

自然領域教學單元案例

領域	自然科學領域		設計者	陳美卿、林雨慶、林怡伶
實施年級	六年級		總節數	2
單元名稱	第二單元活動 3 炎熱地區的房屋建築		教材來源	南一版
教學內容				
第一節	窗戶的採光、通風和隔熱			
第二節	房屋建築的設計和熱			
設計依據				
學習重點	學習內容 Learning content	INa- III -8 熱由高溫處往低溫處傳播，傳播的方式有傳導、對流和輻射，生活中可運用不同的方法保溫與散熱。	核心素養 Essential literacy	自 -E- B2 能了解科技及媒體的運用方式，並從學習活動、日常經驗及科技運用、自然環境、書刊及網路媒體等，察覺問題或獲得有助於探究的資訊。
	學習表現 Learning behavior	ah- III -1 利用科學知識理解日常生活觀察到的現象。		
跨域連結	英文領域			
學習目標 Learning objectives	<p>By the end of the course, students will be able to</p> <p>3-1 能區別百葉窗裝在室外和室內的區別。 Identify the differences between setting louvre outside or inside.</p> <p>3-2 能由節能屋的建築設計探討房屋隔熱、通風的方法。 Discuss the ways of house insulation and ventilation by energy-saving buildings' designs.</p>			
教學設備／資源 Teaching aids/ sources	<p>Videos</p> <p>[What is green building?] (0:00-0:45')</p> <p>https://www.youtube.com/watch?v=MyI0tsx3wDs</p> <p>Saving Energy Around The Home - Energy Efficiency Tips</p> <p>https://www.youtube.com/watch?v=pY6fAYkscTY</p> <p>10 Ways to Save Electricity at Home</p> <p>https://www.youtube.com/watch?v=YhPTaS9c2ec</p>			
語言學習目標	Language <i>of</i> learning			
	lighting(採光)、ventilation(通風)、choke(阻風)、curtain (窗簾)、blind(百葉窗、窗簾)、 shutter(百葉窗、活動遮版)、shading equipment(遮陽設備)、louvre(百葉門、百葉窗)、Solar photovoltaic panels(太陽能光電板)、Insulation(隔熱)、corridor(走廊)、heat dissipation(散熱)			
	Language <i>for</i> learning			

The air conditioner is the application(應用) of convection and conduction.

教學活動設計 Teaching activities design			
教學目標 Teaching objectives	主要問題與引導 Main questions and guides	時間 time	評量重點 Evaluation points
Ss understand How can we do to adjust the sunshine amount that shine into the houses	3-1 窗戶的採光、通風和隔熱 windows' lighting, ventilation and choke 【Engage 參與】 ◇ 門窗具有採光、通風和阻風等功能 Doors and windows' functions are lighting, ventilation and Choke ◇ 怎麼做可以調節陽光照入屋內的量呢? 可以加窗簾、百葉窗等等 How can we do to adjust the sunshine amount that shine into the houses? We can put/ add window curtains and blind/shutter	3'	Ss can think and discuss How can we do to adjust the sunshine amount that shine into the houses
	【Explore 探索】【Explain 解釋】 ◇ 窗面加裝的遮陽設備，具有什麼特殊功能? 百葉遮陽設施除了遮陽外，還兼具通風的效果； 一般窗簾僅可遮陽，不大通風 What special functions do these extra shading equipments have for windows? Louvre equipments have shade and ventilation effects. Normal curtains could only shade and not so good for ventilation	15'	Ss can think and discuss
Ss understand What special functions do these extra shading equipments have for windows	◇ 遮陽設備裝置在窗戶外側或內側，哪種方式對阻隔或減少太陽的光和熱進入室內的 效果 比較好?為什麼? 室外百葉窗：遮擋了入射的陽光和熱 室內百葉窗：雖然擋住陽光，但光已進入玻璃窗內，熱也進入屋內了 →因此室外百葉窗比室內百葉窗阻隔陽光輻射熱更有效	15'	

<p>Ss understand what conditions should our building have to make people live more comfortable</p>	<p>→光進入室內，熱就一起帶入室內</p> <p>Which way is better for cutting off or reduce sunshine and the sun's heat get into indoors? Setting up shading equipments at outside windows or inside windows? Why?</p> <p>Outside louvre: it can shade sunshine and heat go into indoors</p> <p>Inside louvre: it can shade sunshine, but the heat gets to inside when the sunshine gets into the glass windows.</p> <p>→Hence outside louvres more effective than inside louvre</p> <p>→when light gets into indoors, the heat was brought inside, too.</p> <p style="text-align: center;">【Evaluate 評量】 Activity Book p.26</p> <p>3-2 房屋建築設計和熱 Building's design and heat</p> <p style="text-align: center;">【Engage 參與】</p> <p>◇ 想一想，要讓人們住的更舒適，我們的建築物應該具備什麼條件呢?</p> <ol style="list-style-type: none"> 1. 自然採光及通風：開設窗戶 2. 雨水回收：屋頂加裝雨水回收設備，可收集雨水再利用 3. 太陽能光電板：加裝於屋頂，可將光轉化為電力 4. 屋頂綠化：屋頂栽種植物可達到隔熱效果 <p>Think about it: what conditions should our building have to make people live more comfortable?</p> <ol style="list-style-type: none"> 1. Natural lighting and ventilation: set windows 2. Rain recycling: add rain recycling equipments on the roofs can recycle the rain water and reuse it 3. Solar photovoltaic panels: set this on the roofs can turn lights into electricity 4. Environmental greening: growing plants on the roofs can have insulation effects <p>◇ [What is green building?] (0:00-0:45')</p> <p>https://www.youtube.com/watch?v=MyI0tsx3wDs</p>	<p>7'</p> <p>5'</p>	<p>Ss can complete assessment</p> <p>Ss can think and discuss</p>
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<p>Ss understand What buildings' designs can cool down the indoors</p>	<p style="text-align: center;">【Explore 探索】【Explain 解釋】</p> <p>◇ 有走廊和百葉式外牆的建築設計，具有什麼功能呢？ 可以阻擋陽光直接照射室內，並可達到通風、散熱的效果</p> <p>What functions do the buildings which are with corridors and louvres designs have?</p> <p>They can shade sunshine shine into indoors directly, also they can ventilate and dissipate heat.</p> <p>◇ 有遮陽設備的建築設計，對氣候溼熱地區的房子有哪些幫助？ 遮陽板、屋頂栽種植物可以避免陽光直接曝曬，達到隔熱和散熱的效果</p> <p>What helps do buildings with shading equipment design have for houses in humid areas?</p> <p>Sunshading boards and plants grown on the roofs can avoid exposing to strong sunshine in order to have insulation and heat dissipation effects</p> <p>◇ 在溼熱的台灣，有哪些建築設計可以使屋內較為涼爽舒適？ 窗戶、旋轉風扇、百葉型通風塔等等</p> <p>In Taiwan, it is humid and hot. What buildings' designs can cool down the indoors?</p> <p>Windows, rotating fan, ventilation tower with louvres designs</p> <p>◇ Saving Energy Around The Home - Energy Efficiency Tips https://www.youtube.com/watch?v=pY6fAYkscTY</p> <p>◇ 10 Ways to Save Electricity at Home https://www.youtube.com/watch?v=YhPTaS9c2ec</p> <p style="text-align: center;">【Evaluate 評量】 Science Reading P.54-55</p>	<p>20'</p> <p>5'</p> <p>10'</p>	<p>Ss can think and discuss</p> <p>Ss can complete assessment</p>
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