambridge IGCSE

Arabic, Portuguese (Foreign Language) 	
Cambridge IGCSE (Foreign Language) Arabic, Syllabus 0544, Portuguese, Syllabus 0540	<p>From June 2015</p> <p>These syllabuses have been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Summary of changes</p> <ul style="list-style-type: none"> • Papers 2, 3 and 4 will be taken by all candidates. • The writing tasks have been removed from Paper 2, which now only tests Reading. The examination time has been reduced from 1 hour 30 minutes to 1 hour. The total marks for Paper 2 are 45. • Paper 3 has minor changes to the wording of the mark scheme. • A new Paper 4 for all candidates replaces Paper 4: Continuous Writing (which was for Extended candidates only). • The three skills are now weighted at approximately 33% each. • Minor changes have been made to the <i>Defined Content</i> booklets for each language. <p>In addition to reading the syllabus carefully, teachers should refer to the published specimen papers and language-specific <i>Defined Content</i> booklets for exemplification of these changes, available on our public website at www.cie.org.uk</p> <p>Centres wishing to submit recordings as digital files to Cambridge for external moderation will find more detailed guidance in the Exams Officer area of our public website at www.cie.org.uk</p> <p>From June 2016</p> <p>Paper 3, Speaking: the Speaking tests of all candidates must be recorded by the Centre. The Centre will then select a sample to send to Cambridge for external moderation according to the instructions provided.</p>

Bahasa Indonesia NEW	
Cambridge IGCSE Bahasa Indonesia, Syllabus 0538	<p>From June 2016</p> <p>This new syllabus will be available for first assessment in June 2016. Full details are contained in the 2016 syllabus and specimen papers available on our public website www.cie.org.uk</p> <p>You can learn more about this new syllabus at www.cie.org.uk/new</p> <p>Combining this syllabus with Cambridge IGCSE Indonesian (0545)</p> <p>Please note that candidates will not be able to combine a qualification in Cambridge IGCSE Bahasa Indonesia (0538) with Cambridge IGCSE Indonesian (0545) in the same exam series.</p>

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Chinese as a Second Language	
<p>Cambridge IGCSE Chinese as a Second Language, Syllabus 0523</p>	<div style="text-align: right; margin-bottom: 10px;"> NEW  </div> <p>From June 2015</p> <p>Following a pilot period, this syllabus is available to all Centres for first assessment in June 2015.</p> <p>This syllabus assesses candidates' ability to use Chinese as a medium of practical communication. It is aimed at candidates for whom Chinese is not a first language/mother tongue but for whom it is a lingua franca or language of study.</p> <p>There are two components:</p> <p>Paper 1 Reading and Writing: 2 hours (70%). The question paper is divided into two sections. Section 1 contains three reading exercises and Section 2 contains two writing exercises. Texts and questions are printed in both traditional and simplified characters on the question paper. This paper is externally assessed.</p> <p>Paper 2 Speaking: 10–12 minutes (30%). Candidates deliver a presentation on a topic of their choice. This is followed by a conversation on that topic, and then a conversation with the examiner on more general topics. Initial assessment of this component is carried out by the Centre, and is then subject to moderation by Cambridge.</p> <p>Full details are contained in the 2015 syllabus on our public website at www.cie.org.uk. In addition to reading the syllabus carefully, teachers should refer to the published specimen papers, also available on our public website.</p> <p>You can learn more about this new syllabus at www.cie.org.uk/new</p>

Dutch (Foreign Language) 	
<p>Cambridge IGCSE Dutch (Foreign Language), Syllabus 0515</p>	<p>From June 2015</p> <p>This syllabus has been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Summary of changes</p> <ul style="list-style-type: none"> • Papers 1, 2, 3 and 4 will be taken by all candidates. • The total marks for Paper 1 have been reduced from 48 to 45. • The writing tasks have been removed from Paper 2, which now only tests Reading. The examination time has been reduced from 1 hour 30 minutes to 1 hour. The total marks for Paper 2 are 45. • Paper 3 has minor changes to the wording of the mark scheme. • A new Paper 4 for all candidates replaces Paper 4: Continuous Writing (which was for Extended candidates only). • The four skills are now weighted at 25% each. • Changes have been made to the Dutch <i>Defined Content</i> booklet. <p>In addition to reading the syllabus carefully, teachers should refer to the published specimen papers and Dutch <i>Defined Content</i> booklet for exemplification of these changes, available on our public website at www.cie.org.uk</p> <p>Centres wishing to submit recordings as digital files to Cambridge for external moderation will find more detailed guidance in the Exams Officer area of our public website at www.cie.org.uk</p> <p>From June 2016</p> <p>Paper 3, Speaking: the Speaking tests of all candidates must be recorded by the Centre. The Centre will then select a sample to send to Cambridge for external moderation according to the instructions provided.</p>

First Language Korean 	
<p>Cambridge IGCSE First Language Korean, Syllabus 0521</p>	<p>From November 2015</p> <p>The November exam series is being withdrawn. The last November exam series is November 2014. From 2015, this syllabus will be examined in June only. It will not be examined in November 2015.</p>

First Language Spanish 	
Cambridge IGCSE First Language Spanish, Syllabus 0502	<p>From June 2015</p> <p>This syllabus has been revised. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Paper 1</p> <ul style="list-style-type: none"> • A second reading passage has been added. The combined word count for both passages is between 800 and 950 words. • Question 1 (20 marks): the number of sub-questions has been reduced. • A new Question 3 (Summary) has been added. <p>Paper 2</p> <ul style="list-style-type: none"> • Question 2: candidates select and comment on a specified number of words and phrases. <p>Paper 3</p> <ul style="list-style-type: none"> • Section 1: candidates produce a discursive/argumentative letter or article in response to a passage of between 650 and 750 words. • Section 2: candidates answer one question from a choice of two descriptive and two narrative titles. The two discursive/argumentative titles have been removed from this section. <p>Component 4 (Coursework Portfolio)</p> <ul style="list-style-type: none"> • Assignment 2 is renamed 'descriptive and/or narrative'. Reference to 'imaginative' has been removed. • Further specific guidance is provided to Centres on the text to be used for Assignment 3. • Instructions for marking and moderating have been clarified. <p>Component 5 (Speaking and Listening Test (Optional))</p> <ul style="list-style-type: none"> • Instructions for marking and moderating have been clarified. • All candidates must be recorded for the purpose of external moderation.

French (Foreign Language)   	
Cambridge IGCSE French (Foreign Language), Syllabus 0520	<p>From 2015</p> <p>This syllabus has been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Summary of changes</p> <ul style="list-style-type: none"> • Papers 1, 2, 3 and 4 will be taken by all candidates. • The total marks for Paper 1 have been reduced from 48 to 45. • The writing tasks have been removed from Paper 2, which now only tests Reading. The examination time has been reduced from 1 hour 30 minutes to 1 hour. The total marks for Paper 2 are 45. • Paper 3 has minor changes to the wording of the mark scheme. • A new Paper 4 for all candidates replaces Paper 4: Continuous Writing (which was for Extended candidates only). • The four skills are now weighted at 25% each. • Minor changes have been made to the French <i>Defined Content</i> booklet. <p>In addition to reading the syllabus carefully, teachers should refer to the published specimen papers and French <i>Defined Content</i> booklet for exemplification of these changes, available on our public website at www.cie.org.uk</p> <p>Centres wishing to submit recordings as digital files to Cambridge for external moderation will find more detailed guidance in the Exams Officer area of our public website at www.cie.org.uk</p> <p>From March 2015</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2016</p> <p>Paper 3, Speaking: the Speaking tests of all candidates must be recorded by the Centre. The Centre will then select a sample to send to Cambridge for external moderation according to the instructions provided.</p>
French (Foreign Language)  	
Cambridge IGCSE French (Foreign Language), Syllabus 0685	<p>Last examination: November 2014</p> <p>This syllabus is being withdrawn. The last exam series is November 2014.</p> <p>This syllabus is only available to UK schools. It is approved by Ofqual and funded in state schools in England, Wales and Northern Ireland until 2014. UK schools preparing learners for examination in 2015 should teach syllabus 0520, which is approved by Ofqual and funded in state schools in England, Wales and Northern Ireland for teaching from September 2013. Schools outside the UK should also teach syllabus 0520.</p>

German, Spanish, Greek (Foreign Language)  	
Cambridge IGCSE (Foreign Language) German, Syllabus 0525, Spanish, Syllabus 0530, Greek, Syllabus 0543	<p>From June 2015</p> <p>These syllabuses have been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Summary of changes</p> <ul style="list-style-type: none"> • Papers 1, 2, 3 and 4 will be taken by all candidates. • The total marks for Paper 1 have been reduced from 48 to 45. • The writing tasks have been removed from Paper 2, which now only tests Reading. The examination time has been reduced from 1 hour 30 minutes to 1 hour. The total marks for Paper 2 are 45. • Paper 3* has minor changes to the wording of the mark scheme. • A new Paper 4 for all candidates replaces Paper 4: Continuous Writing (which was for Extended candidates only). • The four skills are now weighted at 25% each. • Minor changes have been made to the <i>Defined Content</i> booklets for each language. <p>In addition to reading the syllabus carefully, teachers should refer to the published specimen papers and language-specific <i>Defined Content</i> booklets for exemplification of these changes, available on our public website at www.cie.org.uk</p> <p>Centres wishing to submit recordings as digital files to Cambridge for external moderation will find more detailed guidance in the Exams Officer area of our public website at www.cie.org.uk</p> <p>*For Greek (0543), please note that Listening will no longer be tested in Paper 3. Instead candidates will take a separate listening paper (Paper 1).</p> <p>From June 2016</p> <p>Paper 3, Speaking: the Speaking tests of all candidates must be recorded by the Centre. The Centre will then select a sample to send to Cambridge for external moderation according to the instructions provided.</p>

German (Foreign Language)  	
Cambridge IGCSE German (Foreign Language), Syllabus 0677	<p>Last examination: June 2014</p> <p>This syllabus is being withdrawn. The last exam series is June 2014.</p> <p>This syllabus is only available to UK schools. It is approved by Ofqual and funded in state schools in England, Wales and Northern Ireland until 2014. UK schools preparing learners for examination in 2015 should teach syllabus 0525, which is approved by Ofqual and funded in state schools in England, Wales and Northern Ireland for teaching from September 2013. Schools outside the UK should also teach syllabus 0525.</p>

Hindi as a Second Language	
<p>Cambridge IGCSE Hindi as a Second Language, Syllabus 0549</p>	<div style="text-align: right;">   </div> <p>In 2015</p> <p>In 2015, this syllabus will be examined in both June and November. This syllabus will also be made available for examination in March for India only.</p> <p>From June 2016</p> <p>The June exam series is being withdrawn. The last June exam series is June 2015. From 2016, this syllabus will be examined in November (and March for India only). It will not be examined in June 2016.</p>

Indonesian (Foreign Language)  	
Cambridge IGCSE Indonesian (Foreign Language), Syllabus 0545	<p>From June 2016</p> <p>This syllabus has been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Change to availability</p> <p>The November exam series is being withdrawn. The last November exam series is November 2015. From June 2016 we will be introducing a June exam series. From 2016, this syllabus will be available in the June exam series only.</p> <p>Summary of changes</p> <ul style="list-style-type: none"> • Papers 2, 3 and 4 will be taken by all candidates. • The writing tasks have been removed from Paper 2, which now only tests Reading. The examination time has been reduced from 1 hour 30 minutes to 1 hour. The total marks for Paper 2 are 45. • Paper 3 has minor changes to the wording of the mark scheme, and the instructions in the Teachers' Notes Booklet have been amended. • A new Paper 4 for all candidates replaces Paper 4: Continuous Writing (which was for Extended candidates only). • The three skills are now weighted at approximately 33% each. • A <i>Defined Content</i> booklet has been created for Indonesian. <p>In addition to reading the syllabus carefully, teachers should refer to the published specimen papers and Indonesian <i>Defined Content</i> booklet for exemplification of these changes, available on our public website at www.cie.org.uk</p> <p>Centres wishing to submit recordings as digital files to Cambridge for external moderation will find more detailed guidance in the Exams Officer area of our public website at www.cie.org.uk</p> <p>For Paper 3, Speaking, the Speaking tests of all candidates must be recorded by the Centre. The Centre will then select a sample to send to Cambridge for external moderation according to the instructions provided.</p> <p>Combining this syllabus with the new Cambridge IGCSE Bahasa Indonesia (0538)</p> <p>Please note that candidates will not be able to combine a qualification in Cambridge IGCSE Indonesian (0545) with Cambridge IGCSE Bahasa Indonesia (0538) in the same exam series.</p>

Italian (Foreign Language) NEW  	
Cambridge IGCSE Italian (Foreign Language), Syllabus 0535	<p>In June 2014</p> <p>This new syllabus is available for first assessment in June 2014.</p> <p>This syllabus has been approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate with a different code (please see the information relating to syllabus 0679).</p> <p>Full details are contained in the 2014 syllabus on our public website at www.cie.org.uk</p> <p>You can learn more about this new syllabus at www.cie.org.uk/new</p> <p>From June 2015</p> <p>This syllabus has been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Summary of changes</p> <ul style="list-style-type: none"> • Papers 1, 2, 3 and 4 will be taken by all candidates. • The total marks for Paper 1 have been reduced from 48 to 45. • The writing tasks have been removed from Paper 2, which now only tests Reading. The examination time has been reduced from 1 hour 30 minutes to 1 hour. The total marks for Paper 2 are 45. • Paper 3 has minor changes to the wording of the mark scheme. • A new Paper 4 for all candidates replaces Paper 4: Continuous Writing (which was for Extended candidates only). • The four skills are now weighted at 25% each. • Minor changes have been made to the Italian <i>Defined Content</i> booklet. <p>In addition to reading the syllabus carefully, teachers should refer to the published specimen papers and the Italian <i>Defined Content</i> booklet for exemplification of these changes, available on our public website at www.cie.org.uk</p> <p>Centres wishing to submit recordings as digital files to Cambridge for external moderation will find more detailed guidance in the Exams Officer area of our public website at www.cie.org.uk</p> <p>For schools in England:</p> <p>Please note that this syllabus will not count towards the Key Stage 4 performance tables or the EBACC.</p> <p>From June 2016</p> <p>Paper 3, Speaking: the Speaking tests of all candidates must be recorded by the Centre. The Centre will then select a sample to send to Cambridge for external moderation according to the instructions provided.</p>

Italian (Foreign Language) NEW  	
<p>Cambridge IGCSE Italian (Foreign Language), Syllabus 0679</p>	<p>In June 2014</p> <p>This is a new syllabus, which will be examined in June 2014. It is approved by Ofqual and funded in state schools in England, Wales and Northern Ireland for examination in 2014. It is only available to UK schools.</p> <p>However, please note that this syllabus will not count towards the 2014 Key Stage 4 performance tables or the EBACC.</p> <p>Schools outside the UK should teach syllabus 0535.</p> <p>Last examination: June 2014</p> <p>This syllabus is being withdrawn. The last exam series is June 2014.</p> <p>From June 2015</p> <p>Please note, UK schools preparing learners for examination in 2015 and beyond should teach syllabus 0535, which is approved by Ofqual and funded in state schools in England, Wales and Northern Ireland for examination in 2015 and beyond.</p> <p>Schools outside the UK should teach syllabus 0535.</p>

Japanese (Foreign Language) 	
Cambridge IGCSE Japanese (Foreign Language), Syllabus 0519	<p>From November 2015</p> <p>This syllabus has been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Summary of changes</p> <ul style="list-style-type: none"> • The writing tasks have been removed from Paper 2, which now only tests Reading. The examination time has been reduced from 1 hour 30 minutes to 1 hour 15 minutes. The total marks for Paper 2 are 45. • Paper 3 has minor changes to the wording of the mark scheme. In Test 1: Role Plays the images have been removed from the Role Play Cards. • A new Paper 4 for all candidates replaces Paper 4: Continuous Writing (which was for Extended candidates only). • The three skills are now weighted at approximately 33% each. • Changes have been made to the Japanese <i>Defined Content</i> booklet. The Kanji requirement will increase from 100 to 150 Kanji. <p>In addition to reading the syllabus carefully, teachers should refer to the published specimen papers and the Japanese <i>Defined Content</i> booklet for exemplification of these changes, available on our public website at www.cie.org.uk</p> <p>Centres wishing to submit recordings as digital files to Cambridge for external moderation will find more detailed guidance in the Exams Officer area of our public website at www.cie.org.uk</p> <p>From November 2016</p> <p>Paper 3, Speaking: the Speaking tests of all candidates must be recorded by the Centre. The Centre will then select a sample to send to Cambridge for external moderation according to the instructions provided.</p>

Literature (Spanish) 	
Cambridge IGCSE Literature (Spanish), Syllabus 0488	<p>From June 2016</p> <p>This syllabus has been revised. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to assessment</p> <ul style="list-style-type: none"> • Revised component names and weightings: <ul style="list-style-type: none"> – Paper 1 Set Texts – Open Books (75%) (compulsory component) – Component 2 Coursework (25%) (optional component) – Paper 3 Alternative to Coursework (25%) (optional component). • Paper 1 Set Texts – Open Books: at least one question on each set text will be an optional essay question.
Malay (Foreign Language) 	
Cambridge IGCSE Malay (Foreign Language), Syllabus 0546	<p>From June 2016</p> <p>This syllabus has been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Summary of changes</p> <ul style="list-style-type: none"> • Papers 2, 3 and 4 will be taken by all candidates. • The writing tasks have been removed from Paper 2, which now only tests Reading. The examination time has been reduced from 1 hour 30 minutes to 1 hour. The total marks for Paper 2 are 45. • Paper 3 has minor changes to the wording of the mark scheme, and the instructions in the Teachers' Notes Booklet have been amended. • A new Paper 4 for all candidates replaces Paper 4: Continuous Writing (which was for Extended candidates only). • The three skills are now weighted at approximately 33% each. • A <i>Defined Content</i> booklet has been created for Malay. <p>In addition to reading the syllabus carefully, teachers should refer to the published specimen papers and Malay <i>Defined Content</i> booklet for exemplification of these changes, available on our public website at www.cie.org.uk</p> <p>Centres wishing to submit recordings as digital files to Cambridge for external moderation will find more detailed guidance in the Exams Officer area of our public website at www.cie.org.uk</p> <p>For Paper 3, Speaking, the Speaking tests of all candidates must be recorded by the Centre. The Centre will then select a sample to send to Cambridge for external moderation according to the instructions provided.</p>

Mandarin Chinese (Foreign Language)  	
Cambridge IGCSE Mandarin Chinese (Foreign Language), Syllabus 0547	<p>From June 2015</p> <p>This syllabus has been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Summary of changes</p> <ul style="list-style-type: none"> • Papers 1, 2, 3 and 4 will be taken by all candidates. • The writing tasks have been removed from Paper 2, which now only tests Reading. The examination time has been reduced from 1 hour 30 minutes to 1 hour 15 minutes. The total marks for Paper 2 are 36. • Paper 3 has minor changes to the wording of the mark scheme. • A new Paper 4 for all candidates replaces Paper 4: Continuous Writing (which was for Extended candidates only). • The four skills are now weighted at 25% each. • Minor changes have been made to the Mandarin Chinese <i>Defined Content</i> booklet. <p>In addition to reading the syllabus carefully, teachers should refer to the published specimen papers and the Mandarin Chinese <i>Defined Content</i> booklet for exemplification of these changes, available on our public website at www.cie.org.uk</p> <p>Centres wishing to submit recordings as digital files to Cambridge for external moderation will find more detailed guidance in the Exams Officer area of our public website at www.cie.org.uk</p> <p>From June 2016</p> <p>Paper 3, Speaking: the Speaking tests of all candidates must be recorded by the Centre. The Centre will then select a sample to send to Cambridge for external moderation according to the instructions provided.</p>

Spanish (Foreign Language)  	
Cambridge IGCSE Spanish (Foreign Language), Syllabus 0678	<p>Last examination: November 2014</p> <p>This syllabus is being withdrawn. The last exam series is November 2014.</p> <p>This syllabus is only available to UK schools. It is approved by Ofqual and funded in state schools in England, Wales and Northern Ireland until 2014. UK schools preparing learners for examination in 2015 should teach syllabus 0530, which is approved by Ofqual and funded in state schools in England, Wales and Northern Ireland for teaching from September 2013. Schools outside the UK should also teach syllabus 0530.</p>

Urdu as a Second Language		NEW
Cambridge IGCSE Urdu as a Second Language, Syllabus 0539	From June 2015 This new syllabus will be available for first assessment in June 2015. Full details are contained in the 2015 syllabus and specimen papers available on our public website at www.cie.org.uk You can learn more about this new syllabus at www.cie.org.uk/new	

Cambridge O Level

First Language Urdu		
Cambridge O Level First Language Urdu, Syllabus 3247	From June 2015 This syllabus has been revised. Teachers are advised to read the whole syllabus before planning their teaching programme. Paper 1 Reading and Writing Test materials are based on prescribed topic areas. Part 1 Reading (25 marks): candidates answer reading comprehension questions testing a range of reading skills. Part 2 Writing (25 marks): candidates write one composition of 300–400 words in response to a choice of argumentative, discursive, descriptive and narrative titles. Paper 2 Texts The duration of this question paper has been increased to 2 hours. Part 1 Unseen Passage (20 marks): candidates answer a question based on an extract from poetry or prose, which they have not seen before. The focus is on critical commentary in relation to the extract. Part 2 Poetry (15 marks): candidates answer an essay question based on the prescribed set texts. Part 3 Prose (15 marks): candidates answer an essay question based on the prescribed set texts. Overall, the number and types of prescribed set text have been reduced.	

Cambridge International AS and A Level

Japanese Language		
Cambridge International AS Level Japanese Language, Syllabus 8281	From November 2015 The Kanji requirement will increase from 300 to 350 Kanji. Full details are available in the syllabus.	

Cambridge Pre-U Short Courses

French, German, Spanish, Russian, Italian	
<p>Cambridge International Level 3 Pre-U Certificate (Modern Foreign Languages) French (Short Course), Syllabus 1342, German (Short Course), Syllabus 1343, Spanish (Short Course), Syllabus 1344, Russian (Short Course), Syllabus 1345, Italian (Short Course), Syllabus 1346</p>	<p>From June 2016</p> <p>This syllabus has been revised for first assessment in 2016. Teachers are strongly advised to read the whole syllabus before planning their teaching programme.</p> <p>Summary of changes</p> <ul style="list-style-type: none"> • The skills tested in each component have been clarified by adding supplementary information under the syllabus content section. • Editorially, the revised syllabus has been enhanced. • The wording of assessment objective AO4 has been updated. The weighting of this assessment objective has not changed in the individual papers or across the qualification. • The specimen papers have been updated in line with the revised syllabus. <p>Paper 2</p> <ul style="list-style-type: none"> • In Paper 2, Part I: Listening has changed from a teacher-controlled recording to a candidate-controlled recording. Candidates will have control of the recordings on their individual listening equipment. • The combined word counts for the Listening and Reading parts are now given in the syllabus. The three listening passages have a combined word count of 600–750 words (Russian 450–560 words). The three reading passages have a combined word count of 500–650 words (Russian 375–485 words). • The question format in Reading Exercise 1 has changed from a passage with questions to be answered in the target language to a passage with multiple choice questions in the target language. • Paper 2 has amended rubric instructions to reflect the change to the control of the listening equipment and the revised Reading Exercise 1.



Mandarin Chinese  	
<p>Cambridge International Level 3 Pre-U Certificate Mandarin Chinese (Short Course), Syllabus 1341</p>	<p>From June 2014</p> <p>For information about syllabus changes for 2014 and 2015, please refer to the 2013–2015 Syllabus Update notice on the Cambridge Pre-U Mandarin Chinese (Short Course) (1341) page available on our public website at www.cie.org.uk</p> <p>From June 2016</p> <p>This syllabus has been revised for first examination in June 2016. Teachers are advised to read the whole syllabus before planning their teaching programme to ensure they are teaching the correct topics/options.</p>

Cambridge Pre-U Principal Subjects

French, German, Spanish, Russian, Italian	
<p>Cambridge International Level 3 Pre-U Certificate (Modern Foreign Languages) French (Principal), Syllabus 9779, German (Principal), Syllabus 9780, Spanish (Principal), Syllabus 9781, Russian (Principal), Syllabus 9782, Italian (Principal), Syllabus 9783</p>	<div style="text-align: right;">    </div> <p>From November 2014</p> <p>The November retake exam series for these syllabuses has been withdrawn. They will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>These syllabuses have been revised for first assessment in 2016. Teachers are strongly advised to read the whole syllabus before planning their teaching programme.</p> <p>Summary of changes</p> <ul style="list-style-type: none"> • The skills tested in each component have been clarified by adding supplementary information under the syllabus content section. • Editorially, the revised syllabus has been enhanced. • The wording of assessment objective AO4 has been updated. The weighting of this assessment objective has not changed in the individual papers or across the qualification. • The rubrics in the question papers have been revised for further clarity. • The specimen papers have been updated in line with the revised syllabus. <p>Paper 2</p> <ul style="list-style-type: none"> • The combined word counts for Part I Reading passages have been revised. The passages in Reading Exercise 1 and Reading Exercise 2 have a combined word count of 500–650 words (Russian 375–485 words). • The combined word counts for Part II Listening passages have been revised. The three listening exercises have a combined word count of 700–850 words (Russian 525–640 words), including 200–300 words (Russian 150–225 words) for the recording in the third listening exercise. <p>Paper 4</p> <ul style="list-style-type: none"> • Part I has been renamed ‘Topics’ (previously ‘Cultural Topics’) and Part II has been renamed ‘Texts’ (previously ‘Literary Texts’). • The topics and texts for examination in 2016 have been updated. For examination in 2017 onwards, please see our public website at www.cie.org.uk, as changes will occur.

Mandarin Chinese	
<p>Cambridge International Level 3 Pre-U Certificate Mandarin Chinese (Principal), Syllabus 9778</p>	<div style="text-align: right; margin-bottom: 10px;">    </div> <p>From June 2014</p> <p>For information about syllabus changes for 2014 and 2015, please refer to the 2013–2015 Syllabus Update notice on the Cambridge Pre-U Mandarin Chinese (Principal) (9778) page available on our public website at www.cie.org.uk</p> <p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>This syllabus has been revised for first examination in June 2016. Teachers are advised to read the whole syllabus before planning their teaching programme to ensure they are teaching the correct topics/options and Chengyu.</p>

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Finding your way round

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Updated information

We have updated the information on Cambridge International A Level Global Perspectives & Research (9239), Cambridge Pre-U Classical Greek (9787), Cambridge Pre-U Latin (9788), Cambridge Pre-U Economics (9772) and Cambridge Pre-U History (9769) on pages 135, 143–144, 145–146 and 149. Changes are marked by black vertical lines.

Syllabus changes

Cambridge IGCSE

Development Studies 	
Cambridge IGCSE Development Studies, Syllabus 0453	<p>From June 2014</p> <p>There are some changes to the syllabus content which are indicated in the syllabus by black vertical lines either side of the text.</p> <p>We have also added a statement to confirm that the syllabus will take into account any reviews of the Millennium Development Goals made by the United Nations, after 2015.</p>

Economics  	
Cambridge IGCSE Economics, Syllabus 0455	<p>From June 2014</p> <p>There are a few additions to and deletions from the syllabus content. The structure of the assessment and the number of assessment objectives have changed.</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • One syllabus aim relating to candidates participating in decision-making as consumers, producers and citizens has been removed. • Candidates should not only describe but also analyse trade unions and their role in the economy. • A new bullet point has been added to syllabus content Section 4.4: <i>'describe the characteristics of perfect competition and monopoly'</i>. • A new bullet point has been added to syllabus content Section 4.6: <i>'describe and have a general understanding of the causes and consequences of economic growth'</i>. • The resource list is now available online only, and is not included in the syllabus document. <p>Changes to assessment</p> <ul style="list-style-type: none"> • Paper 3 'Analysis and Critical Evaluation' has been removed. Interpretation and analysis of unseen data are now included in the compulsory question in Paper 2. • Paper 2 'Structured Questions' is increased by 10 marks, making question 1 worth 30 marks. The duration is increased by 15 minutes. • Paper 1 'Multiple Choice' has not changed but it now accounts for 30% of total marks instead of 20%. Paper 2 accounts for 70% of total marks. • There are three assessment objectives instead of four. Assessment objectives 3 and 4 have been combined as a single objective, <i>'critical evaluation and decision-making'</i>. • The grade descriptions have been adjusted in the light of the changes to the assessment objectives. <p>From March 2015</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p>

Geography  	
Cambridge IGCSE Geography, Syllabus 0460	<p>From June 2016</p> <p>This syllabus has been revised. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>The main revisions include:</p> <ul style="list-style-type: none"> • The syllabus content has been revised to include more material on 21st-century/global issues including globalisation, development and disparities and climate change. • Sections 5 and 6 have been merged to provide a single source of information for each theme and topic including applicable case studies. • On Paper 1: Geographical themes candidates continue to answer three questions. However, candidates will now be required to answer one question on each of the three geographical themes rather than choosing three questions out of six with no restrictions. <p>The specimen papers have been updated to match the revised syllabus content.</p>

Global Perspectives 	
Cambridge IGCSE Global Perspectives, Syllabus 0457	<p>From March 2015</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p>

History  	
Cambridge IGCSE History, Syllabus 0470	<p>From June 2015</p> <p>Changes to syllabus content</p> <p>The following syllabus content is new:</p> <ul style="list-style-type: none"> • Key Question 5 (19th century) on European imperialism • Key Question 7 (20th century) on events in the Gulf c. 1970–2000 • Depth Study A on the First World War. <p>The following syllabus content has been restructured:</p> <ul style="list-style-type: none"> • Depth Study E on South Africa (formerly Southern Africa in the 20th Century). <p>The following syllabus content has been removed:</p> <ul style="list-style-type: none"> • Key Question 5 (19th century) on Japanese modernisation • Key Question 7 (20th century) on the United Nations • Depth Study G on modern industrial society • Depth Study H on Western imperialism. Some of the content from this Depth Study is included in the new Key Question 5 (19th century) on European imperialism.

History (continued)  	
Cambridge IGCSE History, Syllabus 0470	<p>Changes to assessment</p> <ul style="list-style-type: none"> The wording of assessment objective AO2 has been revised to emphasise the importance of deploying historical skills. The overall weightings of the assessment objectives across the qualification as a whole have been revised. Minor revisions have been made to the wording of the grade descriptions in line with the change to the assessment objectives. The stimulus material that sets the context for each question in Component 1 has been replaced by a short opening sentence for each question. The number of marks available for each part-question in Component 1 has been changed as follows: <ul style="list-style-type: none"> Part (a) 4 marks Part (b) 6 marks Part (c) 10 marks. Component 3 (Coursework) now requires candidates to produce one piece of extended writing. The word limit (2000 words) must not be exceeded. Component 4 (Alternative to Coursework) now requires candidates to answer one non-structured question from a choice of two on their chosen Depth Study. <p>Changes to previously published specimen paper material</p> <p>A revision has been made to Question 1 in specimen Paper 4 Alternative to Coursework and mark scheme to better reflect the content of the revised syllabus for 2015.</p> <p>The new Question 1 is: How significant was the failure of the Schlieffen Plan to the course of the First World War? Explain your answer.</p>

India Studies  	
Cambridge IGCSE India Studies, Syllabus 0447	<p>From June 2014</p> <ul style="list-style-type: none"> This syllabus is no longer classified as a pilot qualification. Paper 3 (Research portfolio) has been clarified in terms of the research report and the background reflection and recommendations. The relationship between the assessment objectives and the components has been clarified. Slight changes have been made to the wording of the content concerning India's relationship with Pakistan (Paper 1 Theme 4 and Paper 2 Case study 3) and environmental sustainability (Paper 2 Case study 1). The set questions for Paper 3 (2014 exam series) have been included.

Latin 	
Cambridge IGCSE Latin, Syllabus 0480	From June 2016 The Paper 2 Literature set texts have been updated in the 2016 syllabus.

Pakistan Studies 	
Cambridge IGCSE Pakistan Studies, Syllabus 0448	<p>From June 2015</p> <p>Changes to syllabus content</p> <p>There are no major changes to content.</p> <p>Paper 1</p> <p>There are minor changes to:</p> <ul style="list-style-type: none"> • Key question 2 • Key question 6 • Key question 7 • Key question 8 • Key question 9 • Key question 11 • Key question 14. <p>The spelling of some names has been revised to reflect the most commonly used spelling. Teachers are encouraged to start using these spellings in their teaching. The revised spellings will be accepted by examiners for 2013 and 2014, as well as the current spellings.</p> <p>Paper 2</p> <p>There is more emphasis on development and an understanding of GDP and GNP has been included. There are minor changes in order to refresh and clarify content in:</p> <ul style="list-style-type: none"> • The land of Pakistan 1(b) Location of provinces and cities • Natural resources – an issue of sustainability 2(b) Water 2(c) Forests • Power 3(a) Sources 3(b) Non-renewables 3(c) Renewables • Industrial development 5(b) Secondary and tertiary industries • Trade 6(a) Major exports and imports 6(b) Pakistan’s trading partners

Pakistan Studies (continued)



Cambridge IGCSE
 Pakistan Studies,
 Syllabus 0448

- Transport and telecommunications
 7(a) Internal transport
 7(b) Telecommunications
- Population
 8(a) Structure and growth
 8(d) Employment

Changes to content are indicated in the syllabus by black vertical lines either side of the text.

Changes to assessment

- Assessment objectives are now presented as one set for the whole syllabus.
- Paper 1 assessment objectives include increased analysis skills and the interpretation of historical sources.
- Paper 1 will include a compulsory source-based question.

In Section A candidates answer **one** compulsory question made up of four parts, (a), (b), (c) and (d), which are linked by a common theme. Parts (a) and (b) are source-based questions using historical sources, either text or pictures/graphics. Candidates use and interpret each source in answering the questions.

In Section B candidates answer **two** questions from a choice of **four**.

- For Paper 2 candidates continue to answer **three** questions from a choice of **five**.
 Part (d) of each question in Paper 2 will specifically assess analysis skills (6 marks). A levels mark scheme will be used for the part (d) questions.
- For Paper 2 candidates may be required to plot information on graphs and charts.

Changes to previously published specimen paper material

Guidance on timing has been added to the front of specimen **Paper 1** History and Culture of Pakistan:

Section A – You are advised to spend 30 minutes on this section

Section B – You are advised to spend 1 hour on this section.

The specimen mark scheme for Paper 1 has been revised to indicate that candidates may use contextual historical knowledge as a way of supporting inferences in their answers to Question 1 in Section A.

Sociology 	
<p>Cambridge IGCSE Sociology, Syllabus 0495</p>	<p>From June 2015</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • Unit 4 'Power and Authority' has been removed. • Units are now as follows: <ul style="list-style-type: none"> – Unit 1: The title has changed to 'Theory and methods' and the content has been updated. – Unit 2: The title remains unchanged but the content has been updated. – Unit 3: The title remains unchanged but the content has been updated. – Unit 4: This is now 'Family' (which was Unit 5 in the 2014 syllabus) and the content has been updated. – Unit 5: This is now 'Education' (which was Unit 6 in the 2014 syllabus) and the content has been updated. – Unit 6: This is now 'Crime, deviance and social control' (which was Unit 7 in the 2014 syllabus) and the content has been updated. – Unit 7: This is now 'Media' (which was Unit 8 in the 2014 syllabus) and the content has been updated. <p>Changes to assessment</p> <ul style="list-style-type: none"> • For Paper 1, candidates now answer one compulsory data question and one optional structured question from a choice of two. The examination time for this paper has been reduced from 2 hours 30 minutes to 2 hours (including 15 minutes reading time). • For Paper 2, candidates now answer two optional structured questions from a choice of four.

Cambridge O Level

Economics 	
Cambridge O Level Economics, Syllabus 2281	<p>From June 2014</p> <p>There are a few additions to and deletions from the syllabus content. The structure of the assessment and the number of assessment objectives have changed.</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • One syllabus aim relating to candidates participating in decision-making as consumers, producers and citizens has been removed. • Candidates should not only describe but also analyse trade unions and their role in the economy. • A new bullet point has been added to syllabus content Section 4.4: <i>'describe the characteristics of perfect competition and monopoly'</i>. • A new bullet point has been added to syllabus content Section 4.6: <i>'describe and have a general understanding of the causes and consequences of economic growth'</i>. • The resource list is now available online only, and is not included in the syllabus document. <p>Changes to assessment</p> <ul style="list-style-type: none"> • Paper 1 'Multiple Choice' now includes 30 instead of 40 multiple-choice questions and has been reduced from 1 hour to 45 minutes. It still accounts for 30% of the total marks. • The compulsory question in Paper 2 now includes interpretation and analysis of unseen data and is increased to 30 marks. Paper 2 is extended by 15 minutes to 2 hours 15 minutes. • There are three assessment objectives instead of four. Assessment objectives 3 and 4 have been combined as a single objective, <i>'critical evaluation and decision-making'</i>. • The grade descriptions have been adjusted in the light of the changes to the assessment objectives.

Geography 	
Cambridge O Level Geography, Syllabus 2217	From June 2016 <p>This syllabus has been revised. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>The main revisions include:</p> <ul style="list-style-type: none"> • The syllabus content has been revised to include more material on 21st-century/global issues including globalisation, development and disparities and climate change. • The syllabus content is presented in an updated format to clarify the learning requirements for each topic. Each topic now has bullet points for each learning objective, further guidance, and case studies where applicable. • Additional guidance has been provided on the learning requirements for each paper. • Specimen papers to match the revised syllabus are now published on our public website at www.cie.org.uk
Geography (Southern Africa) 	
Cambridge O Level Geography (Southern Africa), Syllabus 2223	Last examination: November 2014 <p>This syllabus is being withdrawn. The last exam series is November 2014. Centres are advised that from 2015, entries should be made for Cambridge O Level Geography (2217) or Cambridge IGCSE Geography (0460), both of which are available in the June and November exam series.</p>

History (Central and Southern Africa) 	
Cambridge O Level History (Central and Southern Africa), Syllabus 2160	Last examination: November 2014 This syllabus is being withdrawn. The last exam series will be November 2014. Centres are advised that from 2015, entries should be made for Cambridge O Level History (Modern World Affairs) (2134) or Cambridge IGCSE History (0470), both of which are available in the June and November exam series.
History (Modern World Affairs) 	
Cambridge O Level History (Modern World Affairs), Syllabus 2134	From June 2015 This syllabus replaces Cambridge O Level History (World Affairs 1917–1991) (2158). It has been renamed Cambridge O Level History (Modern World Affairs), with a new syllabus code, 2134 . <ul style="list-style-type: none"> • The main change is moving from one component (2 hours 15 minutes) to two components (2 hours and 1 hour 15 minutes). The components will be timetabled on different days. • The 2015 syllabus includes a new focus on developing historical skills such as analysis and explanation. Component 2 will be a source-based paper. • The assessment objectives have been revised to reflect the focus on historical skills. The syllabus also includes details of how the assessment objectives are weighted across the two components. • The current two-part question structure will be retained. Part-questions will be clearly differentiated with letters. Part (a) tests AO1 and Part (b) tests AO2. Both parts are worth 10 marks. The syllabus content has been revised to include some new topics. The revised syllabus is designed to offer learners the opportunity to study major international issues of the 20th century. The presentation of the syllabus content has also been refreshed.
History (World Affairs 1917–1991) 	
Cambridge O Level History (World Affairs 1917–1991), Syllabus 2158	Last examination: November 2014 This syllabus is being withdrawn. The last exam series is November 2014. From June 2015, a revised Cambridge O Level History (Modern World Affairs) (2134) will be examined, with teaching beginning in 2013. Please see the Cambridge O Level History (Modern World Affairs) (2134) syllabus change.

Pakistan Studies 	
Cambridge O Level Pakistan Studies, Syllabus 2059	<p>From June 2015</p> <p>Changes to syllabus content</p> <p>There are no major changes to content.</p> <p>Paper 1</p> <p>There are minor changes to:</p> <ul style="list-style-type: none"> • Key question 2 • Key question 6 • Key question 7 • Key question 8 • Key question 9 • Key question 11 • Key question 14. <p>The spelling of some names has been revised to reflect the most commonly used spelling. Teachers are encouraged to start using these spellings in their teaching. The revised spellings will be accepted by examiners for 2013 and 2014, as well as the current spellings.</p> <p>Paper 2</p> <p>There is more emphasis on development and an understanding of GDP and GNP has been included. There are minor changes in order to refresh and clarify content in:</p> <ul style="list-style-type: none"> • The land of Pakistan <ul style="list-style-type: none"> 1(b) Location of provinces and cities • Natural resources – an issue of sustainability <ul style="list-style-type: none"> 2(b) Water 2(c) Forests • Power <ul style="list-style-type: none"> 3(a) Sources 3(b) Non-renewables 3(c) Renewables • Industrial development <ul style="list-style-type: none"> 5(b) Secondary and tertiary industries • Trade <ul style="list-style-type: none"> 6(a) Major exports and imports 6(b) Pakistan’s trading partners • Transport and telecommunications <ul style="list-style-type: none"> 7(a) Internal transport 7(b) Telecommunications • Population <ul style="list-style-type: none"> 8(a) Structure and growth 8(d) Employment <p>Changes to content are indicated in the syllabus by black vertical lines either side of the text.</p>

Pakistan Studies (continued) 	
<p>Cambridge O Level Pakistan Studies, Syllabus 2059</p>	<p>Changes to assessment</p> <ul style="list-style-type: none"> Assessment objectives are now presented as one set for the whole syllabus. Paper 1 assessment objectives include increased analysis skills and the interpretation of historical sources. Paper 1 will include a compulsory source-based question. <p>In Section A candidates answer one compulsory question made up of four parts, (a), (b), (c) and (d), which are linked by a common theme. Parts (a) and (b) are source-based questions using historical sources, either text or pictures/graphics. Candidates use and interpret each source in answering the questions.</p> <p>In Section B candidates answer two questions from a choice of four.</p> <ul style="list-style-type: none"> For Paper 2 candidates continue to answer three questions from a choice of five. <p>Part (d) of each question in Paper 2 will specifically assess analysis skills (6 marks). A levels mark scheme will be used for the part (d) questions.</p> <ul style="list-style-type: none"> For Paper 2 candidates may be required to plot information on graphs and charts. <p>Changes to previously published specimen paper material</p> <p>Guidance on timing has been added to the front of specimen Paper 1 History and Culture of Pakistan:</p> <p>Section A – You are advised to spend 30 minutes on this section</p> <p>Section B – You are advised to spend 1 hour on this section.</p> <p>The specimen mark scheme for Paper 1 has been revised to indicate that candidates may use contextual historical knowledge as a way of supporting inferences in their answers to Question 1 in Section A.</p>

Religious Studies (Bible Knowledge)



Cambridge O Level
Religious Studies (Bible
Knowledge),
Syllabus 2048

From June 2015

Changes to syllabus content

- For 2015–2017 the Paper 1 examination will be based on the Gospel of Matthew (**not** the Gospel of Luke).
- For 2018–2020 the Gospel of Luke will be re-introduced to the examination.
- The syllabus content section has been updated to provide guidance to teachers regarding the depth and breadth of teaching required.

Changes to assessment

- Revised question papers including their duration, number of marks and weightings:
 - Paper 1 ‘The life and teaching of Jesus as portrayed in Matthew’s Gospel’ (1 hour 30 minutes – 50% weighting) – candidates answer **four** questions from a choice of six, each question will have three parts; 80 marks.
 - Paper 2 ‘The birth of the early church as portrayed in the Acts of the Apostles’ (Ch1:1–21:15) (1 hour 30 minutes – 50% weighting) – candidates answer **four** questions from a choice of six; each question will have three parts; 80 marks.
- The assessment objectives have been revised for clarity.
- Level descriptors have been revised and are provided in the specimen mark schemes.

Sociology 	
<p>Cambridge O Level Sociology, Syllabus 2251</p>	<p>From June 2015</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • Unit 4 'Power and Authority' has been removed. • Units are now as follows: <ul style="list-style-type: none"> – Unit 1: The title has changed to 'Theory and methods' and the content has been updated. – Unit 2: The title remains unchanged but the content has been updated. – Unit 3: The title remains unchanged but the content has been updated. – Unit 4: This is now 'Family' (which was Unit 5 in the 2014 syllabus) and the content has been updated. – Unit 5: This is now 'Education' (which was Unit 6 in the 2014 syllabus) and the content has been updated. – Unit 6: This is now 'Crime, deviance and social control' (which was Unit 7 in the 2014 syllabus) and the content has been updated. – Unit 7: This is now 'Media' (which was Unit 8 in the 2014 syllabus) and the content has been updated. <p>Changes to assessment</p> <ul style="list-style-type: none"> • For Paper 1, candidates now answer one compulsory data question and one optional structured question from a choice of two. The examination time for this paper has been reduced from 2 hours 30 minutes to 2 hours (including 15 minutes reading time). • For Paper 2, candidates now answer two optional structured questions from a choice of four.

Cambridge International AS and A Level

Economics  	
Cambridge International AS and A Level Economics, Syllabus 9708	<p>From June 2014</p> <p>General changes</p> <p>We have added a 'specification grid' to illustrate in greater detail how the marks available for each group of skills are distributed between the components.</p> <p>Changes to syllabus content</p> <p>Supplement</p> <ul style="list-style-type: none"> • 2. The Price System. We have added '<i>concentration ratio</i>' and '<i>minimum efficient scale</i>' to 'examples of other concepts and terms included'. • 5. Theory and Measurement in the Macroeconomy. We have added '<i>output gap</i>' to 'examples of other concepts and terms included'. <p>From March 2016</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2016</p> <p>This syllabus has been revised. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • The 'Core' and 'Extended' syllabus content headings are replaced by 'AS Level content' and 'Additional A Level content'. • The syllabus content has been refreshed and the seven topic areas in the 2015 syllabus have been reorganised and presented within five topic areas: <ol style="list-style-type: none"> 1. Basic economic ideas and resource allocation 2. The price system and the micro economy 3. Government microeconomic intervention 4. The macro economy 5. Government macro intervention • Examples of economic concepts and terms which were previously listed below the topic areas have been integrated within the topic content. • The 'Syllabus overview' contains a summary of the revised syllabus content. • The resource list for the syllabus can be found on our public website at www.cie.org.uk/alevelsupport

Economics (continued)  	
Cambridge International AS and A Level Economics, Syllabus 9708	<p>Changes to assessment</p> <ul style="list-style-type: none"> For 2016, there are four assessment objectives: <ul style="list-style-type: none"> AO1 Knowledge and understanding – 30% AO2 Application – 20% AO3 Analysis – 30% AO4 Evaluation – 20% <p>Communication has been included in AO3 Analysis.</p> <ul style="list-style-type: none"> The Paper 3 examination time has increased from 1 hour to 1 hour 15 minutes. <p>Availability by exam series</p> <p>In 2016, assessments will be based on the revised syllabus only.</p> <ul style="list-style-type: none"> Candidates can carry forward the result of their Cambridge International AS Level assessments in 2015 to complete the Cambridge International A Level in 2016. The Cambridge International A Level assessments in the 2016 exam series are based on the revised syllabus. Assessments for candidates retaking Cambridge International AS Level or A Level in 2016 are based on the revised syllabus. <p>Learn more about this revised syllabus at www.cie.org.uk/new</p>

General Papers 	
Cambridge International AS Level General Paper, Syllabuses 8001, 8004, 8009	<p>From November 2014</p> <p>Components 8001/11, 8001/12, 8001/13, 8004/11, 8004/12, 8004/13, 8009/01</p> <p>Candidates will write their answers in generic Cambridge Answer Booklets.</p>

Global Perspectives 	
Cambridge International AS Level Global Perspectives, Syllabus 8987	<p>Last examination: November 2015</p> <p>This syllabus is being withdrawn. The last exam series is November 2015. After the June and November 2015 exam series all candidates will have to be entered for the revised syllabus Cambridge International AS Level Global Perspectives & Research (9239).</p> <p>For 2015 examination only, Centres can choose between the current syllabus (8987) and the revised syllabus (9239).</p>

Global Perspectives & Research (AS Level)



Cambridge International AS Level

Global Perspectives & Research,
Syllabus 9239
(The AS Level 9239 is revised from Cambridge International AS Level Global Perspectives, Syllabus 8987)

From June 2015

This is a revised syllabus with first examination in June 2015. For 2015 examination only, Centres can choose between the current syllabus (8987) and the revised syllabus (9239). After the June and November 2015 exam series, all candidates will have to be entered for the revised syllabus (9239).

The revised syllabus is **not** available to private candidates.

Teachers are advised to read the whole syllabus (9239) before planning their teaching programme.

Change to syllabus title

The new name is Cambridge International AS Level Global Perspectives & Research.

Changes to syllabus content

The syllabus sections and the description of the content have been revised for additional clarification.

Changes to assessment

- The assessment objectives have been revised.
- Component 1 has been renamed Written Examination.
- Component 3 has been renamed Team Project.
- The assessment structure has been revised so that the component weightings are more equal:
 - Component 1 Written examination (30%)
 - Component 2 Essay (35%)
 - Component 3 Team Project: Presentation (25%) and Reflective Paper (10%) with a component total of 35%.
- Component 3 is now assessed through a presentation and a reflective paper relating to a team project. Each candidate within a team prepares these two pieces of work individually.
- Teachers should note that this AS Level syllabus will allow progression to a Cambridge International A Level Global Perspectives & Research being introduced for first assessment in June 2016.

In addition to reading the syllabus carefully, teachers should refer to the published specimen papers and are encouraged to access schemes of work, lesson plans and discussion forums.

Full details are contained in the 2015 syllabus on our public website at www.cie.org.uk

You can learn more about this revised syllabus at www.cie.org.uk/new

Global Perspectives & Research (A Level) NEW	
Cambridge International AS and A Level Global Perspectives & Research, Syllabus 9239	<p>From June 2016</p> <p>A Level Global Perspectives & Research will be examined for the first time in June 2016.</p> <p>The syllabus is not available to private candidates.</p> <p>Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to syllabus content</p> <p>The A Level syllabus offers candidates the opportunity to build on their work in AS Level Global Perspectives & Research by engaging with the academic process of developing a research report (components 1 to 3).</p> <p>Changes to assessment</p> <p>For A Level, candidates take four components:</p> <ul style="list-style-type: none"> • Component 1 Written examination (15%) • Component 2 Essay (17.5%) • Component 3 Team Project (17.5%) • Component 4 Cambridge Research Report (50%). <p>In addition to reading the syllabus carefully, teachers should refer to the published specimen papers and are encouraged to access schemes of work, lesson plans and discussion forums.</p> <p>Full details are contained in the 2016 syllabus which will be available on our public website at www.cie.org.uk by June 2014.</p> <p>You can learn more about this syllabus at www.cie.org.uk/new</p>

History 	
Cambridge International AS and A Level History, Syllabus 9389	<p>From June 2014</p> <p>This syllabus has been revised for first examination in June 2014:</p> <ul style="list-style-type: none"> • We have ensured appropriate progression from Cambridge IGCSE or Cambridge O Level in terms of required skills and knowledge. • We have revised the assessment objectives and have included information about how they are weighted. This will make the focus of the assessment clearer for teachers and learners. • We have revised the list of topics available and improved flexibility. This will enable teachers to tailor choices to suit learners' interests. • The revised A Level syllabus will be available for first examination in June 2015. This means that in 2014, it will not be possible to carry forward AS Level components from syllabus 9697. Candidates taking AS Level as part of a staged assessment must take the AS Level papers of the new syllabus from 2014 onwards. Candidates following a two-year linear course will take 9697 up to 2014 and 9389 from June 2015. First teaching of the new syllabus, whether for staged or linear assessment, will be from September 2013. <p>From June 2015</p> <p>Cambridge International A Level History can be achieved as either a staged assessment over different exam series or in one exam series at the end of the course.</p> <ul style="list-style-type: none"> • The syllabus has been divided into four separate components: Source investigation, Outline study essays, Historians' interpretations and Depth studies. • For Components 1 and 2, teachers/learners select one option from a choice of European, American or International options. There is no requirement to select the same option for both components. • For Components 3 and 4 there is a choice of topics. These are explained in detail in the syllabus. • The assessment objectives have been revised and information is included about how these are weighted across the qualification as a whole. • The revised syllabus content has been devised to allow Centres to continue to use their existing resources, although there are new elements should teachers and learners wish to explore them.

History (continued) 	
<p>Cambridge International AS and A Level History, Syllabus 9389</p>	<p>From June 2016</p> <p>The following changes have been made to the syllabus content to take into account the background material which has to be addressed to be able to study the topics in question; and to give candidates a wider range of issues to discuss when answering questions.</p> <p>Component 1: European Option</p> <p>Liberalism and Nationalism in Italy and Germany, 1815–1871</p> <p>The date has been amended from 1848 to 1815 to take into account the necessary background to the topic.</p> <p>Component 2: European Option</p> <p>France, 1789–1814</p> <p>The date has been amended from 1804 to 1814 to give candidates a wider range of material to access in relation to Bonaparte’s domestic policies.</p> <p>Industrial revolution, c. 1800–c. 1890</p> <p>The date has been extended to c. 1890 to give candidates a greater range of examples, particularly from France and Germany. The Key Questions have been updated accordingly.</p> <p>Russian Revolution, 1894–1917</p> <p>The start date has been amended to 1894 to allow for teaching of the background to the 1905 revolution. A separate bullet point on social and economic change has been added to the content for the Key Question on the 1905 Revolution; and Witte has been removed from the specified content for the Key Question on the strengths and weaknesses of Romanov rule.</p> <p>Component 2: American Option</p> <p>The Great Crash, the Great Depression and the New Deal, 1920s–1941</p> <p>The start date has been amended to include the 1920s and the bullet point on the USA in the 1920s has been moved into this section.</p> <p>Component 4: European Option</p> <p>Theme 4: Hitler’s Germany, 1929–1941</p> <p>A fourth bullet point has been added to the content of the first Key Question to include the consolidation of power, 1933–1934.</p>

History  	
Cambridge International AS and A Level History, Syllabus 9697	<p>Last examination: November 2014</p> <p>This syllabus is being withdrawn. The last exam series of AS and A Level is November 2014.</p> <p>The new syllabus (9389) was available for first teaching in September 2013:</p> <ul style="list-style-type: none"> • The first exam series for the new AS Level is June 2014. • The first exam series for the new A Level is June 2015. <p>Therefore:</p> <ul style="list-style-type: none"> • Candidates following a two-year linear course, with all examinations at the end of their course, will be able to take the new AS and A Level in 2015. • Candidates following a staged assessment route will be able to take the new AS Level in 2014 and the new A Level in 2015. <p>It will not be possible to carry forward marks for 9697 into the revised syllabus. Therefore candidates wishing to take A Level History in 2015 will need to study the revised syllabus.</p> <p>For further information, please refer to the syllabus for 2014.</p>
Nepal Studies NEW	
Cambridge International AS Level Nepal Studies, Syllabus 8024	<p>From June 2016</p> <p>This new syllabus is available for first assessment in June 2016.</p> <p>Full details are contained in the 2016 syllabus and specimen papers which we expect to be available on our public website at www.cie.org.uk by July 2014.</p>

Sociology 	
Cambridge International AS and A Level Sociology, Syllabus 9699	<p>From June 2014</p> <p>This syllabus has been revised providing a smoother transition from IGCSE/O Level to AS/A Level.</p> <p>For the AS Level, candidates study two units:</p> <p>Unit 1: The Family Unit 2: Theory and Methods.</p> <p>The AS Level is assessed through two written papers, Paper 1 and Paper 2. These papers both test Units 1 and 2.</p> <p>In each of Paper 1 and Paper 2, candidates answer one compulsory data-response question and one essay question from a choice of two.</p> <p>For the A Level, candidates study Units 1 and 2 plus up to four additional units:</p> <p>Unit 3: Education Unit 4: Global Development Unit 5: Media Unit 6: Religion.</p> <p>The A Level is assessed through three written papers, Papers 1, 2 and 3. Papers 1 and 2 are the same as for the AS Level.</p> <p>In Paper 3, candidates answer three essay-style questions from a choice of eight.</p> <p>Paper 3 is in four sections, one for each of Units 3 to 6. There are two essay questions in each section and candidates must choose three questions from three different sections.</p>

Cambridge Pre-U Short Courses

Global Perspectives (Short course)  	
Cambridge International Level 3 Pre-U Certificate Global Perspectives (Short Course), Syllabus 1340	From November 2014 The November retake exam series for this syllabus will continue to be offered. The June exam series will also still be available.

Cambridge Pre-U Principal Subjects

Art History	
Cambridge International Level 3 Pre-U Certificate Art History (Principal), Syllabus 9799	<div style="text-align: right;">    </div> <p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>This syllabus has been revised. Some of the changes are significant. Teachers are strongly advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to syllabus content</p> <p>Paper 1 Analytical Studies in Western and non-Western Art</p> <ul style="list-style-type: none"> • The number of works of art has been reduced from twelve to ten for each of the four sections. This reduces the overall number of named works of art to be studied from 48 to 40. • Some of the works of art have been updated. <p>Paper 2 Historical Topics</p> <ul style="list-style-type: none"> • The number of historical topics has been reduced from nine to eight. • There is a new topic area for Historical Topic 1: 1.5 The art and architecture of late antiquity, c. 330 AD to c. 570 AD. Topics 2 and 3 have been restructured into topic area 1.2. • Historical Topic 4 (Man the measure of all things: the early Italian Renaissance, 1400–1500) and Historical Topic 5 (The Renaissance in Northern Europe, c. 1420–1570) have been replaced with a new Historical Topic: Man, the measure of all things: the Italian Renaissance, c. 1400 to c. 1600. This includes content on the Italian High Renaissance. • There have been some minor changes to the content of the other historical topics to clarify and exemplify the breadth that is to be covered. • The list of books to consult will be available as a separate resource on the Teacher Support site. The key texts for each historical topic of study remain in the syllabus.

Art History (continued)   	
Cambridge International Level 3 Pre-U Certificate Art History (Principal), Syllabus 9799	<p>Paper 3 Thematic Topics</p> <ul style="list-style-type: none"> • Thematic Topic 1: Art and architecture in the city <ul style="list-style-type: none"> – A new sample case study has been introduced: Florence, to add to the existing exemplification (Barcelona). – Topic area 1 ‘Topographical concerns’ has been renamed ‘City spaces’. – The suggested topic area 6 ‘Public spaces’ has been replaced with ‘The city now’. A new suggested topic that invites candidates to explore the contemporary artistic life of their chosen city (museums that show contemporary work, private galleries, cinema, fashion, design, building projects...Public spaces) now becomes part of the suggested topic area 1 ‘City spaces’. • Thematic Topic 2: Landscape <ul style="list-style-type: none"> – A new suggested topic area has been introduced: Landscape of fantasy: the northern tradition. – Suggested topics 4, 5 and 6 have been consolidated into two suggested topic areas to account for the introduction of the new northern tradition topic. • Thematic Topic 3: Portraiture <ul style="list-style-type: none"> – Examples from the 21st century have been added to suggested topic 6 that now becomes: ‘Making it new: the 20th and the 21st centuries’. • Thematic Topic 4: The nude <ul style="list-style-type: none"> – Examples from the 21st century have been added to suggested topic 6 that now becomes: ‘The nude in 20th and 21st centuries’. • There have been some minor changes to the content across the thematic topics to clarify and exemplify the breadth that is to be covered. • The list of books to consult will be available as a separate resource on the Teacher Support site. The key texts for each thematic topic of study remain in the syllabus. <p>Paper 4 Personal Investigation</p> <ul style="list-style-type: none"> • This paper remains unchanged. There are some minor changes to the wording in this section of the syllabus purely for clarification. <p>Changes to assessment</p> <ul style="list-style-type: none"> • The assessment objectives have been slightly reworded. The relationship between the scheme of assessment and the assessment objectives remains unchanged. • There are no changes to the assessment structure, question types or the levels of response mark schemes. <p>The specimen papers have been updated to ensure that they reflect the revised syllabus content.</p>

Classical Heritage   	
Cambridge International Level 3 Pre-U Certificate Classical Heritage (Principal), Syllabus 9786	<p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond.</p> <p>Last examination: June 2015</p> <p>This syllabus is being withdrawn. The last exam series is June 2015.</p>

Classical Greek, Latin   	
Cambridge International Level 3 Pre-U Certificate Classical Greek (Principal), Syllabus 9787, Latin (Principal), Syllabus 9788	<p>From November 2014</p> <p>The November retake exam series for these syllabuses have been withdrawn. They will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>There are significant changes to these syllabuses for first assessment in 2016. Teachers are strongly advised to read the whole of the syllabus before planning their teaching programmes.</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • The prescribed texts in Papers 1 and 2 have been updated. The prescribed texts for 2016, 2017 and 2018 are now specified in the syllabus. • The suggested bibliography will be available as a separate resource at Teacher Support. <p>Paper 1 Verse Literature</p> <ul style="list-style-type: none"> • The paper has been restructured with a revised scheme of assessment. • In Section A, candidates now answer two questions on their chosen prescribed text: a translation question which may be taken from a separate part of the prescription (15 marks); and one context and style question set on their chosen text from a choice of two questions each set on a separate passage of the prescribed text (25 marks). • In section C, candidates now have a choice between an Unseen Literary Criticism question (English translation provided), or a choice of one of two essays on 'paired texts' (set text and one additional related text). The paired texts will replace the theme texts. • The examination time has been reduced from 2 hours and 30 minutes to 2 hours and 15 minutes.

Classical Greek, Latin (continued)



Cambridge International Level 3 Pre-U Certificate
Classical Greek (Principal),
Syllabus 9787,
Latin (Principal),
Syllabus 9788

Paper 2 Prose Literature

- The paper has been restructured with a revised scheme of assessment.
- In Section A, candidates now answer **two** questions on their chosen prescribed text: a translation question which may be taken from a separate part of the prescription (10 marks); and **one** context and style question set on their chosen text from a choice of two questions each set on a separate passage of the prescribed text (25 marks).
- In Section B there now is a choice of **three** questions set on the candidate's prescribed text. Candidates have a choice between a commentary question on their chosen prescribed text, or a choice of two essay questions on their chosen prescribed text. This section is now worth 25 marks.
- The examination time has been reduced from 2 hours to 1 hour and 30 minutes.

Paper 3 Unseen Translation

- The marks allocated to this paper have been reduced from 100 to 90 marks.
- Updated principles of marking for the unseen prose and the unseen verse translation have been added to the mark scheme.

Paper 4 Prose Composition or Comprehension

- The marks allocated to this paper have been increased from 40 to 60 marks.
- Updated principles of marking for the prose composition have been added to the mark scheme.

Changes to scheme of assessment

- The assessment objectives have been updated. The weightings of the assessment objectives in the question papers have also been updated.
- The rubrics in the question papers have been revised for further clarity.
- Further guidance to examiners has been added to the specimen mark schemes.
- The specimen papers have been updated in line with the revised syllabus. You are strongly advised to refer to the published specimen materials on our website www.cie.org.uk for exemplification of the changes to the scheme of assessment.

Comparative Government and Politics	
Cambridge International Level 3 Pre-U Certificate Comparative Government and Politics (Principal), Syllabus 9770	<div style="text-align: right;">    </div> <p>From June 2014</p> <p>Paper 1 and Paper 2: rewording of instructions</p> <p>The instructions on the front page of Paper 1 (9770/01) and Paper 2 (9770/02) have been amended: 'This paper contains two sections: Section A and Section B. Answer two short essays from the same section, and one long essay from either Section A or Section B.'</p> <p>This change has been made to ensure the assessment requirements for these papers are clear. The assessment has not changed and no other changes have been made to the qualification.</p> <p>The specimen papers have been updated to reflect this change.</p> <p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p>

Economics	
Cambridge International Level 3 Pre-U Certificate Economics (Principal), Syllabus 9772	<div style="text-align: right;">    </div> <p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>There have been minor changes to the syllabus for 2016. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>The syllabus aims have been broadened to reflect the international dimension of the syllabus.</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • Some syllabus content has been reworded for clarity. Changes to content are indicated by black vertical lines either side of the text within the syllabus content section. • The current issues in economics in Paper 3 have been refreshed for 2016. One of these changes is that 'The Millennium Development Goals and the Post-2015 Development Agenda' replaces 'The Millennium Development Goals'. The other change is that 'Behavioural economics and government policy' replaces 'Economic thinkers and their relevance today (Adam Smith, Karl Marx and John Maynard Keynes)'.

Economics (continued)	
<p>Cambridge International Level 3 Pre-U Certificate Economics (Principal), Syllabus 9772</p>	<p>Changes to assessment</p> <ul style="list-style-type: none"> • There are minor changes to streamline the wording of the Assessment Objectives: <ul style="list-style-type: none"> – AO1 is unchanged. – ‘AO2 Apply economic theory to real-world situations.’ <i>replaces</i> ‘AO2 Apply theoretical knowledge and understanding to real-life situations presented to them.’ – ‘AO3 Analyse economic problems using appropriate numerical and non-numerical techniques’ <i>replaces</i> ‘AO3 Analyse economic problems and have a good knowledge of statistical methods used within the discipline.’ – ‘AO4: Evaluate and make conclusions; assess the relevance and appropriateness of assumptions made within economic models.’ <i>replaces</i> ‘AO4: Evaluate and reach well-informed and considered conclusions. Candidate must be able to make a critical assessment of the relevance and appropriateness of assumptions made within models.’ • Paper 1: The duration is increased by 15 minutes from 2 hours 15 minutes to 2 hours 30 minutes. • The Grade descriptions have been reworded for clarity. • The specimen papers have been updated to reflect changes to the assessment and syllabus content.

Geography	
<p>Cambridge International Level 3 Pre-U Certificate Geography (Principal), Syllabus 9768</p>	<div style="text-align: right;">    </div> <p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>This syllabus has been revised. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • The syllabus content has been revised. • In Global Themes (Paper 2) the topic 'World of Work' has been replaced by 'People, Place and Conflicts'. <p>Changes to assessment</p> <ul style="list-style-type: none"> • The order of Papers 1, 2 and 3 has changed. The order of these papers is now Paper 1: Global Environments, Paper 2: Global Themes and Paper 3: Geographical Issues. • The type of assessment for Paper 1: Global Environments has changed from wholly essay questions to a mixture of structured questions and extended writing. • The examination time for Paper 3: Geographical Issues has been increased from 2 hours 30 minutes to 2 hours 45 minutes. <p>The specimen papers have been updated to reflect the changes to the syllabus.</p>

Global Perspectives and Independent Research (International version) 	
Cambridge International Level 3 Pre-U Certificate Global Perspectives and Independent Research (International version) (Principal), Syllabus 9766	Progression between Cambridge International AS Global Perspectives & Research (9239) and Cambridge Pre-U Certificate in Global Perspectives and Independent Research (9766) From 2017, Cambridge Pre-U Global Perspectives and Independent Research (9766) will no longer be assessed as a staged course. It will not be possible to progress from Cambridge International AS Level Global Perspectives & Research (9239) to the second year of Cambridge Pre-U Global Perspectives and Independent Research (9766). Learners taking assessments for the current Cambridge International AS Level Global Perspectives syllabus (8987) in 2014 or 2015 have until the end of 2016 to complete assessments for the second year of Cambridge Pre-U Global Perspectives and Independent Research (9766). After 2016, learners wanting staged certification of a Cambridge Global Perspectives & Research qualification will have to take the Cambridge International AS and A Level Global Perspectives & Research (9239) route.
Global Perspectives and Independent Research (UK only)  	
Cambridge International Level 3 Pre-U Certificate Global Perspectives and Independent Research (UK only) (Principal), Syllabus 9777	From November 2014 The November retake exam series for this syllabus will continue to be offered. The June exam series will also still be available.

History   	
<p>Cambridge International Level 3 Pre-U Certificate History (Principal), Syllabus 9769</p>	<p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>This syllabus has been revised. Teachers are advised to read the whole of the syllabus before planning their teaching programme.</p> <ul style="list-style-type: none"> • Some of the chronological divisions between components and between the sections within components have been changed. • Some topics within different content sections have been reorganised. • The following Special Subjects have been removed from the syllabus: <ul style="list-style-type: none"> – The Origins and Causes of the American Civil War, c. 1820–1861 – The Campaign for Female Suffrage, c. 1880–1928 – Winston Churchill, 1914–1946 <p>Appendix 1: Guidance for teachers has been removed. Please refer to the Cambridge Pre-U History Teacher Guide on our Teacher Support website for guidance for teachers.</p> <ul style="list-style-type: none"> • The following Special Subjects are available for assessment in 2016 only: <ul style="list-style-type: none"> – The Norman Conquest, 1051–1087 – Gladstone and Disraeli, 1867–1886 • The following Special Subject is available for assessment in 2016 and 2017 only: <ul style="list-style-type: none"> – Reformation Europe, 1516–1559 <p>The specimen papers have been updated to ensure they reflect the revised syllabus content.</p>

Philosophy and Theology		  
Cambridge International Level 3 Pre-U Certificate Philosophy and Theology (Principal), Syllabus 9774	<p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>This syllabus has been reviewed, but there are no significant changes. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> An explanation regarding which versions of set texts will appear on the question papers has been added to the syllabus under the 'Description of components' section, under the sub-heading 'Set texts' (p.11). <p>Changes to assessment</p> <ul style="list-style-type: none"> The assessment objectives have been slightly reworded. The relationship between the scheme of assessment and the assessment objectives remains unchanged. There are no changes to the assessment structure, question types or the levels of response mark schemes. <p>The specimen papers have been refreshed using content from the 2012 question papers and mark schemes.</p>	
Psychology		
Cambridge International Level 3 Pre-U Certificate Psychology (Principal), Syllabus 9773	<p>From June 2016</p> <p>There are no changes to this syllabus. A copy of the 2016 syllabus is available from our public website at www.cie.org.uk</p>	

Contents for Cambridge business, technical and vocational

Please share the relevant pages with subject staff.

Cambridge IGCSE

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Finding your way round

Select the relevant subject to learn more about changes highlighted by these icons:

-  New syllabus
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Updated information

We have updated the information on Cambridge IGCSE Computer Science (0478), Cambridge IGCSE Information and Communication Technology (0417) and Cambridge International AS and A Level Accounting (9706) on pages 157, 162 and 170–171. Changes are marked by black vertical lines.

Syllabus changes

Cambridge IGCSE

Accounting  	
Cambridge IGCSE Accounting, Syllabus 0452	<p>From March 2015</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2016</p> <p>Changes to the syllabus content Section 6.6.3 Limited liability companies</p> <p>Learners should be able to prepare statements of changes in equity rather than simple appropriation accounts for limited liability companies.</p>

Art and Design  	
Cambridge IGCSE Art and Design, Syllabus 0400	<p>From June 2015</p> <p>Changes to assessment</p> <ul style="list-style-type: none"> The number of options has been reduced from five to three to provide three alternative options. Component 1 (broad-based assignment) is compulsory for all candidates. Candidates have an unspecified amount of preparation time for Components 1 and 2. <p>Changes to examination-specific information</p> <ul style="list-style-type: none"> The requirements for all components have been clarified. Detailed information for teachers and candidates will be provided with the question papers for Components 1 and 2. Component 3 Critical and Historical assignment: Candidates must use first-hand studies from primary sources as the starting point to inform the development of their own ideas. This means they should initially base their studies on primary sources (local buildings, crafts persons, local galleries, etc.) and not from secondary sources (magazines, books or internet searches). As the study progresses candidates may compare and contrast with secondary source material, particularly as primary source material may be limited in certain cases.

Art and Design (continued)


Cambridge IGCSE

 Art and Design,
 Syllabus 0400

Changes to submission of work

- Photography, digital and lens-based media – moving work:** Any moving image work (no longer than three minutes) should be submitted on DVD, or alternatively on CD in common forms of digital format such as Mpeg or WMV. Candidates may develop their own blogs or video blogs (social networking sites can be used) but the authenticity of the work produced must be evidenced in the supporting work showing the development of ideas. All research must be clearly referenced.
 - Graphic communication – game design:** Candidates should be able to combine drawing and software skills to create concept artwork, environments, gameplay, storyboards or character development related to a theme or brief. Supporting work for digitally produced artwork should include evidence of the development of ideas and understanding of techniques and processes. Prototype platform games and RPG games concepts can be produced, and should have age-appropriate content.
 - Quality of written communication:** Where written evidence is presented alongside practical work, both the practical work and the written information (commentary, notes and annotations) will be assessed in conjunction with each other and against all assessment objectives.
- Candidates do not have to communicate in writing but if they do, they must ensure that their writing is legible and in English. The spelling and grammar should be checked to ensure that the meaning is clear. The form and style of writing should be appropriate and should fit the context of the work. All source material should be correctly referenced.
- Component 4 Coursework assignment – supporting portfolio:** This should contain work which shows the research, exploration, development and evaluation relevant to the final outcome. The **maximum** size is A2 and **no more than four sheets** – eight sides in total should be submitted. The supporting portfolio should relate directly to the final outcome.

Business Studies	
<p>Cambridge IGCSE Business Studies, Syllabus 0450</p>	<div style="text-align: right;">    </div> <p>From March 2015</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2015</p> <p>Changes to syllabus content</p> <p>The syllabus content has been updated and reorganised:</p> <ul style="list-style-type: none"> • Topics have been reordered to create a more logical structure and to make the syllabus more accessible for teachers. • A new 'Syllabus at a Glance' section has been added to the syllabus for quick referencing (p.6). • The 'Assessment at a Glance' section has been modified to reflect changes to the component and assessment structure. <p>The following content has been removed:</p> <ul style="list-style-type: none"> • 1.3.1 State the role of the government in influencing decisions within local, national and international contexts and explain how business may react • 1.4.1 Mixed and market economies and the appreciation of different outcomes of the systems in terms of choice, prices and availability of goods/services • 1.4.4 Show awareness of the potential for consumer exploitation in uncompetitive markets • 3.3.7 Financial budgets • 5.1.1 Explain why intervention in business activity is required so that social and economic objectives of the state can be better achieved • 5.2.2 Show awareness of how trade unions can influence business behaviour • 5.2.2 Describe the main features of an employment contract. <p>Content now includes clarification of the following:</p> <ul style="list-style-type: none"> • 2.4.1 'Methods of communication' now include a specific reference to information technology • 4.3.1 The concept of 'quality assurance' has been added to quality control.

Business Studies (continued)   	
<p>Cambridge IGCSE Business Studies, Syllabus 0450</p>	<p>The following new content has been added:</p> <ul style="list-style-type: none"> • 1.1.1 Importance of specialisation • 1.3.1 Enterprise and entrepreneurship • 1.3.4 Why some (new or established) businesses fail • 1.5.1 Objectives of social enterprises • 2.1.1 Maslow's hierarchy and key motivational theories – Taylor and Herzberg • 2.3.1 Benefits of part-time and full-time workers • 3.1.1 Maintaining customer loyalty; building customer relationships • 3.3.5 Use of social networks for promotion • 5.1.2 Importance of micro-finance in developing economies • 6.3.1 The concept of globalisation, the reasons for it and the opportunities and threats of globalisation for businesses. <p>Changes to assessment</p> <ul style="list-style-type: none"> • The number of components has been reduced from three to two: the optional coursework element (Paper 3) of the assessment has been removed. Paper 1 and Paper 2 each account for 50% of the total marks. • The examination times for Papers 1 and 2 have been reduced from 1 hour 45 minutes per paper to 1 hour 30 minutes each. • The number of questions on Papers 1 and 2 has been reduced from five to four questions. <p>Changes to previously published specimen paper material</p> <p>A small change has been made to the Paper 2 mark scheme: Question 3(a), to ensure that the terminology used in the mark scheme is up to date with the 2015 syllabus. In the revised mark scheme for this question, the term 'income statement' replaces 'profit/loss account' (first bullet point).</p>

Child Development 	
<p>Cambridge IGCSE Child Development, Syllabus 0637</p>	<p>From June 2014</p> <p>There are changes to the syllabus content. These are indicated in the syllabus by black vertical lines either side of the text.</p>

Computer Science	
Cambridge IGCSE Computer Science, Syllabus 0478 (revised from Cambridge IGCSE Computer Studies, Syllabus 0420)	<div style="text-align: right;">   </div> <p>From June 2015</p> <p>Previously named Cambridge IGCSE Computer Studies (0420), this syllabus has been revised to bring it up to date and to allow learners to begin the development of their computational thinking and programming skills. Teachers are advised to read the whole syllabus before planning their teaching programme. As 'Computer Science', this syllabus now shares the same name as the AS/A Level syllabus (formerly AS/A Level Computing), indicating the firm links and progression between these syllabuses.</p> <p>This syllabus has a new syllabus code, 0478.</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • There is one new practical topic introducing the concept of arrays and so enabling learners to develop programming solutions for real world problems. • There are two new theory topics: 'Computer ethics' and 'Hexadecimal numbers'. • The 'Systems life cycle' topic has been removed. <p>Changes to assessment</p> <ul style="list-style-type: none"> • All components are externally assessed. • Both papers contain short-answer and structured questions. There is no choice of questions. No calculators are permitted for either paper. • Paper 1 'Theory' is now: 1 hour 45 minutes; 60% weighting; 75 marks. • New Paper 2 'Problem-solving and Programming': 1 hour 45 minutes; 40% weighting; 50 marks. This paper replaces Paper 2 'Coursework' and Paper 3 'Alternative to Coursework'. There is pre-release material for Paper 2 'Problem-solving and Programming' for candidates to complete practical tasks. 20 of the marks for this paper are from questions set on the pre-release material. Teachers are expected to incorporate the pre-release material tasks into their lessons and give support in finding methods and reaching solutions. • There is no coursework. • The syllabus aims and assessment objectives have been clarified. <p>From June 2016</p> <p>From examination in 2016 this syllabus is regulated by the UK regulator, Ofqual.</p> <p>There are some amendments to Section 6 Syllabus Content; these are indicated by black vertical lines either side of the text.</p> <ul style="list-style-type: none"> • Section 7 gives details of changes to the availability of the pre-release material for Paper 2 Problem-Solving and Programming. • There are some editorial changes for clarification. • Section 6 explains the annual technical update process which will take account of emerging technologies, relevant to the syllabus content for examinations from 2017.

Design and Technology 	
<p>Cambridge IGCSE Design and Technology, Syllabus 0445</p>	<p>From June 2015</p> <p>Changes to syllabus content</p> <p>The syllabus content has been revised to reflect changes in technology and the way the subject is now taught.</p> <p>Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to assessment</p> <p>There are minor changes to the presentation of the assessment in the syllabus, and advice has been included for Centres.</p> <ul style="list-style-type: none"> • The syllabus aims and assessment objectives have been revised for clarity. • Paper 1 has been renamed 'Product design'. • Centres are advised that some content from Paper 1 may be examined in Papers 2, 3 and 4. • Advice on the drawing equipment to be used in the Paper 2 examination is included. • For Paper 5 Centres are advised that the use of CAD/CAM is encouraged where facilities exist. However, all relevant work should still be presented in hard copy as an A3-size folder; soft copy submission is not acceptable. • Minor changes have been made to the wording of the project assessment criteria for clarity. <p>From 2015 candidates will no longer take Paper 1 and the optional paper (2, 3 or 4) together in one session of 2 hours and 15 minutes.</p> <p>The specimen papers have been updated to reflect the refreshed syllabus content.</p>

Drama 	
<p>Cambridge IGCSE Drama, Syllabus 0411</p>	<p>From June 2015</p> <p>This syllabus has been revised. Some changes are significant and these are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Summary of changes</p> <p>Component 1: Written examination</p> <ul style="list-style-type: none"> • In preparation for Component 1, candidates will devise one piece of drama based on one of three stimuli provided in the pre-release material. • The pre-release material will include a broader range of stimuli such as a poem, a picture, a newspaper article, etc. • In Section A of the question paper, candidates answer six to eight short-answer questions on the extract from the play (20 marks), and two to four questions on their chosen stimulus (10 marks). <p>Specimen papers to exemplify the changes above are available on our public website at www.cie.org.uk</p> <p>Component 2: Coursework</p> <ul style="list-style-type: none"> • The Individual piece must be a performance of an extract of a play and should last between three and five minutes. • The coursework assessment criteria have been revised and expanded and a new <i>Individual Candidate Mark Sheet</i> is included in the syllabus. <p>A new <i>Coursework Training Handbook</i> for the June 2015 examination onwards will be available in May 2014. Teachers who are already accredited to assess the coursework component do not need to reapply for accreditation.</p>

Enterprise  	
<p>Cambridge IGCSE Enterprise, Syllabus 0454</p>	<p>From June 2014</p> <p>This syllabus is approved by Ofqual and funded for use in state schools in England, Wales and Northern Ireland.</p> <p>Changes to syllabus content</p> <p>Topic 1</p> <ul style="list-style-type: none"> • 2(a): The list of ways to be enterprising at school has been removed and replaced with a general instruction. • 2(e): This has been moved to Topic 3. <p>Topic 3</p> <ul style="list-style-type: none"> • The title of the topic has been expanded to include '<i>personal attributes</i>' of entrepreneurs. • 1: A requirement to '<i>evaluate the personal attributes</i>' has been added. • 1: '<i>Determination to succeed; practical/technical skills; prioritisation/time management; interpersonal/communication skills and delegation</i>' have been added. • 2: A requirement to carry out evaluation has been added. <p>Topic 4</p> <ul style="list-style-type: none"> • The title of the topic has been changed to include '<i>responsibilities</i>'. • 1: '<i>Carry out advertising</i>' has been removed. • 3: The '<i>implications of rights and responsibilities and ethical considerations</i>' has been added. • A new topic 3(b) has been added requiring understanding of the concept of ethical and moral principles related to enterprise. <p>Topic 5</p> <ul style="list-style-type: none"> • 2: This has been changed to '<i>Analyse and evaluate the process of negotiation</i>'. • Parts 2 and 3 have been merged. <p>Topic 6</p> <ul style="list-style-type: none"> • The order of the topics has been changed.

Enterprise (continued)  	
<p>Cambridge IGCSE Enterprise, Syllabus 0454</p>	<p>Topic 10</p> <ul style="list-style-type: none"> • 2(d): This has been removed. • 3: This has been changed to '<i>Analyse and evaluate the internal and external communication methods used in an enterprise</i>'. • A new topic 3(c) has been added. • 5: The requirement to '<i>understand the importance of effective communication to running an effective meeting</i>' has been removed. • 5(a): This has been removed. <p>We have made some editorial improvements to the topic outlines.</p> <p>Changes to Component 2</p> <p>In response to feedback from Centres and examiners, the requirements of the coursework component (Component 2) have been streamlined.</p> <p>Task 1</p> <ul style="list-style-type: none"> • A formal written report is now the only requirement. The syllabus provides details of what the report should cover. <p>Task 2</p> <ul style="list-style-type: none"> • Candidates no longer have to submit a risk assessment as part of their planning. • The witness statement of the candidate's financial presentation must be submitted in writing. Video recordings will not be accepted as evidence, owing to practical difficulties in providing and accessing video recordings. • A requirement in the '<i>planning marketing communications task</i>' for candidates to present their proposed marketing communications methods to a teacher or business person has been included. A written witness statement must also be provided. <p>Task 3</p> <ul style="list-style-type: none"> • The structure of the assessment guidelines has been clarified. • '<i>Negotiation with others</i>' is now a separate point in the guidelines. This reflects the fact that candidates must complete both the negotiation and the action plan monitoring tasks. <p>Task 4</p> <ul style="list-style-type: none"> • The requirements have been streamlined to make it explicit that the candidate must submit a formal report for assessment of their communication skills. • The syllabus emphasises that the option to evaluate internal communications is only available to candidates who have worked as part of a group. <p>There are no changes to the externally assessed components, the specimen papers or the mark schemes for this syllabus.</p>

Food and Nutrition 	
Cambridge IGCSE Food and Nutrition, Syllabus 0648	From June 2014 There are changes to the syllabus content. These are indicated in the syllabus by black vertical lines either side of the text.

Information and Communication Technology   	
Cambridge IGCSE Information and Communication Technology, Syllabus 0417	<p>From March 2015 In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2016 This syllabus has been revised. Teachers are advised to read the whole syllabus document before planning their teaching programme.</p> <p>Changes include:</p> <ul style="list-style-type: none"> • some changes to the assessment structure (see Section 4): <ul style="list-style-type: none"> – the names of the components have changed – the topics to be assessed within each component have been revised • revised syllabus aims, assessment objectives and grade descriptions (see Section 5) • revised syllabus content (see Section 6).

Music  	
Cambridge IGCSE Music, Syllabus 0410	<p>From June 2015</p> <p>This syllabus has been revised. Some changes are significant and are outlined below. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to assessment</p> <p>Component 1 Listening</p> <ul style="list-style-type: none"> • Section A: Unprepared Western Repertoire is unchanged. • Sections B and D in the 2014 syllabus are combined into a single Section B: World Music (22 marks). • Section C: Skeleton Score (16 marks). • Section D: Set Work (was Section E in the 2014 syllabus) (16 marks). <p>The overall number of marks is unchanged at 70 marks.</p> <p>The requirements for Component 2 Performing both <i>individually</i> and in an <i>ensemble</i> have been clarified.</p> <p>The requirement in Component 3 Composing for the two compositions to be either contrasting in character or written for different forces has been strengthened. The marking criteria have been adjusted accordingly.</p> <p>From June 2016</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • Some of the content in Component 1 Listening has been changed. <p>The Set Works have been updated for 2016:</p> <ul style="list-style-type: none"> • Rodrigo: <i>Concierto de Aranjuez</i> (Movements 1 and 3) • Vivaldi: <i>Spring</i> from <i>The Four Seasons</i>. <p>The World Focus for 2016 is:</p> <ul style="list-style-type: none"> • Japanese Instrumental Music. <p>Changes to content are indicated in the syllabus by black vertical lines either side of the text.</p>
Travel and Tourism 	
Cambridge IGCSE Travel and Tourism, Syllabus 0471	<p>From June 2014</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • There are changes to the syllabus content. These are indicated in the syllabus by black vertical lines either side of the text. • Section 3 details the relationship between the assessment objectives and the components. It also includes grade descriptions.

Cambridge O Level

Art 	
Cambridge O Level Art, Syllabus 6010	Last examination: November 2014 This syllabus is being withdrawn. The last exam series is November 2014.

Art and Design 	
Cambridge O Level Art and Design, Syllabus 6090 (only for Centres in Bangladesh, the Maldives, Mauritius and Pakistan)	<p>From June 2015</p> <p>This syllabus replaces Cambridge O Level Art (6010).</p> <p>It is now only offered to Centres in Bangladesh, the Maldives, Mauritius and Pakistan.</p> <p>In this new syllabus, candidates now take two components out of a choice of three, instead of three out of a choice of six. There is now a compulsory component, Paper 1.</p> <p>For each component, there is now a practical examination of 6 hours instead of either 2.5 or 3 hours.</p> <p>Candidates must have a minimum of two weeks' preparation time before the examination (instead of one week) and question papers will be released in time to reflect this.</p> <p>Submission dates for examination work are now 30 April for the June exam series and 31 October for the November exam series.</p> <p>The syllabus has five assessment objectives (AO), which apply to all components:</p> <ul style="list-style-type: none"> • AO1 Gathering, recording, research and investigation • AO2 Exploration and development of ideas • AO3 Organisation and relationships of visual and/or other forms • AO4 Selection and control of materials, media and processes • AO5 Personal vision and presentation. <p>Please note that research (AO1) and exploration and development of ideas (AO2) are assessed in 6090. AO1 and AO2 together account for 40% of the marks.</p> <p>The examination work should draw on the earlier research and exploration and development of ideas. Accordingly, supporting studies (preparatory work) must be taken into the examination. Supporting studies must not be removed from the Centre once the examination has started. Supporting studies must be submitted together with the final examination piece after the examination, with the final examination piece on the top. All work must be labelled using the labels in the syllabus.</p> <p>In this syllabus any component can be approached using any of the media or techniques listed in the syllabus.</p> <p>Centres in Brunei are offered Cambridge O Level Art and Design (6089) (BN) in place of 6010.</p>

Business Studies 	
<p>Cambridge O Level Business Studies, Syllabus 7115</p>	<p>From June 2015</p> <p>Changes to syllabus content</p> <p>The syllabus content has been updated and reorganised:</p> <ul style="list-style-type: none"> • Topics have been re-ordered to create a more logical structure and to make the syllabus more accessible for teachers. • A new 'Syllabus at a Glance' section has been added to the syllabus for quick referencing (p.6). • The 'Assessment at a Glance' section has been modified to reflect changes to the component and assessment structure. <p>The following content has been removed:</p> <ul style="list-style-type: none"> • 1.3.1 State the role of the government in influencing decisions within local, national and international contexts and explain how business may react • 1.4.1 Mixed and market economies and the appreciation of different outcomes of the systems in terms of choice, prices and availability of goods/services • 1.4.4 Show awareness of the potential for consumer exploitation in uncompetitive markets • 3.3.7 Financial budgets • 5.1.1 Explain why intervention in business activity is required so that social and economic objectives of the state can be better achieved • 5.2.2 Show awareness of how trade unions can influence business behaviour • 5.2.2 Describe the main features of an employment contract. <p>Content now includes clarification of the following:</p> <ul style="list-style-type: none"> • 2.4.1 'Methods of communication' now include a specific reference to information technology • 4.3.1 The concept of 'quality assurance' has been added to quality control.

Business Studies (continued) 	
Cambridge O Level Business Studies, Syllabus 7115	<p>The following new content has been added:</p> <ul style="list-style-type: none"> 1.1.1 Importance of specialisation 1.3.1 Enterprise and entrepreneurship 1.3.4 Why some (new or established) businesses fail 1.5.1 Objectives of social enterprises 2.1.1 Maslow's hierarchy and key motivational theories – Taylor and Herzberg 2.3.1 Benefits of part-time and full-time workers 3.1.1 Maintaining customer loyalty; building customer relationships 3.3.5 Use of social networks for promotion 5.1.2 Importance of micro-finance in developing economies 6.3.1 The concept of globalisation, the reasons for it and the opportunities and threats of globalisation for businesses. <p>Changes to assessment</p> <ul style="list-style-type: none"> The examination times for Papers 1 and 2 have been reduced to 1 hour 30 minutes per paper from 1 hour 45 minutes each. The number of questions on Papers 1 and 2 has been reduced from five to four questions. <p>Changes to previously published specimen paper material</p> <p>A small change has been made to the Paper 2 mark scheme: Question 3(a), to ensure that the terminology used in the mark scheme is up to date with the 2015 syllabus. In the revised mark scheme for this question, the term 'income statement' replaces 'profit/loss account' (first bullet point).</p>

Commercial Studies 	
Cambridge O Level Commercial Studies, Syllabus 7101	<p>From November 2016</p> <p>Changes to assessment</p> <p>From November 2016 there are two components:</p> <ul style="list-style-type: none"> Paper 1 Elements of Commerce Paper 2 Arithmetic. <p>The final examination for Paper 3 Text Processing is November 2015.</p> <ul style="list-style-type: none"> Syllabus aim 7, relating to keyboarding skills has been removed. (There are no changes to the syllabus aims 1–6). There is one change to the assessment objectives: Application – demonstration of keyboarding skills has been removed.

Computer Science 	
Cambridge O Level Computer Science, Syllabus 2210 (revised from Cambridge O Level Computer Studies, Syllabus 7010)	<p>From June 2015</p> <p>Previously named Cambridge O Level Computer Studies (7010), this syllabus has been revised to bring it up to date and to allow learners to begin the development of their computational thinking and programming skills. Teachers are advised to read the whole syllabus before planning their teaching programme. As 'Computer Science', this syllabus now shares the same name as the AS/A Level syllabus (formerly AS/A Level Computing), indicating the firm links and progression between these syllabuses.</p> <p>This syllabus has a new syllabus code, 2210.</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • There is one new practical topic introducing the concept of arrays and so enabling learners to develop programming solutions for real world problems. • There are two new theory topics: 'Computer ethics' and 'Hexadecimal numbers'. • The 'Systems life cycle' topic has been removed. <p>Changes to assessment</p> <ul style="list-style-type: none"> • All components are externally assessed. • Both papers contain short-answer and structured questions. There is no choice of questions. No calculators are permitted for either paper. • Paper 1 'Theory' now: 1 hour 45 minutes; 60% weighting; 75 marks. • New Paper 2 'Problem-solving and Programming': 1 hour 45 minutes; 40% weighting; 50 marks. This paper replaces Paper 2 'Coursework' and Paper 3 'Alternative to Coursework'. There is pre-release material for Paper 2 'Problem-solving and Programming' for candidates to complete practical tasks. 20 of the marks for this paper are from questions set on the pre-release material. Teachers are expected to incorporate the pre-release material tasks into their lessons and give support in finding methods and reaching solutions. • There is no coursework. • The syllabus aims and assessment objectives have been clarified. <p>From June 2016</p> <ul style="list-style-type: none"> • For examination in 2016, there are some technical update amendments to Section 6 <i>Syllabus Content</i>; these are indicated by black vertical lines either side of the text. • Section 6 explains the annual technical update process which will take account of emerging technologies, relevant to the syllabus content for examination from 2017. • Section 7 gives details of changes to the availability of the pre-release material for Paper 2 Problem-solving and Programming. • There are some editorial changes for clarification.

Design and Technology 	
<p>Cambridge O Level Design and Technology, Syllabus 6043</p>	<p>From November 2016</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> The syllabus content, including the description of the Paper 2 design project, has been reworded for clarity. More emphasis has been placed on consideration of the environment and a list of 'smart' materials has been included. <p>Changes to assessment</p> <ul style="list-style-type: none"> The assessment objectives have been re-presented. The assessment structure has been revised so that Papers 1 and 2 are each worth 50%. The mark allocations for Papers 1 and 2 have been changed. <p>Paper 1 Technology</p> <ul style="list-style-type: none"> The marks allocated to this paper have been increased from 80 to 100 marks. The weighting of marks between Part A and Part B is slightly changed (from 30% and 70% to 28% and 72%). In Part B candidates must now answer two out of four questions from Section 1 and two out of four questions from Section 2. <p>Paper 2 Design project</p> <ul style="list-style-type: none"> The marks allocated to this paper have been reduced from 120 to 100 marks. The assessment criteria have been streamlined and reworded for clarity. <p>In addition to reading the syllabus carefully, teachers should refer to the published specimen papers. These have been updated.</p> <p>Full details are contained in the 2016 syllabus and specimen papers available on our public website at www.cie.org.uk</p>

Fashion and Textiles NEW	
Cambridge O Level Fashion and Textiles, Syllabus 6130	From November 2014 Summary of changes <ul style="list-style-type: none"> • This syllabus replaces Cambridge O Level Fashion and Fabrics (6050). It has been renamed Cambridge O Level Fashion and Textiles, with a new syllabus code, 6130. • The syllabus has been revised to make it more contemporary. • The practical examination has been replaced with more coursework and a revised written paper. • The coursework has been expanded to include a fashion accessory as well as a fashion garment. • New assessment criteria have been produced. • The merging of Papers 2 (practical) and 3 (coursework) into a single coursework component simplifies the administration for Centres and provision of paper patterns is no longer required. <p>Full details are contained in the 2014 syllabus available on our public website at www.cie.org.uk</p>
Food and Nutrition 	
Cambridge O Level Food and Nutrition, Syllabus 6065	From June 2014 There are changes to the syllabus content. These are indicated in the syllabus by black vertical lines either side of the text.
Travel and Tourism 	
Cambridge O Level Travel and Tourism, Syllabus 7096	From June 2014 Changes to syllabus content <ul style="list-style-type: none"> • There are changes to the syllabus content. These are indicated in the syllabus by black vertical lines either side of the text. • Section 3 details the relationship between the assessment objectives and the components.

Cambridge International AS and A Level

Accounting  	
Cambridge International AS and A Level Accounting, Syllabus 9706	<p>From March 2016</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2016</p> <p>There are significant changes to this syllabus. Teachers are strongly advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> The 'Core' and 'Extended' syllabus content headings are replaced by 'AS Level content' and 'Additional A Level content'. The syllabus content has been completely revised to refresh the syllabus in response to feedback from teachers, and to improve the balance of content between the AS Level and A Level. A brief summary of the changes is given below. <p>Moved to the AS Level:</p> <ul style="list-style-type: none"> All aspects of partnership accounting, including dissolution and revaluation (not sale to a limited company or merger with a sole trader/other partnership) Book-keeping entries for the issue of shares and debentures The application of accounting to business planning (new) <p>Moved to the A Level:</p> <ul style="list-style-type: none"> Financial statements of not for profit organisations (from the AS Level) Financial statements of a manufacturing business (all aspects including profit on transfer) (from the AS Level) Consignment and Joint venture accounts (new) Auditing and stewardship of limited companies (new) Aspects of computerised accounting (new) Activity based costing (new) <p>Removed from the syllabus:</p> <ul style="list-style-type: none"> Redemption of shares Capital reduction and reconstruction for a limited company Process costing The 'Syllabus overview' gives a summary of the syllabus content. The Resource list for the syllabus and a list of international Accounting terminology are available on our public website at www.cie.org.uk/alevelsupport

Accounting (continued)  	
Cambridge International AS and A Level Accounting, Syllabus 9706	<p>Changes to assessment</p> <ul style="list-style-type: none"> From 2016 and beyond there will be three examination papers (two AS Level papers and one A Level paper). <ul style="list-style-type: none"> Paper 1 Multiple Choice, 1 hour, 30 marks 30 multiple-choice questions based on the AS Level syllabus content. Paper 2 Structured Questions, 1 hour 30 minutes, 90 marks Four compulsory structured questions based on the AS Level syllabus content. Paper 3 Structured Questions, 3 hours, 150 marks Section A: Four structured questions on the A Level financial accounting content (4 x 25 marks) Section B: Two structured questions on A Level cost and management accounting content (2 x 25 marks) Evaluation has increased from approximately 7% in the 2015 assessment to 12% overall. The additional evaluative demand is included in Paper 3, which now provides clear progression from the AS Level. From 2016, there are four assessment objectives for the A Level: AO1 Knowledge and understanding – 20%; AO2 Application – 43%; AO3 Analysis – 25%; AO4 Evaluation – 12% Communication has been included in AO3 Analysis. The changes in the weightings of AO1 and AO2 provide a better reflection of the nature of the papers. The specimen materials have been revised to reflect the changes to the assessment and the syllabus content. <p>Availability by exam series</p> <p>In 2016, assessments will be based on the revised syllabus only.</p> <ul style="list-style-type: none"> Candidates can carry forward the result of their Cambridge International AS Level assessments in 2015 to complete the Cambridge International A Level in 2016. The Cambridge International A Level assessments in the 2016 exam series are based on the revised syllabus. Assessments for candidates retaking Cambridge International AS Level or A Level in 2016 are based on the revised syllabus. <p>Learn more about this revised syllabus at www.cie.org.uk/new</p>

Applied Information and Communication Technology 	
Cambridge International AS and A Level Applied Information and Communication Technology, Syllabus 9713	<p>From March 2016</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p>

Art and Design 	
Cambridge International AS and A Level Art and Design, Syllabus 9704	<p>From June 2014</p> <p>Changes to submission dates for Papers 1 and 4</p> <ul style="list-style-type: none"> • Paper 1 (Controlled Test). Centres are advised to check the 2014 timetable for up-to-date information. • Paper 4 (Personal Study) must be received at Cambridge for moderation at the same time as the other coursework components, Paper 2 (Coursework A) and Paper 3 (Coursework B). Centres are advised to check the <i>Cambridge Administrative Guide 2014</i> for information on coursework submission.

Business	
Cambridge International AS and A Level Business, Syllabus 9609 (previously Cambridge International AS and A Level Business Studies, Syllabus 9707)	<div style="text-align: right;">   </div> <p>From March 2016</p> <p>In addition to the June and the November exam series, this syllabus is also available for examination in March for India only.</p> <p>From 2016</p> <p>Previously named Cambridge International AS and A Level Business Studies (9707), from 2016 this syllabus will be renamed Cambridge International AS and A Level Business (9609) to reflect the maturity of the subject.</p> <p>This syllabus has a new syllabus code, 9609.</p> <p>There are significant changes to this syllabus. Teachers are advised to read the whole syllabus before planning their teaching programme.</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • The 'Core' and 'Extended' syllabus content headings are replaced by 'AS Level content' and 'Additional A Level content'. • There are minor changes to the syllabus content. The changes mainly provide clarification and some content has been reorganised and updated. Significant changes to the syllabus content are indicated by black vertical lines to either side of the text. • In topic area 5 'Finance and accounting' – all the content on '<i>forecasting cash flows</i>' is now included at AS Level. • Accounting terms have been updated. Candidates will be expected to know and understand: <i>statement of financial position</i> (previously called balance sheet), <i>operating profit</i>, <i>profit for the year</i>, <i>retained earnings</i> (previously called retained profit). • Content has been deleted in the following AS Level sections: <ul style="list-style-type: none"> – '<i>Job enrichment</i>' and '<i>Job rotation</i>' from section 2.2.4 Motivation methods in practice – '<i>Disciplinary procedures</i>' from section 2.3 Human resource management – '<i>How an analysis of costs can help in the calculation of payments for resources</i>' from section 5.3.2 Uses of cost information – '<i>Distinction between financial and management accounting</i>' from section 5.4.7 Limitations of published accounts • Content has been deleted from the following A Level sections: <ul style="list-style-type: none"> – '<i>Nationalisation</i>' and '<i>Public/private partnerships</i>' from section 1.2 Business structure – '<i>Negotiation</i>' and '<i>Single union deals</i>' from section 2.3 Human resource management – '<i>Promotional campaigns</i>' from section 3.4 Marketing planning – '<i>How intangible assets are treated in the balance sheet</i>' from section 5.7 Contents of published accounts • The Resource list for the syllabus and a list of international Accounting terminology can be found online at www.cie.org.uk/alevelsupport

Business (continued)



Cambridge International AS and A Level Business,
Syllabus 9609
(previously Cambridge International AS and A Level Business Studies, Syllabus 9707)

Changes to assessment

- There are changes to the assessment objectives weightings in the syllabus to reflect the nature of the papers.

The specimen papers have been updated to reflect the changes to the assessment objectives weightings and the refreshed content.

Availability by exam series

		Availability by exam series							
		Jun -15	Nov -15	Jun -16	Nov -16	Jun -17	Nov -17	Jun -18	Nov -18
Exam									
9707 AS/AL Business Studies	Papers 1,2,3	✓	✓						
9609 AS/AL Business	Papers 1,2,3			✓	✓	✓	✓	✓	✓

Note: Candidates who studied the 2015 9707 syllabus need to be aware of the following:

- Assessments in the 2016 exam series are based on the revised **9609** syllabus. There will be no question papers called '9707 Business Studies' in 2016.
- Candidates can carry forward the result of their Cambridge International AS Level 9707 assessments in 2015 to complete the Cambridge International 9609 A Level in 2016 (within the usual time limit rules for carry forward components). The Cambridge International A Level assessments in the 2016 exam series are based on the revised syllabus.
- Assessments for candidates retaking Cambridge International AS Level or A Level in 2016 are based on the revised **9609** syllabus.

Learn more about this revised syllabus at www.cie.org.uk/new



Computer Science

Cambridge International AS and A Level

Computer Science,
 Syllabus 9608
 (revised from Cambridge
 International AS and A
 Level Computing,
 Syllabus 9691)

From June 2015

Previously named **Cambridge International AS and A Level Computing (9691)**, this syllabus has been revised to bring it up to date and to allow learners more time to develop their computational thinking and programming skills. Teachers are advised to read the whole syllabus before planning their teaching programme. As 'Computer Science', the syllabus now shares the same name as the IGCSE and O Level syllabuses (formerly Computer Studies), indicating the firm links and progression between these syllabuses.

This syllabus has a new syllabus code, **9608**.

Changes to syllabus content

- New topics:
 - Principles of operation of specific hardware devices
 - Client-server system
 - Computer ethics
 - TCP/IP protocol
 - Concept of virtual machine
 - Boolean algebra
 - GANTT and PERT charts.
- Programming and algorithmic work from the 2014 syllabus is maintained and updated.
- Topics removed:
 - System life cycle
 - Features of generic application software
 - Expert systems.

Changes to assessment

- All components are externally assessed and have 75 marks.
- All papers contain short-answer and structured questions. There is no choice of questions.
- Paper 1 has a new name 'Paper 1 Theory Fundamentals' (1 hour 30 minutes) (50% AS; 25% A Level) – written paper.
- Paper 2 has a new name 'Paper 2 Fundamental Problem-solving and Programming Skills' (2 hours) (50% AS; 25% A Level) – written paper. There is pre-release material for this paper for candidates to complete practical tasks. Teachers are expected to incorporate the pre-release material tasks into their lessons and give support in finding methods and reaching solutions.
- Paper 3 remains 'Paper 3 Advanced Theory' (1 hour 30 minutes) (25% A Level) – written paper.
- Paper 4 'Further Problem-solving and Programming Skills' (2 hours) (25% A Level) – written paper. There is pre-release material for this paper for candidates to complete practical tasks.
- There is no longer a coursework component (Computing Project).
- The syllabus aims and assessment objectives have been revised.

Computer Science (continued)


Cambridge International AS and A Level

 Computer Science,
 Syllabus 9608
 (revised from Cambridge
 International AS and A
 Level Computing,
 Syllabus 9691)

Availability by exam series

From June 2015, this revised syllabus Computer Science (9608), will run alongside the Computing syllabus (9691). Syllabus 9691 will cease after June 2016 leaving 9608 as the only AS and A Level Computer Science syllabus.

		Availability by exam series								
		Exam	Jun -14	Nov -14	Jun -15	Nov -15	Jun -16	Nov -16	Jun -17	Nov -17
9691 AS/AL Computing	Papers 1,2,3,4		✓	✓	✓	✓	✓			
9608 AS/AL Computer Science	Papers 1,2,3,4				✓	✓	✓	✓	✓	✓

Computing  	
Cambridge International AS and A Level Computing, Syllabus 9691	<p>From June 2014</p> <p>Changes to syllabus content</p> <p>These updates mainly provide clarification or explicit statements of what was previously implied.</p> <ul style="list-style-type: none"> • 1.2 System software: Learning outcome (b) and (c). We have included multi-programming and distinguished between transaction processing and process control (both classed as real-time programming already in the syllabus). • 1.5 Data transmission and networking: Learning outcome (c). We have added '<i>and typical applications where each topology would be used</i>' to the basic network topologies. Learning outcome (e). We have changed the wording to read '<i>explain the relationship between baseband and broadband</i>'. Learning outcome (i). We have removed the sentence '<i>candidates will not be expected to have detailed knowledge of specific protocols.</i>' Learning outcome (j). We have removed the second part of the sentence '<i>and the need for layering in an interface (detail regarding layers is not required)</i>'. • 1.7 Choosing appropriate application software: Learning outcome (c). We have replaced the term '<i>drawing packages</i>' with '<i>graphics packages (bitmapped and vector graphics)</i>' in order to be more explicit. • 1.9 Designing a user interface: Learning outcome (c). We have added '<i>type of interface, type of application</i>' to the list to be considered when designing interfaces. • 2.3 Data types and data structures. We have added the words '<i>(serial, sequential, random)</i>' to section 2.3.3 to make more explicit the type of files candidates are expected to be able to work with. • 3.1 The functions of operating systems, 3.1.2 Scheduling. We have added the term '<i>multi-programming</i>' to make it clear in which context scheduling should be taught. Learning outcome (d). We have added '<i>partitions</i>' to the list of memory management techniques. • 3.4 Data representation, data structures and data manipulation: Learning outcome (i). We have corrected the term for searching to '<i>sequential search</i>' (instead of '<i>serial search</i>'). Learning outcome (j). We have changed the requirement to describe algorithms to using algorithms and have removed the sentence '<i>detailed algorithmic solutions will not be expected, only descriptions of how a solution to a sort problem would be carried out.</i>' • 3.5 Programming paradigms, Notes. We have removed the sentence '<i>A detailed knowledge of the syntax of programming languages is not required</i>'. To clarify what candidates are expected to do we have added: '<i>Candidates will be expected to understand and use a given algorithm in pseudocode.</i>' '<i>Candidates will be expected to understand and apply a given set of assembly language instructions.</i>' • 3.6 Databases. We have added a note that candidates will be expected to understand a simple DML script.

Computing (continued)



Cambridge International AS and A Level Computing, Syllabus 9691

- **3.7 Simulation and real-time processing:** Learning outcome (a). We have clarified what is meant by real-time applications by adding '*process control*'. Learning outcome (b) has been replaced by new learning outcomes (b) and (c). Learning outcome (b) now states explicitly what physical signals candidates should know: '*explain the use of sensors for detecting physical signals (temperature, pressure, motion, light intensity)*'. Learning outcome (c) was originally part of (b): '*explain the use of actuators*'.
- **3.8 Networking, learning outcome (b).** We have deleted '*bridges*' from the list of network components and have added '*hubs*' and '*network interface cards (NICs)*'. Learning outcome (d) has been reworded to be more technically correct and now reads '*discuss the problem of maintaining security of data on an open network and practical techniques to address the issue*'. Learning outcome (e). We have deleted the sentence '*candidates will not be expected to know any specific method in detail*'.

From June 2015

This syllabus has been renamed Cambridge International AS and A Level Computer Science, with a new syllabus code, **9608**. Please see the Cambridge International AS and A Level Computer Science syllabus change.

Availability by exam series

From June 2015, there will be a revised syllabus for AS Level and A Level named Computer Science (9608). The current syllabus 9691 will run until June 2016. This means that the two syllabuses, 9691 and 9608, will be running alongside each other from June 2015 until June 2016. Syllabus 9691 will cease after June 2016 leaving 9608 as the only AS and A Level Computer Science syllabus.

		Availability by exam series								
		Exam	Jun -14	Nov -14	Jun -15	Nov -15	Jun -16	Nov -16	Jun -17	Nov -17
9691	AS/AL Computing	Papers 1,2,3,4	✓	✓	✓	✓	✓			
9608	AS/AL Computer Science	Papers 1,2,3,4			✓	✓	✓	✓	✓	✓

Media Studies NEW	
Cambridge International AS and A Level Media Studies, Syllabus 9607	<p>From June 2015</p> <p>This is a new syllabus, with first examination of both AS Level and A Level in June 2015.</p> <p>Full details are contained in the 2015 syllabus and specimen papers available on our public website at www.cie.org.uk</p> <p>This syllabus is not available in the UK.</p> <p>You can learn more about this new syllabus at www.cie.org.uk/new</p>
Music i	
Cambridge International AS and A Level Music, Syllabus 8663/9703	<p>From June 2016</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • Component 1: Listening Section B. This section has been changed to <i>Love and Loss</i>. <p>The Core Works for 2016 are:</p> <ul style="list-style-type: none"> • Purcell: <i>Dido and Aeneas</i> (Act I excluding the overture; Act III from Dido's entrance) • Verdi: <i>Otello</i> (Act I Scene 3; Act IV) • Berlioz: <i>Symphonie Fantastique</i> (Movements II, III and IV).
Thinking Skills i	
Cambridge International AS and A Level Thinking Skills, Syllabus 9694	<p>From June 2015</p> <p>Changes to the duration of papers</p> <ul style="list-style-type: none"> • The examination time for Paper 1 Problem Solving is 1 hour 45 minutes, and the examination time for Paper 3 Problem Analysis and Solution is 2 hours. • The durations for Paper 2 and Paper 4 are unchanged.

Cambridge Pre-U Principal Subjects

Art and Design  	
Cambridge International Level 3 Pre-U Certificate Art and Design (Principal), Syllabus 9837 (previously 9798)	<p>From June 2016</p> <p>This syllabus has been revised. Significant changes are outlined below.</p> <ul style="list-style-type: none"> Cambridge Pre-U Art and Design is now a single qualification. This qualification replaces six qualifications, which already share their assessment objectives, assessment structure and syllabus document: <ul style="list-style-type: none"> 9830 Cambridge International Level 3 Pre-U Certificate in Art and Design: Fine Art (Principal) 9831 Cambridge International Level 3 Pre-U Certificate in Art and Design: Graphic Communication (Principal) 9832 Cambridge International Level 3 Pre-U Certificate in Art and Design: 3D Design (Principal) 9833 Cambridge International Level 3 Pre-U Certificate in Art and Design: Textile Design (Principal) 9834 Cambridge International Level 3 Pre-U Certificate in Art and Design: Lens Based Imagery (Principal) 9798 Cambridge International Level 3 Pre-U Certificate in Art and Design: Unendorsed (Principal). <p>The revised qualification provides the same opportunities as do the current six qualifications for specialism and assessment in fine art, graphic communication, three-dimensional design, textile design, fashion design and lens- and time-based media. It offers new opportunities for candidates to combine study and assessment in more than one medium. (Of the current six syllabuses, Cambridge International Level 3 Pre-U Certificate in Art and Design: Unendorsed (Principal) allows the most movement between disciplines, but there are some restrictions even with this syllabus.) The new single qualification allows for innovative combinations of media and approaches. Learners will not be required to commit prematurely to an art or design specialism, although the qualification allows them to specialise should they so wish.</p> <ul style="list-style-type: none"> Syllabus content has been updated to take account of contemporary technology and techniques in art and design. The wording of the assessment objectives has been changed to clarify the main focus of the assessments. The description of components has been changed, including the name of Component 2, to reflect the separate purpose of each part of the assessment in the structure of the qualification as a whole. Component 2 is now called 'Critical and contextual study'. The assessment criteria for Components 1 and 3 have been updated and new assessment criteria have been included for Component 2. A single stimulus starting point for Component 3 replaces the previous question paper which had 20 starting points.

Business and Management


**Cambridge International
 Level 3 Pre-U Certificate**
 Business and Management
 (Principal),
 Syllabus 9771

From November 2014

The November retake exam series for this syllabus has been withdrawn. It will **not** be offered in November 2014 and beyond. The June exam series is still available.

From June 2016

This syllabus has been revised. Significant changes to the syllabus are indicated by black vertical lines either side of the text. Teachers are advised to read the whole syllabus before planning their teaching programme.

Changes to syllabus content

Syllabus content has been removed from the following sections:

- 1.2 Business and the economy (see Supply and demand)
- 1.4 Stakeholders (see Stakeholders in a business)
- 1.6 Business opportunities and constraints (see Technology; Environmental; Business ethics)
- 1.8 Corporate issues (see Corporate governance)
- 1.9 Equities
- 2.9 Value (section has been removed)
- 3.4 Investment decisions (see Methods of investment appraisal)
- 3.7 Accounts (see Ratio analysis)
- 4.6 Managing projects (see Project management; Gantt charts has been removed)
- 4.8 Reducing waste (see Waste management)
- 5.8 Employment law and collective representation (see reworded section)
- 5.9 Labour markets (section has been removed).

Changes to assessment

- AO5 Communication – communicate clearly in discussing business problems and solutions has been replaced by AO5 Research – design, carry out, use and communicate business research.
- AO5 Research is weighted at 25% and has a 1:1 relationship with Paper 3 Personal Investigation.
- The table in the syllabus which shows the weightings allocated to each of the assessment objectives has been adjusted to reflect the change to AO5, and the effect on the other AOs.

Business and Management (continued)



Cambridge International Level 3 Pre-U Certificate
Business and Management (Principal),
Syllabus 9771

- Paper 1: The examination time is increased by 15 minutes to 2 hours 45 minutes.
There are minor changes to the AO mark allocations within Paper 1:
 - 27 marks for AO1 Knowledge (from 30)
 - 24 marks for AO2 Application (from 22)
 - 25 marks for AO3 Analysis (from 24)
 - 24 marks for AO4 Evaluation (unchanged).
- Paper 2: There are minor changes to the allocation of marks between AO1 and AO2. Overall on Paper 2, 'AO1 Knowledge' has increased by one mark and 'AO2 Application' has decreased by one mark.
- Paper 3: The assessment criteria for the Personal Investigation have been rewritten for clarity and to reflect the change to AO5. The word count for the report has been increased from 3000–3500 to 3500–4000 words. There is no substantive change to the nature of the Personal Investigation.

Music   	
<p>Cambridge International Level 3 Pre-U Certificate Music (Principal), Syllabus 9800</p>	<p>From November 2014</p> <p>The November retake exam series for this syllabus has been withdrawn. It will not be offered in November 2014 and beyond. The June exam series is still available.</p> <p>From June 2016</p> <p>Changes to syllabus content</p> <ul style="list-style-type: none"> • Information on previous knowledge and progression has been included (p.3). • Component 42, Advanced Recital has been clarified (p.14). • Component 1, Topic A has become The Symphony in the Classical Period (c. 1740 – c. 1802) (p.17). • Component 1, Topic B has become Orchestral Music or Opera in the nineteenth century (c. 1803 – 1900) (p.17). • Topic B1 has become Orchestral Music. Please see updated content in the syllabus (p.18). • Topic B2 has become Opera. Please see updated content in the syllabus (p.18). • Topic C1 has become Latin Church Music in Continental Europe during the late Renaissance (c. 1530 – c.1630) together with new prescribed works and content (p.19). • Topic C2 has become The Baroque Concerto together with new prescribed works and content (p.20). • Topic C3 has become innovation and Exploration in Twentieth-Century Music, (c. 1899 – c.1953) together with a new prescribed work and content (p.20). • Topic C4 the prescribed work for this topic will be valid for assessment in 2016. A new prescribed work and content will be issued as a syllabus change for assessment in 2017 (p.21). • For 2016, there will be four topics for Section C of Component 1 (Paper 12) rather than five. Topic C5 will no longer be available from first assessment June 2016. <p>Changes to scheme of assessment</p> <ul style="list-style-type: none"> • Papers 11 and 12 are presented as separate examination papers in the syllabus, both assessed as part of Component 1. • Mark schemes for Performance for Paper 2 and 42 now include references to sense of ensemble for Aural and Stylistic Awareness. <p>The specimen papers have been updated for examination from 2016.</p>

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