教案 Lesson Plan

<table>
<tr><td colspan="2">教學單元
Teaching lesson</td><td>Permutations 、Combinations</td><td>授課教師
Teacher</td><td>洪宜慧</td></tr>
<tr><td colspan="2">教學時間
Teaching time</td><td>50min</td><td>教學對象
Class</td><td>510</td></tr>
<tr><td rowspan="4">教學研究 Teaching research</td><td>教學理念
Teaching Philosophy</td><td colspan="3">1. 課室雙語及專有名詞融入教學
2. 利用生活實例融入教學
3. 雙語課堂配合分組討論，降低學生焦慮
4. 雙語課堂需要報告，使學生可以自然說出專有名詞</td></tr>
<tr><td>教學目標
Teaching objectives</td><td colspan="3">1. 熟悉基本數學專有詞彙
2. 理解概念：Fundamental Counting Principle, Permutations, Factorial, Combinations
3. 可以理解概念之間的連貫性
4. 可以說出完整的算式
5. 在理解之後運用並順利解題
6. 學生可依據概念的連貫性設計題組</td></tr>
<tr><td>教學方法
Teaching methods</td><td colspan="3">1. ODIR 教學架構</td></tr>
<tr><td>評量方式
Evaluation methods</td><td colspan="3">1. Kahoot
2. 分組討論，在搶答計分
3. 回家作業：Padlet</td></tr>
<tr><td rowspan="2">教學活動 Teaching activity</td><td>具體目標
Specific goals</td><td>教學流程及內容設計
Teaching process and content design</td><td>時間
Time
(minutes)</td><td>教學資源
Teaching resources</td></tr>
<tr><td>Sentence patterns:
1. If there are m ways to make the first selection and n ways to make the second selection, then there are m × n ways to make the two selections. If a third selection with p choices is added, then</td><td>Lesson O:
實施雙語課程時，課前先將預習講義，完成 Vocabulary

Loop 1
Sub Orientation:
Kahoot 引起學生動機，增強學生完成課前預習單字的動機，各組積分賽</td><td>10min</td><td>kahoot</td></tr>
</table>

	there are $m \times n \times p$ to make all three selections, and so on 2. There are 3 choices for the first song, 2 choices for the second song, and 1 choice for the third song. 3. The number of different possible orders for the songs is 3! $3! = 3 \cdot 2 \cdot 1 = 6$ （three *factorial equals three times two times one equals six*） There are 6 different possible orders for the 3 songs. 4. $n! = n \cdot (n-1) \cdot (n-2) \cdot \ldots \cdot 2 \cdot 1$ N *factorial* equals n times n minus one times n minus two times, and so one, times two time one. 5. $P_r^n = \frac{n!}{(n-r)!}$ N pick r equals n *factorial over n minus r factorial.* 6. $C_r^n = \frac{n!}{r!(n-r)!}$ N choose r equals n *factorial over n minus r factorial times r factorial.*	Delivery(T): (teaching steps) 生活實例導入： EXAMPLE 1: Use the Fundamental Counting Principle，由樹狀圖帶入概念。 概念講解： Fundamental Counting Principle Sub Re-cap: 介紹完整嚴謹的 CONCEPT： Fundamental Counting Principle	15min	Ipad 及投影機
		Interaction（S/S）: 分組討論：Try it! Performance: 搶答：Try it!（＋3 points）	10min	射飛鏢計分
		Loop 2 Sub Orientation: 說明進入下一個主題 Permutations Interaction（T/S）: 問答方式，引導學生進入下一個概念 EXAMPLE 1: Find the Number of Permutations Method 1 Use an organized list. Method 2 Use the Fundamental Counting Principle. Delivery(T): (teaching steps) 概念解說：由 Method 2 Use the Fundamental Counting Principle.導入 factorial Sub Re-cap: 介紹完整嚴謹的 CONCEPT：factorial	15min	Ipad 及投影機