



S.3科學（生物、物理、化學）（補習課程）

請各位同學留意：

- 章程上所有課程的開課日期和時間均有機會改動，請以報名時收據上列印的資料為準；報名後如上課安排有所改動，本校會以學生所填寫的聯絡電話作個別通知。
- 同學必須保留收據，並按收據上的日期、時間、地點上課。
- 每區的班數有限，如同學需要調堂，雖可依照相關守則提出申請，惟本校不保證一定能夠成功申請，更不確保可原區補上，亦不會因為學生缺課而退回部分或全部學費。
- 同學報名或交費前應仔細考慮個人時間表。

S.3 常規課程 // 包含9個獨立課程 合共36堂

每堂課時為1小時15分鐘

上課地點	課程編號	開課日	時間	課堂形式	*學費 (每個獨立課程4堂)
九龍灣	KRN24AM301-L	29/9 (SUN)	11:30am-12:45pm		
銅鑼灣	CRN24AM302-L	29/9 (SUN)	2:00pm-3:15pm		
荃灣 (海之戀)	TRN24AM303-L	28/9 (SAT)	10:00am-11:15am	Live	\$940
旺角 (周大福)	MRN24AM304-L	23/9 (MON)	5:15pm-6:30pm		
屯門 (安定)	HRN24AM305-L	24/9 (TUE)	4:00pm-5:15pm		
ONLINE [^]	ORN24AM300-1	4/10 (FRI)	N/A	OT	

[^]同學可於Online 班影片上載後，或報讀課程日起計(以日期較後者為準) 60天內觀看2次。

符號 L：代表Live班，導師每期會現場授課3至4堂，職員會根據學生人數及登記情況安排入座次序及班房。

符號 SL：代表Semi-Live班，導師每期會現場授課1至2堂，其餘堂數會以播放Video的形式授課。

符號 V：代表Video班，導師會預先錄製教學影片，並於凝皓分校播放。

符號 OT：代表線上課程，導師會預先錄製教學影片，學生須登入凝皓網站觀看。影片設觀看期限、次數及權限。

符號 LO/VO：代表Live或Video班與線上課程的混合模式，導師每期會現場授課2至4堂，其餘堂數會以線上課程授課，導師會預先錄製教學影片，學生須登入凝皓網站觀看。影片設觀看期限、次數及權限。

*此為參考學費，一切以報名時收據上列印的學費為準。

【課程特色】

- 涵蓋中三選科重中之重：物理、化學、生物
- 首年分拆三科，因涉及部分新高中課程，難度相比中一二科學會突然提升不少，有系統地溫故知新非常關鍵
- 課程內容按照教育局對中三科學教育的指引設計，同時會適量加入一些新高中課程的相關內容
- 學習理科與文科大有不同，不能依賴背誦，必須透過解難過程學習
- 圍繞解難能力設計（Problem-solving based）的課程，每期課程都設有導修（Tutorial）與練習（Exercise），讓學生鞏固所學，並熟悉不同題型
- 課程最後設有模擬試環節，讓同學溫習全年學習內容，應付期末試
- 課程編排善用間隔重複效應（spaced repetition），有助鞏固記憶
- 考慮到有學校以中文或英文授課，課程筆記將會有中英對照
- 由理科專業出身老師授課，可解答同學一些超出課程範圍的疑難
- 免費網上問書、問功課服務，短時間內解答學生問題

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【Course Features】

- Covers the core science subjects of Form 3: Physics, Chemistry, and Biology
- This is the first year that the three subjects are split. They involve part of the DSE curriculum, which lead to a sudden increase in difficulty compared to Form 1 and 2 science. Systematic review and practice are crucial.
- The course content is designed according to the Education Bureau's guidelines for Form 3 science education, with some additional DSE curriculum content.
- Learning science requires a different approach than learning humanities, and cannot rely solely on memorization. It requires learning through problem-solving.
- The course is designed around problem-solving skills, with each lesson including tutorials and exercises to help students consolidate their learning and become familiar with different question types.
- The course includes a mock exam at the end to help students review the entire year's content and prepare for the final exam.
- The course schedule utilizes the spaced repetition effect to help consolidate memories.
- Considering the fact that some schools teach in Chinese or English, course notes will be provided in both languages.
- The course is taught by teachers with a strong science background, who can answer students' questions that go beyond the course content.
- Free online Q&A and homework help services are available, with quick response times to answer students' questions.

中三科學課程時間表(2024-2025)

月份	期數	授課內容	描述
九月	1.1	Phy 1-2	1. 來自物體的光線 1.1. 發光體和非發光體 1.2. 光線 2. 反射
	1.2	Chem 1.1-1.2	1. 原子和元素 1.1. 元素 1.2. 簡單的原子模型
	1.3	Bio 1-2.1	1. 保持身體健康 2. 營養與健康 2.1. 食物物質
	1.4	Phy 3	3. 折射
十月	2.1	Chem 1.2-1.3	1.2. 簡單的原子模型 1.3. 離子
	2.2	Bio 2.1	2.1. 食物物質
	2.3	Phy 3-4	3. 折射 4. 全內反射
	2.4	Tut. & Ex. 1	期中試溫習(一)
十一月	3.1	Chem 2.1	2. 週期表 2.1. 週期表的發展
	3.2	Bio 2.2	2.2. 食物的消化與吸收
	3.3	Phy 5	5. 凸透鏡的成像
	3.4	Chem 2.2	2.2. 週期表中的族
十二月	4.1	Bio 2.2	2.2. 食物的消化與吸收
	4.2	Phy 5	5. 凸透鏡的成像
	4.3	Chem 3	3. 混合物和化合物
	4.4	Tut. & Ex. 2	期中試溫習(二)
一月	5.1	Bio 2.3	2.3. 均衡膳食與不均衡膳食 2.3.1. 均衡飲食 2.3.2. 不均衡飲食
	5.2	Phy 6	6. 凹透鏡的成像
	5.3	Chem 4.1-4.2	4. 金屬 4.1. 金屬應用的歷史 4.2. 提取金屬的方法
	5.4	Tut. & Ex. 3	期末試溫習(一)
二月	6.1	Phy 6	6. 凹透鏡的成像

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	6.2	Chem 4.2	4.2. 提取金屬的方法
	6.3	Bio 3.1	3. 健康與疾病 3.1. 傳染病
	6.4	Phy 7.1	7. 電磁光譜 7.1. 可見光譜
三月	7.1	Chem 4.3	4.3. 金屬的性質和應用
	7.2	Bio 3.1	3.1. 傳染病
	7.3	Phy 7.1-7.2	7.1. 可見光譜 7.2. 可見光譜以外
	7.4	Tut. & Ex. 4	期末試溫習 (二)
四月	8.1	Chem 5.1-5.2	5. 現今世界的材料 5.1. 合金 5.2. 從原油而來的有用材料
	8.2	Bio 3.2	3.2. 非傳染病
	8.3	Chem 5.2	5.2. 從原油而來的有用材料
	8.4	Chem 5.3 Bio 3.3	5.3. 使用材料帶來的環境問題 3.3. 生物工程與健康
五月	9.1	PHY MOCK 及解卷	
	9.2	CHEM MOCK 及解卷	
	9.3	BIO MOCK 及解卷	
	9.4	最後複習	

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Schedule for S.3 Science Class (2024-2025)

Month	Lesson	Contents	Description
Sept	1.1	Phy 1-2	1. Light rays from an object 1.1. Luminous objects and non-luminous objects 1.2. Light rays 2. Reflection
	1.2	Chem 1.1-1.2	1. Atoms and elements 1.1. Elements 1.2. Simple model of atom
	1.3	Bio 1-2.1	1. Keeping our bodies healthy 2. Nutrition and health 2.1. Food substances
	1.4	Phy 3	3. Refraction
Oct	2.1	Chem 1.2-1.3	1.2. Simple model of atom 1.3. Ions
	2.2	Bio 2.1	2.1. Food substances
	2.3	Phy 3-4	3. Refraction 4. Total internal reflection
	2.4	Tut. & Ex. 1	Tutorial and Exercise 1
Nov	3.1	Chem 2.1	2. Periodic Table 2.1. The development of Periodic Table
	3.2	Bio 2.2	2.2. Digestion and absorption of food
	3.3	Phy 5	5. Images formed by convex lenses
	3.4	Chem 2.2	2.2. Groups in the Periodic Table
Dec	4.1	Bio 2.2	2.2. Digestion and absorption of food
	4.2	Phy 5	5. Images formed by convex lenses
	4.3	Chem 3	3. Mixtures and compounds
	4.4	Tut. & Ex. 2	Tutorial and Exercise 2
Jan	5.1	Bio 2.3	2.3. Balanced diet and Unbalanced diet 2.3.1. Balanced diet 2.3.2. Unbalanced diet
	5.2	Phy 6	6. Images formed by concave lenses

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	5.3	Chem 4.1-4.2	4. Metals 4.1. History of the use of metals 4.2. Obtaining metals
	5.4	Tut. & Ex. 3	Tutorial and Exercise 3
Feb	6.1	Phy 6	6. Images formed by concave lenses
	6.2	Chem 4.2	4.2. Obtaining metals
	6.3	Bio 3.1	3. Health and diseases 3.1. Infectious diseases
	6.4	Phy 7.1	7. Electromagnetic spectrum 7.1. Visible spectrum
Mar	7.1	Chem 4.3	4.3. Properties and uses of metals
	7.2	Bio 3.1	3.1. Infectious diseases
	7.3	Phy 7.1-7.2	7.1. Visible spectrum 7.2. Beyond the visible spectrum
	7.4	Tut. & Ex. 4	Tutorial and Exercise 4
Apr	8.1	Chem 5.1-5.2	5. Materials of the modern world 5.1. Alloys 5.2. Useful materials from crude oil
	8.2	Bio 3.2	3.2. Non-infectious diseases
	8.3	Chem 5.2	5.2. Useful materials from crude oil
	8.4	Chem 5.3 Bio 3.3	5.3. Environmental problems associated with the use of materials 3.3. Biotechnology and health
May	9.1		PHY MOCK & Analysis
	9.2		CHEM MOCK & Analysis
	9.3		BIO MOCK & Analysis
	9.4		FINAL REVISION

【生物】

健康的身體

1. 保持身體健康

- 保持身體健康就必需建立健康的生活模式（例如均衡膳食、適量運動、足夠休息）和預防疾病
- 知道酗酒、濫藥和吸煙對健康帶來的不良影響

2. 營養與健康

2.1. 食物物質

2.2. 食物的消化與吸收

- 人體消化系統的主要部分及其功能
- 食物的消化過程（食物要先被消化成簡單的可溶物質，才可被人體細胞吸收和使用）
- 消化模式
 - 1. 機械消化
 - 2. 化學消化

2.3. 均衡膳食與不均衡膳食

2.3.1. 均衡飲食

- 均衡膳食的定義：進食適量和合乎比例的各种食物物質
- 不同種類食物的能量值
- 能量需求因應年齡、性別、職業而有不同
- 閱讀食物標籤、能量值的比較、因應需求制定餐單

2.3.2. 不均衡飲食

- 缺乏食物物質對健康的影響
- 不均衡飲食帶來的風險
- 進食不足或進食過量對體重和健康的影響

3. 健康與疾病

3.1. 傳染病

- 多數傳染病是由於感染微生物（病原體）所致
- 常見傳染病（傷風、流行性感冒）由病毒引起
- 預防傳染病的方法

3.2. 非傳染病

- 非傳染病與不健康的生活模式相關
- 健康生活模式對預防一些非傳染病的重要性
- 引致癌症的風險因素
- 糖尿病是與一種專責調節血糖水平的激素（胰島素）有關的疾病

3.3. 生物工程與健康

- 生物工程於醫學上的應用

【化學】

從原子到材料

1. 原子和元素

1.1. 元素

- 物質皆由非常細小的原子組成
- 元素和原子的關係
- 常見元素的名稱和符號
- 元素的物理性質

1.2. 簡單的原子模型

- 原子的結構：質子、中子和電子
- 質子、中子和電子的特徵
- 原子序：質子數目相等
- 質量數：中子數目和質子數目的總和

1.3. 離子

- 離子帶有電荷，因為其質子和電子的數目不同
- 簡單離子的化學符號

2. 週期表

2.1. 週期表的發展

- 週期表：有系統地組織各種元素的方法
- 過往一些科學家曾以原子的質量和化學性質來組織各種元素
- 現代的週期表是把元素按其原子序遞增次序排列

2.2. 週期表中的族

- 在週期表中，同族的元素會有一些共通的性質
- 不同族的元素及其應用的例子
- 同族的元素具有相似的化學性質，但有不同的活躍性

3. 混合物和化合物

- 混合物：由兩種或多種物質，在沒有生成新的物質下混和而成
- 化合物：由元素以化學方式結合形成
- 化學變化：透過反應而生成新物質的過程
- 物理變化：不涉及化學成分的改變
- 離心分離、水電解、比較化合物（例如硫化鐵(II)、鐵和硫）
- 物質的分辨
- 由元素生成化合物的平衡化學反應式（氯化鈉、氯化氫、水和二氧化碳）（ NaCl 、 HCl 、 H_2O 、 CO_2 ）

4. 金屬 Metals

4.1. 金屬應用的歷史

- 金屬的應用與金屬提取的
 - 1. 難易程度
 - 2. 蘊藏量

4.2. 提取金屬的方法

- 金屬在大自然中存在的形式
- 使用碳提取金屬的方法

4.3. 金屬的性質和應用

- 金屬的性質與其應用連繫
- 比較一些金屬的物理性質

5. 現今世界的材料

5.1. 合金

- 合金：在金屬中加入其它元素可製成合金，以改良金屬的性質
- 合金及其用途的例子

5.2. 從原油而來的有用材料

- 原油：包含了不同大小的碳氫化合物的混合物
- 碳氫化合物的物理性質與其分子大小連繫
- 分餾法：將原油分成不同的餾份

- 不同餾份的一些主要用途
- 塑料：由很多碳氫分子結合而成的巨大分子
- 一些塑料（PE、PVC）及其用途
- 新塑料的研發是建基於社會的新需求

5.3. 使用材料帶來的環境問題

- 使用材料（塑料、金屬）所帶來的環境問題及其解決方法

【物理】

光、顏色和光譜以外

1. 來自物體的光線

1.1. 發光體和非發光體

- 分辨發光體和非發光體

1.2. 光線

- 光是沿直線進行的
- 以直線和箭號代表光線

2. 反射

- 反射定律（入射角和反射角相等）
- 平面鏡的成像
- 應用光反射的日常例子（潛望鏡、萬花筒）

3. 折射

- 折射的原理
- 光線由空氣進入不同折射率的物質時會有不同程度的折曲
- 以光線圖解釋折射產生的現象
- 斯涅耳定律

4. 全內反射

- 全內反射出現的條件
- 運用斯涅耳定律計算臨界角
- 全內反射的日常例子（三稜鏡、光纖）

5. 凸透鏡的成像

- 光線穿過凸透鏡後會聚
- 以光線圖繪畫凸透鏡的成像
- 凸透鏡成像的性質
- 計算凸透鏡成像的放大率
- 應用凸透鏡的例子

6. 凹透鏡的成像

- 光線穿過凹透鏡後發散
- 以光線圖繪畫凹透鏡的成像
- 描述凹透鏡成像的性質
- 計算凹透鏡成像的放大率
- 應用凸透鏡的例子

7. 電磁光譜

7.1. 可見光譜

- 可見光是電磁波譜中的一部分
- 可見光譜的描述
- 波長與顏色的關係
- 光的三原色
- 混合三原色光可以產生不同顏色
- 物體在不同色光下的顏色

7.2. 可見光譜以外

- 電磁波譜中可見光以外的不同部分
- 列舉一些應用電磁波譜的例子
- 使用電磁輻射的潛在風險

【Bio】

Unit 12: A Healthy Body

1. Keeping our bodies healthy

- healthy lifestyles (e.g. balanced diet, appropriate amount of nphysical activities, enough rest) and prevention of diseases are required for keeping our bodies healthy
- Harmful effects of abuse of alcohol and drugs, and smoking on our health

2. Nutrition and health

2.1. Food Substances

- Key functions of the six main types of food substances
- Building blocks of carbohydrates, lipids and proteins
- The importance of water to the human body
- Tests for glucose, starch, lipids, proteins and vitamin C

2.2. Digestion and absorption of food

- Names and functions of the main parts of the digestive system in humans
- The process of digestion(food has to be digested into simple and soluble substances before it can be absorbed and used by body cells)
- Digestive modes
 - 1. Mechanical digestion
 - 2. Chemical digestion

2.3. Balanced diet and imbalanced diet

2.3.1. Balanced diet

- Balanced diet: the intake of different food substances in the right proportion and quantities
- the energy value of different foods

- the energy requirement for people of different age, sex and occupation are different
- Inspect food labels, compare energy values, design menu of balanced diet

2.3.2. Unbalanced diet

- the effect of insufficient intake of food substances on health
- Unbalanced diet will increase the risk of various diseases
- The effects of undereating and overeating on weight and health

3. Health and diseases

3.1. Infectious diseases

- Most infectious diseases are caused by infection of microorganisms
- Some common infectious diseases are caused by viruses(cold and influenza)
- Ways of preventing infectious diseases

3.2. Non-infectious diseases

- Some non-infectious diseases are related to unhealthy lifestyles
- Importance of healthy lifestyles to the prevention of certain non-infectious diseases
- Some risk factors for cancers
- Diabetes is a disorder related to a hormone(insulin) for regulating blood glucose level

3.3. Biotechnology and health

- Health-related applications of biotechnology

【Chemistry】

From Atoms to Materials

1. Atoms and elements

1.1. Elements

- All matter is composed of small particles called atoms
- The relationship between elements and atoms
- The names and symbols of some common elements
- Their physical properties

1.2. Simple model of an atom

- Structure of an atom: protons, neutrons and electrons
- Characteristics of protons, neutrons and electrons
- Atomic number: the number of protons
- Mass number: the sum of the number of protons and neutrons

1.3. Ions

- Ions carry charges as they have different number of protons and electrons
- The chemical symbols of simple ions

2. Periodic table

2.1. The development of periodic table

- Periodic table: a way to organise elements in a systematic order
- Scientists in the past organise elements according to the mass of atoms and their chemical properties
- The modern periodic table lists elements in order of increasing atomic number

2.2. Groups in the Periodic table

- Elements in the same group of the periodic table exhibit some common properties

- Examples of some elements in different groups and their daily applications
- The chemical properties among elements in the same group are similar but with different reactivity

3. Mixtures and compounds

- Mixtures: formed when two or more substances mix with each other without the formation of a new substance
- Compounds: formed by elements joining together chemically
- Chemical change: a process in which new substances are formed in reactions
- Physical change: does not involve a change in chemical composition
- Centrifugation, electrolysis of water, compare the properties between a compound and its constituent elements (e.g. iron(II) sulphide, iron and sulphur)
- Distinguish between:
 - 1. elements
 - 2. compounds
 - 3. mixtures
- Write balanced chemical equations for the reactions between elements to form compounds(sodium chloride, hydrogen chloride, water and carbon dioxide)(NaCl 、 HCl 、 H_2O 、 CO_2)

4. Metals

4.1. History of the use of metals

- The use of metals and their ease of extraction and availability

4.2. Extraction methods of metals

- How do metals exist in Nature
- metal extraction using carbon

4.3. Properties and uses of metals

- Relationship between the properties of metals and their uses
- Compare physical properties of metals:

5. Materials of the modern world

5.1. Alloys

- Alloys: adding other elements into metals for the improvement of the properties of the metals
- Examples of alloys and their common uses

5.2. Useful materials from crude oil

- Crude oil: a mixture of hydrocarbon molecules of different sizes
- Relationship between the size and the physical properties of hydrocarbons
- Fractional distillation: the method for separating crude oil into different fractions
- Some major uses of the different fractions
- Plastics: macromolecules made by joining up many hydrocarbon molecules
- Examples of plastics(PE, PVC) and their usage
- New plastics are invented based on the emerging needs in our society

5.3. Environmental problems associated with the use of materials

- Environmental problems associated with the use of materials (e.g. plastics, metals) and solutions

【Physics】

Light, Colours and Beyond

1. Light rays from an object

1.1. Luminous objects and non-luminous objects

- Distinguish between luminous and non-luminous objects

1.2. Light rays

- Light travels in a straight line
- Represent light rays by straight lines and arrows

2. Reflection

- The laws of reflection
- The nature of images formed by plane mirror
- Examples of daily applications of reflection of light (periscope, kaleidoscope)

3. Refraction

- Light is refracted at the interface between media with different refractive indices
- Materials with different refractive indices lead to different degree of bending of light
- Use ray diagrams to illustrate some phenomena due to refraction
- Snell's Law

4. Total internal reflection

- Conditions for total internal reflection
- Use Snell's law to compute the critical angle
- Daily examples of total internal reflection

5. Images formed by convex lenses

- Light converges after passing through convex lenses
- Construct the images formed by convex lenses using ray diagrams
- The nature of images formed by convex lenses
- Compute the magnification of images formed by convex lenses
- Daily applications of convex lenses

6. Images formed by concave lenses

- Light rays diverge after passing through a concave lens
- Construct the images formed by concave lenses using ray diagrams
- Describe the nature of the images formed by concave lenses
- Find out the magnification of the images formed by concave lenses
- Daily applications of concave lenses

7. Electromagnetic spectrum

7.1. Visible spectrum

- Visible light is part of the electromagnetic spectrum
- Description of the visible spectrum
- Relation between light and color
- Three primary colours of light
- Primary colour of light can be combined to produce different colours
- Coloured objects appear different in white light and in different colour lights

7.2. Beyond the visible spectrum

- The invisible parts of the electromagnetic spectrum
- Applications of electromagnetic spectrum
- The potential hazards of using electromagnetic radiations