English Immersion Program

Science Notes

Name：_____

Class：_____

Number：_____

Teacher：_____

國立臺北教育大學附設實驗國民小學
國立臺北教育大學雙語教學研究中心

前言

面對全球化及國際化浪潮，2030雙語國家政策發展藍圖中強調「厚植國人英語力」、「提升國家競爭力」為重要目標（國家發展委員會，2020），因此，為提升國民英語力以增加國際競爭力，政府預計於2030年打造臺灣成為雙語國家。

臺北市為因應此國家重要政策，積極推動每個行政區至少一所雙語實驗課程學校，自106學年度起至109學年度止，臺北市已有20所雙語實驗課程國小及8所雙語實驗課程國中，並將於110學年度再增加20校，達到48校之多，期望成為我國雙語教育之先驅，讓臺北市的孩子成為具有國際移動力的未來公民。

本校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，因此自108學年度開始針對六年級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。

這本科學筆記本是本校六年級自然任課老師陳美卿、林怡伶、林雨慶、范瑋庭、張淑惠、陳姿瑾所共同設計的，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，期望學生可以紮紮實實的學習自然科學知識，更透過以英語指導科學實驗步驟，動手做實驗來激發學童的科學探究潛能、啟發學童善用英語進行科學領域學習的能力。

2020.09.02

Weather Changes

Water in the atmosphere

Cloud and fog

Factors affecting cloud and fog formation.
（雲）和（霧）的形成原因。

Rain, dew, frost and snow

Factors affecting rain, dew, frost and snow formation.
（雨、露、霜、雪）的形成原因。

Water cycle

Water cycle in nature.
大自然中（水的循環）過程。

Weather chart and weather changes

Satellite images

How to read satellite images to forecast weather changes.
如何閱讀（衛星雲圖）來預測未來天氣演變。

Satellite images are photographed by meteorological satellites.
衛星雲圖是由（氣象衛星）拍攝而成的圖片。

Surface weather chart

The meaning of the symbols and information on surface weather charts.
（地面天氣圖）上的符號意義及帶給我們的資訊。

Typhoon

Typhoon is coming

The impact of typhoon to life.
（颱風）對生活的影響。

To decrease disasters caused by typhoon, we should know how to prevent typhoons. 要減少颱風所帶來的災害，就要知道(防颱)的方法。

Typhoon

Factors affecting the formation and path of a typhoon.
颱風的（形成原因）及（路徑）。

Read typhoon-related information.
閱讀颱風相關資料。

Unit 1
Weather Changes

Unit 1 Weather Changes
天氣的變化

日期

應會認讀/聽懂的字彙

1. 大氣 atmosphere
2. 凝結 condensation
3. 蒸發 evaporation 蒸散 transpiration
4. 凝固 freezing 融化 melt
5. 水蒸氣 water vapor (小水滴 droplet)
6. 雲 cloud
7. 霧 fog
8. 霜 frost
9. 雪 snow
10. 雨 rain 降水 precipitation
11. 露 dew
12. 固態 solid/液態 liquid/氣態 gas
13. 水循環 water cycle

14. 氣象預報 weather forecast
15. 氣溫 temperature
16. 濕度 humidity
17. 氣壓 atmospheric pressure
18. 高/低氣壓
    high/low pressure system
19. 氣團 air mass
20. 暖/冷空氣 warm/cold air mass
21. 鋒面 front
22. 冷/暖鋒 cold/warm front
23. 滯留鋒 stationary front

1. 溫度計 thermometer 
2. 線香 incense
3. 錐形瓶 Erlenmeyer flask 
4. 燒杯 beaker 

5. 冰晶 ice crystal

6. 大氣層 atmospheric layer
7. 中央氣象局 Central Weather Bureau
8 .等壓線 isobaric line
9. 地面天氣圖 surface weather chart
10. 衛星雲圖 satellite images
11. 熱帶性低氣壓 tropical depression

12. 颱風 typhoon
    (severe強/moderate中/weak輕)
13. 颶風 hurricane
14. 災害 disaster
15. 颱風眼 typhoon eye
16 淹水 flooding
17. 坍方/土石流 landslide

18. 停電 outage/停水 out of water
19. 路徑 path
20. 防颱準備
    typhoon precautionary measures
21. 颱風來臨的徵兆 signs of a typhoon
22. 颱風警報發布 typhoon warning issued

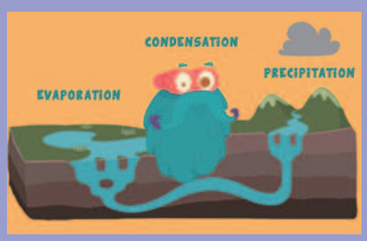
應聽懂/說出的科學概念:

1. The weather in a low pressure area is <u>cloudy</u>.
   The weather in a high pressure area is <u>sunny</u>.
2. The weather condition(狀況) in a stationary front is <u>rainy</u>.
3. The typhoon is developed(發展) by <u>tropical depression</u>.
4. Weather forecast for today is _____ .
5. We should prepare _____ before a typhoon comes.
(手電筒flashlight, 膠帶tapes, 食物food, 民生用品daily commodities/necessities…)

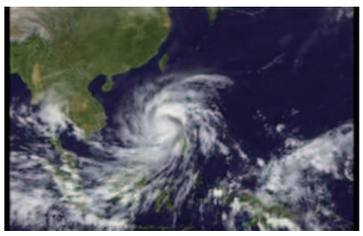
完成日期

For Further Watching Unit 1

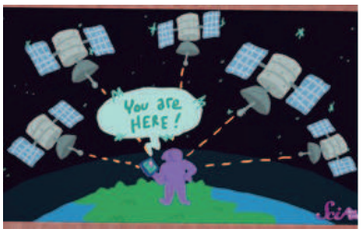
1-1
The Water Cycle.3



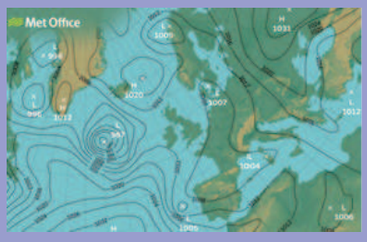
1-2
Super Typhoon
Haiyan Satellite
Image Time Lapse
12th November 2013



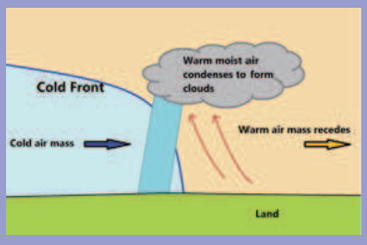
1-2
Check Out the
Satellites!



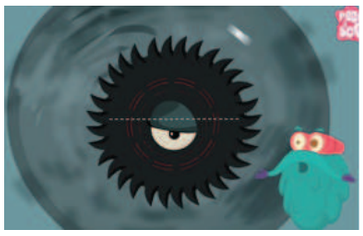
1-2
How to Read a
Synoptic Weather
Chart



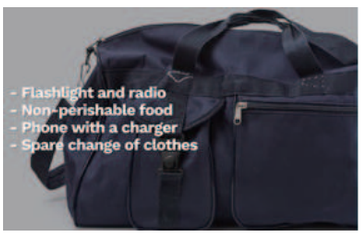
1-2
How to Read
Weather Maps



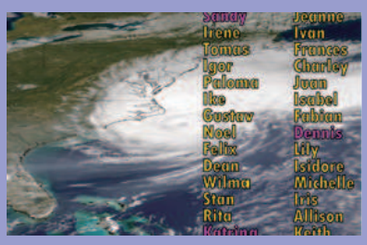
1-3
Hurricane



1-3
Typhoon Tips:
What to Do Before,
During and After



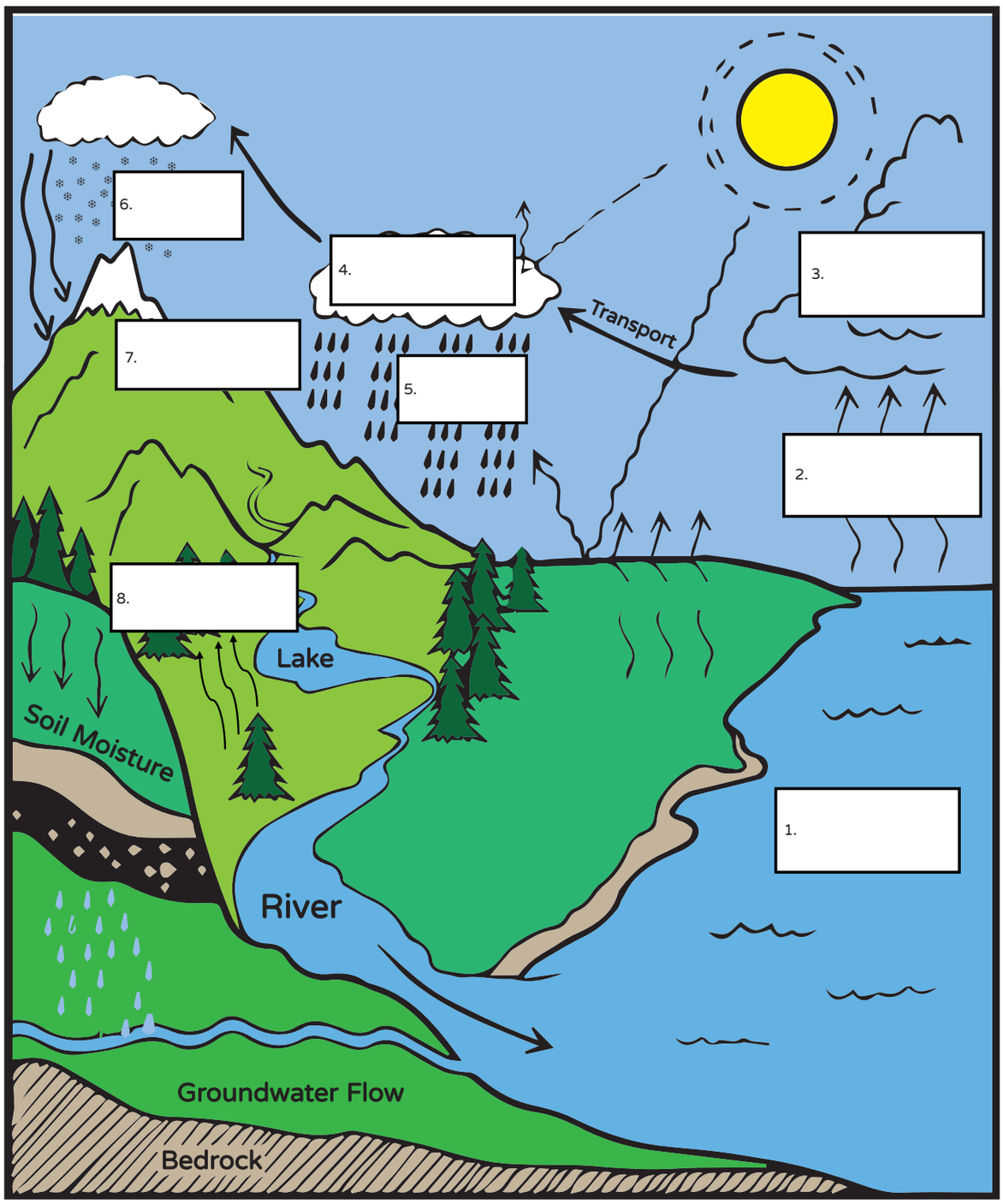
1-3
How to Name a
Typhoon



水循環 Water Cycle

■請在下圖中填入以下名詞(Add the words to the water cycle picture)
可用中或英文：(每格2分)

★雲 cloud
★雨 rain
★海洋 ocean
★蒸發 evaporation
★蒸散 transpiration
★雪 snow
★凝結 condensation
★降水 precipitation



What information can you get from this weather map?

★低氣壓中心 low pressure center　★等壓線 isobaric line　★暖鋒 warm front

★高氣壓中心 high pressure center　★冷鋒 cold front　★滯留鋒 stationary front

★陰雨連綿的天氣 drizzle　★天氣晴朗 sunny

★氣溫增高，雨期長、雨勢較小，連綿性降雨。 Temperature rises, long rainy period, light rain, and continuous rainfall.

★氣溫顯著下降，雲量增多、下大雨、雷雨，風速變大。Temperature drops, more cloud cover, heavy rain, thunderstorm, and wind speed increases.

★天氣會變壞、下雨。The weather gets worse and it will rain.

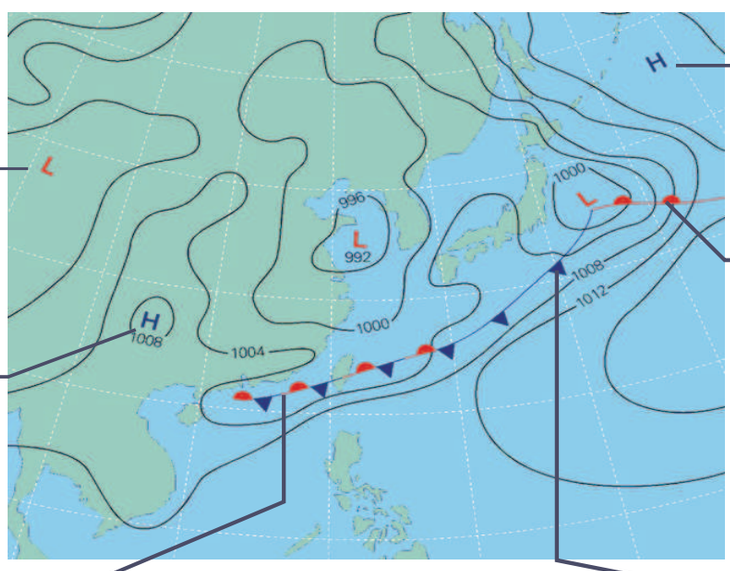
(每格2分)

This is (名稱)：

Possible weather conditions (可能的天氣狀況)：

This is (名稱)：

Possible weather conditions (可能的天氣狀況)：



This is (名稱)：

Possible weather conditions (可能的天氣狀況)：

This is (名稱)：

Possible weather conditions (可能的天氣狀況):

This is (名稱)：

Possible weather conditions (可能的天氣狀況)：

This is (名稱)：

Possible weather conditions (可能的天氣狀況)：

颱風 Typhoon

What can we learn from the typhoon path map? Please check the map and answer the following questions in English:

Tropical Depression ⊗熱帶性低氣壓

Moderate Typhoon 中度颱風

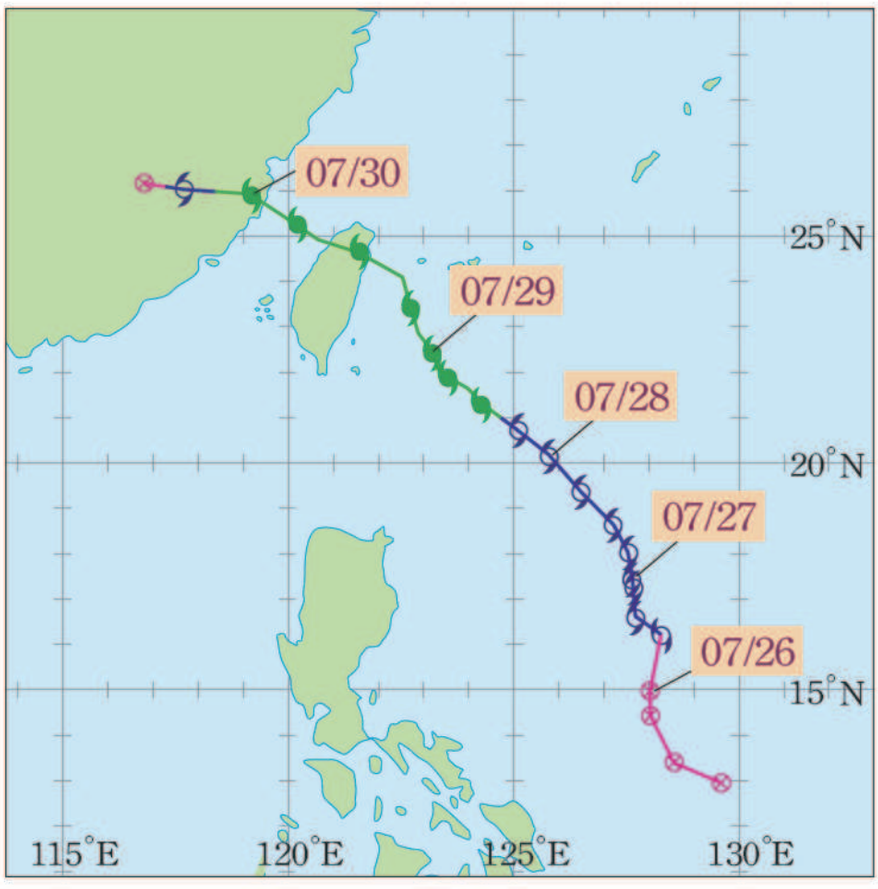
Severe Typhoon 強烈颱風

Weak Typhoon 輕度颱風

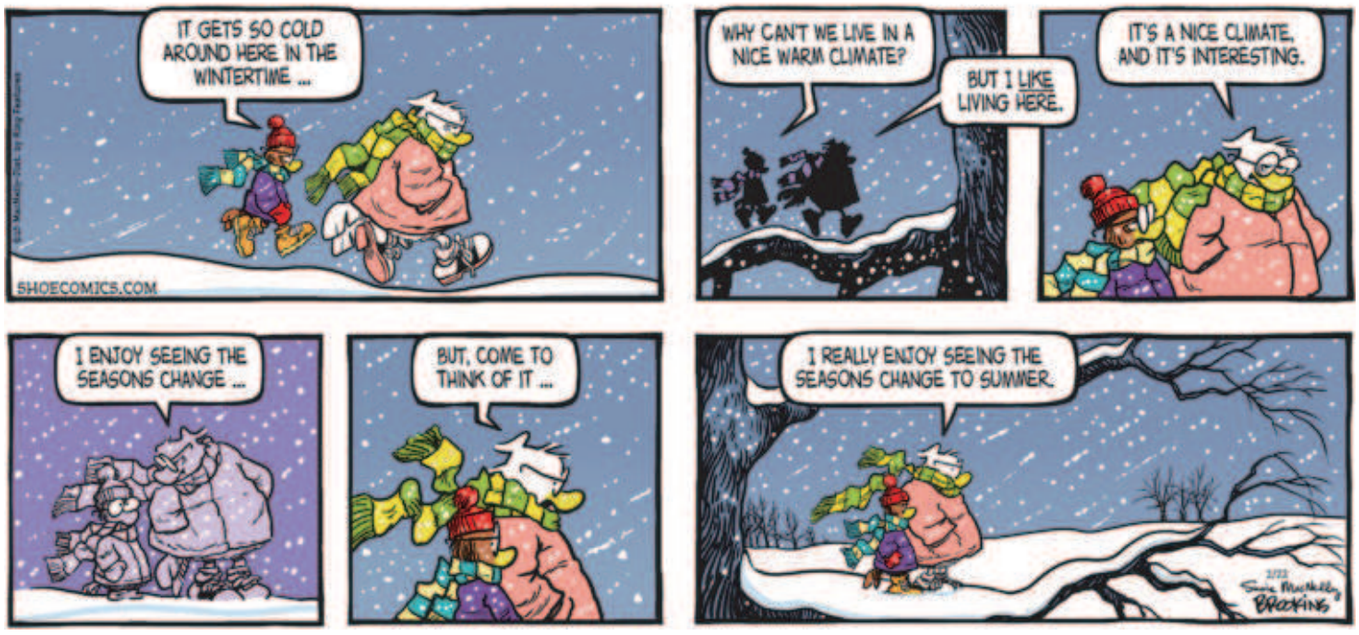
(1) What was the category of the typhoon on July 28th?_____
7月28日颱風的強度是

(2) When the typhoon made its landfall, what was the category of the typhoon? _____
登陸臺灣的颱風強度是

(3) When the typhoon made its landfall and weakened, it became a _____ once again.
颱風遇到陸地後，強度減弱，最後又會變回



SCIENCE READING
Unit 1



https://i.pinimg.com/originals/6c/46/fb/6c46fb162cf86ae6f55e1f168472cf09.gif

(　　) 1：How does snow turn into water?

A) freezing　B) evaporation

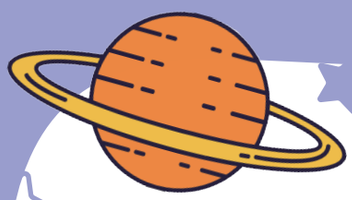
C) melting　D) condensation

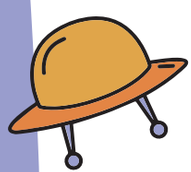
(　　) 2：Snow is a form of _____.

A) transpiration　B) humidity

C) precipitation　D) evaporation

NOTES






Heat and Our Lives
Changes in heated materials
Physical properties
Hardness
Color
Smell
Volume
Thermal expansion and contraction
Liquid
Gas
Solid
Heat transfer
Conduction
Heat is transferred from higher temperature to lower temperature through materials.
藉著物質將熱由(高溫)處傳向(低溫)處。
Convection
Liquid and gas transfer heat through convection.
利用對流來傳播熱的形態有(液體)、(氣體)。
Radiation
Heat is transferred from higher temperature to lower temperature without materials. 不用倚靠（物質）就可以傳播熱，但還是由高溫傳向低溫。
The heated part of air and water will start to move upward and the colder part will move downward, causing a cycle.
空氣和水等會流動的物質，會由（受熱）的部分開始向上運動，同時引起較（冷）的部分（向下）運動，造成循環。
Buildings in hot places
Ventilation
Convection, radiation (dissipation) 對流、散熱。
Transparent
Radiation is inevitable because heat enters as long as light enters.
無法阻擋（輻射熱），因為（光）進入屋內，（熱）就進入屋內。
Keep the sun out and use insulation
Different designs for sunshade 各種（遮陽）設計

Unit 2
Heat

Unit 2 Heat
熱對物質的影響

日期

應會認讀/聽懂的字彙

1. 熱脹 thermal expansion
2. 冷縮 contraction
3. 熱傳導 conduction
4. 熱對流 convection
5. 熱輻射 radiation
6. 熱傳遞 heat transfer
7. 可逆的改變 reversible change
   不可逆的改變 irreversible change
8. 節能減碳
   energy saving and carbon reduction
9. 雨水回收 rainwater recycling
10. 綠色建築 green buildings

1. 冷氣 air conditioner
2. 太陽能板 solar panel
3. 百葉窗 shutter
4. 熱氣球 hot air balloon
5. 巧克力 chocolate
6. 雞蛋 egg
7. 酒精燈 alcohol lamp
8. 保溫袋 isothermic bag
9. 羽絨外套 down jacket
10. 保溫杯 thermos bottle
11. 鐵軌縫隙 railroad gap
12. 電塔 electric tower
13. 橋樑 bridge

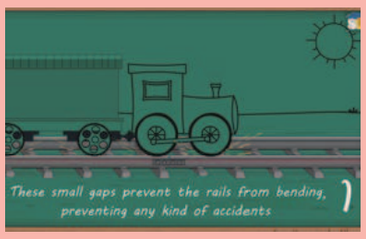
應聽懂/說出的句型:

1. Heat is transferred through conduction, convection and radiation.
2. Conduction happens when heat moves from a hot thing to a cold one through direct touch.
   Convection happens when heat moves from a hot thing to a cold one through a moving liquid or gas.
   Radiation happens when heat moves from a hot thing to a cold one without touching each other.
3. Cooking eggs is an irreversible change.
   Melting chocolate is a reversible change.
4. The air conditioner works by the application (應用) of convection and conduction.

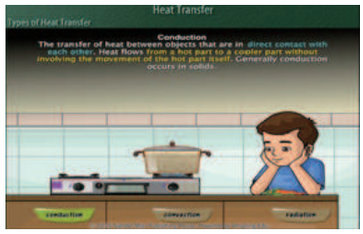
本頁
完成日期

For Further Watching Unit 2

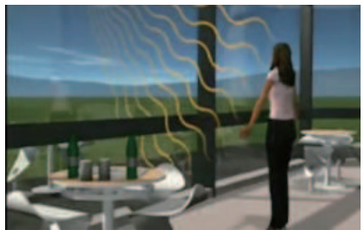
2-1
Thermal Expansion - Why are Gaps Left Between Railway Tracks?



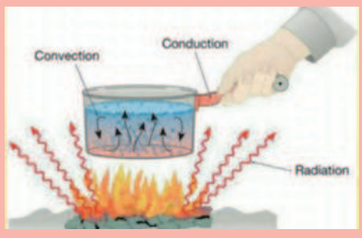
2-2
Types of Heat Transfer



2-2
Animation - Third Heat Flow : Radiation (Commerical)



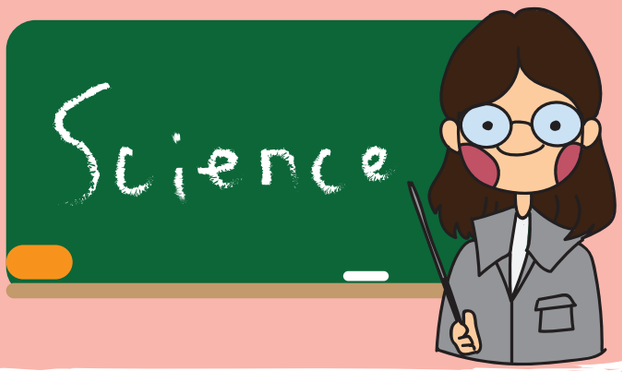
2-2
Heat Transfer: Conduction, Convection, and Radiation



2-2
Conduction, Convection, and Radiation [SONG!]

2-3
10 Ways to Save Electricity at Home

2-3
Saving Energy Around The Home - Energy Efficiency Tips



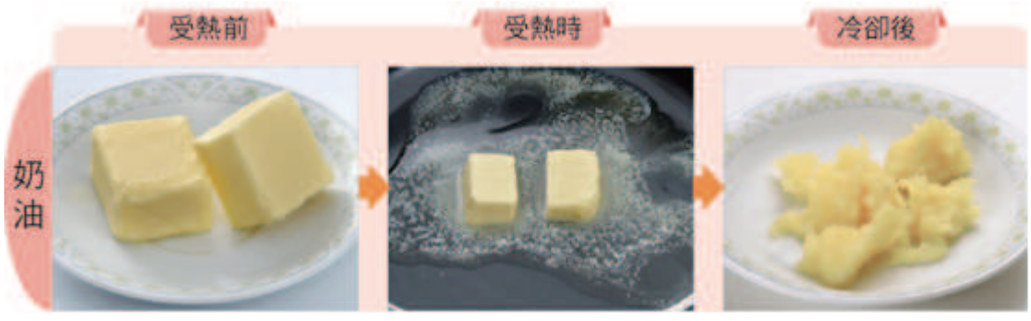
When a material is heated
物質受熱後

Heating an egg is
[ ] a reversible change
[ ] an irreversible change
because the color, shape, and hardness of the egg cannot be changed back again.

Other examples are heating _____ and _____.

Heating butter is
[ ] a reversible change
[ ] an irreversible change
because the heated butter can be turned back into solid butter.

Other examples are heating _____ and _____.



Heat transfer

conduction	convection	radiation
傳 導	對 流	輻 射

Choose the BEST heat transfer option for each picture below.
請依圖片及文字敘述選擇最適合的熱傳播的方式，並將答案填入 _____ 中。

1. An oven mitt gets warmer while transporting a hot pan.
拿熱的烤盤時，烤箱手套會變熱

新資調查

_____

2. The sun causes water in a pond to evaporate.
太陽使池塘中的水蒸發

_____

3. Hot air inflates a hot air balloon
熱空氣使熱氣球膨脹

_____

4. A spoon gets warmer after sitting in a bowl of soup
放在熱湯中的金屬湯匙會變熱

_____

5. A bowl of oatmeal cools
熱的燕麥片放在大碗中使它變涼

_____

6. A pot on an induction cooker
放在電磁爐上的鐵鍋

_____

Heat Insulation and Heat Dissipation

Insulation helps heat to stay. Dissipation helps heat to spread.
Write down whether the picture shows heat insulation or heat dissipation.
減緩熱的傳播速度可以保溫，加快熱的傳播速度就可以達到散熱的效果。
以下生活中的例子是為了保溫還是散熱？

Putting a lid on a cup is an example of _____.
茶杯加上蓋子是為了...

Using an ice pack for therapy is an example of_____.
利用冰袋冰敷是為了...

Turning on the fan is an example of_____.
吹電扇是為了 ...

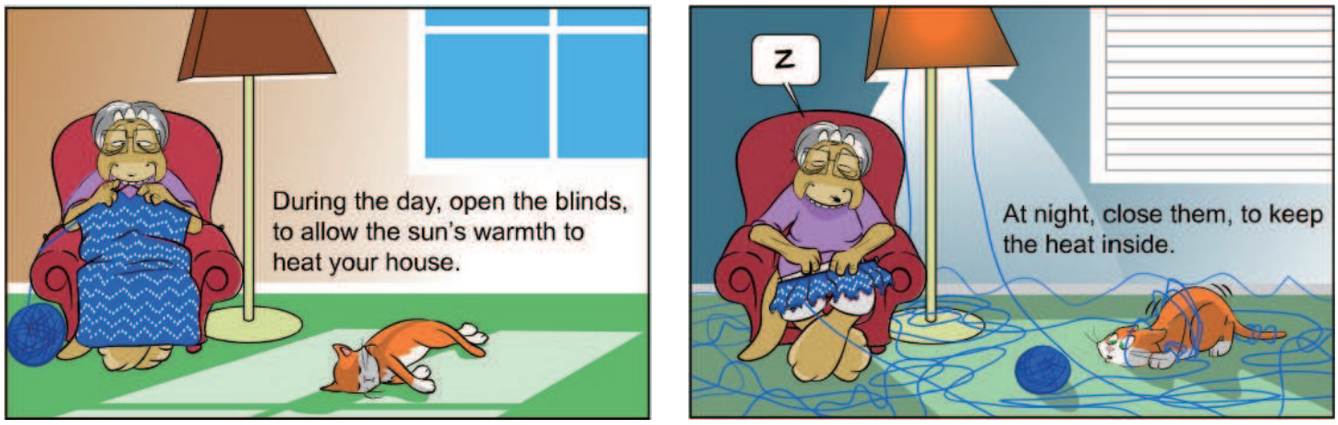
Tucking ourselves in a quilt is an example of _____.
蓋上厚棉被是為了...

Blowing on the soup before eating is an example of _____.
喝熱湯之前先吹氣是為了...

Putting ice cream in a Styrofoam box is an example of_____.
用保麗龍盒裝冰淇淋是為了...

SCIENCE READING
Unit 2

Let the sun help you out :



https://greenplanet4kids.com/comic/save-heating-cooling/blinds-save-energy

( ) 1 : Sunlight warms the house through _____ .

A) conduction B) convection

C) radiation D) solar panel

( ) 2 : Closing the blinds keep heat inside the house through_____.

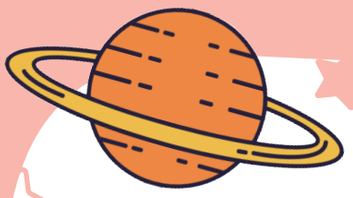
A) conduction

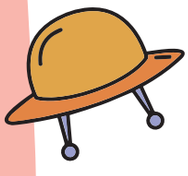
B) dissipation

C) insulation

D) radiation

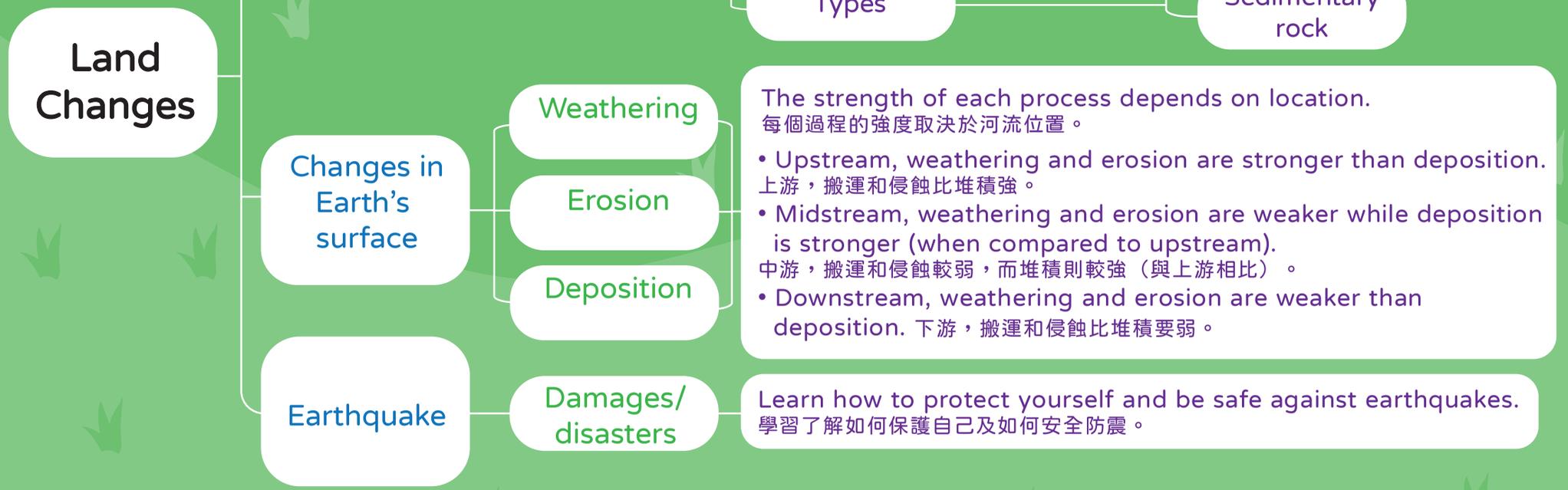
NOTE





Rewards

Date	Points	Emoticons	Date	Points	Emoticons


Land Changes
Mineral and rock
Mineral
How to classify
Color
Luster
Shape
Hardness
Odor
Rock
Made up of minerals
Types
Igneous rock
Metamorphic rock
Sedimentary rock
Changes in Earth's surface
Weathering
Erosion
Deposition
The strength of each process depends on location.
每個過程的強度取決於河流位置。
• Upstream, weathering and erosion are stronger than deposition.
上游，搬運和侵蝕比堆積強。
• Midstream, weathering and erosion are weaker while deposition is stronger (when compared to upstream).
中游，搬運和侵蝕較弱，而堆積則較強（與上游相比）。
• Downstream, weathering and erosion are weaker than deposition. 下游，搬運和侵蝕比堆積要弱。
Earthquake
Damages/ disasters
Learn how to protect yourself and be safe against earthquakes.
學習了解如何保護自己及如何安全防震。

Unit 3
Land Changes

Unit 3 Land Changes
地質的變化

應聽懂及認讀的生字

1. ☐ even**	平陡
2. ☐ steep**	陡峭的
3. ☐ landslide**	土石流
4. ☐ canyon**/valley**	峽谷/山谷
5. ☐ weathering	搬運/風化
6. ☐ erosion**	侵蝕
7. ☐ deposition	堆積
8. ☐ collapse**	倒塌
9. ☐ rock**	岩石
10. ☐ mineral	礦物
11. ☐ hardness	硬度
12. ☐ crystallization**	結晶
13. ☐ turbulent	湍急的
14. ☐ sedimentary rock	沉積岩
15. ☐ igneous rock	火成岩
16. ☐ metamorphic rock	變質岩
17. ☐ marine cave	海蝕洞
18. ☐ chessboard rock**	豆腐岩
19. ☐ sea cliff	海蝕崖
20. ☐ wave-cut platform**	海蝕(平臺**)
21. ☐ Mohs hardness scale	莫氏硬度表

Minerals 礦物:

1. ☐ talc	滑石
2. ☐ gypsum	石膏
3. ☐ quartz	石英
4. ☐ feldspar	長石
5. ☐ black mica/ white mica	黑雲母/ 白雲母
6. ☐ calcite	方解石
7. ☐ diamond**	鑽石
8. ☐ sulfur	硫磺
9. ☐ copper	銅礦
10. ☐ iron ore**	鐵礦
11. ☐ graphite	石墨

Rocks 岩石:

12. ☐ limestone	石灰岩
13. ☐ granite	花崗岩
14. ☐ sandstone	砂岩
15. ☐ shale	頁岩
16. ☐ basalt	玄武岩
17. ☐ marble**	大理石
18. ☐ slate	板岩
19. ☐ andesite	安山岩
20. ☐ gneiss	片麻岩

Applications 應用:

① talc 滑石 → talcum powder 爽身粉
② sulfur 硫磺 → gunpowder 火藥
③ graphite 石墨 → pencil lead 筆心
④ limestone 石灰岩 → cement 水泥
⑤ granite 花崗岩 → wall/floor 牆壁/地板

1. Rocks are made up of one or more minerals.
2. A harder mineral can scratch (刮) a softer one.
3. We can use nails, coins or iron ruler to scratch minerals. Their hardness can also be compared.
4. When there is an earthquake, drop, cover and hold. Wait until the earthquake stops.

**學測指考7000單字

完成日期

For Further Watching Unit 3

3-1
Be a Rock Detective!
https://www.youtube.com/watch?v=tNs1gqkYerg

3-1
Types of Rocks
https://www.youtube.com/watch?v=CeuYx-AbZdo

3-1
3 Types of Rocks
https://www.youtube.com/watch?v=17l2LrjZi9o

3-2
Erosion and Sedimentation: How Rivers Shape the Landscape
https://www.youtube.com/watch?v=EMwGPPJ1Umk

3-2
Why Do Rivers Curve?
https://www.youtube.com/watch?v=8a3r-cG8Wic

3-2
Why Do Rivers Have Deltas?
https://www.youtube.com/watch?v=A47ythEcz74

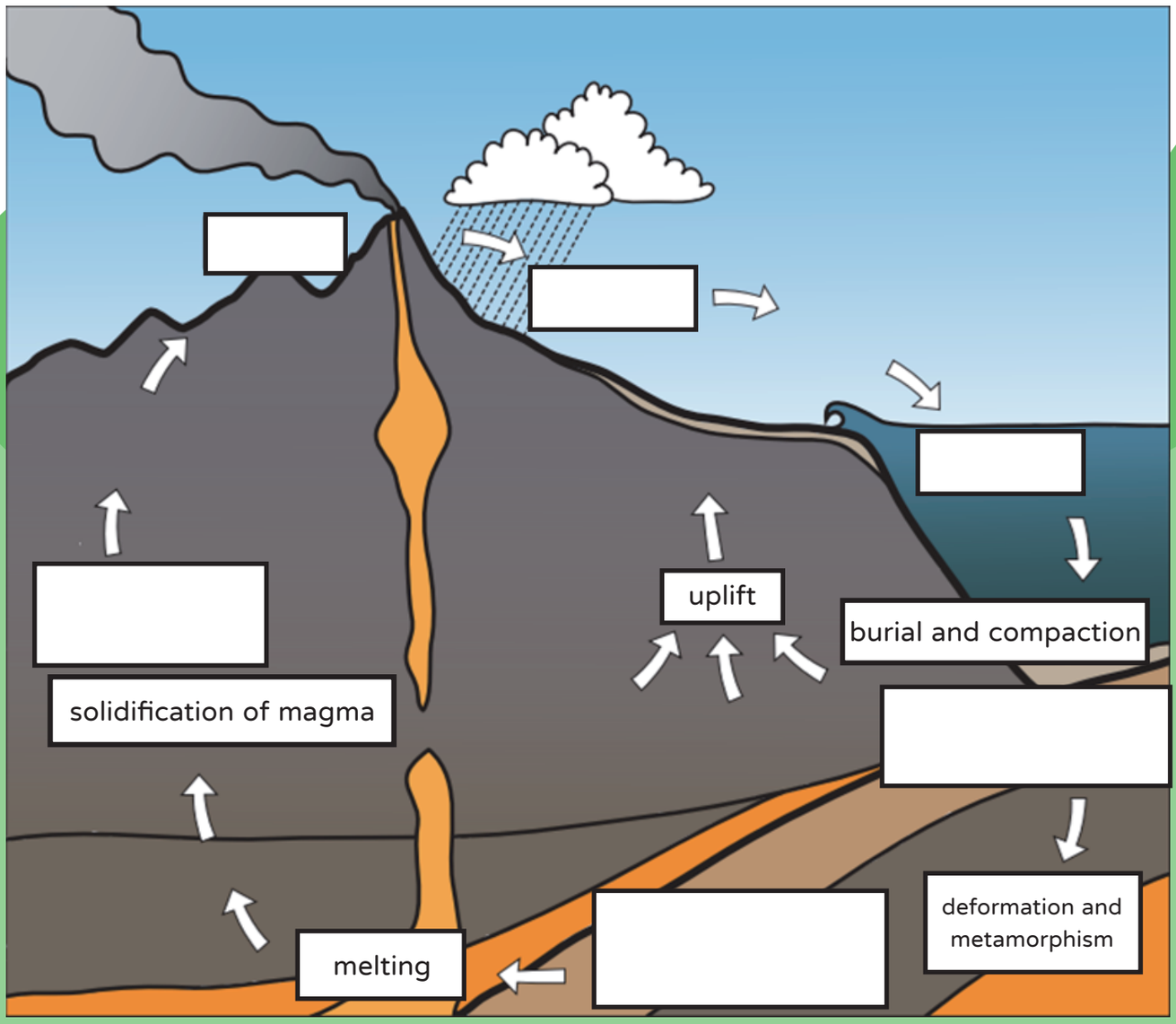
3-3
What Causes Earthquakes?
https://www.youtube.com/watch?v=AArne-wh_Uc

3-3
What is an Earthquake?
https://www.youtube.com/watch?v=dJpIU1rSOFY

Rock Cycle 搖滾週期

Add the words to the rock cycle picture (填入單詞到石頭轉動的格子中).

★ deposition (堆積)
★ erosion (侵蝕)
★ weathering (搬運/風化)
★ igneous rock (火成岩)
★ metamorphic rock (變質岩)
★ sedimentary rock (沉積岩)



https://www.education.com/worksheet/article/rock-cycle-quiz/

Is this a mineral or a rock?

Calcite (方解石)

Granite (花岗岩)

Limestone (石灰岩)

Quartz (石英)

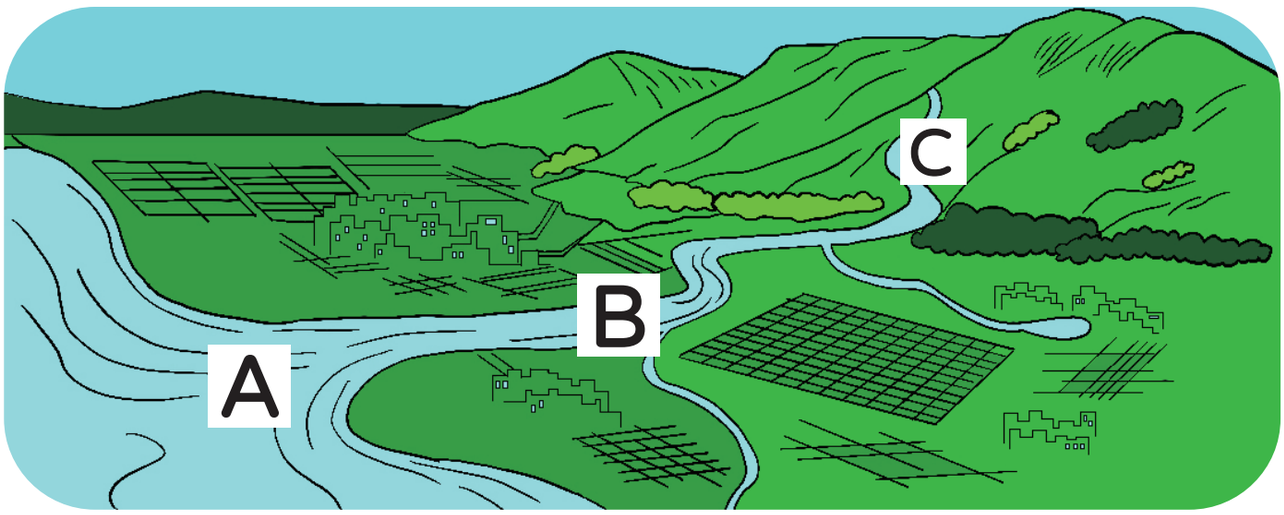
Sandstone (砂岩)

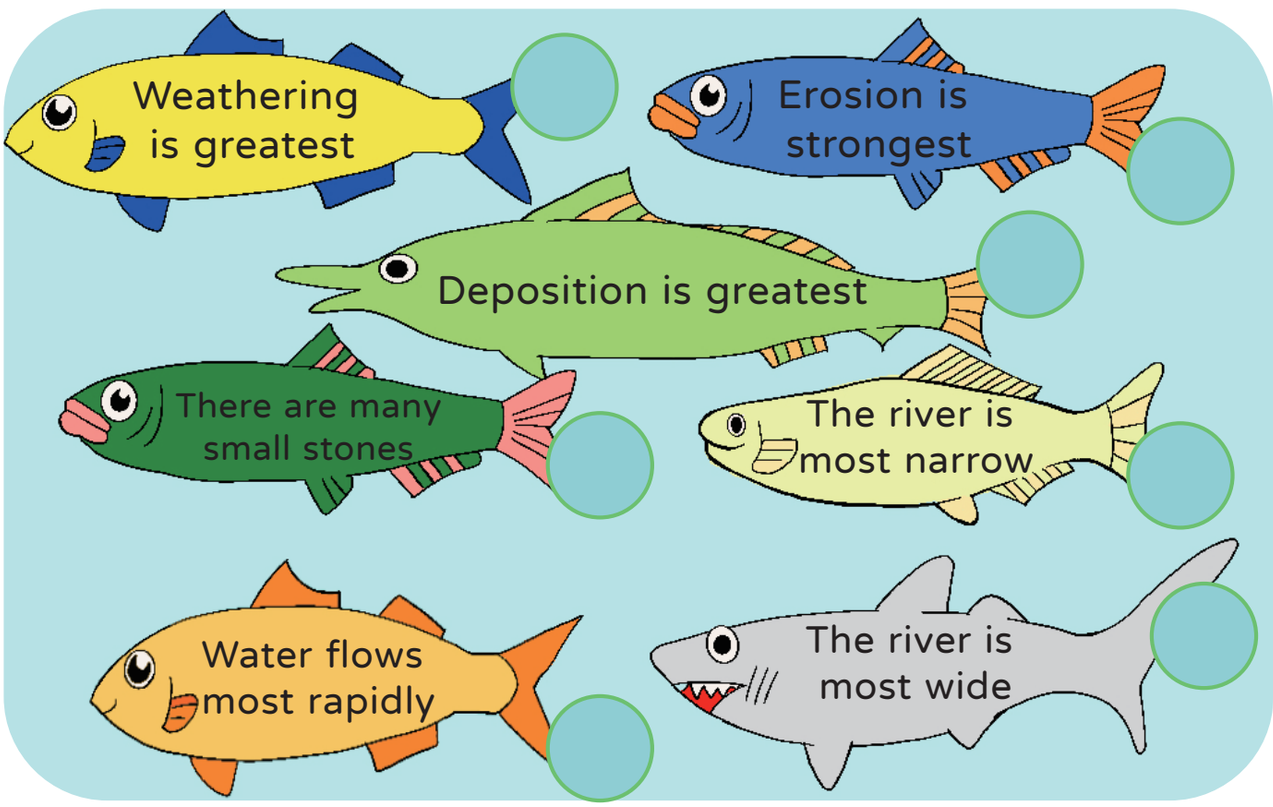
Talc (滑石)

A harder mineral can scratch a softer one.
For example, _____ can scratch _____.

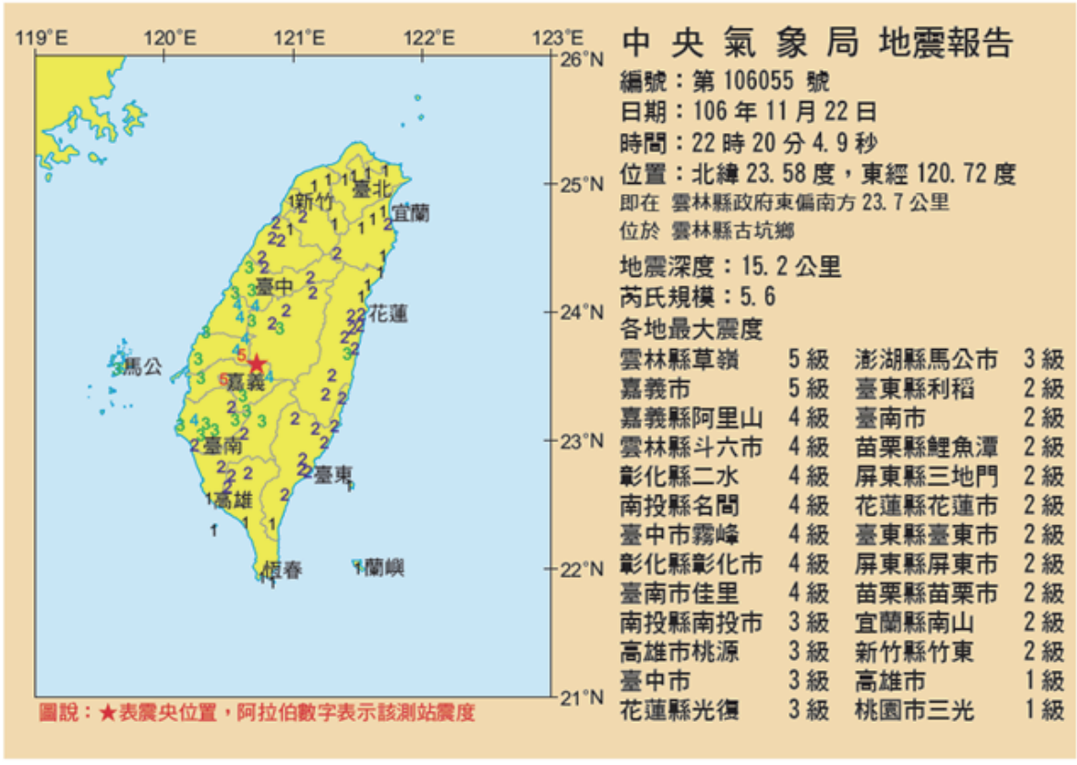
Exploring the River

Based on the description, determine in which part of the river each fish lives. Write A, B or C inside the ◯ .





An earthquake is coming!



圖說：★表震央位置，阿拉伯數字表示該測站震度

中 央 氣 象 局 地震報告

編號：第 106055 號
日期：106 年 11 月 22 日
時間：22 時 20 分 4.9 秒
位置：北緯 23.58 度，東經 120.72 度
即在 雲林縣政府東偏南方 23.7 公里
位於 雲林縣古坑鄉
地震深度：15.2 公里
芮氏規模：5.6
各地最大震度

雲林縣草嶺	5 級	澎湖縣馬公市	3 級
嘉義市	5 級	臺東縣利稻	2 級
嘉義縣阿里山	4 級	臺南市	2 級
雲林縣斗六市	4 級	苗栗縣鯉魚潭	2 級
彰化縣二水	4 級	屏東縣三地門	2 級
南投縣名間	4 級	花蓮縣花蓮市	2 級
臺中市霧峰	4 級	臺東縣臺東市	2 級
彰化縣彰化市	4 級	屏東縣屏東市	2 級
臺南市佳里	4 級	苗栗縣苗栗市	2 級
南投縣南投市	3 級	宜蘭縣南山	2 級
高雄市桃源	3 級	新竹縣竹東	2 級
臺中市	3 級	高雄市	1 級
花蓮縣光復	3 級	桃園市三光	1 級

Based on the report, where is the epicenter (震央) of the earthquake? _____

What should you do during an earthquake (地震時的防範)? Circle the answer.

地震災害防範措施
ㄅ、保持冷靜盡速躲在堅固家具、桌子下，並用書包保護頭部。
ㄆ、家中應準備救急箱及滅火器，並告知家人所儲放的地方，了解使用方法。
ㄇ、察看周圍的人是否受傷，如有必要予以急救或通知救護人員。
ㄈ、切勿靠近窗戶，以防玻璃震破。

Science Watching Unit 3

Be a Rock Detective! (https://youtu.be/tNs1gqkYerg?t=160 2:42 – 3:55)

Watch the video and listen carefully to the narrator to help you fill in the blanks using the words below.

colors	textures	igneous rock
metamorphic rock	sedimentary rock	

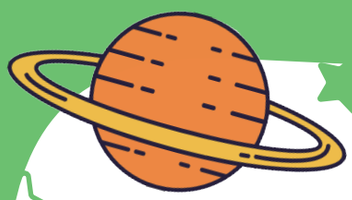
Here's our first mystery rock. What kind do you think it is? You see those bendy stripes? This rock looks like it's been stretched and squeezed. It must have gone through quite a change, and in fact intense heat and pressure gave this rock its squiggly bands. Because it went through a big change inside the earth, it must be a _____ _____.

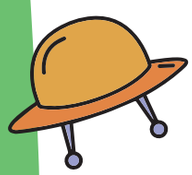
Now what about this one, Rock Detectives?
Check out those layers—kind of like a big cake. Those are layers of sediment that were put down by rivers and oceans over millions of years. Since you can see it's made up of smooshed up layers of sediment, can you guess what it is? It must be a _____ _____ .

This stuff hardly looks like rock at all. Those big goopy loops of black rock look like they're practically melting. And at one time, they were. They were made when lava from a volcano spilled into the ocean and solidified into rock. And since this rock came from lava or magma, you know it's _____ .

So now you know there's more to rocks than meets the eye.
They all have different _____ and _____ .
Each one has a story to tell—a story of how it formed.

NOTES






Electricity and magnetism
Geomagnetism and compass
Earth is like a big magnet that interacts with a compass needle.
A compass is attracted to Earth's magnetic field.
羅盤受地球磁場吸引。
The compass needle points north.
羅盤指針指向北方。
Electricity creates magnetism
Live wire
Reversing the battery or electric wire also reverses the compass needle's deflection.
改變電池或電線(擺放位置)也會改變羅盤針的偏轉。
Electromagnet
An electromagnet affects a compass needle's deflection.
電磁鐵會影響指南針的偏轉。
Strength of an electromagnet
How to make an electromagnet stronger
Increase the number of batteries
增加電池數量
Add more turns to the coil
增加線圈數量
Wrap the coil around an iron rod
將線圈纏繞在鐵棒上
Applications of electromagnet
Telephone, electric bell, maglev train
Handmade toy (電池電動機)

Unit 4
Electricity and Magnetism

Unit 4 Electricity and Magnetism
電磁作用

應聽懂及認讀的生字

1. ☐ compass**	指北針
2. ☐ magnet**	磁鐵
3. ☐ electromagnet	電磁鐵
4. ☐ electromagnetic	電磁的
5. ☐ current**	電流
6. ☐ magnetic field**	磁場
7. ☐ maglev train	磁浮列車
8. ☐ magnetic crane**	電磁起重機
9. ☐ geomagnetism	地磁
10. ☐ battery**	電池
(in series)	(串聯)
(in parallel)	(並聯)
11. ☐ magnetic**	磁力的
12. ☐ magnetism	磁性
13. ☐ enameled wire	漆包線
14. ☐ sandpaper**	砂紙
15. ☐ wooden stick**	木棒
16. ☐ telephone**	電話
17. ☐ remote control**	遙控器
18. ☐ electric motor	小馬達
19. ☐ flashlight**	手電筒
20. ☐ dryer**	吹風機
21. ☐ electric bell**	電鈴
22. ☐ electrical wire	電線
23. ☐ induction coil	線圈
24. ☐ paper clip**	迴紋針
25. ☐ iron rod	小鐵棒

1. 同極相斥;異極相吸
   Like poles of magnets repel each other, while unlike poles attract each other.
2. 線圈越多，電磁鐵磁性越強。
   The greater the number of coils, the stronger the magnet.
3. 電池數量越多，電磁鐵磁性越強。
   The greater the number of batteries, the stronger the magnet.

完成日期

**學測指考7000單字

For Further Watching Unit 4

4-1
Earth's Magnetic Field – Earth Itself is a Huge Magnet – Magnetosphere
https://www.youtube.com/watch?v=Gea4cEA5Ris

4-1
Magnets How Do They Work by Minutephysics
https://www.youtube.com/watch?v=q3uchK1dZIo

4-1
Earth and Compasses | Magnetism | Physics | FuseSchool
https://www.youtube.com/watch?v=OsQNHFlF8w4

4-2
How Electricity Works – Working Principle
https://www.youtube.com/watch?v=mc979OhitAg

4-2
Awesome Idea! How to Twist Electric Wire Together/ Properly Joint Electrical Wire | Part 1
https://www.youtube.com/watch?v=N8F6KcfB9Go

4-2
18 Electric Inventions to Make Your Home Smart
https://www.youtube.com/watch?v=UMi002pO2Z0

4-2
Introduction to Electricity – Video for Kids
https://www.youtube.com/watch?v=Uf76pThNXZc

4-3
Build Your Electric Magnet in 30 Seconds Tutorial
https://www.youtube.com/watch?v=aq1zGr8wE9U

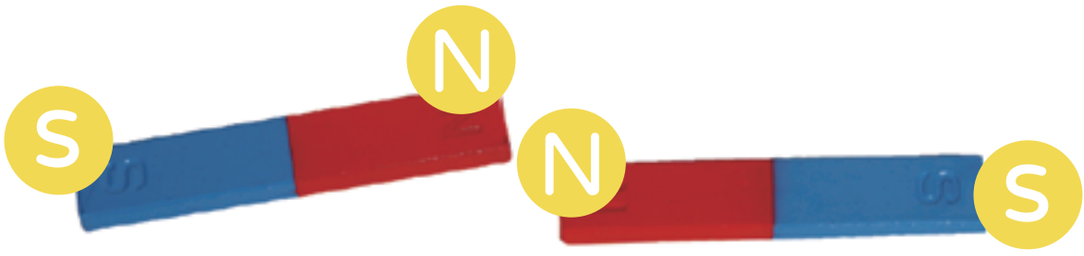
4-3
How Do Maglev Trains Work?
https://www.youtube.com/watch?v=m-rNILcfTKM

Geomagnetism

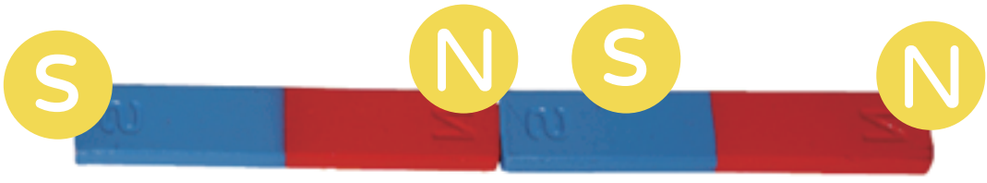
Fill in the blanks using the words below.

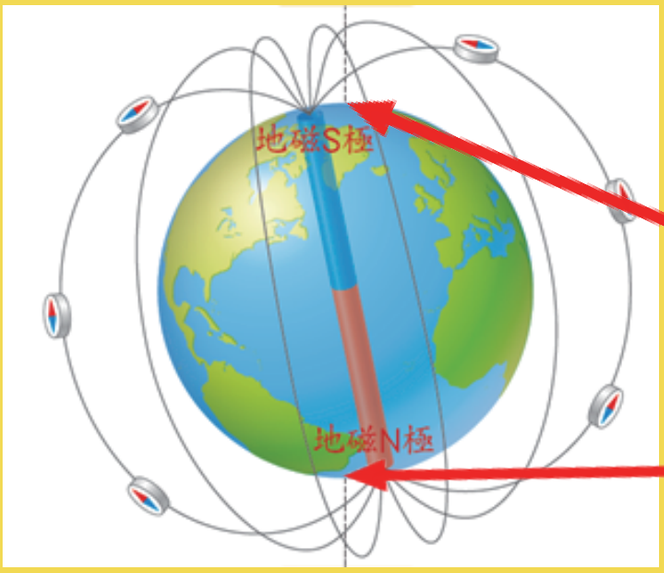
attract	geomagnetism	
north	repel	south

Like poles of magnets _____ each other.



Unlike poles of magnets _____ each other.





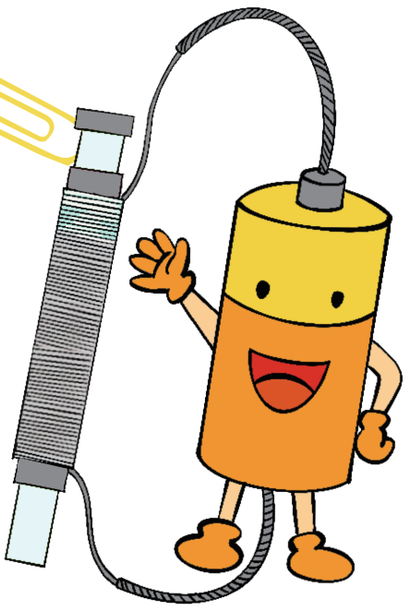
Earth is like a big magnet. The study of its magnetic field is called _____ .

This is the geographic _____ pole.

This is the geographic _____ pole.

Electromagnet

Let's make an electromagnet!



1. What materials do we need to make an electromagnet?

Material	Purpose

2. Please draw how you will put together the materials to make an electromagnet.

3. How many paper clips can your electromagnet pick up?

4. How can make the electromagnet stronger? Write or draw your ideas.

Magnet versus Electromagnet

Match each description with the correct picture.

Always magnetic

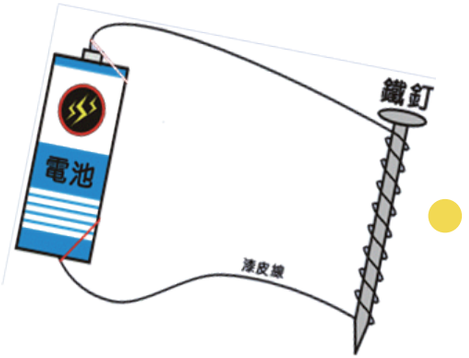
Not always magnetic

Strength of magnetic field (磁場強度) **cannot be** changed

Strength of magnetic field (磁場強度) **can be** changed

Needs electric current (電流)

Does not need electric current (電流)



Poles **can be** reversed (相反)

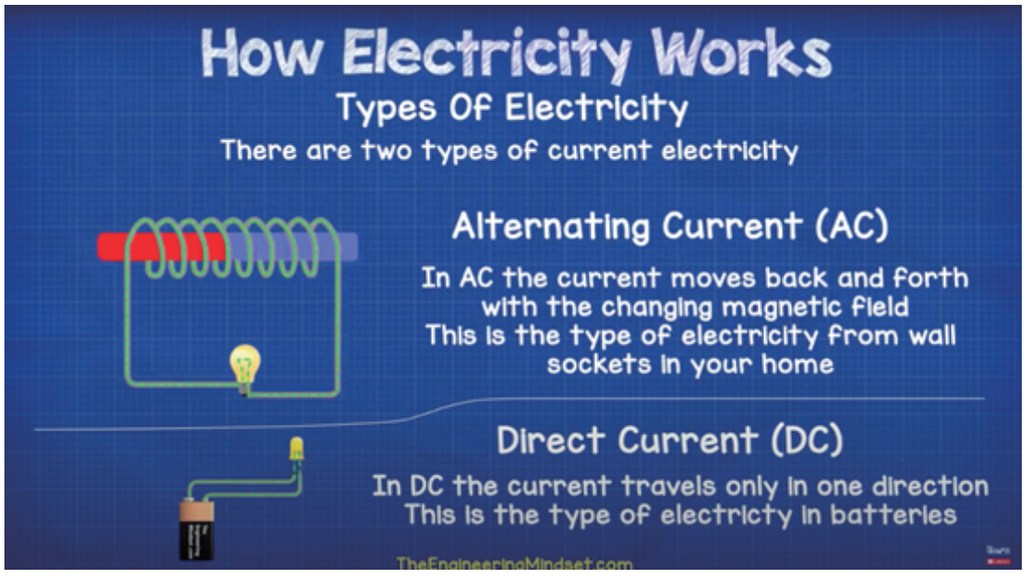
Poles **cannot be** reversed (相反)

Science Watching
Unit 4

How Electricity Works (https://youtu.be/mc979OhitAg?t=499 8:20 – 9:42)

Watch the video and listen carefully to the narrator to help you fill in the blanks using the words below.

AC	AC power	alternating current	batteries	circuit
DC	DC power	direct current	solar panels	



There are two types of current electricity. That being alternating current or _____ , and then direct current or _____ .

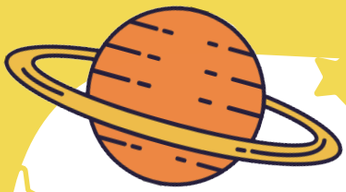
Alternating current simply means that the current flows backwards and forwards in a _____ as the terminals are constantly reversed. This is a bit like the tide of the sea.

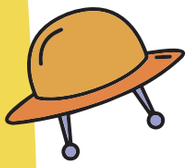
It goes in and out, in and out, in and out. So there is reversing constantly. Now _____ is the most common source of power and the plug sockets in your homes, in your buildings, in schools, and work places, et cetera, these are all being providing alternating current, AC.

Now, on the other hand, we've got _____ , or DC, and that simply means that the current flows directly in only one direction. It does not alternate. This is what's provided from _____ and almost all your handheld devices are from this as well.

So we can convert AC to DC and vice versa using power electronics. And this is how we charge and power small devices, and it's also how _____ can be used to power our homes because solar panels produce _____ and our homes need _____ .
So we have to convert this for it to be usable. So both AC and DC have pros and cons to it.

NOTES





Rewards

Date	Points	Emoticons	Date	Points	Emoticons