

Science 科學

	Question	Answer
1.	Why is a new subject Science offered in the Science Education Key Learning Area?	In line with the target of providing a broad and balanced curriculum for students, Integrated Science and Combined Science are offered in the Science Education Key Learning Area (KLA) so that students have space to take up elective subjects from other KLAs while taking one or more elective(s) from the Science Education KLA.
	為什麼科學教育學習領域設立新的科目科學科?	為配合提供基礎更廣闊的課程這個目標，科學教育學習領域設立綜合科學科及組合科學科，讓學生學習各個科學領域的知識；同時，仍有空間修讀其他學習領域的選修科目，以擴闊視野。
2.	How does the subject, Science, operate in schools?	<p>This subject operates in two modes. Mode I, entitled Integrated Science, adopts an interdisciplinary approach to the study of science, while Mode II, entitled Combined Science, adopts a combined approach. The two modes are developed in such a way as to provide space for students to take up elective subjects from other KLAs after taking one or more elective(s) from the Science Education KLA.</p> <p>Integrated Science is designed for students wishing to take up one elective subject in the Science Education Key Learning Area (KLA). Students wishing to take two elective subjects in the Science Education KLA are recommended to take one of the Combined Science electives together with one specialised science subject. Each Combined Science elective contains two parts, and these should be the parts that complement the discipline in which they specialise. Students are, therefore, offered three possible combinations:</p> <ul style="list-style-type: none"> • Combined Science (Physics, Chemistry) + Biology • Combined Science (Biology, Physics) + Chemistry • Combined Science (Chemistry, Biology) + Physics
	科學科在學校的推行模式是怎樣的？	<p>本科以兩種模式推行：模式 I 為跨學科設計；模式 II 以組合方式設計。旨在讓學生學習各個科學領域的知識，同時，仍有空間修讀其他學習領域的選修科目，以擴闊視野。</p> <p>綜合科學為在科學教育學習領域中只修讀一科的學生而設計。</p> <p>組合科學為在科學教育學習領域中選修兩科的學生而設計。課程由三個部分組成，各部分的内容分別選自生物、化學及物理課程。學生應在這三個部分選修其二，以配合自己的專修理科科目。學生可選讀的科目組合詳列如下：</p>

		<ul style="list-style-type: none"> • 組合科學（物理、化學）+ 生物科 • 組合科學（生物、物理）+ 化學科 • 組合科學（化學、生物）+ 物理科
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Integrated Science 綜合科學

	Question	Answer
1.	Which kind of students should take Integrated Science?	<p>Integrated Science (S4-6) is designed for students with diverse interests, who wish to be exposed to knowledge and understanding of different Key Learning Areas (KLAs). In taking this subject, students will gain a comprehensive and balanced learning experience in Biology, Chemistry and Physics. They may then take up subjects from other KLAs to widen their horizons.</p> <p>The curriculum aims to empower students to be inquisitive, reflective and critical thinkers, by equipping them with a variety of ways of looking at the world and by emphasizing the importance of evidence in forming conclusions. It is believed that in a technologically advanced society, like Hong Kong's, many people will find a knowledge and understanding of science concepts useful to their work, and a competency in scientific inquiry of great value in creative problem-solving in life.</p>
	哪類型的學生應修讀綜合科學科？	<p>綜合科學（中四至中六）是為志趣廣泛，希望涉獵不同學術領域的同學而設，目標是提高他們的科學素養；內容涵蓋生物、化學和物理等領域的重要科學概念。旨在讓同學認識各個科學領域的知識，同時，仍有空間修讀其他學習領域的選修科目，以擴闊視野，促進全人發展。</p> <p>本課程將透過讓學生運用科學方法察看世界，及強調在作結論時證據的重要性，以培養學生成為好奇愛問、懂得反思和思路嚴謹的人。我們相信，在香港這個科技發達的社會，掌握一些科學知識和科學概念，對發展事業有一定幫助；在工作崗位上遇到困難時，懂得以科學態度思考問題，亦往往有助找出創新的解決方法。</p>
2.	How can Integrated Science help students prepare for their future?	<p>The Integrated Science Curriculum will enable students to cultivate and maintain an enthusiasm across a wide scientific spectrum, whilst retaining the option of going more deeply into a specific science discipline, or branching out into other subject areas.</p> <p>According to the recent announcement of university requirements, many science-related faculties and departments in tertiary institutions, including the Science Faculties of University of Hong Kong and the Chinese University of Hong Kong, have already indicated their readiness to accept students taking the Integrated Science curriculum.</p> <p>By broadening and enriching students' knowledge, skills and experiences</p>

		<p>in science, the Integrated Science curriculum also opens up for students a variety of possible post-secondary educational and careers pathways including Actuarial Science, Business Administration, Dental Surgery, Environmental Science, Food and Nutritional Sciences, Law, Nursing, Risk Management Science, Sports Sciences, etc.</p>
	<p>本科如何裝備學生為未來作出準備？</p>	<p>本課程培養學生對整個科學世界的興趣，保持著這份興趣，學生可選擇在某一門科學領域中進一步發展，或者把有關的思維和技能應用在其他學科的學習上。</p> <p>按新公布的大學新學制收生要求，不少與科學相關的大專學科部門，包括香港大學理學院和中文大學理學院，都表示樂意錄取修讀綜合科學的學生。而學生在本課程中獲得的知識、建立的思考模式和解難能力，有助他們日後在各大專院校修讀各類課程，例如精算學、工商管理、牙醫、環境科學、食品及營養科學、法律、護理、風險管理及運動科學等。</p>
3.	<p>Will the subject be too difficult for students who are not science-inclined?</p>	<p>Integrated Science is designed for students taking only one elective subject in the Science Education KLA. A thematic approach has been adopted and students will benefit from learning concepts and scientific ideas in context that bring out their relevance to everyday life. In terms of coverage of topics, the Integrated Science Curriculum will cover less than the total of the Biology (S4-5), Chemistry (S4-5), and Physics (S4-5) curricula, while the depth of treatment for some topics will be beyond the current S4-5 Level.</p>
	<p>對於理科性向不太強的學生，綜合科學科會否太難？</p>	<p>綜合科學科是為在科學教育學習領域中只修讀一科的學生而設計。課程內容以單元模式組織，讓學生在與日常生活相關的情境下探索科學概念，並體會這些概念與生活的關係。在課題的涵蓋方面，綜合科學科課程的廣度將不及生物科（中四至中五）、化學科（中四至中五）及物理科（中四至中五）課程三者的總和，但在個別課題上，深度肯定會超越目前中四至中五的程度。換句話說，不同的單元將會有不同的深度和廣度。</p>
4.	<p>Will the Integrated Science Curriculum be recognized by international institutes?</p>	<p>The Integrated Science Curriculum obtained very positive results in the benchmarking exercise conducted by the University of Cambridge International Examinations, the Wilf Malcolm Institute of Educational Research (WMIER) of University of Waikato, New Zealand and the Netherlands Institute for Curriculum Development (SLO). The agencies acknowledged that the curriculum is interesting and relevant and would promote scientific literacy; the thematic approach is considered modern and there is solid coherence among modules with excellent embedding of positive values and attitudes. There is also sufficient academic rigour to</p>

		<p>stretch more able students.</p> <p>The Education Bureau (EDB) & Hong Kong Examinations and Assessment Authority (HKEAA) will continue to negotiate with international academic organizations and examination boards and work on the accreditation of the SS curriculum. The Integrated Science Curriculum will bear equal status as any of the other SS subjects.</p>
	綜合科學科會否得到國際認可？	<p>綜合科學科課程已獲多個海外課程機構(包括英國劍橋大學考試委員會、紐西蘭懷卡托大學 WMIER 教育研究中心和荷蘭課程發展機構)認可和高度評價，認為其課程設計靈活新穎，選材適切，既能促進學生的科學素養，亦具備足夠學術水平挑戰能力高的學生，且有助培養學生正面的價值觀和態度。</p> <p>教育局和香港考試及評核局將繼續與國際學術評審機構及考試局，就高中各科目的認證進行磋商，綜合科學科的資格與其他各高中科目的並無分別。</p>
5.	Is there any reference made towards similar curriculum in other countries? If the international trend changes in the future, should we follow?	<p>Quite a number of countries in the world have acted in response to the need for raising the scientific literacy of the citizens and adapted their science curriculums accordingly. Countries, like Britain, and the Netherlands have even made science a core subject for their senior secondary students.</p> <p>We have been exercising prudent judgment in making reference to international trends to ensure that the curriculum, on the one hand, meets the need of our students, and on the other hand, meets international benchmarking.</p>
	外國是否有相類似的課程可作參考？假若外國的課程發展趨勢在未來有所改變，我們可會跟隨？	<p>世界各地多個國家，早已預視隨著科學與科技的迅速發展，人類的生活與之的關連亦愈趨緊密，紛紛編寫為以提升整體市民科學素養為宗旨的課程。有些國家如英國及荷蘭等地，甚至以此作為高中的必修課程。</p> <p>在參考外國的課程發展趨勢時，我們已非常審慎地作出適切的判斷，務求令課程設計既適合香港學生的需要，亦同時能符合國際的學術水平。</p>
6.	Can a student take Integrated Science together with Combined Science (Physics/Chemistry), Combined Science (Biology/Physics) or Combined Science (Chemistry/Biology)?	<p>The SS Science Curriculum is offered in 2 modes: Integrated and Combined. The 4 subjects listed are the different variations of the same subject.</p> <p>The Integrated Science Curriculum is a provision for students who wish to take 1 elective in the Science Education KLA. The Combined mode is offered to students who wish to take 2 electives in the Science Education KLA. They originated from different grounds and serve different purposes.</p> <p>As part of the content of Integrated Science Curriculum overlaps with the</p>

		Combined mode, studying these 2 modes together violates the aims of the education reform: providing a broad and balanced learning experience for our students. Students are not allowed to take Integrated Science with any other science elective.
	學生可否同時修讀綜合科學科和組合科學科(物理、化學)、組合科學科(生物、物理)或組合科學科(化學、生物)?	所列的科目屬科學科不同的運作模式，分別為綜合模式和組合模式。前者是為在科學教育學習領域中只修讀一選修科目的學生而設，後者則為在科學教育學習領域中選修兩科的學生而設；設計理念不同，目的亦有異。而且，綜合科學科課程的內容與後三者有部分重疊，同時修讀有違教改提倡均衡而廣闊的學習的大原則，故綜合科學科不可與任何其他科學課程同時修讀。
7.	Can student study Physics, Biology or Chemistry in S4 and switch to study the Integrated Science Curriculum in S5 and S6?	The SS Integrated Science Curriculum emphasizes understanding of the process by which scientific knowledge is constructed and validated. It also highlights the overarching coherence of concepts that pervade science and transcend disciplinary boundaries in understanding the natural world. Each module of this curriculum is designed with unique characteristics and different focus. Thus, a continuous and thorough learning experience is essential to build a solid foundation upon the curriculum emphases. Students may face difficulties if they switch to study this subject in S5. To help students bridge the gap, schools are encouraged to allocate more lesson time and provide other means of supporting measures (e.g. bridging programmes) for those who wish to make the switch.
	學生可否在高中一年級修讀物理、生物或化學，高中二、三年級轉修綜合科學科？	綜合科學科強調讓學生認識主要的科學解說及其成立依據，並認清貫通各學科領域的主要思想模式，作為理解世界的認知架構。不同單元各具不同特色與重點，持續而連貫的學習經驗將是學生從中建立這個認知架構的重要基礎。故此，學生若在高中二、三年級才修讀本科，或會面對一定困難。學校可考慮為學生編配較多的學習時間或提供其他輔助計畫，以助學生銜接課程。
8.	What has EDB done to help teachers teach topics not in their specialized area?	The EDB has organised 80 hours of Professional Development Programmes to prepare teachers for implementing the curriculum. Special emphasis has been given to curriculum planning, knowledge enrichment, pedagogies and new assessment approaches. Due to the multi-disciplinary nature of this curriculum, it would be helpful for schools offering this subject to two or more classes to arrange for teachers with different expertise to the classes, so that they can share ideas and collaborate in the teaching of the curriculum. Collaboration can be in the form of partnership in the preparation of lessons, team teaching as well as lesson observations. These practices often provide

		<p>opportunities for mutual exchanges of experiences and concerns.</p> <p>Collaboration in classrooms, no matter it is team teaching or lesson observation, can contribute to teachers' professional growth.</p> <p>The EDB has set up a web-based Teacher Sharing Platform, on which Integrated Science teachers could share their teaching experiences and resources developed. The website of the Integrated Science Teacher Sharing Platform is: http://edblog.hkedcity.net/is4to6</p>
	<p>這個課程內容廣闊，一向接受專科訓練的教師在處理一些非本科內容時或會有困難，教育局如何協助教師面對有關困難？</p>	<p>為配合本課程的實施，教育局已為教師安排了 80 小時的專業發展課程，內容包括本課程的理念與設計、知識增益、教學法與評估等。</p> <p>為配合本科課程的跨科單元模式設計，學校可同時為兩班或以上的學生提供本課程，並安排兩位或以上不同專科背景的教師負責，以促進教師間的協作和經驗交流。而教師間的協作可以多種模式進行，包括共同備課、小組教學，以及互相觀課等，這不但能提供機會讓教師交流教學的心得和關注，對提昇教師的專業亦有莫大幫助。</p> <p>教育局亦已為任教綜合科學的教師設立了一個網上交流平台，讓教師互相分享經驗和教學資源。綜合科學教師交流平台的網址為：http://edblog.hkedcity.net/is4to6</p>
9.	<p>Is there any textbook available on the market for the subject?</p>	<p>There is no textbook available on the market for the subject.</p> <p>The Science Education Section of EDB, in collaboration with tertiary institutions, has developed learning and teaching resources for the students and teachers. The Chinese and English resources of all modules have been distributed to teachers in Professional Development Programmes.</p> <p>EDB has also provided a list of appropriate materials (including local and overseas materials) for teachers' reference.</p> <p>The resources of all the modules and the list of appropriate materials for teachers' reference have been uploaded in the website: http://www.edb.gov.hk/is4to6</p>
	<p>市場上有沒有綜合科學科的教科書供應？</p>	<p>市場上暫時未有相關科目的教科書。教育局科學教育組與各大專院校合作開發了相關的學與教資源，以供學生和教師使用。所有單元的中英文教材已於相關之教師培訓課程中派發。</p> <p>教育局亦已為教師提供與課程相關的參考資料表(包括本地及海外資源)。</p> <p>所有單元的中英文教材及與課程相關的參考資料表已上載於網頁：http://www.edb.gov.hk/is4to6</p>

10.	How will the “Nature of Science” and the “Unifying concepts” be assessed?	<p>We have put an emphasis on the Nature of Science in the curriculum so as to develop students’ understanding of science, not only as a body of useful knowledge but also as a means of making sense of the world; and hence nurture the scientific literacy of the students. The introduction of Unifying Concepts attempts to provide conceptual tools with which students can learn beyond the facts and see the overarching coherence in our understandings of the natural world.</p> <p>The introduction of the “Nature of Science” and the “Unifying Concepts” highlights the close relationship between the process and the content of science. They should be dealt with in the context of the different modules. And, it is inappropriate to assess them independently. The HKEAA will provide sample questions and exemplars for teachers’ reference in this regard.</p>
	如何評核學生對「科學本質」和「統一概念」的認識？	<p>我們在課程中強調科學本質的目的是提昇學生對科學概念的理解，而引入統一概念是為讓學生在理解自然世界的過程中，看出事物的主要相通之處，培養高層次的思考能力。兩者都必須配合實在的科學概念，在有意義的情境中體現。故此，不宜把它們抽離作獨立的評估。考評局將提供樣本試題和學習活動範例，供教師參考。</p>
11.	How would students be assessed in school-based assessment (SBA)?	<p>Candidates are required to perform a stipulated amount of practical work. In S5 and S6, candidates will be assessed in two ability areas: A and B. Ability area A assesses the practical skills of candidates in conducting experiments/fieldwork, whereas ability area B assesses the candidates’ ability in planning and reporting of experiments/fieldwork. Ability area A carries 10% of the subject mark, and area B carries 10% of the subject mark. The minimum number of assessments required in each area is 1 in S5, and the minimum number of assessment required in each area is also 1 in S6. The mark of SBA will contribute to 20% of the final subject mark.</p> <p>The SBA Teachers’ Handbook for School-based Assessment can be found in the website: http://www.hkeaa.edu.hk/en/sba/sba_hkdse_elective/dse_subject.html?22&2</p>
	課程的校本評核怎樣評核學生的表現？	<p>考生須進行指定數目的實驗。在中五和中六期間，教師會就考生的兩個能力範圍(A 和 B) 進行評核。能力範圍 A 評核考生進行實驗／實地考察的技巧；而能力範圍 B 則評核考生在計劃和報告實驗／實地考察的能力。能力範圍 A 及能力範圍 B 各佔本科總分 10%。在中五期間，每一能力範圍須進行最少一次評核；而在中六期間，每一能力範圍亦須進行最少一次評核。校本評核的分數將佔科目總分數</p>

		20%。 校本評核教師手冊已上載於網頁： http://www.hkeaa.edu.hk/tc/sba/sba_hkdse_elective/dse_subject.html?22&2
12.	Will there be sufficient equipment for implementing the new curriculum?	The reference lists of Furniture and Equipment for the subjects of SS Integrated Science and Combined Science have been uploaded to the webpage for teachers' reference. http://www.edb.gov.hk/en/sch-admin/sch-premises-info/furniture-equipment/primary-secondary-schools.html Schools are advised to deploy grants (e.g. CFEG/OEBG)* flexibly to purchase and update the necessary equipment.
	是否有足夠的實驗室設備協助新課程的實施？	高中綜合科學科及組合科學科的家具及設備一覽表已上載教育局網頁供教師參考。 http://www.edb.gov.hk/en/sch-admin/sch-premises-info/furniture-equipment/primary-secondary-schools.html 學校宜靈活運用各項津貼(如綜合家具及設備津貼、營辦開支整筆津貼)，購置所需的儀器和設備。

Combined Science 組合科學

	Question	Answer
1.	If students are interested in science and wish to take two elective subjects in the Science Education KLA, how should they choose their subject combinations?	Students are recommended to take one of the Combined Science electives together with one specialised science subject. Each Combined Science elective contains two parts, and these should be the parts that complement the discipline which they specialise in. For example, a student taking Physics may at the same time choose Combined Science (Chemistry and Biology). This provides more room for students to take up elective subjects from other KLAs after taking two electives from the Science Education KLA.
	如果學生對學習科學有濃厚興趣，欲在科學教育學習領域中選修兩科，他們應如何選擇科目組合？	學生可修讀一個專修科學科目及其餘兩個科學科目所組成的組合科學。例如學生可選修物理一科，及組合科學(化學、生物)。這樣，學生在修讀科學教育學習領域的兩個選修科時，仍有空間修讀其他學習領域的選修科目。
2.	Will there be any textbooks available for Combined Science?	Textbooks for Combined Science are listed in the Recommended Textbook list.

	組合科學是否備有課本？	組合科學的課本已列於適用書目表。
3.	Under the New Academic Structure, will Combined Science be recognised in the University Entrance Requirements?	HUCOM announced on 5 July 2006 that universities have supported Combined Science (with a combination of any two of Physics, Chemistry or Biology) alongside single-disciplined science subjects in their entrance requirements. For details, please refer to the link provided by 'NAS' bulletin at EDB homepage (http://www.edb.gov.hk/nas)
	新學制下，組合科學在大學收生要求的認受性如何？	大學校長會已於 2006 年 7 月 5 日發表聲明，各大院校支持把組合科學及單一科學學科一併列為入學要求。有關詳情請瀏覽教育局的「新學制」網頁(http://www.edb.gov.hk/nas)所提供的連結。
4.	If students choose Combined Science as one of the electives, will there be any forbidden combination in Science Education KLA?	If students choose Combined Science as one of the electives, they are forbidden to repeat taking the two corresponding specialised subjects. For example, a student takes Combined Science (Chemistry, Biology), is forbidden to take either Chemistry or Biology as electives.
	如果學生修讀組合科學，在科學學習領域中的選擇會有限制嗎？	如學生以組合科學的形式修讀兩個科學科目，便不能重複專修這兩科，也不可以修讀綜合科學。舉例來說，學生修讀組合科學（化學、生物），便不能再專修化學或生物。
5.	Can candidates attempt Combined Science in HKDSE using English for one subject and Chinese for another subject?	According to HKEAA, Combined Science is regarded as one single subject, candidates may attempt the examination using either English or Chinese.
	考生是否可以用英文應答香港中學文憑考試組合科學的其中一科試卷，而用中文應答另一科試卷？	根據香港考試及評核局，組合科學乃一個學科。考生只可選用英文或中文應答試卷。

6.	How about the credential of Combined Science for admission into universities?	<p>According to the current admission criteria, only a small part of faculties, e.g. the Medical Schools and the Pharmacy Departments are highly likely to require Chemistry and the Engineering Departments may require Physics. Many programmes actually do not require more than one specific subject. Students can use the result of the subject or Combined Science to apply for different faculties.</p> <p>However, only 18% of the S.6 students will be admitted to universities. Among those 18%, only a small percentage will enter these programmes. We should also consider the majority of students when we are designing our curriculum.</p>
	組合科學的成績能否獲得各大學認可，作為收生的條件之一？	<p>按現有的大學收生準則，除部分學院，如醫學院和藥劑系會指定報讀的學生曾修讀化學，而工程學系則要求學生曾修讀物理外，很多大學課程均沒有設定多於一個特定的科目作為收生的條件。學生可用本科或組合科學的成績來申請不同學系。</p> <p>然而，每年會升讀大學的學生人數只佔高中學生總人數的百分之十八，當中會修讀有關學系的亦屬小數。本科的課程設計是以照顧大多數同學的需要為原則。</p>
7.	If we want to know more about the curriculum content, assessment, learning and teaching resources of each of specialised science subjects, where do we obtain such information?	<p>For details about the curriculum content, assessment, learning and teaching resources of each specialized science subjects, please refer to the FAQ of the corresponding subject.</p>
	如果我們想知道更多關於各專修科學科目的課程內容、評核、學與教資源等資料，我們可從哪兒獲得這些資訊？	<p>有關各專修科學科目的課程內容、評核、學與教資源等資料，可參考各相關科目的問與答。</p>

* CFEG – Composite Furniture and Equipment Grant
 OEBG – Operating Expenses Block Grant