

# ■ 跨 領 域 美 感 課 程 教 學 方 案 ■

南 區 / 國 立 東 石 高 級 中 學

<b>學校名稱</b>	國立東石高級中學		
<b>團隊成員</b>	林建勳老師(英文)、林巖郡老師(美術)		
<b>跨領域學科</b>	英文	<b>藝術學科</b>	美術
<b>教學對象 先備能力</b>	<p>教學對象為高中部三年級學生。</p> <ol style="list-style-type: none"> <li>大部分學生為中等英文程度，簡單聽說能力及短文閱讀能力沒問題。</li> <li>學生之前已上過美術老師的課，該班學生創作能力不錯。</li> </ol>		
<b>跨領域 美感課程 實施模式</b>	<b>【實施模式】</b>		
	<ol style="list-style-type: none"> <li>傳統的英文課程大多由老師用課本進行教學講解,學生學習意願較低。這次英文課程主要在每次造窯前花些時間，就當天上課造窯所需詞彙做解釋並於操作時重複練習。 為了加深同學印象,每次造土窯過程中所用過的單字及用法都會請同學利用 quizlet 網站複習(網址請參考教學資源 8-10)。</li> <li>讓學生親手接觸土地，將土、沙、麥稈等混合成披薩窯所需土條。</li> <li>引導學生利用身邊可用材料，裝飾自己搭建的披薩窯，培養同學合作精神和展示設計之能力。</li> </ol>		
<b>跨領域 美感課程 應用 策略</b>	<b>【應用策略】(請勾選)</b>		
	<b>使用時機</b> <input type="checkbox"/> 課前預習 <input checked="" type="checkbox"/> 引起動機 <input type="checkbox"/> 發展活動 <input type="checkbox"/> 綜合活動 <input checked="" type="checkbox"/> 課後複習 <input type="checkbox"/> 其他	<b>教學策略</b> <input checked="" type="checkbox"/> 應用藝術素材之問題導向教學 <input type="checkbox"/> 虛擬實境之情境教學 <input type="checkbox"/> 網路資源之體驗學習教學 <input type="checkbox"/> 應用藝術類數位典藏資源之探究式教學 <input checked="" type="checkbox"/> 合作學習式教學 <input checked="" type="checkbox"/> 專題討論式教學 <input checked="" type="checkbox"/> 協同教學 <input checked="" type="checkbox"/> 創造思考教學 <input type="checkbox"/> 其他	<b>評量模式</b> <input checked="" type="checkbox"/> 學習單 <input type="checkbox"/> 試題測驗 <input type="checkbox"/> 遊戲評量 <input type="checkbox"/> 專題報告製作 <input type="checkbox"/> 展演實作 <input type="checkbox"/> 影音紀錄 <input checked="" type="checkbox"/> 其他

課程架構 與跨領域 課程設計 概念	目標	<ol style="list-style-type: none"> <li>1. 透過「造窯」活動,學會披薩窯搭建時相關英文詞彙及用法。</li> <li>2. 讓學生親手接觸土地,將土、沙、麥稈等混合成披薩窯所需土條,並完成披薩窯搭建。</li> <li>3. 運用不同素材進行披薩窯美化。</li> <li>4. 培養獨自或與他人合作進行美術的探討與實作。</li> </ol>			
	時間	七節課			
	主要教學活動	<ol style="list-style-type: none"> <li>1. 搭建披薩窯基座及蓄熱層。</li> <li>2. 完成鋪設耐火磚、沙模、保溫層及隔熱層。</li> <li>3. 窯體裝飾。</li> <li>4. 烤製披薩。</li> </ol>			
	教學策略	分組活動			
<b>教學計畫</b>					
單元名稱	造窯生飾				
教學總時數	7 小時	實施班級數	2	學生數	80
實施情形	實施時間:2017 年 3 月至 5 月期間 利用課程時間: 英文課及美術課				
設計理念	希望透過實際搭窯的過程,將英文應用到日常生活中,並將美感元素融入,來美化窯的外觀,也引導學生仔細觀察自己生活周遭的事物,有些表面上看來不起眼常常丟棄的東西,經過巧思,加入人的溫度後,也可成為美的事物。				
藝術概念與美感元素	裝置藝術、視覺傳達、美的形式原理				
教學方法	講述法、實作				
教學資源	<ol style="list-style-type: none"> <li>1. <a href="https://www.permaculture.co.uk/articles/simple-art-making-earth-oven">https://www.permaculture.co.uk/articles/simple-art-making-earth-oven</a> The Simple Art of Making an Earth Oven</li> <li>2. <a href="http://www.instructables.com/id/Build-Your-Own-Earth-Oven/">http://www.instructables.com/id/Build-Your-Own-Earth-Oven/</a> Build Your Own Earth Oven</li> <li>3. <a href="http://www.handprintpress.com/wp-content/uploads/2014/02/BYOEO.lkinside1.pdf">http://www.handprintpress.com/wp-content/uploads/2014/02/BYOEO.lkinside1.pdf</a> Build your own earth oven</li> <li>4. <a href="https://www.youtube.com/watch?v=SFuGzhPxfE">https://www.youtube.com/watch?v=SFuGzhPxfE</a> How to Build a Cob Oven - Part One</li> </ol>				

	<p>5. <a href="https://www.youtube.com/watch?v=m7Ym01q_Mcg&amp;t=12s">https://www.youtube.com/watch?v=m7Ym01q_Mcg&amp;t=12s</a> How to Build a Cob Oven - Part Two</p> <p>6. <a href="https://www.youtube.com/watch?v=Wa84y0Le4QI">https://www.youtube.com/watch?v=Wa84y0Le4QI</a> How to Build a Cob Oven - Part Three</p> <p>7. <a href="http://pinkbird.org/w/How_to_construct_a_pizza_oven_dome_out_of_cob">http://pinkbird.org/w/How_to_construct_a_pizza_oven_dome_out_of_cob</a></p> <p>8. <a href="https://quizlet.com/203982410/words-and-expressions-needed-when-building-a-cob-oven-1-flash-cards/">https://quizlet.com/203982410/words-and-expressions-needed-when-building-a-cob-oven-1-flash-cards/</a></p> <p>9. <a href="https://quizlet.com/203987597/words-and-expressions-needed-when-building-a-cob-oven-2-flash-cards/">https://quizlet.com/203987597/words-and-expressions-needed-when-building-a-cob-oven-2-flash-cards/</a></p> <p>10. <a href="https://quizlet.com/203989231/words-and-expressions-needed-when-building-a-cob-oven-3-flash-cards/">https://quizlet.com/203989231/words-and-expressions-needed-when-building-a-cob-oven-3-flash-cards/</a></p>		
<b>教學目標</b>			
<b>單元目標</b>	<ol style="list-style-type: none"> <li>學會用簡單的材料搭建披薩窯。</li> <li>學會跟搭設披薩窯相關的英文詞彙及用法。</li> <li>學會用生活周遭的物品美化披薩窯。</li> </ol>		
<b>具體目標</b>	<b>能力指標／核心素養</b>		
<ol style="list-style-type: none"> <li>認識搭建披薩窯所需材料特性及英文發音</li> <li>了解披薩窯搭建的步驟。</li> <li>設計並完成各小組的視覺創作</li> <li>認識不同素材的創作。</li> <li>學習運用美感經驗與素描概念延伸至窯的外觀美化。</li> </ol>	<p><b>英文部分</b></p> <p>A-2-1 有效連結學生的新舊知能或生活經驗，引發與維持學生學習動機。</p> <p>A-2-2 清晰呈現教材內容，協助學生習得重要概念、原則或技能。</p> <p>A-2-3 提供適當的練習或活動，以理解或熟練學習內容。</p> <p>A-2-4 完成每個學習活動後，適時歸納或總結學習重點。</p> <p><b>美學部分</b></p> <ol style="list-style-type: none"> <li>分組探討不同素材的特性並討論出創作的主题與內涵。</li> <li>運用素材的特質，研究表現的技法進行創作。</li> <li>培養多面向的美學概念與其他領域的關係。</li> </ol>		
<b>課程架構</b>			
<b>節次</b>	<b>課程名稱</b>	<b>教學重點</b>	<b>教學工具</b>
1-2	披薩窯基座製作	基座搭建、蓄熱層完成	廢棄磚、水泥塊土、沙、麥桿及玻璃瓶
3-4	披薩窯窯體製作	鋪設耐火磚、堆沙模、完成窯體	耐火磚、土、沙、及麥桿
5	窯體美化	美化窯體	土、沙

6-7	燒烤披薩	燒窯、製作免揉麵糰、烤披薩	麥稈、枯枝、製作麵糰相關材料、配料				
<b>教學流程</b>							
節次	活動	時間	藝術媒介 藝術資源	藝術概念 美感元素	跨領域 策略	評量模式	備註
1-2	披薩窯基座製作	100 分鐘				線上測驗	解說
3-4	披薩窯窯體製作	100 分鐘					實作
5	窯體美化	50 分鐘					實作
6-7	Pizza Party	100 分鐘					實作
<b>教學省思與建議</b>							
<b>教學省思</b>							
<ol style="list-style-type: none"> <li>1. 此教案主體課程為英文，上課基本上以英文為主，但大部分時間都在戶外，所以強調在英文聽與說上面。在搭窯過程中可與學生做簡單對話，雖然時間有限，但因上課地點在戶外，所以學生感覺較不害怕說英文！</li> <li>2. 披薩窯需要大量的沙及土，因學生較不適合上課時間外出，所以大部分材料需要老師利用課餘時間準備。以此次為例，搭建一個底座直徑 110cm 高度約 60cm 的窯約需 1/3 滿布袋約各 10-15 個，建議老師若要搭建需要找其他老師幫忙準備上述材料，以免受傷。</li> </ol>							
<b>建議</b>							
<ol style="list-style-type: none"> <li>1. 雖然用廢棄材料來搭建基座，但若是學校沒有的話，可能就必須思考用其他材料來取代，如空心磚，廢輪胎等。</li> <li>2. 黏土可用底層土取代，但要注意沙與土的比例約 2-3:1, 否則窯體容易裂開。</li> <li>3. 製作窯體所需土條，網路上通常是用踩土方式，若是班上同學只有少部分同學願意踩土，可每人分固定比例的沙及土，請同學用手揉方式製作土條。</li> </ol>							
<b>教學研發成果</b>							
<div style="border: 1px solid black; padding: 5px; display: inline-block;"><b>學習單</b></div>							
<h2 style="margin: 0;">How to Build a Cob Oven</h2> <p style="margin: 0;">Cob is an earthen building material that is made of clay, sand, straw, and water. It has been used for thousands of years to construct homes and buildings. It has been used worldwide, but has only recently started to attract interest from Western countries. Cob has its origins in millennia of traditional building, in some of the oldest permanent human dwellings. Humans have made shelters this way for so long that we may carry a genetic memory of how to do it.</p>							

To experience what our ancestors had done with cob, today we are going to use “COB” to build our own pizza oven.

The materials we need are:

- Sand (used to reduce shrinking)
- Clay (subsoil) (used to bond the sand and straw into an indivisible monolithic system)
- Straw ( used to connect the cob to the wall preventing the clay from flaking and provide strength against pulling forces)
- Wasted bricks and cement lumps (serve as the foundation of the pizza oven)
- Tarps (used to stomp mix of clay and sand)
- Fire Bricks (unlike ordinary bricks, they don't split in the heat of the fire)
- Water (used to moisten the clay/sand mix during the stomp)
- Wine Bottles (placed down to form a perfect insulating layer below the fire bricks)
- Newspaper (served as a layer between the sand form & the first layer of clay so that you know when to stop digging out your sand so you don't accidentally gouge your oven wall)

With these materials, we can build our own pizza oven. But before that, we have to decide how big our oven will be. If you would like to build your own oven, you may choose the one you like from the given table. Today, we are going to build an oven that is about 110cm in diameter.

### **Here are the steps to build our own cob oven.**

**Step 1 Build a foundation** with the bricks and concrete lumps which seem useless .

#### **Step 2 Insulate the Oven Floor**

First, mix sifted clay(1 part) and dry sand (2-3 parts) together then add water to obtain a cookie dough consistency. Do some treading with your feet so the mixture can gradually come together. Do not mix the cob with covered feet. It is easier and

faster to mix barefoot. Doing this can also help you check if the mixture has reached the desired texture.

You can use the tarp to roll the drier mixture onto the wetter mix; continue stomping while adding water until the mixture turns sticky and stiff.

Next, add straw. If the mixture is wetter than expected, use dry straw to counteract the problem and soaked straw otherwise. Add as much straw as possible and continue to fold the pile with the tarp.

Note: The drier the cob mixture, the better. Wet mixture will collapse due to its own weight.

### **Step 3 Build the Oven Floor and Form the Sand Dome (about 41cm)**

### **Step 4 Build the Thermal Layer and Let Dry for a few days**

Cover the sand dome with wet newspapers and start applying cob to build oven walls.

### **Step 6 Cut a Door and Build the Insulation Layer**

### **Step 7 Let the oven dry for a few days, then pull out the sand**

### **Step 8 Sculpt your oven as desired**

### **Step 9 Let your oven dry out completely & then have a pizza party**

We can build a series of small fires over time to assist in drying it out faster.

Watch the clips to know more about how the steps to build a cob oven

1. <https://www.youtube.com/watch?v=u5tpFkBQqIE>
2. <https://www.youtube.com/watch?v=SFuGzhPxofE> How to Build a Cob Oven - Part One
3. [https://www.youtube.com/watch?v=m7Ym01q\\_Mcg&t=12s](https://www.youtube.com/watch?v=m7Ym01q_Mcg&t=12s) How to Build a Cob Oven - Part Two
4. <https://www.youtube.com/watch?v=Wa84y0Le4QI> How to Build a Cob Oven - Part Three

## Worksheet for the project “Build Your Own Cob Oven”

**Class:      No:      Name:**

1. What kind of oven are we going to build?
  - a. A solar oven    b. A cob oven    c. A brick oven    d. A concrete oven
  
2. When did human begin to use cob to build houses?
  - a. 100 years ago.    b. 500 years ago.    c. 1000 years ago.    d. thousands of years ago.
  
3. What is Cob made up of? (multiple choices)
  - a. Clay    b. sand    c. straw    d. water    e. wood    f. brick    g. concrete    h. paper
  
4. Why do we need sand in cob?
  - a. To reduce shrinking.    B. to moisten the cob    c. to build the foundation    d. to provide strength against pulling forces
  
5. What do we use to serve as a perfect insulating layer below the fire bricks?
  - a. Newspaper    b. tarp    c. straw    d. wine bottles
  
6. What do we use to form the dome of the oven?
  - a. Sand    b. newspaper    c. straw    d. earth
  
7. The second layer of the cob oven is called the \_\_\_\_\_ layer.
  - a. thermal    b. insulation

**8. Picture your ideal Cob Oven!**

**Reflections and suggestions for the project “Build Your Own Cob Oven”**

**Class:                      No:                      Name:**

**You can answer the following questions either in English or Chinese.**

- 1. Do you find the course interesting? Why? Or why not?**
  
- 2. What is the most interesting part of building the cob oven? Please give me some reasons about why you like it best.**
  
- 3. Ordinary things which seem useless at first sight, like sand, wasted concrete, straw, and soil, can be made into a cob oven. Does the activity give you some thought about making good use of what seems useless to you? Use your imagination to create something new with any commonly seen stuff in your life?(You can either explain it in written form or picture it.)**
  
- 4. The cob oven you make might get ruined by the rain. Please design a shelter for the oven so that it will last longer on campus.**



5. Do you have any suggestions for the teacher to make the course better?

#### 未來推廣計畫

1. 因窯體怕雨水，加上披薩窯附近有多種鳥類活動，所以可以再規劃用嘉義地區常見的搭蚵棚用的廢棄竹子，或其他材料，搭設兼具賞鳥及遮雨的空間。
2. 學校本來就有食品加工課程可以用來規劃烘焙課程。
3. 可結合美術課程捏陶課程，燒製裝飾用陶藝品。

#### 課程實施紀錄（教學照片 10 張加說明）



1. 搬運廢棄水泥塊



2. 完成基座



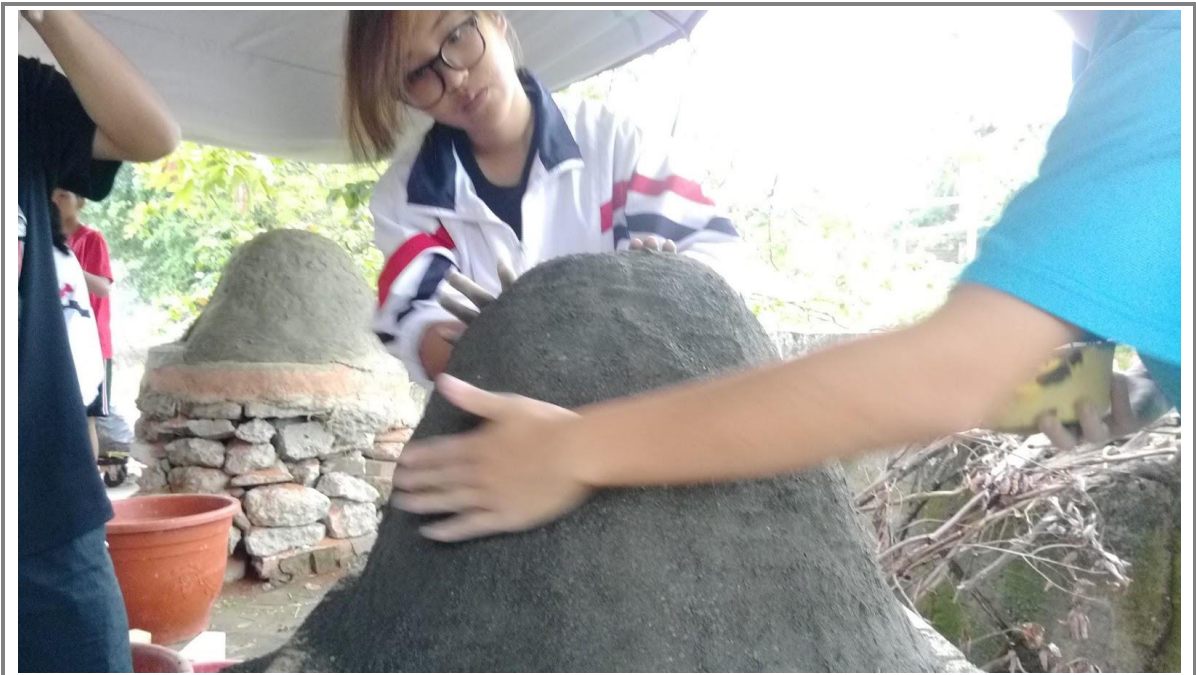
3. 土條製作 (鋪防火磚下方蓄熱層)



4. 蓄熱層玻璃瓶鋪設



5. 鋪設耐火磚 (注意水平) p.s.防火磚上黑色圈圈為沙模搭設的底部大小



6. 堆砂模



7. 鋪上濕報紙後，開始堆第一層蓄熱層(用手指將土壓實,不可用拍打方式避免出水)



8.堆第二層隔熱層(除了砂及土外加入麥稈)



9. 陰乾幾天後開窯門(高度約窯高的 63%)並挖出沙子



10. 第三層窯土裝飾並試燒(用小火慢慢將窯體烤乾避免用大火以免窯體受損)



11. 窯體美化



12.Pizza Party

### 參考資料

1. <https://www.permaculture.co.uk/articles/simple-art-making-earth-oven> The Simple Art of Making an Earth Oven
2. <http://www.instructables.com/id/Build-Your-Own-Earth-Oven/> Build Your Own Earth Oven
3. <http://www.handprintpress.com/wp-content/uploads/2014/02/BYOEO.lkinside1.pdf> Build your own earth oven
4. <https://www.youtube.com/watch?v=SFuGzhPxofE> How to Build a Cob Oven - Part One
5. [https://www.youtube.com/watch?v=m7Ym01q\\_Mcg&t=12s](https://www.youtube.com/watch?v=m7Ym01q_Mcg&t=12s) How to Build a Cob Oven - Part Two
6. <https://www.youtube.com/watch?v=Wa84y0Le4QI> How to Build a Cob Oven - Part Three
7. [http://pinkbird.org/w/How\\_to\\_construct\\_a\\_pizza\\_oven\\_dome\\_out\\_of\\_cob](http://pinkbird.org/w/How_to_construct_a_pizza_oven_dome_out_of_cob)