

108 年普通高級中學海洋教育資源中心
綠階/初階海洋教育者培訓課程教案設計

教案名稱	拯救桃園藻礁 Save Algae Reefs in Taiwan	設計者名稱	教師一：鄭錚易	
教學對象	中學(含高中職)		教學領域 (科目或名稱)	語文領域-英語文
教學資源	教學簡報 ppt, 學習單, 文本,		教學時數	3 節課 - 150 分鐘
教學理念	利用桃園在地自然環境：『桃園藻礁』連結學生生活經驗(旅遊)讓學生有感以簡介獨特的藻礁及其消失的危機；在課程的最後利用國際線上課程與外國學生交流報告介紹在地自然環境：『桃園藻礁』且嘗試找出解方作為總結性評量，以達到真實生活的連結與遷移。			
教學對象分析	較少接觸以海洋為主題的相關課程，對於海洋主題課程的先備知識與經驗較不足			
十二年國教課綱	海洋教育實質內涵		本教案學習目標	1. 能利用英語閱讀技巧(預測, 略讀, 掃描, 推論辨別文章結構..)以理解文章並評估不同資訊提出合理判斷與建議 2. 能依主題寫出並說出語意連貫且條理分明的
	海 U3 了解近海景觀與生態旅遊。			
	海 U18 了解海洋環境污染造成環境累積的後果，並嘗試提出因應對策。			
領域學習重點				

	<p>學習表現：</p> <p>1-V-10 能聽懂以英語說明或敘述的主要內容。</p> <p>2-V-10 能依主題說出語意連貫且條理分明的簡短演說、簡報或說明。</p> <p>3-V-13 能利用各種閱讀技巧進行快速閱讀並有效應用於廣泛閱讀中。</p> <p>4-V-8 能依提示寫出符合主題、語意連貫且組織完整的段落或說明。</p> <p>6-V-7 能積極以英語文為工具，探索新知並關注環境議題。</p> <p>9-V-7 能評估不同資訊，提出合理的判斷或建議。</p> <p>學習內容：</p> <p>Ae-V-9 不同體裁、不同主題之文章。</p> <p>B-V-7 符合情境或場景的自我表達與人際溝通。</p> <p>D-V-7 不同資訊 的評估，及合 理判斷或建議的提供。</p>		<p>簡短演說</p> <p>3. 能認識藻礁獨特的構成及其對環境的重要性</p> <p>4. 能引發對保護環境的意識並嘗試找出保護或減緩污染破壞的方法/採取具體行動</p>	
對應教學目標	教學活動流程 (數量可自行調整)	時間	教學資源	教學評量
1,2,3	<p>第一堂課/活動一名稱：介紹桃園藻礁</p> <p>文本 1: Guanxin algal reef (請見附錄)</p> <p>文本 2: It is time to shout for Taoyuan' s algal reefs (請見附錄)</p> <p>(1) 暖身活動: 影片 & 焦點討論法 ORID</p> <p>影片: https://www.youtube.com/watch?v=zrl7117-KT0</p> <p>問題: What do you see? How do you feel? Why is this place in danger? What can you do to help this situation?</p> <p>(2) 文本閱讀: 藻礁介紹 / 消失危機原因</p> <p>問題: What is algae reef? Why is it special? What causes its disappearance? What action did people in Taoyuan take?</p> <p>(3) 國際線上課程交流報告準備:</p> <p>I. 評分規準說明 (請見附錄) 報告長度四分鐘內</p> <p>II. 異質性分組四人一組 (工作分配說明)</p> <p>III. 上網搜尋藻礁相關資料並初擬簡報以及報告內容</p> <p>問題: How will you introduce algae reefs in your hometown to your friends?</p>	50 分鐘	影片，學習單 文本	學習單 學習單

3,4	<p>第二堂課/活動二名稱：藻礁生態環境教室導覽解說 桃園市政府海岸管理工程處線上預約 https://tyocaclass.tw/course.php?id=Cs4ae76663e146349067c9081487432472</p> <p>(1) 填寫學習單 (2) 拍照並完成線上交流課程報告內容</p>	60 分鐘	學習單	
2,3,4	<p>第三堂課/活動三名稱：國際線上交流課程準備 分組介紹桃園藻礁</p> <p>(1) 抽籤順序報告 (2) 成績: 教師評分 50% / 學生互評 50% (3) 各組分享評語 (4) 分工任務分配表以及評分表計算成績 (5) 後選出三組於國際線上交流課程分享</p>	50 分鐘	評量規準	報告內容 &評量規準

★表格若不敷使用，請自行增刪。

★填完後請寄至臺灣海洋教育中心張瑋倫小姐信箱 vera7197@email.ntou.edu.tw。

★後續將寄送審查建議，請參考建議後修正後回傳，完成綠階/初階海洋教育者資格。

附錄

文本 1: Guanxin algal reef

When we talk about reefs, a coral reef usually comes to mind, such as the world-famous Great Barrier Reef in Australia. In Taiwan, there is a different kind of reef that is just as valuable and rarely seen elsewhere in the world. This spectacular sight is the Guanxin algal reef along the coastline of Taoyuan City.

Different from coral reefs, which are formed by tiny marine animals, the algal reef is composed of rocky structure formed by marine algae, a type of plant. The algae grows extremely slow – about 0.1 cm a year, compared to coral reef’s 1-10 cm per year. According to an estimate by local experts, it took 6,000-7,000 years for the Guanxin algal reef to grow to today’s size. Therefore, it is a very precious ecological wonder. The reef looks quiet at daytime, but it becomes lively and energetic after sunset with thousands of crabs, fish, and a number of threatened or endangered species emerging from the porous reef structure.

There used to be more than 20 km of algal reefs along the coastline of Taoyuan. Unfortunately, due to waste water pollution from the plants in the nearby industrial park, most algal reefs have died except the 4-km area in Guanin and Xinwu districts. That’s how Guanxin algal reef got its name. Many local environmental groups and NGOs are urging the government to recognize the algal reef’s distinctiveness and put it on the natural reservation list. “The algal reef in Taoyuan is an ecosystem that’s very new to science, and so far we know so little about it,” said a research fellow with Academia Sinica, Taiwan’s most prestigious research institute.

Taiwan has so many treasures hidden in plain sight. We should cherish them and protect them so as to leave a beautiful environment for the generations to come.

文本 2: It is time to shout for Taoyuan' s algal reefs (Taipei Times)

Stretching for 27km, the Taoyuan coastline, draped in sand dunes, is home to a unique shallow-water algal reef ecosystem.

Unlike the colorful coral reefs commonly found in warm, tropical waters, the porous algal reefs look dark in summer and turn red in winter. This relatively unknown paradise for exploration has excited many scientists.

Geological research shows that the formation of the reefs 7,500 years ago was a coincidence. When ice age glaciers began to fade 12,000 years ago, it took nearly 5,000 years for the sea level to rise 120m to its current level, swallowing up the Taiwan Strait.

At that time, hermatypic — reef-building — coral arrived on the coast of Taoyuan from warmer, southern waters, adhering to stones washed down from Dahan Creek (大漢溪).

With crustose coralline red algae serving as an adhesive, the reefs slowly stacked up. Later, as temperatures dropped again during the Little Ice Age of the northern hemisphere 4,400 years ago, along with an increase in sand deposits, the seawater was no longer warm and clear.

As a result, the original coral species that contributed to the formation of the reef complexes could no longer survive, leaving the crustose coralline red algae to build reefs, which eventually lead to the distinctive ecological landscape along Taoyuan' s sand dune coast.

Due to industrial pollution and habitat destruction, most algal reefs have disappeared or stopped growing. Unfortunately, the most well-preserved reefs in the Datan (大潭) area of Taoyuan' s Guanyin District (觀音) are also doomed to disappear from Taiwan and the world once CPC Corp builds its planned tanker port there for Taiwan' s third liquefied natural gas (LNG) receiving terminal.

For more than two years, more than 50 scientists and countless citizen scientists have worked night and day to collect data, defying strong winds and heavy rain.

Together, they completed in just nine months research that would normally take three years, proving that the Datan algal reefs are in top condition and have great biodiversity.

Based on this evidence, the scientists have made every effort tell the government that Datan' s algal reefs must not cease to exist due to mistaken policies, opaque environmental impact assessments (EIA) and the authorities in charge shirking their responsibility to conserve the algal reefs.

They have urged the government to leave the reefs intact for future generations.

However, an arrogant EIA meeting chairman, ruthless authorities and cold-hearted politicians have completely ignored the data collected by scientists at the risk of their own lives, choosing instead to rely on an ethereal national development discourse to send the reefs to the scaffold.

Last year, a then-15-year-old Swedish schoolgirl, Greta Thunberg, began what has become the “Fridays for Future” school strike against climate change, an outcry against hypocritical adults dealing with climate issues by saying one thing and doing another.

Her Earth protection campaign has been causing huge waves across the continents.

As Thunberg has said: “Why should I go to school when politicians don' t even listen to scientists?”

By replacing Thunberg' s target with algal reefs, the question would be: Why should people believe in the government' s conservation work when politicians do not even listen to scientists?”

評分規準

Scoring Rubric for Oral Presentations:

Content-algae reefs 50%	5	4	3	2	1	0
-importance						
-the situation (cause / effect of pollution)						
Language skills 30%	5	4	3	2	1	0
-correct usage						
-appropriate vocabulary and grammar						
-understandable (rhythm, intonation, accent)						
-spoken loud enough to hear easily						
Visual Aids 20%	5	4	3	2	1	0
-transparencies, slides						
-handouts						
-audio, video, etc.						

Comments: