

### Preface 前言

政府推動2030雙語政策,期基於臺灣已掌握華語使用的優勢, 在專業知識之上,進一步強化我國人,尤其年輕世代的英語溝通能力,增強全球競爭力(國家發展委員會,2020);而如何提升國民 英語溝通能力以增加國際競爭力,是學校教育中努力的目標。

有感於雙語教育及近年來我國積極培養學童STEAM (Science, Technology, Engineering, Arts, and Mathematics) 結合科學、技術、工程、藝術,以及數學跨學科素養的教育趨勢,本校自108學年度開始試辦自然課程雙語教學,以英語營造生活情境中的科學,透過趣味科學實驗增進學童以英語來進行科學探究的興趣與能力。

這本科學筆記本是國北教大簡雅臻教授、本校自然課程雙語教學團隊陳美卿、林爾慶、吳雅蓁、范瑋庭以及外師 Leonawen 等教師所共同設計的;國立臺北教育大學雙語教學研究中心協助自然科學英語內容校對、編排及印製;教學過程中階段性的提高雙語的使用,以英語指導科學實驗步驟,透過動手做實驗來激發學童的科學探究潛能,期望學童可以紮紮實實的學習自然科學知識,提升學生英語聽說能力,以及把所學的英語運用在課堂上,啟發學童善用英語進行科學領域學習的能力,厚植學童的科學力及英語力,進而培養我國國際型人才與視野。

國北教大實小校長

飛勒捷

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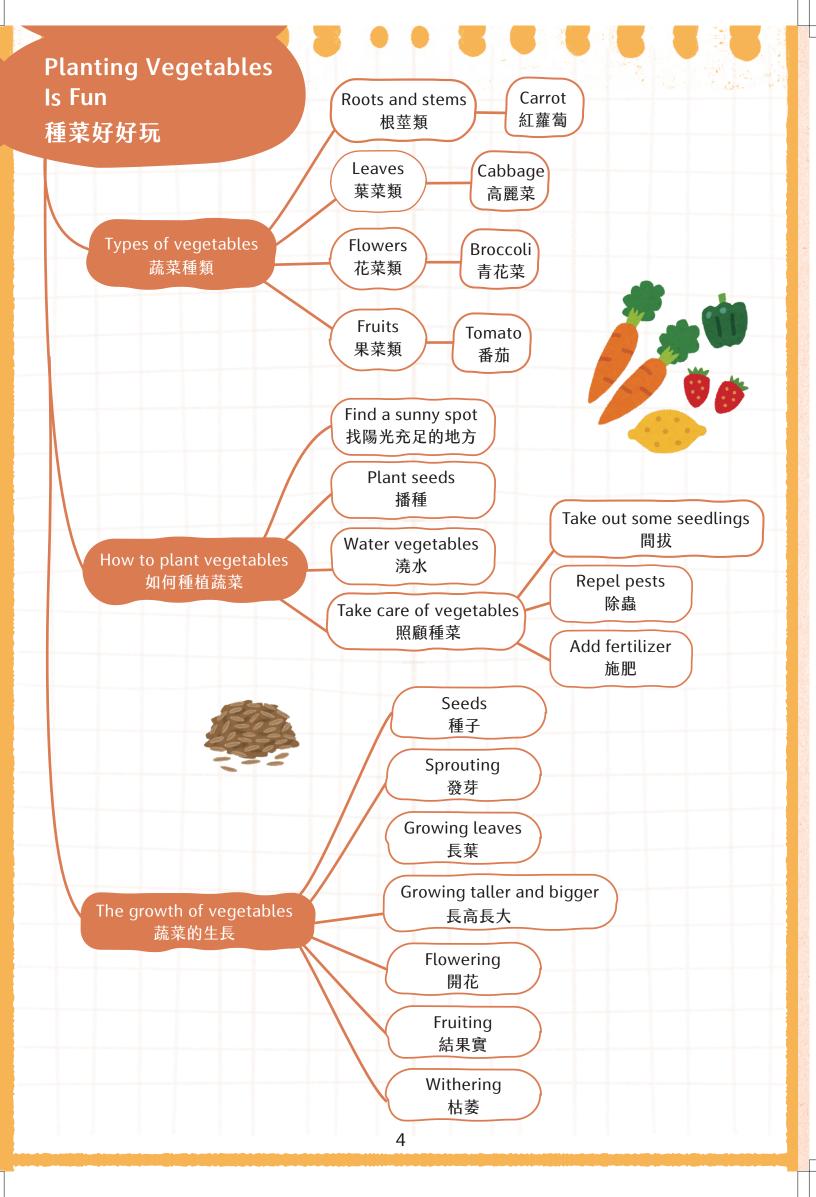
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Unit 1

# Planting Vegetables Is Fun 種菜好好玩





# Unit 1 Planting Vegetables Is Fun 種菜好好玩

eleggelelle

	_	200

### 應聽懂及認讀的生字

	□ 1. 植物 plant □ 2. 蔬菜 vegetable □ 3. 陽光 sunlight □ 4. 水 water □ 5. 土壤 soil □ 6. 肥料 fertilizer □ 7. 花盆 flower pot	□ 15. 播種 plant seeds □ 16. 照顧 take care of □ 17. 施肥 add fertilizer □ 18. 除蟲 repel pest □ 19. 害蟲 pest □ 20. 發芽 sprouting
1		□ 21. 長葉 growing leaves
	□ 8. 根 root	□ 22. 長高長大
	□ 9. 莖 stem	growing taller and bigger
	□ 10. 葉子(單數) leaf	□ 23. 開花 flowering
	□ 11. 葉子(複數) leaves	□ 24. 結果實 fruiting
	□ 12. 花 flower	□ 25. 枯萎 withering
	□ 13. 果實 fruit	
	□ 14. 種子 seed	
į		
۱.	There are four types of vegetable flowers, and fruits. 蔬菜有四種類別:根莖類、葉菜類、	
2.	When we eat vegetables, we are 我們吃蔬菜時,是在吃植物的不同部	eating different parts of the plants. 部位。
3.	If we take good care of vegetable 如果我們好好照顧蔬菜,它們就能是	es, they can grow big and healthy. 長得又大又健康。
1.	growing taller and bigger, flowe	are seeds, sprouting, growing leaves, ering, fruiting, and withering. 長葉、長高長大、開花、結果和凋謝。

### Science Videos Unit 1

Names of Vegetables





Classroom Vegetable Lesson





How Do Fruits and Vegetables Grow?





**Grow Your Own Veggies** 





How Do Plants Grow





What Is Seed Germination?



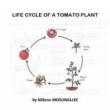


**Phototropism Experiment** 





Life Cycle of a Tomato Plant





### **Types of Vegetables**

Match each vegetable to its correct type.



spinach (菠菜)

root and stem vegetable



white radish (白蘿蔔)

• leaf vegetable



pumpkin (南瓜)

• flower vegetable



broccoli (青花菜)

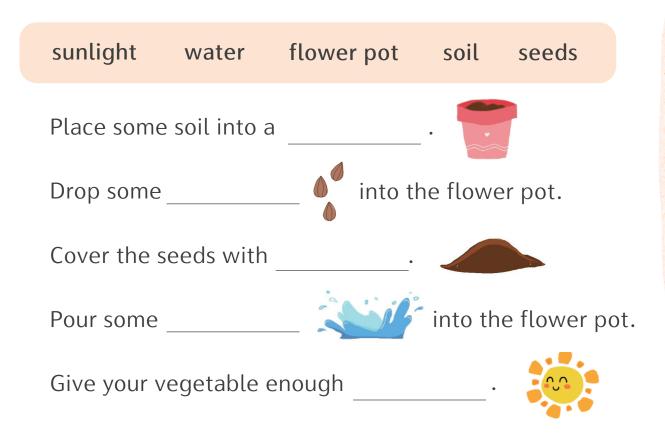
fruit vegetable

### **How to Plant Vegetables**

What do you need to prepare before planting vegetables?
 Circle the correct answer(s).

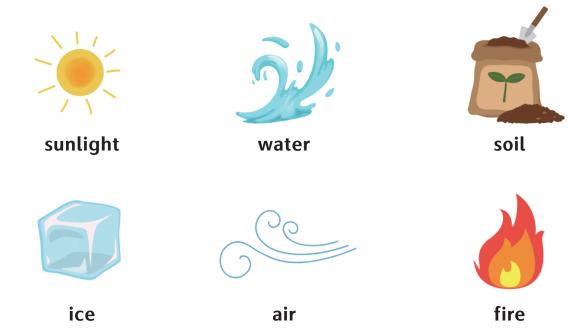


Fill in the blanks using the words below.



### Take Care of Vegetables

What do vegetables need to grow? Circle the correct answer(s).



What should you do when your vegetable is drying out (乾枯)?
 Circle the correct answer.



Add fertilizer



Water the vegetable

What should you do when you find pests on your vegetables?
 Circle the correct answer.



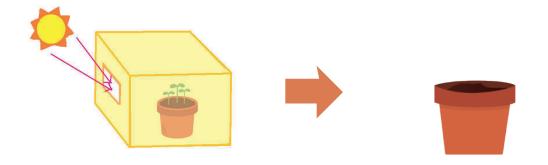
Take out small seedlings (間拔幼苗)



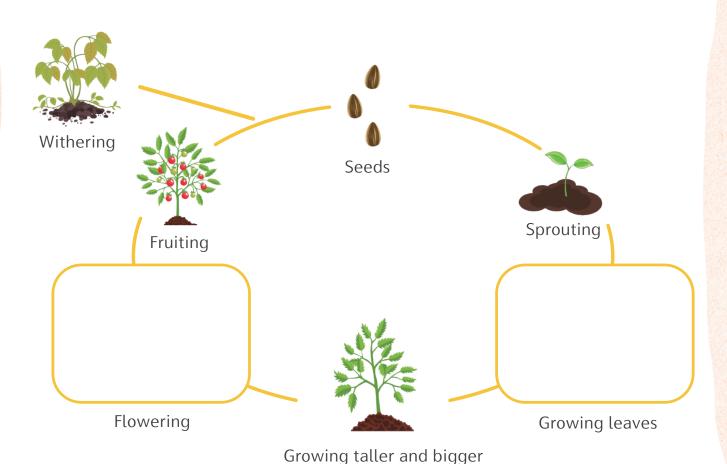
Use hot pepper spray (噴辣椒水)

### The Growth of Vegetables

• Take a look at the yellow box. Can you tell which way the seedlings will grow towards based on the Sun's position?Draw your answer on the right side.



• Draw correct pictures in the boxes to show different stages of vegetable growth.



### Let's Review

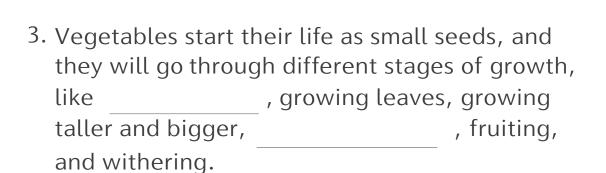
Fill in the blanks using the words below.

flowering leaves sprouting roots

1. There are four different types of vegetables: roots and stems, \_\_\_\_\_\_, flowers, and fruits.



2. When we eat vegetables, we are eating different parts of the plants. For example, when we eat carrots, we are eating the \_\_\_\_\_.











# Effects of Temperature Changes on Matter 温度影響物質的變化



# Effects of Temperature Changes on Matter 溫度影響物質的變化

Factors of changes 使物質產生變化 的因素

Air 空氣

Water 水

1

Temperature 溫度

Solid 固態

Ice 冰

Three states of water 水的三種形態

Liquid 液態

Water 水

Gas 氣態

Water vapor 水蒸氣

Temperature and water 温度和水

When ice gets hot, it **melts** into water. 冰遇熱會融化成水。

Changes in the state of water 水的形態變化 When water gets hot, it **evaporates** into water vapor.

水遇熱會蒸發成水蒸氣。

When water vapor gets cold, it **condenses** into small droplets.

水蒸氣遇冷會凝結成小水珠。

When water gets cold, it **freezes** into ice. 水遇冷會凝固成冰。

Effects of temperature changes 溫度變化產生的 影響 Reversible change 可逆變化 Substances **can change back** to their original form.
物質改變後,可以恢復原來的樣子。

Chocolate 巧克力

Irreversible change 不可逆變化 Substances **cannot change back** to their original form. 物質改變後,無法變回原來的樣子。

Egg 雞蛋

### Unit 2

## Effects of Temperature Changes on Matter 温度影響物質的變化

D. L	Data •	Date:
	Data •	Date ·
		HIATA .

### 應聽懂及認讀的生字

□ 1. 固態 solid □ 2. 液態 liquid □ 3. 氣態 gas □ 4. 水 water □ 5. 水蒸氣 water vapor □ 6. 小水珠 droplet □ 7. 冰 ice □ 8. 融化 melting □ 9. 蒸發 evaporation □ 10. 凝結 condensation □ 11. 凝固 freezing	□ 12. 物質 matter □ 13. 形態 state □ 14. 溫度 temperature □ 15. 上升 rise □ 16. 下降 drop □ 17. 熱 heat □ 18. 加熱 heating □ 19. 冷卻 cooling □ 20. 引起、導致 cause □ 21. 影響、效果 effect □ 22. 可逆變化 reversible change □ 23. 不可逆變化 irreversible change
water vapor. 溫度上升時,冰會融化成水,水則會蒸	and gas. temperatures. ts into water, and water evaporates into 發成水蒸氣。 vapor condenses into small droplets, and

### Science Videos Unit 2

2-1 **Material Changes** 





2-1 Changes in Solid Materials





States of Water





2-2 What Are the States of Matter?





States of Matter



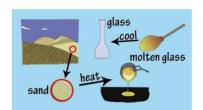


Water: Solid, Liquid, and Gas





**Heating and Cooling** 





Physical and Chemical Changes Due to Temperature





### **Factors of Substance Changes**

• Fill in the blanks with the correct factors of change for each substances.

microbes (微生物)

air

temperature

water







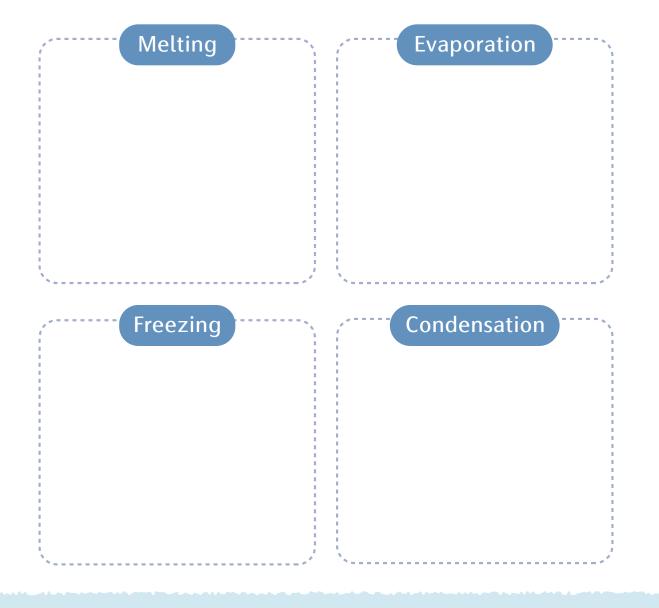






### Three States of Water

 Draw pictures in the blanks to explain melting, evaporation, freezing, and condensation.



### **Effects of Temperature Changes**

• Heating the substances below will cause them to change. Can any of them change back to its original form after it cools down? Put a checkmark ( ✓ ) in the box if it can, or a cross ( X ) if it cannot.





□ a raw egg (生雞蛋)



□ water (水)



\_\_ chocolate (巧克力)



□ wood (木頭)



■ wax (蠟)



### Let's Review

Fill in the blanks using the words below.

gas melting Ice evaporation



1. There are three states of water: solid, liquid, and

-----



2. \_\_\_\_\_ is the solid state of water.



3. If you heat ice, it turns into water. This is called



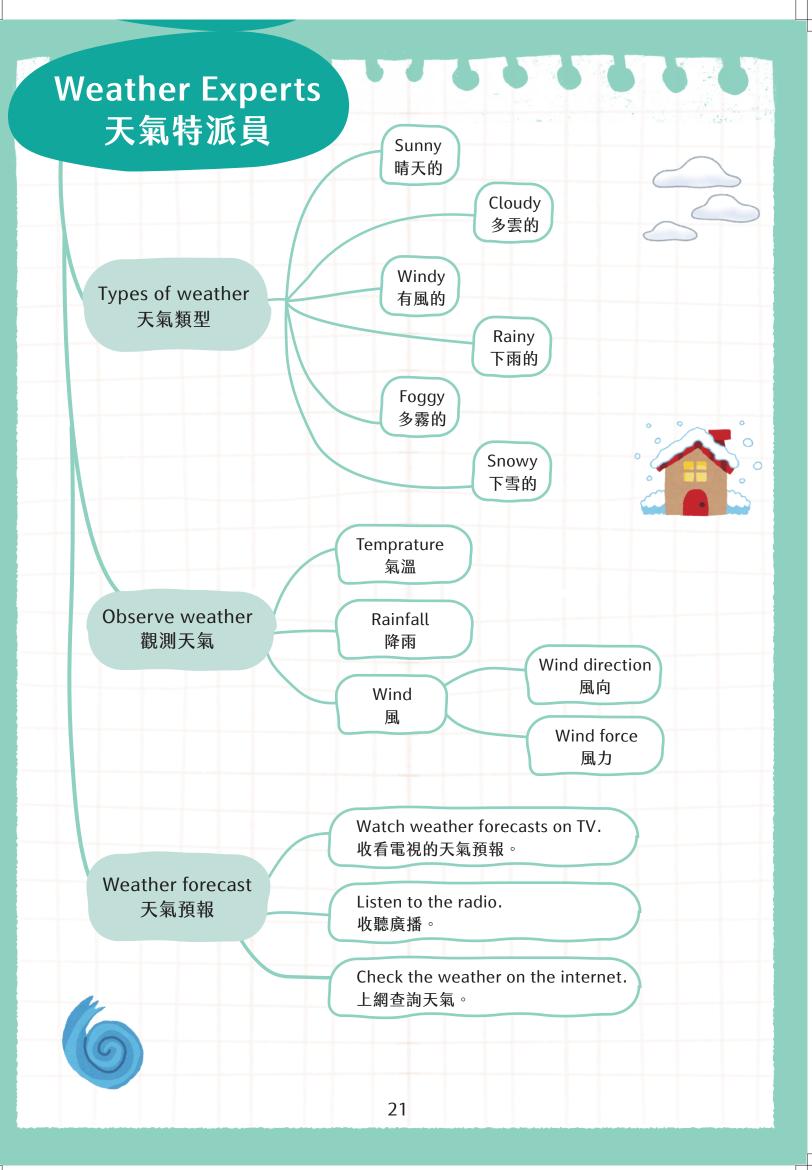


4. If you heat water, it turns into water vapor. This is called .









# Unit 3 Weather Experts 天氣特派員

222222

Date	•		
Date			

### 應聽懂及認讀的生字

□ 1. 天氣 weather	└ □ 19. 溫度計 thermometer
□ 2. 晴天的 sunny	□ 20. 風速計 anemometer
□ 3. 多雲的 cloudy	□ 21. 雨量計 rain gauge
□ 4. 有風的 windy	
□ 5. 下雨的 rainy	□ 22. 早上 morning
□ 6. 有霧的 foggy	□ 23. 中午 noon
□ 7. 下雪的 snowy	□ 24. 下午 afternoon
	□ 25. 夜晚 night
□ 8. 太陽 sun	
□ 9. 雲 cloud	□ 26. 天氣預報 weather forecast
□ 10. 風 wind	□ 27. 電視 television
□ 11. 雨 rain	□ 28. 頻道 channel
□ 12. 霧 fog	□ 29. 收音機 radio
□ 13. 雪 snow	□ 30. 網路 internet
□ 14. 溫度 temperature	□ 31. 季節 season
□ 15. 熱的 hot	□ 32. 氣候 climate
□ 16. 冷的 cold	□ 33. 氣候變遷 climate change
□ 17. 度 degree	0:0
□ 18. 攝氏溫度(°C) degree Celsius	
1. Weather affects our daily lives and enviro 天氣影響我們的日常生活和環境。	nment.
2. There are different types of weather like	supply cloudy rainy and snowly days

- 2. There are different types of weather, like sunny, cloudy, rainy, and snowy days.
- 3. We measure temperature with a thermometer, rain with a rain gauge, and wind with an anemometer.

我們可以使用溫度計測量溫度、雨量計測量雨、風速計測量風。

天氣有不同的類型,如晴天、多雲、下雨和下雪。

4. We learn about weather conditions from TV channels, radio, and the internet. 我們可以透過電視頻道、廣播和網路,了解天氣的狀況。

本頁完成日期:

### Science Videos Unit 3

How's the Weather?



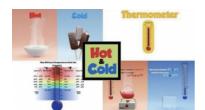


The Weather





3-2 Hot and Cold for Kids





3-2 Measuring Weather with Weather Tools





Where Does Wind Come from?





Making a Weather Forecast with a **GOESR Series Weather Satellite** 





Why Are There Seasons?





Types of Clouds





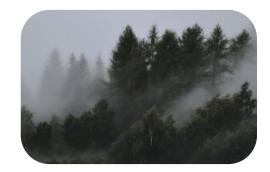
### **Types of Weather**

• Fill in the blanks with the correct types of weather.

sunny rainy cloudy windy foggy lightning(閃電)



1 It's



**2** It's



3 It's



4 It's



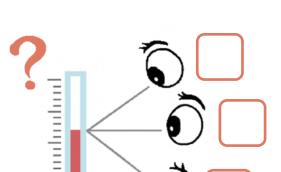
5 It's



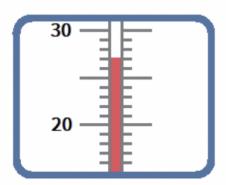
**6** There is

### Measure Temperature and Rainfall

Check the correct way to read the temperature.



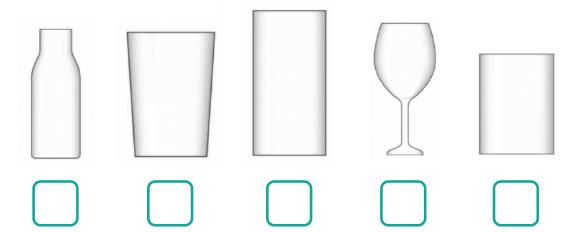
2. Write down the correct temperature.



The temperature is

°C

3. Check ✓ the correct container(s) (容器) for measuring rainfall.



### **Weather Forecasts**

Answer the questions using the graph(圖表) below.

	日期 地區	7/4	7/5	7/6	7/7
Northern Taiwan	北部	26~29°C	26~29°C	25~28°C	29~32°C
Central Taiwan	中部	29~32°C	26~29°C	29~32°C	29~32°C
Southern Taiwan	南部	29~32°C	26~29°C	25~28°C	26~29°C
Eastern Taiwan	東部	25~28°C	26~29°C	29~32°C	26~29°C

- 1. Which area in Taiwan is the hottest on July 4th?
- 2. Which areas will rain on July 6th?

\_\_\_\_\_ and \_\_\_\_\_.

3. How many sunny days are there in central Taiwan from July 4th to July 7th?

There are \_\_\_\_\_ sunny days.

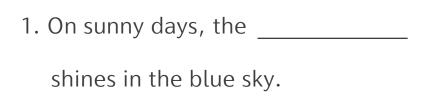
4. What is the highest temperature in Northern Taiwan on July 7th?

The highest temperature is \_\_\_\_\_°C.

### Let's Review

Fill in the blanks using the words below.

internet sun temperature clouds





2. On cloudy days, the sun hides behind the , and the sky looks gray.



3. We can measure \_\_\_\_\_ with a thermometer. The thermometer can tell us how hot or cold it is outside.



4. We can watch weather forecasts on TV, listen to them on the radio, or look them up on the

\_\_\_\_\_





### Science in the Kitchen 厨房中的科學

We use our eyes to look at seasonings. 眼睛可以用來看調味品。

Observe seasonings 觀察調味品 We use our hands to touch seasonings. 手可以用來觸摸調味品。

We use our nose to smell seasonings. 鼻子可以用來聞調味品。

Salt, sugar, baking soda, and citric acid. 食鹽、砂糖、小蘇打粉和檸檬酸粉。

Substances and water 物質和水 Soluble substances 可溶解的物質

Insoluble substances 不易溶解的物質

Flour 麵粉

The purple cabbage juice turns **reddish** when you add something **acidic**. 紫高麗菜汁和酸性物質混合時,會變成偏紅色。

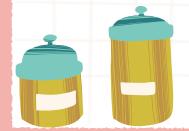
Identify acids and bases 辨識酸鹼

The purple cabbage juice stays **purple** when you add something **neutral**.

紫高麗菜汁和中性物質混合時,會維持紫色。

The purple cabbage juice turns blue-green when you add something basic.

紫高麗菜汁和鹼性物質混合時,會變成藍綠色。





## Unit 4

### Science in the Kitchen 廚房中的科學

Date:	
Date.	

### 應聽懂及認讀的生字

□ 1. 調味品 seasoning □ 2. 食鹽 salt □ 3. 砂糖 sugar □ 4. 粉末材料 powdered ingredient □ 5. 小蘇打粉 baking soda □ 6. 麵粉 flour □ 7. 檸檬酸粉 citric acid	□ 25. 檸檬汁 lemonade □ 26. 沙子 sand
□ 8. 眼睛 eye □ 9. 看 see □ 10. 鼻子 nose □ 11. 聞 smell □ 12. 手 hand	□ 27. 紫高麗菜 purple cabbage □ 28. 紅鳳菜葉 red amaranth leaf □ 29. 蝶豆花瓣 butterfly pea petal □ 30. 紫葡萄皮 purple grape skin
□ 13. 觸摸 touch □ 14. 溶解 dissolve □ 15. 可溶解的 soluble □ 16. 不易溶解的 insoluble □ 17. 水溶液 aqueous solution □ 18. 量筒 measuring cylinder □ 19. 燒杯 beaker	□ 31. 酸 acid □ 32. 酸性的 acidic □ 33. 鹼 base □ 34. 鹼性的 basic □ 35. 中性的 neutral
□ 20. 攪拌棒 stirring rod  1. We use our senses to observe sea 我們可以用感官來觀察調味品。  2. Some substances dissolve well in 有些物質可以溶於水,有些則不能	water; others do not.
3. We use purple cabbage juice to in 我們可以用紫高麗菜汁來辨識酸鹼	

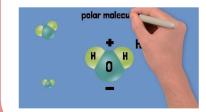
### Science Videos Unit 4

The Herbs, Spices, and Condiments That Are Essential for Every Kitchen!





How Solubility and Dissolving Work





Soluble and Insoluble Materials





**Dissolve Song** 





The Effect of Temperature on Solubility





Acid and Base





Acids and Bases for Kids





Experiment DIY pH Indicator from Red Cabbage





### **Observe Ingredients**

Complete the table below.

Ingredients 材料	Color 顏色	Texture 觸感 (coarse 粗粗的/ fine 細細的)	Smell 味道 (It smells.有味道/ It does not smell. 無味道)
baking soda 小蘇打粉			
flour 麵粉			
pepper 胡椒粉			
sugar 糖			

### **Substances and Water**

Which of the following substances dissolve well in water?
 Circle if it does, or circle if it does not.



butter (奶油)







oil (沙拉油)







tapioca balls (粉圓)







noodles (麵條)







salt (鹽)







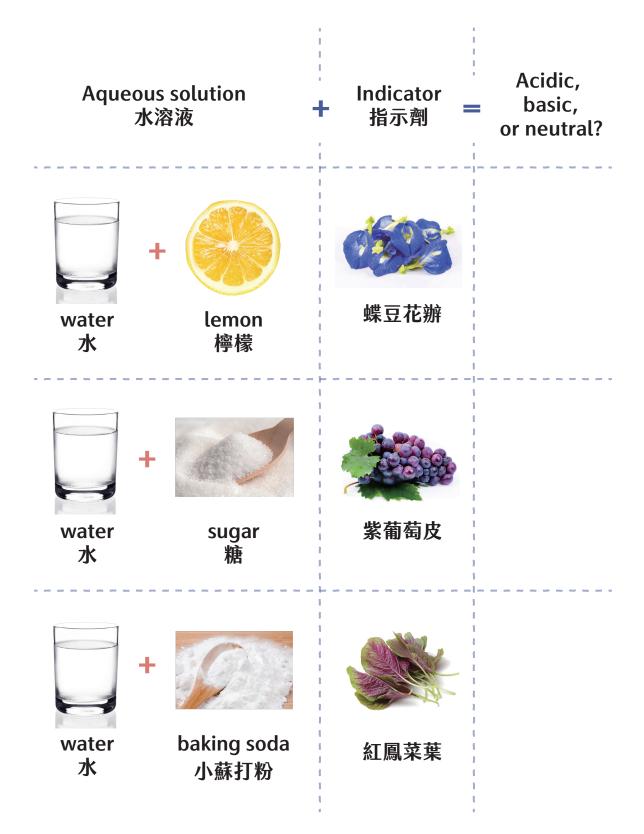
vinegar (醋)





### Acidic, Basic, or Neutral

Complete the table below.



### Let's Review

• Fill in the blanks using the words below.

sugar	blue-green	eyes	flour	
1. We use our of sugar.	ſ	to observe	the color	
2. Hot black t	ea becomes sv n it.	veet after _		S
3. Baking sod	a dissolves we does not.	ll in water,	but	flour
	cabbage juice ixes with bakin		er.	



### Rewards

Date	Points	Emoticon	Date	Points	Emoticon

### Rewards

Date	Points	Emoticon	Date	Points	Emoticon



Science Notes
Bilingual Science
3rd Grade 2nd Semester

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