國中科技領域

雙語教學資源手冊

資訊科技 英語授課用語

A Reference Handbook for Junior High School Bilingual Teachers in the Domain of Technology (Information Technology): Instructional Language in English

〔國中七年級〕

高師大全英語與雙語教學推動中心 發行 iTEACH NKNU

目次 Table of Contents

單元一 資訊科技對我們的影響
The Impact of Information Technology on Us

國立高雄師範大學軟體工程與管理學系 劉峻維、曾士軒

■ 前言 Introduction

本單元的學習目標，是要學生知道，隨著資訊科技的發展，人們對生活產生的影響。本單元將會介紹生活中需要注意的資訊安全漏洞，及便利的資訊科技產品。

- 1-1 學生認識資訊安全。
- 1-2 學生學會電腦與網路的資安防護，了解數位化檔案的管理危機，與個資盜用的嚴重性，並能檢視自身是否有相關的設定及修正。
- 1-3 學生認識個人數位金融安全防護，知道金融服務數位化，與數位支付的方式及載具，並建立正確的使用態度。
- 1-4 學生學會智慧型裝置的資安防護，了解應用程式的便利性，並習得應用程式的權限與隱患。

The learning objective of this unit is to understand that reveal the influence to our daily life along with the improvement of Informational Technology. We will introduce information security that we should be aware of and the convenience of information technology products.

- In 1-1, students will learn information security.
- In 1-2, students will learn about the protection in Information Security., and understand the management crisis of digital files, as well as the severity of personal data thefting, hoping then to review if there's any password they should put reinforce on.
- In 1-3, students will understand how to protect their financial digital data, learn about knowledge of digital financial services, digital payments and information carriers and then establish the proper attitude of using these.
- In 1-4, students will learn information protection on their smart devices, understand the convenience of applications and realize the hidden crisis when authorizing access to data within their devices.

■ 詞彙 Vocabulary

單字	中譯	單字	中譯
information	(n.) 資訊	financial	(adj.) 經濟的
security	(n.) 安全	mobile	(adj.) 行動的
vulnerability	(n.) 漏洞	digitization	(n.) 數位化
digital	(adj.) 數位	payment	(n.) 付款
file	(n.) 檔案	carrier	(n.) 載具
personal	(adj.) 個人的	smart	(adj.) 聰明的
data	(n.) 資料	device	(n.) 裝置
password	(n.) 密碼	application	(n.) 應用程式
authorization	(n,) 授權	antivirus	(n.) 防毒
software	(n.) 軟體	firewall	(n.) 防火牆
malicious	(adj.) 惡意的	attack	(v.) 攻擊

■ 問題與回答 Questions and Answers

Q1:	**Do you know about the CIA of information security?** 你知道什麼是資訊安全的 CIA 嗎？
A1:	**Yes, I do. "C" means confidentiality, "I" means integrity, and "A" means availability.** 是的，我知道。"C"代表保密性，"I"代表完整性，"A"代表可用性。

Q2:	**How do you protect your information while using technology?** 你如何在使用科技時，保護資訊呢？
A2-1:	**I need to logout after using a public computer, and don't save any passwords.** 在使用公共電腦後，我需要登出，不要保存密碼。
A2-2:	**I will not download files on unknown websites.** 我不要在未知的網站上，下載文件。
A2-3:	**I have to check and update computers regularly.** 我必須定期檢查和更新電腦。
A2-4:	**I should install antivirus software on my computer, and update it regularly.** 我應該在電腦上，安裝防病毒軟體，並定期更新。
A2-5:	**I will not set simple passwords like 1234, abcd, or birthday.** 我不要設置簡單的密碼，例如 1234，abcd 或生日。

Q3:	**Have you ever used mobile payment to buy things?** **Share your experience with us.** 你是否曾使用行動支付購物？與我們分享一下！
A3:	**Yes, I have. I bought my breakfast with Line Pay at a 7-11 convenience store this morning.** 是的，我有。我今天早上使用 Line Pay，在 7-11 便利商店買早餐。

Q4:	**Can you name 3-5 applications that you are using on your cell phone or tablet?** 你能否列出在手機或平板電腦上，你使用的 3~5 個應用程式？
A4:	**Yes, I can. I have Line, Dcard, Uber, 傳說對決 and 蝦皮購物.** 是的，我可以。我有 Line、Dcard、Uber、傳說對決和蝦皮購物。

■ 對話 Dialogues

對話一 Dialogue 1

Teacher: Do you know how to set up a safe password?

Student: Yes, I do. When I set up my password, I compose it with a capital English letter and numbers together.

Teacher: You mean that your password is an A following with your phone numbers?

Student: No! I usually rearrange my English name and digits together to make my password more secure.

Teacher: Excellent! Then, do you know how to protect your PC?

Student: Yes, I do. I install antivirus software and a firewall, and regularly update these to protect my computer from viruses and malicious attacks.

Teacher: Great! You are the information security expert in this class!

Student: Thanks a lot, sir!

老師： 你知道如何設置安全密碼嗎？

學生： 是的，我知道。當我設置密碼時，我會組合英文大寫字母和數字。

老師： 你的意思是密碼是一個 A 和你的手機號碼嗎？

學生： 不是！我通常會把我的英文名字和數字重新排列組合，讓密碼更安全。

老師： 太好了！那麼你知道如何保護你的電腦嗎？

學生： 是的，我知道。我會安裝防毒軟體和防火牆，並定期更新，以保護我的電腦，免受病毒和惡意攻擊。

老師： 太棒了！你是本班的資訊安全專家！

學生： 多謝老師！

單元二 善用資訊科技組織與表達
Making Good Use of Information Technology to Organize and Express Our Thoughts

國立高雄師範大學軟體工程與管理學系 劉峻維、曾士軒

■ 前言 Introduction

本單元的學習目標，是要學生學習資訊科技處理問題的優缺點，練習如何解決問題的方法及使用策略，並利用相關資訊科技工具解決問題。

- 學生認識地圖與路徑。
- 學生學會導航與定位系統，
- 學生學習如何運用 Google Maps 規劃路徑。

The learning objective of this unit is for students to learn the advantages and disadvantages of information technology in problem-solving. They can practice problem-solving methods and strategies, and use technology tools to solve problems.

- Students will be introduced to maps and paths.
- Students learn navigation and positioning systems.
- Students use Google Maps to plan routes.

■ 詞彙 Vocabulary

單字	中譯	單字	中譯
travel	(v.) 旅遊	navigate	(v.) 導航
plan	(v.) 計劃	unfamiliar	(adj.) 不熟悉的
trip	(n.) 旅行	location	(n.) 位置
well-known	(adj.) 知名的	traffic	(n.) 交通
tourist	(n.) 遊客	subtopic	(n.) 子主題
attraction	(n.) 景點	customize	(v.) 客製化
thorough	(adj.) 完整的	appeal	(v.) 吸引
utilize	(v.) 使用	effective	(adj.) 有效的
organize	(v.) 組織	direction	(n.) 方向
software	(n.) 軟體		

■ 教學句型與實用句子 Sentence Frames and Useful Sentences

❶ Do you _____?

例句：**Do you** like traveling?

你喜歡旅遊嗎？

❷ How do _____?

例句：**How do** you plan your trip?

你如何規劃旅行？

❸ Have you ever _____?

例句：**Have you ever** made a thorough traveling plan for your family?

你曾經為家人做個周密的旅遊規劃嗎？

❹ Are you_____?

例句：**Are you** familiar with Google Maps?

你熟悉 Google Maps 嗎？

■ 對話 Dialogues

對話一 Dialogue 1

Teacher: Have you ever used Google Maps before?

Student: Yes, I have. It's a really useful tool for finding directions and navigating unfamiliar areas.

Teacher: That's true. Do you know how to use it to find a specific location?

Student: Sure. First, you need to open the Google Maps app or website. Then, you can either search for the location using the search bar or drop a pin on the map. Once you find the location, you can get directions and even see real time traffic updates.

Teacher: That sounds really helpful. Do you also know how to create a mind map using Xmind?

Student: Yes, I do. Xmind is a great tool for organizing our thoughts and ideas. First, we need to open the Xmind app or website. Then, we can create a new mind map and start adding our main ideas and subtopics. We can also customize the colors and styles in the mind map to make it more visually appealing.

Teacher: That sounds pretty easy. Do you have any tips for creating an effective mind map?

Student: Yes, I do. One simple tip is to keep our mind map clear, with only a few main ideas and subtopics. Another tip is to use keywords and images to help us remember the information better.

老師： 你曾經用過 Google Maps 嗎？

學生： 是的，我用過。它是一個很有用的工具，可以幫助我們找到方向並導航到不熟悉的地方。

老師： 對啊！你知道如何使用它找到特定的地點嗎？

學生： 當然。首先，你需要開啟 Google Maps 應用程式或網站。然後，你可以使用搜尋欄搜尋地點，或在地圖上標記一個點。一旦找到地點，你可以獲得方向，並即時查看交通狀況更新。

老師： 聽起來真的很有幫助。你也知道如何使用 Xmind 繪製心智圖嗎？

學生： 是的，我知道。 Xmind 是一個很好的工具，可以幫助我們組織思維和想法。首先，我們需要開啟 Xmind 應用程式或網站。然後，我們可以繪製一個新的心智圖，開始添加主要想法和子題。我們還可以自訂心智圖的顏色和樣式，使它看起來更吸引人。

老師： 聽起來很容易。你有什麼繪製有效心智圖的技巧嗎？

學生： 是的，我有。一個簡單的技巧是，保持我們心智圖的清晰，只需幾個主要想法和子題即可。另一個技巧是，使用關鍵詞和圖片，來幫助我們更好地記住資訊。

單元三 演算法與程式設計
Algorithms and Programming

國立高雄師範大學軟體工程與管理學系 劉峻維、曾士軒

■ 前言 Introduction

在這個單元，學生將認識設計演算法，它是一種解決問題的步驟與方法，它讓我們使用電腦，解決問題或完成工作任務。在遵守五項演算法特性的前提下，我們設計出合理的程式邏輯。了解演算法後，我們會有程式語言的簡介，認識低階與高階程式語言的差異及 Scratch 視覺化程式設計工具。最後，我們將解釋美國國交標準局制定的標準化流程符號，教導學生學習思考，閱讀程式，與繪製流程符號。

In this unit, students will learn that designing algorithms is a procedure and method for solving problems. We use computers to solve problems or complete our jobs by designing algorithms. Following the five characteristics of an algorithm we can design reasonable logic programs. After understanding the algorithm, we will introduce the programming languages, the difference between low-level and high-level programming languages, and Scratch, a visual programming tool. Finally, we will explain the standardized process mapping symbols developed by the National Bureau of Transportation Standards, and teach students to promote their thinking, cultivate the ability to read programs as well as drawing flowcharts.

■ 詞彙 Vocabulary

單字	中譯	單字	中譯
input	(n.) 輸入	low-level	(adj.) 低階的
definiteness	(n.) 明確性	high-level	(adj.) 高階的
effectiveness	(n.) 有效性	characteristic	(n.) 特性
finiteness	(n.) 有限性	machine	(n.) 機器
output	(n.) 輸出	assembly	(n.) 組合、集合
trait	(n.) 特性	difference	(n.) 不同處
algorithm	(n.) 演算法	between	(prep.) 在中間
command	(n.) 指令	categorize	(v.) 分類
program	(n.) 程式	similar	(adj.) 相似的
language	(n.) 語言	logic	(n.) 邏輯
malicious	(adj.) 惡意的	attack	(v.) 攻擊

■ 教學句型與實用句子 Sentence Frames and Useful Sentences

❶ How many ____?

例句：**How many** characteristics of an algorithm?

演算法有多少特色？

❷ What is _____? / What are _____?

例句：**What are** the commands of Scratch programming language?

什麼是 Scratch 程式語言的指令？

❸ Where is _____?

例句：**Where is** the Run button of Scratch interface?

哪裡是 Scratch 界面的執行按鈕？

❹ Are you _____?

例句：**Are you** familiar with commands and logics?

你熟悉指令和邏輯嗎？

■ 對話 Dialogues

對話一 Dialogue 1

Teacher:	Do you know the five characteristics of an algorithm?
Student:	Yes, I do. They are input, definiteness, effectiveness, finiteness and output.
Teacher:	Can you tell the difference between low-level programming languages and high-level programming languages?
Student:	Yes, I can. Low-level programming languages are closer to the machine, which is hard for us to read, while the high-level programming languages are quite similar to our language.
Teacher:	Excellent! Can you categorize these programming languages as low-level and high-level languages? Namely: Machine language Assembly language, Java, and Python?
Student:	Yes, I can. Machine language and Assembly language are low-level programming languages; Java and Python are high-level programming languages.
Teacher:	Great! Now you can open Scratch and start programming.
Student:	Oh, no!

老師： 你知道演算法的五個特性是甚麼？

學生： 是的，我知道。他們分別是輸入、明確性、有效性、有限性與輸出。

老師： 你能否分辨低階程式語言和高階程式語言呢？

學生： 是的，我可以。低階程式語言比較接近電腦本身的語言，對我們來說是難看懂的；而高階程式語言較接近我們的語言。

老師： 太好了！你能夠分類這些程式語言是屬於高階還是低階的嗎？它們分別是機器語言、組合語言、Java 和 Python。

學生： 是的，我可以。機器語言和組合語言是屬於低階程式語言；而 Java 和 Python 是屬於高階程式語言。

老師： 太棒了！現在你可開啟 Scratch，並設計程式了。

學生： 噢不！

單元四 個人資料保護與著作合理使用
Personal Data Protection and Copyright Fair Use

國立高雄師範大學軟體工程與管理學系 劉峻維、曾士軒

■ 前言 Introduction

本單元的學習目標，是希望學生透過學習後，知道個人資料的重要性，學習如何保護個人資料，與認識智慧裝置上的壞習慣並改正。在這個多媒體科技發達的現代，我們應該注重智慧財產與著作權，我們提醒學生，不要在發揮創意時，不小心踩到法律的邊緣。而且，學生在完成自己創作之後，也有保護自己的力量，並認識自己的相關權益。著作權法對作品與創意的保護，不代表我們不可以使用其他人的內容，而是我們要對著作有合理的使用，與引用方法。

The objective of this lesson is to help students understand the importance of personal data, learn how to protect it plus recognize and correct bad habits while using smart devices. In this modern age of advanced multimedia technology, we shouldn't deny the importance of intellectual property and copyright. Hence, we have to remind students not to accidentally tread on the edge of legality when finishing their own creations. By the way, students need to have the power to protect themselves after completing their own creations. They should understand their related rights and interests. The protection of works and ideas by copyright law does not mean that we cannot use other people's works. This type of law requires us to learn fair uses and citations of works.

■ 詞彙 Vocabulary

單字	中譯	單字	中譯
personal data	(n.) 個人資料	privacy	(n.) 隱私
protect	(v.) 保護	password	(a.) (n.) 密碼
smart device	(n.) 智慧裝置	habit	(a.) (n.) 習慣
copyright	(n.) 著作權	intellectual property	(n.) 智慧財產
creation	(n.) 作品、創作	reasonable	(adj.) 合理的
law	(n.) 法律	cite	(v.) 引用
identity	(n.) 身分	fraud	(n.) 詐騙
responsibility	(n.) 責任	access	(v.) 存取
authorization	(n,) 授權	antivirus	(n.) 防毒
software	(n.) 軟體	firewall	(n.) 防火牆

■ 教學句型與實用句子 Sentence Frames and Useful Sentences

❶ How many _____ do you/we /does he/she _____?

例句：**How many** pieces of music **do we** need to finish this video?

我們需要多少音樂來完成這部影片呢？

❷ How much is _____?

例句：**How much is** this song on Apple music?

這首歌在 Apple 音樂上要多少錢？

❸ How could _____ to _____?

例句：**How could** that happen **to** me?

我怎麼會發生這種事？

❹ Always remember to _____.

例句：**Always remember to** double check your answers before turning in test papers.

交卷以前，你永遠要記得再檢查一次答案。

❺ I use my _____ to _____.

例句：**I use my** cellphone **to** shoot my personal contents.

我用我的手機拍攝個人內容。

■ 對話 Dialogues

對話一 Dialogue 1

Teacher: Good morning, students. Today, we will discuss the importance of personal data and how to protect it. We will also introduce intellectual property and copyright. Can anyone tell me why personal data is important?

Student: Personal data is important because it contains information that we might not want other people to know. It can be used to steal our identities or commit fraud.

Teacher: That's right. We all have the right to our privacy, and protecting our personal data is one way to ensure that right. What are some ways we can protect our personal data?

Student: We can use strong passwords and we don't share these with others. We have to be careful about what we post online. And we avoid clicking on suspicious links or downloading unknown files.

Teacher: Great! We also need to be aware of any bad habits when using smart devices. Can anyone give us an example of a bad habit?

Student: I always leave my phone unlocked and lying around, so anyone can access it.

Teacher: That's definitely a bad habit. You should always lock your phone when you're not using it, and be careful about knowing who accesses your device. Now, let's move on to intellectual property and copyright. Why do you think it's important to pay attention to these things?

Student: It's important because we don't want to steal someone else's works or break the law unintentionally.

Teacher: Yes, that's right. We need to be careful when we use other people's content and give credit to them. What are some ways we can do this?

Student: We can use proper citation methods when referencing other people's works, ask for permission before using someone else's content and avoid using copyrighted material without permission.

Teacher: Excellent suggestions. You have to remember that protecting our personal data and respecting intellectual property are very important to help us be responsible digital citizens.

老師： 同學們，早安。今天我們討論個人資料的重要性及我們如何保護它。我們也介紹智慧財產和著作權。有人可以告訴我個人資料為什麼重要嗎？

學生： 個人資料很重要，是因為它包含我們不要他人知道的資料，個人資料可被用來盜取我們的身分或進行犯罪。

老師： 回答正確。我們每個人都有隱私權。保護我們的個人資料是確保隱私權的一個方法。還有什麼方法我們可以保護個人資料呢？

學生： 我們可以使用較難破解的密碼，且不與他人分享。我們必須小心在網際網路中張貼內容，而且，我們要避免點擊未知的連結，或下載未知的檔案。

老師： 很好！我們同時也須要注意我們在使用智慧裝置的壞習慣。有誰能給我們壞習慣的例子呢？

學生： 手機解鎖後，我總是把它亂放，導致任何人都可進入我的手機。

老師： 那肯定是很糟糕的習慣。你應該在使用手機時，都要上鎖，也須留意知道誰使用了你的裝置。現在，讓我們進一步談智慧財產和版權。為什麼你覺得注意這些事很重要呢？

學生： 因為我們不要意外地偷竊他人的作品，或犯法。

老師： 是的，沒錯。我們須要小心使用他人的內容並表明出處。有什麼方法我們能做的呢？

學生： 當參考他人的作品時，我們可以使用適當的引用方法，取得他人作品的同意，並避免在未經同意前，使用有版權的資料。

老師： 很好的建議！你們要記住，保護我們的個人資料與尊重智慧財產，都是身為負責任的數位公民很重要的事。

單元五 資料的處理與分析
Data Processing and Analysis

國立高雄師範大學軟體工程與管理學系 劉峻維、曾士軒

■ 前言 Introduction

本單元的學習目標，是希望學生認識與瞭解資料，並知道如何針對資料進行處理、分析與呈現。在現代科技社會中，人們天天都會接觸資料，不論是數值資料，或非數值資料，我們將對其進行消化與歸納，並將其輸出。另外，本單元也學習資料搜尋，引導學生用同一個問題，輸入不同的關鍵字，搜尋不同領域的結果。更重要的是，在了解此差異性後，學生將練習搜尋技巧，自行學習找資料，希望能夠較有效率地找到有用的資料。

The learning objectives of this unit are to help students understand and digest data. Students can learn how to process, analyze, and present data. People nowadays encounter data processing on a daily basis, no matter numerical or non-numerical. In this unit we teach students how to digest, summarize, and output data. In addition, this unit also focuses on data searching. Students are guided to understand how to search for the same problem using different keywords and approaches. Then, they can produce various results in different fields. More importantly, after realizing these differences, students are led to practice search skills so that they can find useful data more efficiently on their own.

■ 詞彙 Vocabulary

單字	中譯	單字	中譯
data	(n.) 資料	present	(v.) 呈現
process	(v.) 處理	table	(n.) 表格
analyze	(v.) 分析	chart	(n.) 圖表
numerical	(adj.) 數值的	graph	(n.) 圖形
non-numerical	(adj.) 非數值的	infographic	(n.) 資訊圖表
search	(v.) 搜尋	appropriate	(adj.) 合適的
keyword	(n.) 關鍵字	pie chart	(n.) 圓餅圖
approach	(n.) 方法	statistics	(n.) 統計數據
authorization	(n.) 授權	complex	(adj.) 複雜的
efficient	(adj.) 有效率的	convey	(v.) 傳達

■ 教學句型與實用句子 Sentence Frames and Useful Sentences

❶ We will learn about _____

例句：**We will learn about** data, and how to search online.

我們將學習相關資料，並如何在網路上搜尋。

❷ Can you give me _____ of _____?

例句：**Can you give me** an example **of** numerical data?

你可以舉一個數值資料的例子嗎？

❸ It is important to _____ when _____.

例句：**It is important to** look around **when** you are crossing the road.

當你過馬路時，查看周圍是很重要的。

❹ _____ is/are useful for _____.

例句：Pie charts **are useful for** showing percentages or proportions.

圓餅圖在顯示百分比或比例時很有用。

❺ _____ can help to _____.

例句：Infographics **can help to** convey complex information in a clear way.

資訊圖表可以清晰地幫助傳達複雜的資訊。

■ 對話 Dialogues

對話一 Dialogue 1

Teacher: Good morning students. Today, we're going to start a new unit on data analysis. Can anyone tell me what data is?

Student: Data is information that can be collected and analyzed.

Teacher: Excellent! That's exactly right. And why is it important to know how to process and analyze data?

Student: It helps us make better decisions and solve problems.

Teacher: Very good! Now, in this unit, we will learn how to handle both numerical and non-numerical data. We will also focus on data searching, where we will guide you to

understand how to search for the same problem using different keywords and approaches. Thus, it can produce various results in different fields.

Student: Can you give us an example?

Teacher: Sure! For example, you're doing a research project on renewable energy sources. By using different keywords like "solar power" or "wind energy," and different approaches like "environmental impact" or "economic feasibility," you can find different results that help you develop a more well-rounded understanding of the topic.

Student: That's cool! Can we practice searching for data?

Teacher: Absolutely! As we progress through the unit, we will have opportunities to practice search skills and find useful data more efficiently. Thus we will know how to process and analyze data. It's also important to know how to present it. There are many ways to present data, such as tables, charts, graphs, and infographics. Can anyone give me an example of presenting data?

Student: I saw a pie chart in a news article about how people spend their money.

Teacher: Yes. That's a great example. Pie charts are great for showing how parts of a whole data. How about tables?

Student: My mother uses tables to keep track of our family budget.

Teacher: Exactly! Tables are great for organizing numerical data, such as budgets or statistics. How about graphs?

Student: I've seen line graphs in science class to show how the temperature changes over time.

Teacher: Very good! Line graphs are perfect for showing trends or changes over a period of time. And finally, infographics are a new way of presenting data that combines graphics and text to make complex information more understandable.

Student: Wow! There are so many ways to present data!

Teacher: Yes, there are! In this unit, we will also learn how to choose the most appropriate way to present the information that we really want to convey.

老師： 同學們，早安。今天，我們將開始資料分析的新單元。有人能告訴我什麼是資料嗎？

學生： 資料是可以被收集和分析的資訊。

老師： 太棒了！完全正確。那麼，為什麼知道如何處理和分析資料是很重要的呢？

學生： 它幫我們做出較好的決定與解決問題。

老師： 非常好！現在，在此單元中，我們將學習如何處理數值和非數值資料。我們也會著眼於資料的搜尋，引導你們了解如何使用不同的關鍵字和方法，來搜尋同一個問題，因此，也會產生在不同領域的不同結果。

學生： 您能給我們一個例子嗎？

老師： 當然！例如，你正在進行一個關於再生能源的研究專題。你可以用不同的關鍵字，像是「太陽能」或「風能」，及不同的方法，如「環境影響」或「經濟可行性」，你就找到不同的結果，幫助你發展較全面性理解的主題。

學生： 真是太酷了！我們可以練習搜尋資料嗎？

老師： 當然可以！當我們透過此單元學習時，我們會有機會練習資料搜尋的技巧。然後，我們就知道如何處理和分析資料。如何呈現資料也是重要的。譬如表格、圖表、圖形，甚至資訊圖表，就有很多方法可呈現。有人可給我舉一個呈現資料的例子嗎？

學生： 我在一篇關於人們如何花錢的新聞文章中，看過一個圓餅圖。

老師： 是的。那是一個很好的例子。圓餅圖很適合展示團體中各部分。那麼表格呢？

學生： 我媽媽使用表格追蹤我們家的預算。

老師： 回答正確！表格是非常適合用於組織像預算或統計的數值資料。那麼圖表呢？

學生： 我在自然課中，看過折線圖，它呈現溫度隨時間的變化。

老師： 非常好！折線圖非常適合呈現一段時間內的趨勢或變化。最後，資訊圖表是一種結合圖形和文字的新型呈現方式，它能讓複雜的資訊較容易被理解。

學生： 哇！資料呈現的方式有這麼多種！

老師： 是的，的確如此！在本單元中，我們也學習如何選擇最適合的方法，來呈現我們真的想要傳達的資訊。

單元六 Scratch 程式設計
Scratch Programming

國立高雄師範大學軟體工程與管理學系 劉峻維、曾士軒

■ 前言 Introduction

本單元提供學生利用 Scratch，實作程式設計。為了讓程式結構較清晰，較易開發、維護與修改，我們學習如何使用循序結構、重複結構，和選擇結構，進行程式設計。我們幫助學生分析問題並製作流程圖。之後，我們依照流程圖，寫 Scratch 程式碼。最後，我們用程式的虛擬碼程式牌玩遊戲，並製作活動紀錄簿。

This unit provides students with the opportunity to practice programming using Scratch. In order to make the program structure clearer and easier to develop, maintain, and modify, we will learn how to use sequence, repetition, and selection structures in programming. We help students analyze problems and create flowcharts. Then, we write Scratch code based on the flowchart. Finally, we use programming to play pseudocode cards games and create an activity log.

■ 詞彙 Vocabulary

單字	中譯	單字	中譯
sequence structure	(n.) 循序結構	timer	(n.) 計時器
repetition structure	(n.) 重複結構	structure	(n.) 結構
selection structure	(n.) 選擇結構	programming	(n.) 程式設計
condition	(n.) 狀況	block	(n.) 積木
variable	(n.) 變數	loop	(n.) 迴圈

if	(conj.) 如果	then	(adv.) 然後
repeat	(v.) 重複	else	(adv.) 否則
while	(conj.) 當	command	(n.) 命令
break	(v.) 中止	continue	(v.) 繼續

■ 教學句型與實用句子 Sentence Frames and Useful Sentences

❶ Something is used to _____.

例句：The sequence structure **is used to** execute instructions in a predetermined order.

循序結構被用來按照預定順序執行指令。

❷ ____ allow(s) us to ____.

例句：Repetition structures **allow us to** repeat a set of instructions.

重複結構允許我們重複一組指令。

❸ ____ help(s) us ____.

例句：Selection structures **help us** execute different sets of instructions.

選擇結構幫助我們執行不同的指令集。

❹ Base on _____.

例句：**Based on** certain conditions, Selection structure of the program will execute different things.

根據特定條件，選擇結構的程式會執行不同事情。

❺ ____ is essential for _____.

例句：A clear mind **is essential for** writing a program.

清楚的頭腦對寫程式是必要的。

■ 對話 Dialogues

對話一 Dialogue 1

Student:	Hi, teacher, I'm a little bit confused about the different structures of a program. Can you explain the difference between sequence, repetition, and selection?
Teacher:	Sure. Sequence is the most basic type of programming structure, where instructions are executed one after another in a predetermined order. Repetition is used to repeat a set of instructions multiple times until the certain condition is matched. Selection structure is used to execute different sets of instructions depending on true or false conditions.
Student:	I see. Can you give me an example of each type of structure?
Teacher:	Sure. For example, we want to create a program that counts from 1 to 10, it would be a sequence structure. The instructions can be executed in order without any repetition or selection.
Student:	Okay. I got it. How about repetition structure?
Teacher:	Repetition would be used if we want to count from 1 to 10 repeatedly. For example, we can use the "repeat" block in Scratch to repeat the sequence of counting from 1 to 10 a certain number of times.
Student:	That makes sense. And how about the selection structure?
Teacher:	A selection structure would be used if we want to count from 1 to 10, but only if a certain condition is matched. For example, we can use the "if" block in Scratch to check if a certain variable is equal to a certain value. However, it can execute the counting sequence if the condition is true.
Student:	I think I understand now. Teacher, thanks for explaining this.
Teacher:	You are welcome. Don't hesitate to ask me if you have any questions.

學生： 嗨，老師您好。我對程式設計的不同結構有點困惑。您可以解釋一下循序結構、重複結構和選擇結構之間的區別嗎？

老師： 當然可以。循序結構是最基本的程式設計結構，指令會按照預定的順序，一個接著一個執行。重複結構是用於重複執行一組指令，直到條件符合為止。選擇結構則是用於根據條件的真假執行不同的指令。

學生： 我明白了。您可以舉每個結構的例子嗎？

老師： 當然。比如，如果我們想要建立一個從 1 數到 10 的程式，那就是一個循序結構。指令會按照順序執行，不會有任何重複或選擇。

學生： 好的。我明白了。那重複結構呢？

老師： 如果我們想要重複從 1 數到 10 的動作多次，就可以使用重複結構。例如，我們可以在 Scratch 程式中使用「重複」區塊，來重複執行從 1 數到 10 的指令多次。

學生： 我懂了。那選擇結構呢？

老師： 如果我們想要從 1 數到 10，但只在滿足某些條件下執行，就可以使用選擇結構。例如，我們可以在 Scratch 程式中使用「如果」區塊，檢查某些變量是否等於其值量。但是，選擇結構，只有在條件成立時，才能執行從 1 數到 10 的指令。

學生： 我想我現在明白了。老師，謝謝您的解釋。

老師： 不客氣。如果你有任何問題，隨時可以問我。

國內外參考資源 More to Explore

自造教育及科技輔導中心 這個網站以創新教育為主題，提供高級中等以下學校的教育資源，並透過系列課程、競賽專區及線上微課程等功能，推動教育界探索未來教學的新視野與可能性。 https://tech.k12ea.gov.tw/	
能源教育資源總中心 國中機構結構與能源相關教學活動的分享內容，包含木工製作、機械結構與動力實驗等範例 https://learnenergy.tw/index.php?inter=digital&caid=1&id=295	
高雄市教育局國民教育輔導團-高雄國民教育各學科領域專頁 匯集高雄國民教育各學科領域的專頁資訊，提供多元學科資源及社群連結，方便教師和學習者快速找到相關支持與交流平台。 https://reurl.cc/M6yNan	

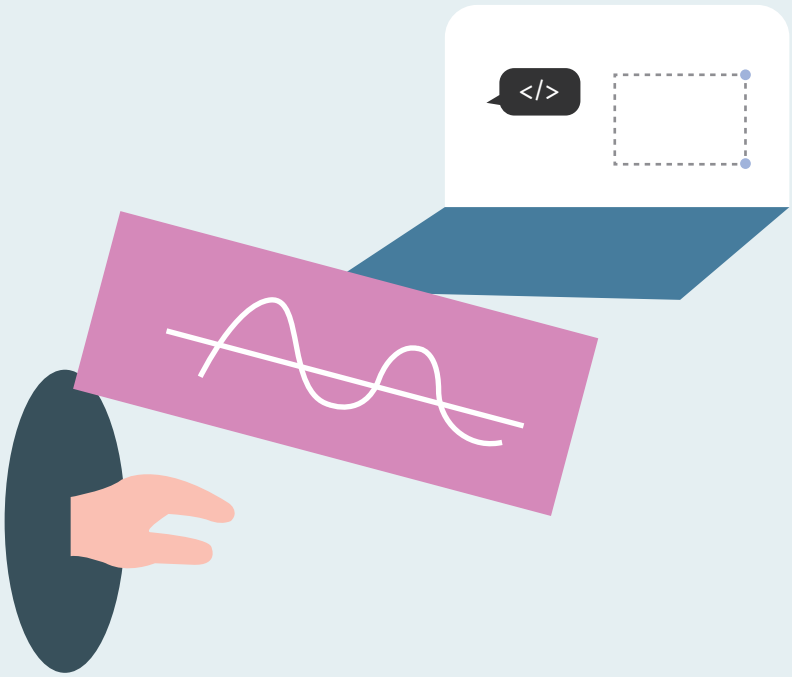
國中科技領域雙語教學資源手冊: 資訊科技英語授課用語

[七年級]

A Reference Handbook for Junior High School Bilingual Teachers in the Domain of Technology (Information Technology): Instructional Language in English

[7th grade]

- 研編單位：國立高雄師範大學全英語與雙語教學推動中心
- 指導單位：教育部師資培育及藝術教育司
- 撰稿：劉峻維、曾士軒
- 語言諮詢：楊惠婷、史懷恩(SCHUTTE WAYNE)
- 綜合規劃：李翠玉
- 編輯排版：吳依靜
- 封面封底：JUPE Design



發行單位　高師大全英語與雙語教學推動中心
NKNU EMI AND BILINGUAL EDUCATION CENTER

指導單位　教育部師資培育及藝術教育司
MOE DEPARTMENT OF TEACHER AND ART EDUCATION