

# Science Notes

Bilingual Science  
3th grade  
1st semester



**Name:**

**Class:**

**Number:**

**Teacher:**

國立臺北教育大學附屬實驗國民小學

國立臺北教育大學雙語教學研究中心

# 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、林雨慶、吳雅蓁、范瑋庭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。

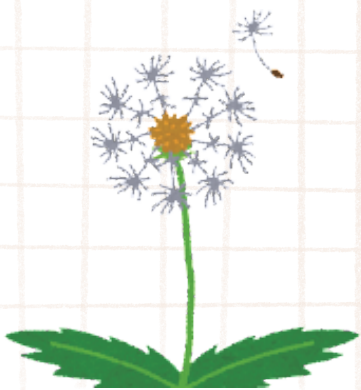
國北教大實小校長

祝勤捷



# Unit 1

## Colorful Plants 多采多姿的植物



# Colorful Plants 多采多姿的植物

## Features 特徵

A plant is a living thing.  
植物是有生命的東西。

A plant uses sunlight and water to make nutrients.  
植物利用陽光和水來製造養分。

The leaf uses sunlight to make nutrients.  
葉子利用陽光來製造養分。

Opposite leaves  
對生葉

Alternate leaves  
互生葉

Whorled leaves  
輪生葉

## How a plant grows 植物如何生長

The stem holds the plant.  
莖支撐著植物。

Woody stem  
木本莖

Herbaceous stem  
草本莖

The root holds the plant in the soil.  
根把植物固定在土壤裡。

Vine stem  
藤本莖

Taproot  
主根

Fibrous root  
鬚根

## Functions of other plant parts 其他植物 部位的功能

The flower attracts insects to feed and pollinate.  
花吸引昆蟲覓食並幫助授粉。

Calyx  
花萼

The seed helps the plant reproduce.  
種子幫助植物繁殖。

Petal  
花瓣

The fruit protects and disperses the seeds.  
果實保護種子並幫助它們傳播。

Stamen  
雄蕊

Pistil  
雌蕊

# Unit 1

## Colorful Plants

## 多采多姿的植物



Date : \_\_\_\_\_

### 本課生字 Vocabulary

- 生物 living thing
- 非生物 non-living thing
- 動物 animal
- 植物 plant

- 根 root
- 莖 stem
- 葉子(單數) leaf
- 葉子(複數) leaves

- 花 flower
- 果實 fruit
- 種子 seed
- 空氣 air
- 水 water
- 陽光 sun

Plants in our life 生活中的植物 :

- 食 food: 稻子 (米飯rice)
- 衣 clothing: 棉花 (衣服clothes)
- 住 housing: 檜木 (房屋建築building)
- 行 transportation: 植物的莖 (橋bridge)
- 育 education: 植物 (植物園botanical garden)
- 樂 entertainment: 花 (花鐘flower)

- 木本莖 woody stem
- 草本莖 herb stem
- 藤本莖 vine stem
- 軸根 taproot
- 鬚根 fibrous root

- 養分 nutrient
- 支撐 support
- 固定 fix
- 吸收 absorb

- 葉形 leaf shape
- 葉緣 leaf margin
- 葉脈 vein
- 葉柄 petiole
- 節 node

葉序 leaf arrangement :

- 互生 alternate
- 對生 opposite
- 輪生 whorled



互生葉序



輪生葉序



對生葉序

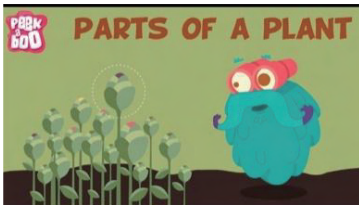
- 雌蕊 pistil
- 雄蕊 stamen
- 花瓣 petal
- 花萼 calyx

1. 自然環境中由有生命的生物和沒有生命的非生物組成。  
Natural environment consists of living things and non-living things.
2. 植物的身體大部分可以分成根、莖、葉、花、果實、種子等構造。  
The parts of most plants are roots, stems, leaves, flowers, fruits, seeds, and other structures.
3. 植物和人們的生活關係密切。  
Plants and people's lives are closely related.

# Science Videos

## Unit 1

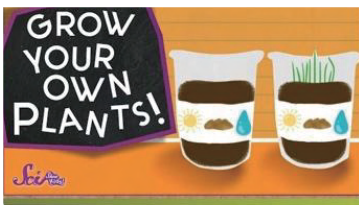
1-1 Parts of a Plant The Dr. Binocs Show



1-1 Plant Structures | Science



1-1 Grow Your Own Plants!



1-1 The Needs of a Plant



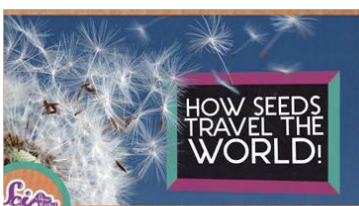
1-2 Plant Parts and Functions for Kids



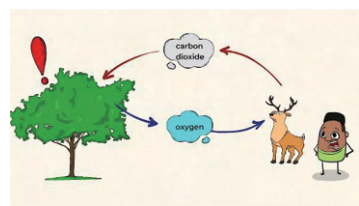
1-2 Parts of a Plant: Definitions & Functions



1-3 How Do Plant Seeds Travel?



1-3 Why Plants and Sunlight are so Important to Humans and Animals



# NOTES



# NOTES

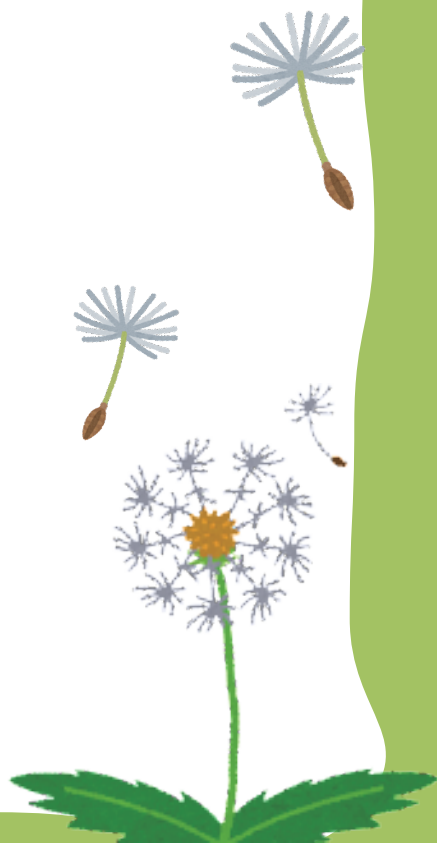




# NOTES



# NOTES



# Parts of a plant

● Write the parts of the plant inside the  .

flower

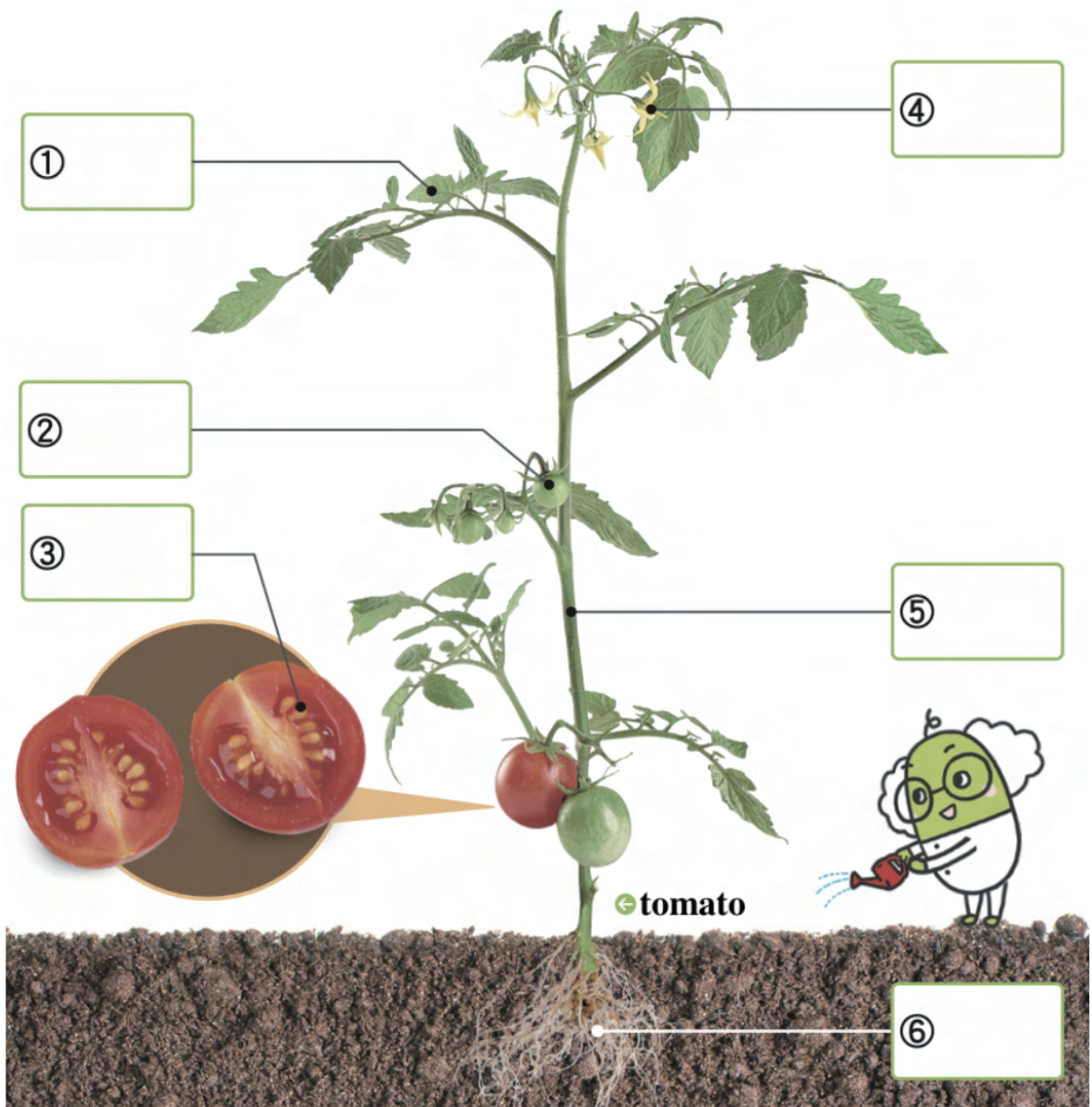
fruit

leaf

root

seed

stem



# Roots

● Match each plant to its type of roots.

spinach  
菠菜



Chinese cabbage  
小白菜



spring onion  
蔥



amaranth  
莧菜



garlic leaves  
蒜



● fibrous root  
鬚根

● taproot  
軸根

# Flower

- Write the parts of the flower inside the  .

calyx

petal

pistil

stamen



# Uses of plants

- What are the uses of plants? Please ✓ inside the .

People eat plants.



Plants make a place beautiful.



Plants can be used to make clothes.



Plants provide a house for animals.



- How else are plants used? Draw it below.



# Unit 2

## Forces in Our Lives 生活中的力



# Forces in Our Lives 生活中的力

## Effects 效果

Force makes things speed up,  
slow down, or stop.  
力可以使物體加速、減速或停止。

Object's shape or direction can change.  
如果對一個物體施加力，它的形狀或方向  
就會改變。

## Elements 元素

Force has size.  
力有大小。

Force has direction.  
力有方向。

The point of application is the place  
where force is applied.  
作用點就是施力點。

## Types 種類

Magnetic force  
磁力

Buoyant force  
浮力

Water force  
水力

Wind force  
風力

Elastic force  
彈力



# Unit 2

## Forces in Our Lives

### 生活中的力



Date : \_\_\_\_\_

## 本課生字 Vocabulary

- 力 force
- 的大小 size
- 的方向 direction
- 的作用點 point of application

- 推 push
- 拉 pull
- 壓 press
- 拋 throw
- 吸引 attract
- 反抗 repel

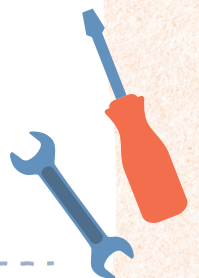
Materials 材料:

- 色紙 colored paper
- 彩色筆 colored pen
- 長尾夾 binder clip
- 迴紋針 paper clip
- 釘書針 staple
- 剪刀 scissors
- 硬幣 coin
- 橡皮擦 eraser
- 膠帶 tape
- 鉛筆 pencil

- 磁力 magnetic force
- 磁性 magnetism
- 磁鐵 magnet
- 磁極 magnetic pole
- 浮力 buoyant force
- 肌力 muscular force

- 水力 water force
- 風力 wind force
- 彈力 elastic force

- 掛鉤 hook
- 西洋棋 chess
- 磁扣 magnetic snap
- 螺絲起子 screwdriver



1. If force is applied to an object, the object can speed up, slow down, or stop.  
如果對物體施加力，它可以加速、減速或停止。
2. If force is applied to an object, the object's shape or direction can change.  
如果對一個物體施加力，它的形狀或方向就會改變。
3. The elements of force are magnitude, direction, and point of application.  
力的要素是大小、方向和作用點。
4. Unlike poles attract each other while like poles repel each other.  
異性相吸，同性相斥。

# Science Videos

# Unit 2

## 2-1 Work, Force & Energy, What is Force?



## 2-1 Force, Work and Energy



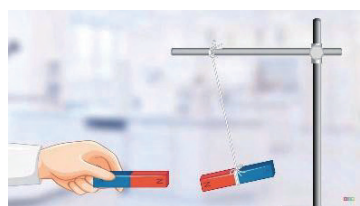
## 2-1 Push and Pull for Kids



## 2-2 Magnetism



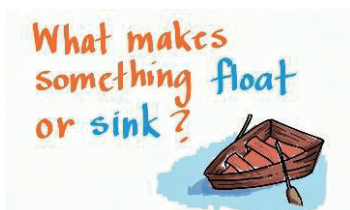
## 2-2 Magnet Interactions – Poles



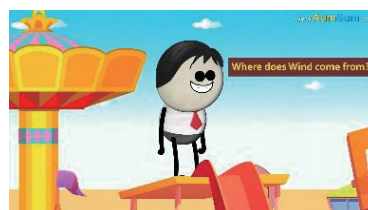
## 2-2 Magnets and Magnetism



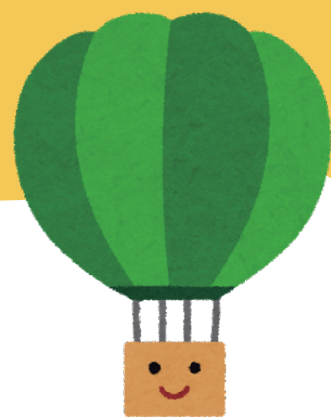
## 2-3 Buoyancy: What Makes Something Float or Sink?



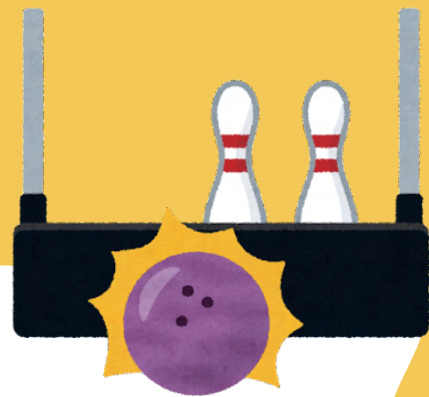
## 2-3 Where Does Wind Come From?



# NOTES



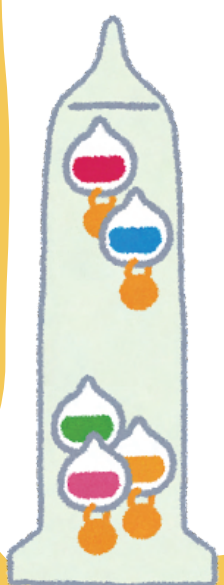
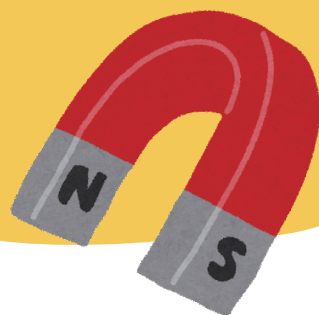
# NOTES



# NOTES



# NOTES



# Force

● Fill in the blanks using the words below.

direction

move

pull

push

shape

slow down

speed up

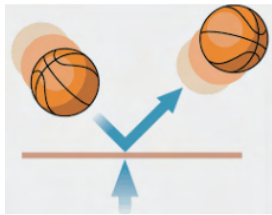
stop



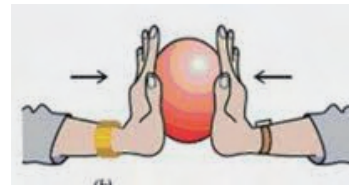
This force is called \_\_\_\_\_ .



This force is called \_\_\_\_\_ .



Force can change an object's \_\_\_\_\_ .



Force can change an object's \_\_\_\_\_ .



Force can change an object's \_\_\_\_\_ .



Force can change an object's \_\_\_\_\_ .



Force can change an object's \_\_\_\_\_ .



Force can change an object's \_\_\_\_\_ .

# Magnetism

- What happens to the magnets? Circle **attract** or **repel**.



attract / repel



attract / repel

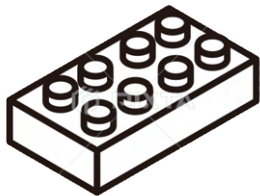


attract / repel



attract / repel

- Color all magnetic objects.



building block toy (樂高積木)



gold coin (金幣)



iron nail (鐵釘)



shell (貝殼)



tin can (錫罐)

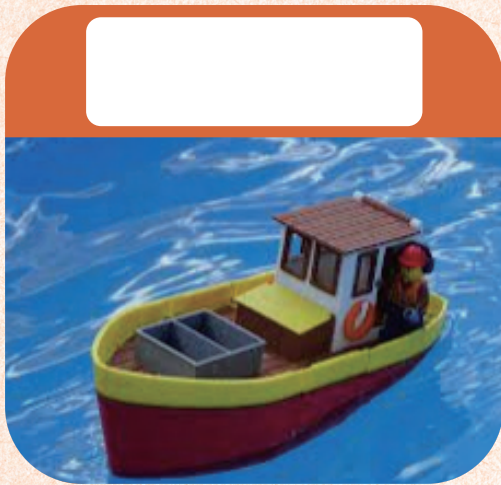


water bottle (寶特瓶)



# Types of forces

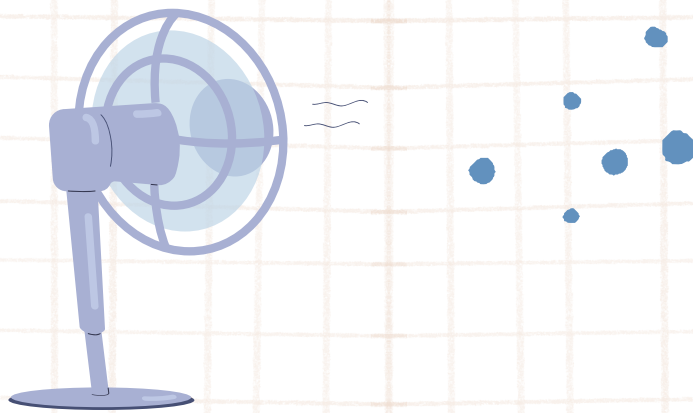
- What is the source of force shown in each picture?  
Write **elastic**, **water** or **wind** inside the  .





# Unit 3

## Amazing Air 奇妙的空氣



# Amazing Air 奇妙的空氣

## Properties 特性

Air is everywhere.  
空氣無所不在。

Air takes up space and the shape of the container.  
空氣佔據空間和容器的形狀。

Air can flow.  
空氣會流動。

Air has weight.  
空氣有重量。

Air can be compressed.  
空氣可以被擠壓。

## Uses 用途

We breathe air.  
我們呼吸空氣。

Air disperses a plant's seeds.  
空氣傳播植物的種子。

Air is used in flotation devices.  
空氣用於漂浮裝置。

Air powers a sailboat.  
空氣為帆船提供動力。

Air provides wind energy.  
空氣提供風能。

## Clean air 乾淨的空氣

Clean and fresh air keeps us healthy.  
乾淨清新的空氣保持我們的健康。

We should go green to keep the air clean.  
我們要愛護環境，維持空氣乾淨。

# Unit 3

## Amazing Air

### 奇妙的空氣



Date : \_\_\_\_\_

#### 本課生字 Vocabulary

- 空氣 air
- 空氣流動 air flow
- 石頭 rock
- 水 water
- 風 wind
- 重量 weight
- 擠壓 compress / squeeze

- 空間 space
- 形狀 shape
- 氣球 balloon
- 游泳圈 swim ring
- 籃球 basketball

- 塑膠袋 plastic bag
- 紙團 paper ball
- 玻璃杯 glass
- 頭髮 hair
- 旗子 flag
- 風車 windmill

- 空氣污染 air pollution
- 空氣品質 air quality

1. Air is everywhere.  
空氣無處不在。
2. Air takes up space and the shape of the container.  
空氣佔據空間和容器的形狀。
3. Wind is moving air; the faster the air moves, the stronger the wind.  
風是流動的空氣；空氣流動得越快，風就越大。
4. If compressed air is released, it can make an object move.  
如果釋放被擠壓的空氣，它可以使物體移動。

# Science Videos

## Unit 3

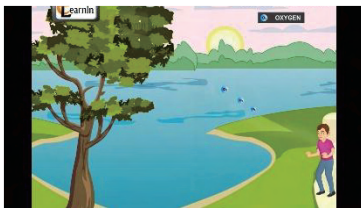
### 3-1 What is Air?



### 3-1 Air Around Us



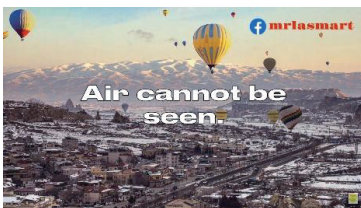
### 3-1 Air Occupies Space



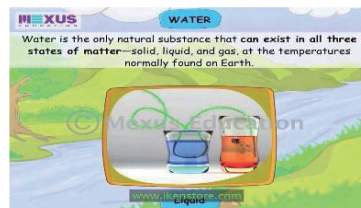
### 3-2 Properties of Air



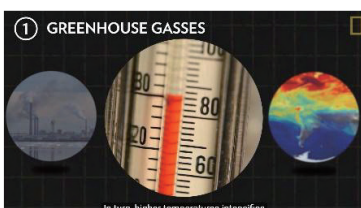
### 3-2 Characteristics of Air



### 3-2 Science Lesson: Properties of Air and Water



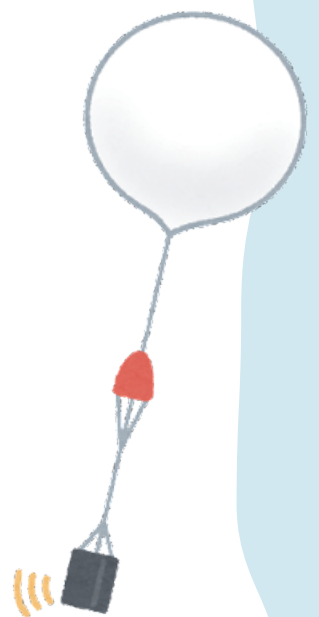
### 3-3 Air Pollution 101



### 3-3 Air Pollution



# NOTES



# NOTES

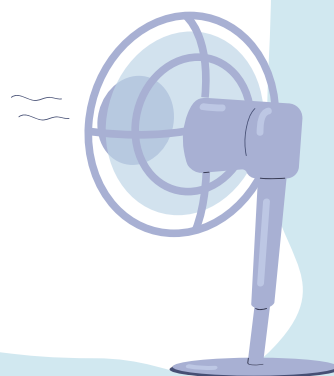


# NOTES





# NOTES



# Properties of air

- Can you find air by using your...



ears ?

YES / NO



eyes ?

YES / NO



nose ?

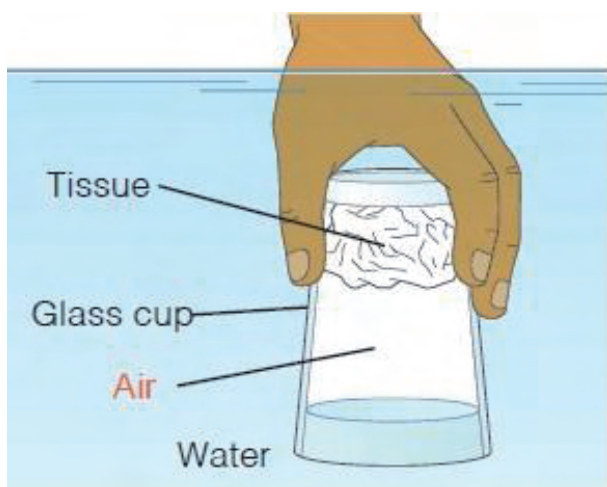
YES / NO



hand ?

YES / NO

- Look at the picture below.



The **tissue** inside the **cup** is not wet by **water** because **air** takes up space.

杯子裡的紙巾不會被水弄濕，  
因為空氣占有空間。

- How else does air take up space? Draw it below.

# Air has weight

- Look at the pictures below.



What happens next? Draw and explain why.



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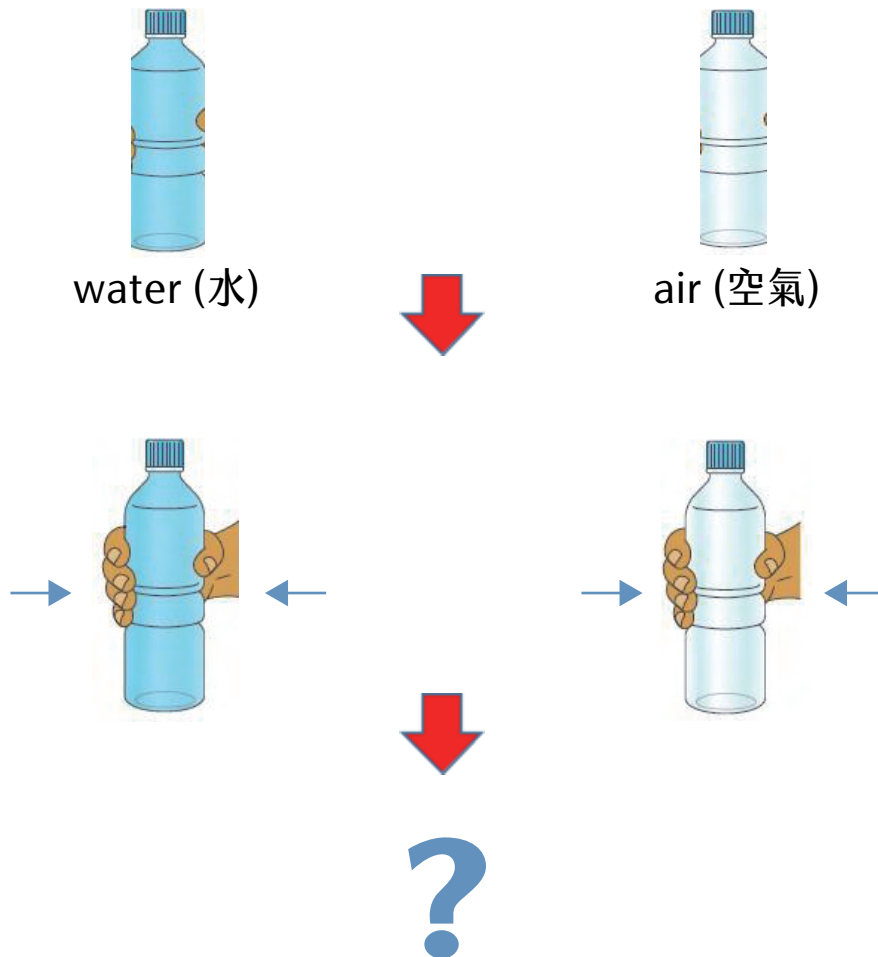
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# Air can be compressed

- Look at the pictures below.



What happens next? Draw your **prediction** and **observation**.

prediction

observation

# Air pollution

- Is this a source of air pollution? Circle 🤔 if yes and circle 👍 if no.



electric car (電動車)



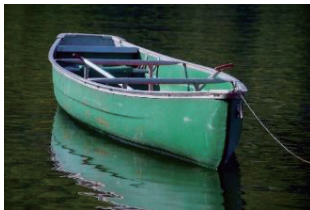
fossil fuel car (汽車)



bicycle (腳踏車)



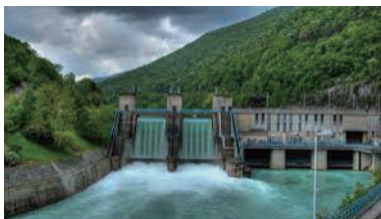
motorcycle (摩托車)



boat (小船)



ship (大型船隻)



hydroelectric power plant  
(水力發電廠)



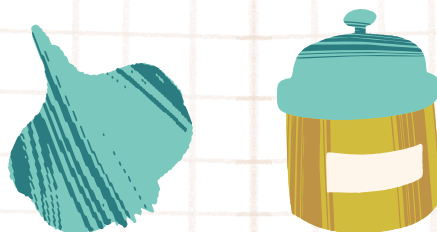
thermal power plant  
(火力發電廠)





# Unit 4

## Science in the Kitchen 廚房裡的科學



# Science in the Kitchen 廚房裡的科學

## Observation 觀察

We use eyes to see condiment.  
眼睛可以用來看調味品。

We use hands to touch condiment.  
手可以用來觸摸調味品。

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

## Reaction with water 遇水的反應

Dissolves in water with purple cabbage juice  
與紫高麗菜汁溶於水

Does not dissolve in water  
不溶於水

The aqueous solution turns red when an acid is added.  
當加入酸性物質時，水溶液會變成紅色。

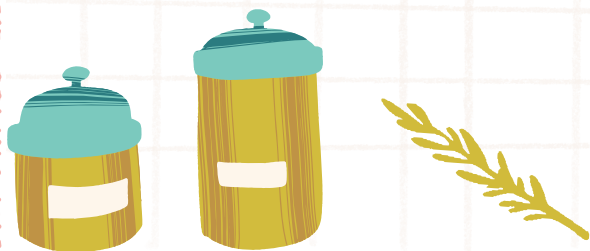
The aqueous solution stays purple when a neutral substance is added.  
當加入中性物質時，水溶液會保持紫色。

The aqueous solution turns blue-green when a base is added.  
當加入鹼性物質時，水溶液會變成藍綠色。

## Identification 利用材料特性判別

Check the color of purple cabbage juice after adding the aqueous solution.  
紫色高麗汁加入水溶液後的顏色

Check if the condiment can or cannot be dissolved in water.  
能否溶於水



# Unit 4

## Science in the Kitchen

### 廚房裡的科學



Date : \_\_\_\_\_

#### 本課生字 Vocabulary

- 調味品 condiment
- 水溶液 aqueous solution
- 酸性(n) acid
- 酸性的 (adj) acidic
- 鹼性 (n) base
- 鹼性的( adj) basic
- 中性 neutral
- 可溶解的 soluble
- 不易溶解的 insoluble
- 溶解 dissolve
- 量筒 graduated cylinder
- 燒杯 beaker
- 攪拌棒 stirring rod

- 眼睛 eyes -看 see
- 手 hands - 觸摸 touch
- 鼻子 nose -聞 smell

- 沙子 sand
- 湯 soup
- 紅茶 black tea
- 廚房 kitchen
- 醋 vinegar
- 檸檬汁 lemon juice

調味品:

- 粉末材料 powdered material
- 砂糖 sugar
- 食鹽 salt
- 小蘇打粉 baking soda
- 麵粉 flour
- 檸檬酸粉 citric acid

- 紫色高麗菜 purple cabbage
- 紅鳳菜葉 red amaranth leave
- 蝶豆花瓣 butterfly pea petal
- 紫色葡萄皮 purple grape skin

1. Condiments can be observed by using the senses.  
調味品可以通過感官來觀察。
2. Some substances can be dissolved in water while others cannot.  
有些物質可以溶於水，有些則不能。





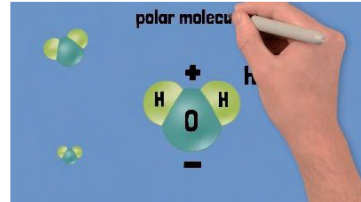
# Science Videos

# Unit 4

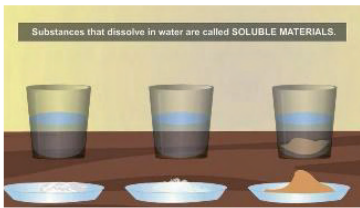
4-1 The Herbs, Spices, and Condiments that are Essential for Every Kitchen!



4-1 How Solubility and Dissolving Work



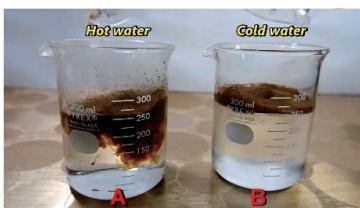
4-1 Soluble and Insoluble Materials



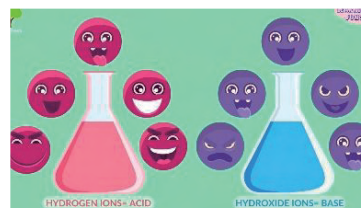
4-1 Dissolve Song



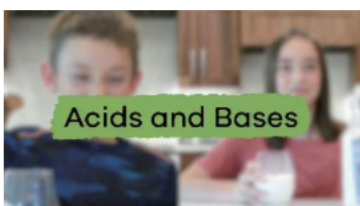
4-1 The Effect of Temperature on Solubility



4-2 Acid and Base



4-2 Acids and Bases for Kids



4-2 Experiment DIY pH Indicator from Red Cabbage



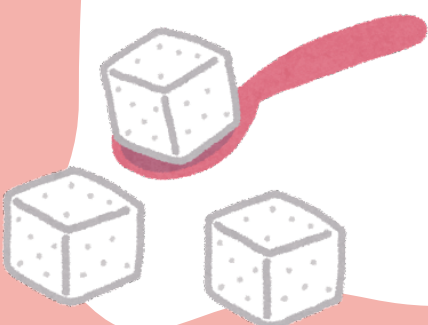
# NOTES



# NOTES



# NOTES



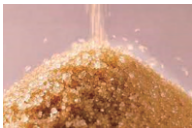


# NOTES





# Properties of condiments

- Complete the table below.

Condiment 調味料	Color 顏色	Texture觸感 (coarse粗粗的/ fine細細的)	Smell味道 (with smell有味道/ without smell無味道)
 baking soda 小蘇打粉			
 flour 麵粉			
 pepper 胡椒粉			
 sugar 糖			

# Dissolve

- Does it dissolve in water? Circle  if yes and circle  if no.



butter(奶油)



noodles(麵條)



oil(沙拉油)



salt(鹽)



tapioca balls(粉圓)



vinegar(醋)



# Acid, neutral, and base


- Complete the table below.

Aqueous solution 水溶液	+	Indicator 紙試劑	=	Acid, neutral, or base?
 water 水	+	 lemon 檸檬片		 蝶豆花瓣
 water 水	+	 sugar 糖		 紫色葡萄皮
 water 水	+	 baking soda 小蘇打粉		 紅鳳菜葉



# Rewards

Date	Points	Emoticon	Date	Points	Emoticon



**Science Notes**  
**Bilingual Science**  
**3rd grade 1st semester**

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