

附件五：

新北市111年度教師跨領域全英語授課教案設計  
(參考範例-課程實施後)

設計者 / 服務學校	黃如鈺、許曼淳、陳民峰/北大國小	
教案名稱	燈泡發亮了	
教學年級：國小四年級	預計課程上使用之英語比例： 80 % (本比例係指教師以英語授課之時間佔總授課時間之比率)	
學生人數：30 人	教學總節數： <u>2</u> 節	學生人數：30 人
公開授課之時間： 111年11月18日 9時30分至10時10分 (第二節課)	公開授課之地點： <u>新北市三峽區北大國小</u> <u>英語教室</u>	公開授課之時間： 111年11月18日 9時30分至10時10分 (第二節課)

核 心 素 養	總 綱	A3 規劃執行與創新應變 B1 符號運用與溝通表達
	領 綱	<u>英語</u> 英 E-B1 具備入門的聽、說、讀、寫英語文能力。在引導下，能運用所學、字詞及句型進行簡易日常溝通。 <u>自然</u> 自-E-A3 具備透過實地操作探究活動探索科學問題的能力，並能初步根據問題特性、資源的有無等因素，規劃簡單步驟，操作適合學習階段的器材儀器、科技設備及資源，進行自然科學實驗。
學 習 重 點	學習表現	<u>英語</u> ◎1-II-10 能聽懂簡易句型的句子。 ◎2-II-6 能以正確的發音及適切的語調說出簡易句型的句子。 ◎3-II-3 能看懂課堂中所學的句子。 4-II-4 能臨摹抄寫課堂中所學的句子。

		◎5-II-3 能以正確的發音及適切的速度朗讀簡易句型的句子。 6-II-2 積極參與各種課堂練習活動。 <u>自然</u> tr-II-1 能知道觀察、記錄所得自然現象的結果是有其原因的，並依據習得的知識，說明自己的想法。 ai-II-3 透過動手實作，享受以成品來表現自己構想的樂趣。		
	學習內容	<u>英語</u> ◎D-II-1 所學字詞的簡易歸類。 <u>自然</u> INe-II-9 電池或燈泡可以有串聯和並聯的接法，不同的接法會產生不同的效果。		
	具體學習目標	<u>英語</u> <ul style="list-style-type: none"> <li>● 能了解愛迪生的一生及其重要事件。</li> <li>● 能完成 Timeline 時間軸將愛迪生的出生、上學、工作、結婚等重大事件年份寫在學習單並放置在相對應的時間軸。</li> </ul> <u>自然</u> <ul style="list-style-type: none"> <li>● 能了解如何讓燈泡發亮。</li> <li>● 能依照 P O E 操作步驟，將電池、燈泡、電線串連起來形成通路。</li> </ul>		
	與其他領域/科目/議題的連結	N/A		
	教學資源/設備需求	PPT、Youtube video、group sharing timeline worksheet、online liveworksheet、experiment materials: battery, light bulb and wire		
<b>各節教學活動設計</b>				
節次	教學活動流程	時間	教學資源	教師語言
第一節	<b>【Warm-Up 引起動機】</b> <ul style="list-style-type: none"> <li>● Greetings</li> <li>● Introduction to today's schedule:</li> </ul> 7. Questions and Answers about Thomas Edison. Ex. Who invented light bulb? What do you know about Edison? 8. Introduction to Thomas Edison's	10 mins	(包含情境布置或教具之運用) <ul style="list-style-type: none"> <li>● Group worksheet</li> <li>● A Mini Bio worksheet of Thomas Edison</li> <li>● Powerpoint</li> <li>● Youtube video</li> </ul>	(教師授課中所使用的指導語，例如：Take out your book, please.) T: Good morning everyone. Ss: Good morning, Miss. T: What date is it today? Class: It's ____, 2022. T: We're going to start with introducing our

story

- 9. Watch a short video of Edison's life.
- 10. Activity: Cut, Paste and Write!
- 11. Gallery Walk
- 12. Homework: Liveworksheet of Edison's story

**【Presentation 發展活動】**

**Q&A of Thomas Edison.**

- Invite some students to answer the questions and reward the students who have correct answers.
- Teacher talks about Edison's story.

**Watch a short video of Edison's story.**

<https://youtu.be/FB3dCGSSkQw>

- Demonstrate the steps of how to complete the group worksheet.
- Distribute each group a Mini bio worksheet of Thomas Edison and teach the class how to find the key words on the worksheet. So students are able to locate the answers and complete the worksheet.
- **Activity: Cut, Paste and Write!**
- Check the answers with the class.
- Have each team put their completed worksheet on the table.

**Gallery Walk**

20 mins

schedule today.

T: First, we're going to undertake Questions & Answers activity. Such as, Who invented light bulb? What do you know about Thomas Edison? We move on to introducing Thomas Edison's story. Next, we're going to watch a short video of Thomas Edison. We're also doing an activity which is a group worksheet about Edison's life. After completing the worksheet, every team is going to put their worksheet on the table and everyone is going to admire other team's work. At last, you have an online homework. We'll explain that later. Are you ready? Here we go.

T: Now, please tell me. Who invented light bulbs?

Ss: I know I know. It's Edison (probably in Chinese or in English).

T: Perfect. What do you know about Edison?

Ss: Mmmm..

T: You can speak

A Mini Bio of Thomas Edison

Thomas Alva Edison was born on February 11, 1847 in Milan, Ohio. He was the youngest son of a modest family. In 1854, Edison's family moved to Port Huron, Michigan, where he attended public school for a total of 12 weeks. A homesick child prone to daydreaming, he was deemed "difficult" by his teacher. His mother, quite-cold, hired him to work on the railroad for six hours a day. It is believed that his education from his mother and his work on the railroad.

At the age of 12 (1859), he left school for good. Then, he worked as a "news boy" on the Grand Trunk Railroad.

Around the age of 15 (1862-63), he was an apprentice to a telegraph operator, and he worked around the clock for the next six years working at telegraph offices.

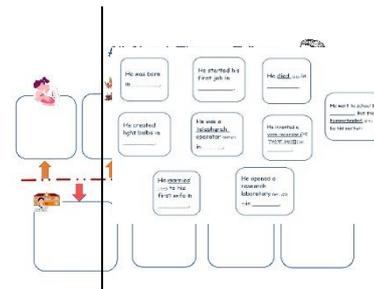
In the spring of 1868, he landed in Eureka, where he read his first, unsuccessful invention, a vote recorder.

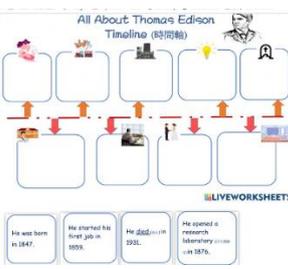
In 1871 Edison married 15-year-old Mary Stilwell, who was an employee of one of his businesses.

He opened a research laboratory in Menlo Park, New Jersey, in 1876.

His most famous invention, the incandescent light bulb, was developed in 1879.

He died on October 18, 1931.

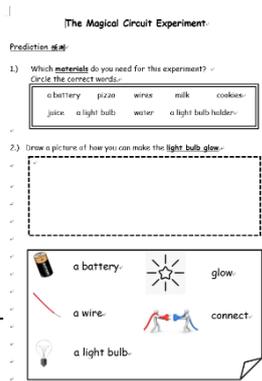


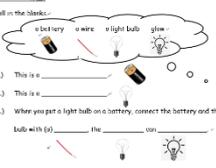
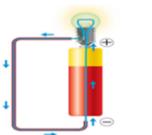
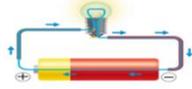
<ul style="list-style-type: none"> <li>● Give everyone a post-it and write down their comments like: Amazing! Well done!</li> <li>● Have students walk to each team and appreciate their work.</li> <li>● Put their post-in on the work they like.</li> <li>● Check which team has the most post-its.</li> <li>● Praise everyone for their hard work and reward the team.</li> </ul> <p><b>【Wrap_Up 統整與總結】</b></p> <ul style="list-style-type: none"> <li>● Display a group worksheet and go through every event on the timeline.</li> </ul> <p><b><u>Introduction to Homework</u></b></p> <ul style="list-style-type: none"> <li>● Introduce to the class how to complete a worksheet on Liveworksheet platform. <a href="https://www.liveworksheets.com/mz3110483xm">https://www.liveworksheets.com/mz3110483xm</a></li> <li>● Inform the class that the link will be posted in their Google Classroom.</li> <li>● Ask everyone whether they have questions about today’s lesson and homework.</li> <li>● Praise everyone for their efforts and see you next time.</li> </ul>	<p>10 mins</p>	 <p>The worksheet is titled "All About Thomas Edison Timeline (時間軸)". It features a central horizontal timeline with several empty boxes for students to write or draw. Below the timeline is a table with four columns, each containing a key event in Edison's life:</p> <table border="1"> <tr> <td>He was born in 1847.</td> <td>He started his first job in 1859.</td> <td>He did his first research in 1876.</td> <td>He opened a research laboratory in 1876.</td> </tr> </table>	He was born in 1847.	He started his first job in 1859.	He did his first research in 1876.	He opened a research laboratory in 1876.	<p>Chinese. Please raise your hand to speak. Ss: He was an inventor. (in Chinese?) T: You’re amazing. What else do you know about Edison? Ss: Well.. I don’t know. T: OK. Now we’re going know about Thomas Edison’s life. T: We’re going to use the mini bio worksheet and introduce Thomas Edison’s life. T: So you know more about Thomas Edison and there are some questions would like you to answer. T: When was Thomas Edison’s birthday? S: He was born on Feb 11, 1847. T: How old was he going to school? Ss: He was seven. T: Who taught him at home? Ss: His mother. T: How old was Thomas Edison when he had his first job? Ss: He was 12 years old. T: When was Thomas Edison working as telegraph operator? S: in 1862</p>
He was born in 1847.	He started his first job in 1859.	He did his first research in 1876.	He opened a research laboratory in 1876.				

			<p>T: What year did he invented a vote recorder? Ss: 1868</p> <p>T: What about light bulbs? When did he invent (發明) light bulbs? Ss: 1879</p> <p>T: You're so brilliant. Let's watch a short video of Thomas Edison. Ss: Okay.</p> <p>T: I'd like to praise for your attention on watching the video. Ss: Thank you, Miss.</p> <p>T: We're doing an activity and you're going to work in a group.</p> <p>T: Here's the mini bio of Thomas Edison's life. Please follow me to underline the keywords.</p> <p>T: Please go to the first line and underline <b>_was born, the second line_ where he attended public school, the fifth line_ He worked, the seventh line_ a telegraph operator, the ninth line_ a vote recorder, the tenth line_ married, the eleventh line_ a research laboratory, the twelfth line_ invention, the light bulb, the last line_ He</b></p>
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			<p><b>died.</b></p> <p>T: Please look at the cutting page and cut out every box and then paste on the timeline.</p> <p>Ss: Okay.</p> <p>T: Please let me know if you have questions.</p> <p>Ss: Okay.</p> <p>T: Are you OK?</p> <p>Ss: Yes.</p> <p>T: Are you done with the timeline?</p> <p>Ss: Yes.</p> <p>T: Let's look at the answers together.</p> <p>Ss: OK.</p> <p>T: Are you OK?</p> <p>Ss: Yes.</p> <p>T: Do you have any questions?</p> <p>Ss: No.</p> <p>T: Alright. Every team's no. 1, please come to the front and fetch post-it for your team. Please write "Amazing!" or "Awesome!" or "Perfect!" or "Fantastic!". Please leave your post-it when admire other team's work.</p> <p>T: Now, please write down the praising words.</p> <p>Ss: Okay.</p> <p>T: Are you all done with the writing? Then, please put your worksheet on</p>
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			<p>the table and stand up to look at other team's work.</p> <p>Ss: OK.</p> <p>T: Attention, please.</p> <p>Does everyone put their post-in on the team you like?</p> <p>Ss: Yes.</p> <p>T: Let's see which team has got more post-it.</p> <p>Wow, it's Team 1. So Team 1, you can get 10 points for your excellent work.</p> <p>T: I'd also like to praise every team for your hard work. Brilliant job!</p> <p>Every team also gets 2 points.</p> <p>Ss: Thank you, Miss.</p> <p>T: We have an online homework which is exactly the same as the team worksheet. But it's on the internet. I'll post the link on the Google Classroom. Please check your email. Alright?</p> <p>T: Let's see how it works. Please go to Google Classroom and click the link. What you do is to drag and drop every box on the timeline.</p> <p>Ss: So just drag the second page's box and</p>
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				<p>then drop on the box?  T: Yes.  Ss: OK.  T: Do you have any questions about today's lesson and homework?  Ss: No, Miss.  T: Thank you everyone for your fantastic work. I'll see you next time.  Ss: Thank you, Miss. See you next time.</p>
<p>第二節</p>	<p><b>【Warm-Up 引起動機】</b></p> <p>4. Greetings  5. Review what students have just learned about Edison.  Ex: Who is Edison?  What did he do?  6. Ask students if they know how to make the light bulb glow?  <b>【Presentation 發展活動】</b></p> <ul style="list-style-type: none"> <li>● <b>Introduce new words</b></li> </ul> <p>4. Briefly introduce the target vocabulary: battery, light bulb, wire, glow, connect, cap, contact, negative, positive</p> <ul style="list-style-type: none"> <li>● <b>Do the experiment</b></li> </ul> <p>5. Introduce the materials students are going to use today.  6. Explain how to do the experiment by using POE learning strategy.</p> <p>I. Students need to grab a worksheet and write down their class, team, number and name.  J. Students should discuss and</p>	<p>5mins</p> <p>5mins</p> <p>5mins</p>	<ul style="list-style-type: none"> <li>● worksheets</li> <li>● experiment materials: wires, batteries, light bulbs, containers</li> <li>● Powerpoint</li> </ul> 	<p>T: Do you remember what we just learned last class?  Ss: Edison!  T: What did he do?  Ss: He invent a light bulb!  T: Great! Do you know how to make the light bulb glow?  Ss: I don't know.  T: It's ok. Today we are going to try to make the light bulb glow!  Ss: Wow!  T: First, let's learn some new words! Everyone can you tell me what is this?  Ss: A _____.  T: Very good. What about this? What does it mean?  Ss: _____.  T: Now we are going to do the worksheet. The worksheet has three parts: prediction, observation and evaluation.</p>

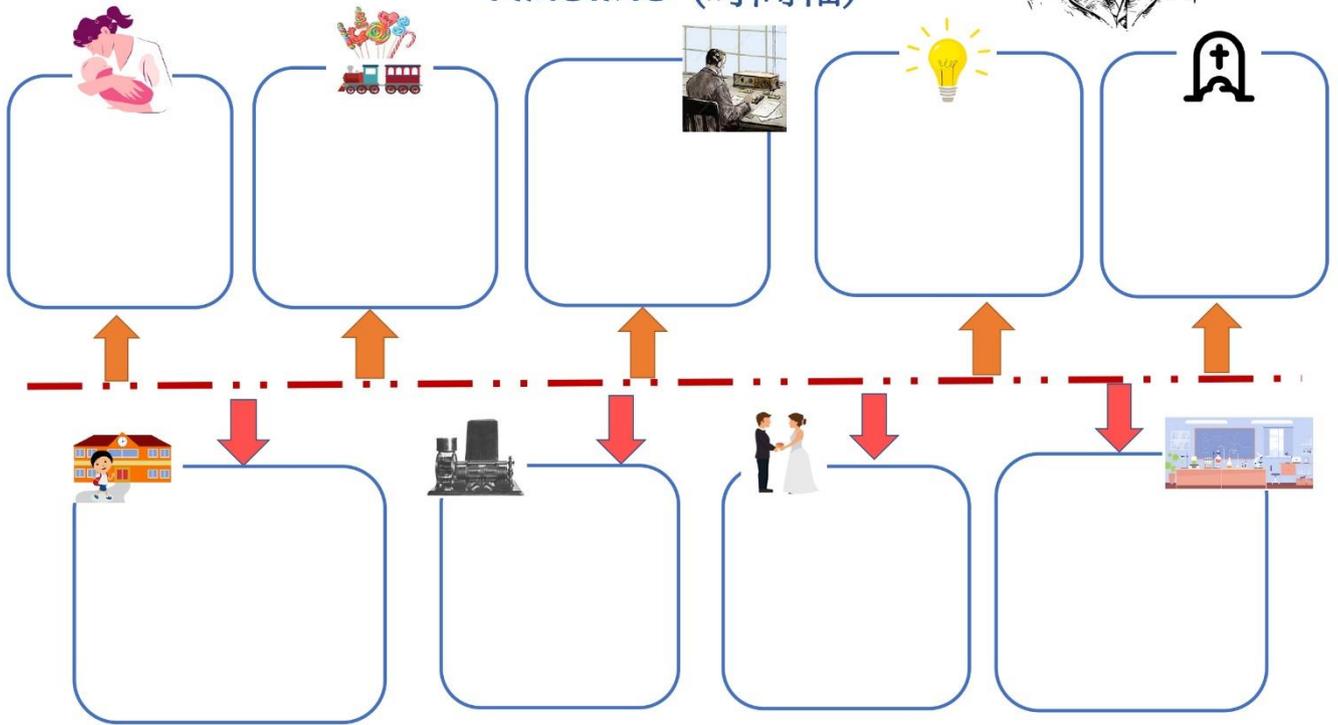
	<p>circle the materials that they need.</p> <p>K. <u>Prediction</u>: Students need to work together to predict how to make the light bulb glow and draw it down.</p> <p>L. Teacher passes down a container to each group which includes a battery, a light bulb and two wires.</p> <p>M. <u>Observation</u>: Students will have 15 minutes to do the experiment and the worksheet. They can start to test out the materials.</p> <p>N. When students successfully make the light bulb glow, they should raise their hands and tell Teacher. Then they should also draw their way of connection down.</p> <p>O. When the time is up, Teacher asks if any team wants to come up stage and share their way to make the light bulb glow. Then ask if there is another way to make the light bulb glow.</p> <p>P. <u>Evaluation</u>: At last, Teacher and students conclude the result together: Put the light bulb on the battery and use the wire to connect them can make the light bulb glow.</p> <p><b>【Wrap_Up 統整與總結】</b></p> <ul style="list-style-type: none"> <li>● <b>Conclude the evaluation.</b></li> </ul> <p>4. Ask students to put the materials back in the container.</p>	<p>15 mins</p> <p>5min</p> <p>5min</p>	<p>Observation #1:</p> <p>1.) Draw a picture of how you made the light bulb glow.</p>  <p>Evaluation #1:</p> <p>I fill in the blanks:</p> <p>a battery   a wire   a light bulb   glow</p> <p>1.) This is a _____</p> <p>2.) This is a _____</p> <p>3.) When you put a light bulb on a battery, connect the battery and the light bulb with (a) _____ the _____ can _____</p>   	<p>T: Right now we only need to do prediction part. Please have a group discussion and answer question one. As for question two, you need to think if you have a battery, two wires and a light bulb, how would you connect them to make the light bulb glow? Please think about it and draw it down. You have five minutes to do this part.</p> <p>Ss: We can use the wire to connect the battery and the light bulb.</p> <p>T: Now time's up, let's look at observation part. Each group will have a container. In the container, you will have a battery, a light bulb and two wires. You will have 15 minutes to try to make the light glow. If you have any question, you can raise your hand and ask me. Remember to work together!</p> <p>Ss: What do you think?</p> <p>Ss: I think we should connect these two together.</p> <p>Ss: We can try one more time.</p> <p>T: Does any group</p>
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<p>5. Have students finish the worksheet.</p> <p>6. Review the evaluation part. Fill in the blanks with the whole class. Say the paragraph together.</p>		<p>successfully make the light bulb glow?</p> <p>T: Group two, good job!</p> <p>T: Now time's up. Please put the materials back in the container in 30 seconds.</p> <p>T: How many groups make the light bulb glow? Please raise your hand.</p> <p>T: Wonderful! Can any group share the way you make the light bulb glow?</p> <p>Ss: We want to share! We put the light bulb on the battery and do this. Then the light bulb glow!</p> <p>T: Very good! Do you have another way to make the light bulb glow?</p> <p>T: Group leader please hand in the container. And you have five minutes to finish the whole worksheet.</p> <p>T: Let's do the last part together! Everyone, please look at you worksheet.</p> <p>T: Number one. This is a _____.</p> <p>Ss: Battery.</p> <p>T: Number two. This is a _____.</p> <p>Ss: Light bulb.</p> <p>T: Number three. When you put a light bulb on a battery, connect the</p>
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				battery and the light bulb with_____. Ss: A wire/ Wires. T: The _____ can _____. Ss: Light bulb can glow.
附錄 (學習單或其他教學相關資料)				

附件一:

# All About Thomas Edison Timeline (時間軸)



附件二:

Please cut out every box and paste on the timeline.

He was born in \_\_\_\_\_.

He started his first job in \_\_\_\_\_.

He died (逝世) in \_\_\_\_\_.

He created light bulbs in \_\_\_\_\_.

He was a telephgrah operator (報務員) in \_\_\_\_\_.

He invented a vote recorder (電子投票計數器) in \_\_\_\_\_.

He went to school in \_\_\_\_\_. But then homeschooled (自學) by his mother.

He married (結婚) to his first wife in \_\_\_\_\_.

He opened a research laboratory (研究實驗室) in \_\_\_\_\_.

附件三:

## A Mini Bio of Thomas Edison

Thomas Alva Edison was born on February 11, 1847 in Milan, Ohio. He was the youngest son of a modest family. In 1854, Edison's family moved to Port Huron, Michigan, where he attended public school for a total of 12 weeks. A hyperactive child, prone to distraction, he was deemed "difficult" by his teacher. His mother quickly pulled him from school and taught him at home. At age 11, he received most of his education from his mother and from himself.

At the age of twelve (1847+ \_\_\_\_), he left school for good. Then, he worked as a "candy butcher" on the Grand Trunk Railroad.

Around the age of fifteen (1847+15), he was an apprentice to a telegraph operator, and he wandered around the Midwest for the next six years working in telegraph offices.

In the spring of 1868, he landed in Boston, where he created his first, unsuccessful invention, a vote recorder.

In 1871 Edison married 16-year-old Mary Stilwell, who was an employee at one of his businesses.

He opened a research laboratory in Menlo Park, New Jersey, in 1876.

His most famous invention, the electric light bulb, was developed in 1879.

He died on October 18, 1931.

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## Unit 4: The Magical Circuit Experiment

### Prediction 預測

- 1.) What do you need for this experiment?   
 Circle the words.

a battery	an umbrella	wires	train
juice	a light bulb	water	a school bag

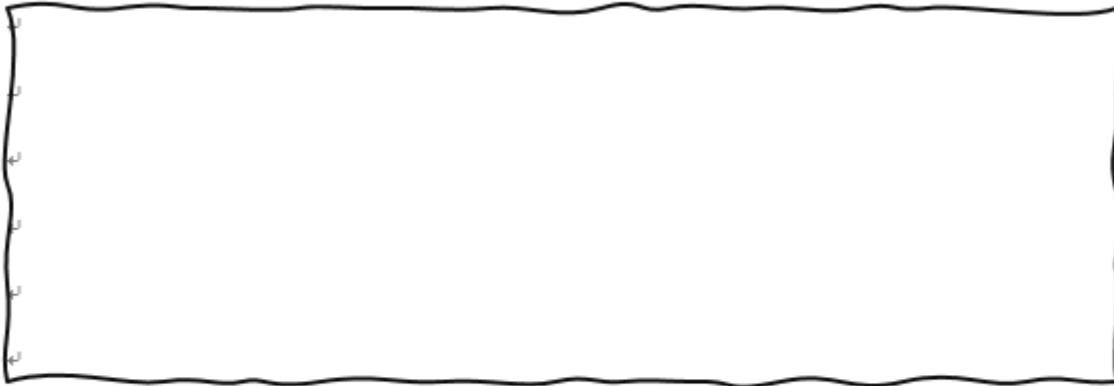
- 2.) How to make a light bulb glow? Think  and draw it down .

Blank drawing area with a wavy border and a vertical line of small arrows on the left side for writing.

	a battery		glow
	a wire		connect
	a light bulb		cap
		contact	

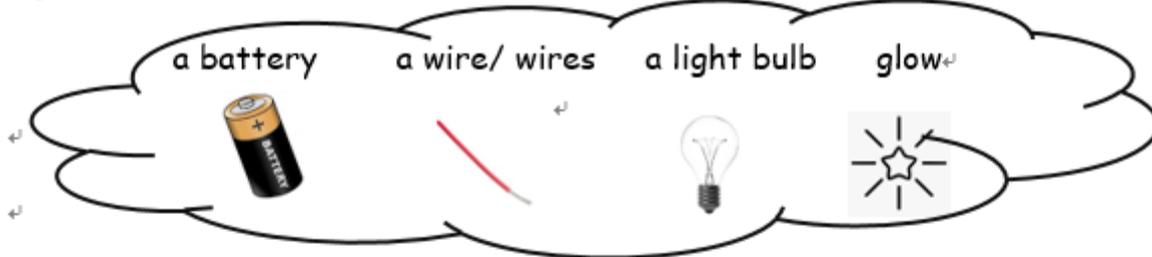
**Observation 觀察**

3.) How to make a light bulb glow? Test and draw it down 



**Evaluation 解釋**

4.) Fill in the blanks.



1. This is \_\_\_\_\_ 

2. This is \_\_\_\_\_ 

3. When you put a light bulb on the battery, connect the battery and \_\_\_\_\_, the light bulb can \_\_\_\_\_.

