



高中數學雙語教學主題包

建構聽、說環境，打造舒適雙語教學環境

從課綱必修課程搭建通用雙語環境

雙語課程單元教案
Bilingual Education Unit Lesson Plan

單元主題 Topic	單元名稱 The Real Numbers, the Exponents and the Logarithms	科目名稱 Subject	教學 Mathematics
教材來源 Teaching Materials	高中一年級上學期 第一學期一冊	雙語課程 Designer	臺南市教育委員會編定
適用年級 Grade Level	高中一年級上學期	課程時間 Time	本單元共 12 課
教學設計理念 Design Concepts	以「生活情境」為起點，引導學生發現問題，再從生活經驗出發，理解數學的意義。		
學習核心素養 Core Competencies	<p>領域核心素養：能理解數學的意義，能理解數學的應用，能理解數學的價值。</p> <p>領域核心素養：能理解數學的意義，能理解數學的應用，能理解數學的價值。</p>		
學習表現領域 Subject Performance	<p>學習表現：能理解數學的意義，能理解數學的應用，能理解數學的價值。</p> <p>學習表現：能理解數學的意義，能理解數學的應用，能理解數學的價值。</p>		
學生先備知識 Student's Prior Knowledge	<p>先備知識：能理解數學的意義，能理解數學的應用，能理解數學的價值。</p> <p>先備知識：能理解數學的意義，能理解數學的應用，能理解數學的價值。</p>		

雙語教學教案共有 3 個主題，規劃完整的雙語教學課程設計，方便教師靈活使用，免去素材準備與大量備課時間，減輕教學壓力。

提供課綱必修課程的教學指引，從暖身、呈現、練習及應用、復習與字庫整理，循序漸進地使用跟理解雙語應用，達到沉浸式雙語教學環境。

5. The density of rational numbers. "There is a rational number that exists between any two distinct rational numbers."

Density of Rational Numbers

(3) There exists a rational number between any two distinct rational numbers.

(4) There are infinitely many rational numbers between two distinct rational numbers.

4. Review & Assessment

(1) 利用實數的定義，解答下列問題。

THE REAL NUMBER SYSTEM

1. This is the tree diagram of the real number system.

We know that real number can be subdivided to two subcategories which are rational numbers and irrational numbers.

Notice that irrational numbers can be subdivided to two subcategories: "irrational numbers".

There are three subcategories of real numbers which are integers, terminating decimal and non-terminating decimal.

5. Self Evaluation

請在下列「rational number (有理數)」, fraction (分數), numerator (分子), denominator (分母)。

Chapter 1-1.2 Algebra Formulas

Introduction

An algebraic formula is an equation or a rule written using mathematical and algebraic symbols and terms. It is an equation that involves algebraic expressions on both sides. The algebraic formula is a exact quick formula to solve complex algebraic calculation.

Vocabulary

cube of the sum difference $(a \pm b)^3$, a cube of sum $(a + b)^3$, a cube of difference $(a - b)^3$, square of the sum difference $(a \pm b)^2$, the term $(a \pm b)^2$, binomial $(a \pm b)$, function $f(x)$, function $f(x)$, expand $(a \pm b)^2$, simplify $(a \pm b)^2$, calculate $(a \pm b)^2$, coefficient (係數).

Cube formulas

The algebra formulas for two variables a , and b and for a maximum degree of 3 can be easily derived by multiplying the expression by itself, based on the exponent value of the algebraic expression.

For two real numbers a and b ,

(1) Cube of the Sum Difference: $(a \pm b)^3 = a^3 \pm 3a^2b + 3ab^2 \pm b^3$

(2) Same Difference of Two Cubes: $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

Try to multiply algebraically the expression and find the formula.

2.3 Expand $(a - b)^3$.

搭配雙語學習單輕鬆檢核學習成果，搭配雙語教材最好上手。

雙語教學教材採中英對照，單字表、發音一應俱全

雙語教學 高中數學
Chapter 01 - 1

THE REAL NUMBERS

Presented by Po-Hsuan Wu

因應 2030 雙語政策，與一線優秀教師合作開發雙語化教學教材，適切的中英雙語教材，可針對性的加強學生聽、說能力的培養。

description

有理數的描述 **terminating decimal**

有理數 $\frac{m}{n}$ 可化成整數、有限小數或循環小數；反之，整數、有限小數或循環小數都是有理數。

density

有理數的稠密性 **distinct**

任意兩個相異有理數之間，都至少可找到一個，乃至於無限多個有理數。

distinct

infinitely many

VOCABULARY 2

terminating decimal 有限小數

density 稠密的

distinct 相異

infinitely many 無限多個

non-terminating and non-recurring decimal 不循環的無限小數

雙語教學教材採中英對照，並附有常用單字表與英文音檔，大幅縮減老師準備教材時間。

公式

(1) $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$ **Cube of the Sum (和立方)**

(2) $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$ **Sum of Cubes (立方和)**

(1) $(a + b)^3 = (a + b)(a + b)^2$

$= (a + b)(a^2 + 2ab + b^2)$

$= a^3 + 2a^2b + ab^2 + ba^2 + 2ab^2 + b^3$

$= a^3 + 3a^2b + 3ab^2 + b^3$

Factor out $(a + b)$

by square of the sum

by the distributive law

combine like terms