

交流課程教學單元案例

領域／科目	國際教育/綜合活動領域	設計者	陳佳琪
實施年級	五年級	總節數	16 periods
單元名稱	Power to Make a Change		
設計依據			
核心素養 (或基本能力)	總綱 (核心素養 具體 內涵)	<p>【綜合活動領域核心素養具體內涵】</p> <p>綜-E-A2 探索學習方法，培養思考能力與自律負責的態度，並透過體驗與實踐解決日常生活問題。</p> <p>綜-E-B1 覺察自己的人際溝通方式，學習合宜¹的互動與溝通技巧，培養同理心，並應用於日常生活。</p> <p>綜-E-B2 蒐集與應用資源，理解各類媒體內容的意義與影響，用以處理日常生活問題。</p> <p>綜-E-B3 覺察生活美感的多樣性，培養生活環境中的美感體驗，增進生活的豐富性與創意表現。</p> <p>綜-E-C1 關懷生態環境與周遭人事物，體驗服務歷程與樂趣，理解並遵守道德規範，培養公民意識。</p> <p>綜-E-C2 理解他人感受，樂於與人互動，學習尊重他人，增進人際關係，與團隊成員合作達成團體目標。</p> <p>【英語文核心素養具體內涵】</p> <p>英-E-A1 具備認真專注的特質及良好的學習習慣，嘗試運用基本的學習策略，強化個人英語文能力。</p> <p>英-E-A2 具備理解簡易英語文訊息的能力，能運用基本邏輯思考策略提升學習效能。</p> <p>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。</p> <p>英-E-B2 具備使用各種資訊科技媒材進行自我學習的能力，以增進英語文聽說讀寫綜合應用能力及文化習俗之理解。</p> <p>英-E-C2 積極參與課內英語文小組學習活動，培養團隊合作精神。</p> <p>【藝術領域核心素養具體內涵】</p> <p>藝-E-B2 識讀科技資訊與媒體的特質及其與藝術的關係。</p> <p>藝-E-C2 透過藝術實踐，學習理解他人感受與團隊合作的能力。</p>	

	領域 (主題、 項目、條 目)	<p>【綜合活動領域】 2b-III-1 參與各項活動，適切表現自己在團體中的角色，協同合作達成共同目標。 2c-III-1 分析與判讀各類資源，規劃策略以解決日常生活的問題。 3a-III-1 辨識周遭環境的潛藏危機，運用各項資源或策略化解 3b-III-1 持續參與服務活動，省思服務學習的意義，展現感恩、利他的情懷。 3d-III-1 實踐環境友善行動，珍惜生態資源與環境。</p> <p>【英語文領域】 1-III-8 能聽懂簡易的日常生活用語。 1-III-9 能聽懂簡易句型的句子。 2-III-5 能使用簡易的教室用語。 2-III-6 能使用簡易的日常生活用語。 2-III-7 能作簡易的回答和描述。 3-III-4 能看懂課堂中所學的句子。 3-III-5 能看懂課堂中所學的簡易對話。 3-III-6 能看懂課堂中所學的簡易短文之主要內容。 4-III-6 能書寫課堂中所學的句子。 5-III-4 能聽懂日常生活應對中常用語句，並能作適當的回應。 6-III-2 樂於參與課堂中各類練習活動，不畏犯錯。 6-III-6 在生活中接觸英語時，樂於探究其意涵並嘗試使用。 7-III-3 在生活中能把握機會，勇於嘗試使用英語。 7-III-4 對教師或同學討論的內容能舉出示例或反例。 9-III-3 能綜合相關資訊作簡易的猜測。</p> <p>【藝術領域】 1-III-3 能學習多元媒材與技法，表現創作主題。 2-III-2 能發現藝術作品中的構成要素與形式原理，並表達自己的想法。 3-III-5 能透過藝術創作或展演覺察議題，表現人文關懷。</p>
議題融入	主題 環境教育 海洋教育 國際教育	內涵 【環境教育】 環 E3 了解人與自然和諧共生，進而保護重要棲地。 環 E5 覺知人類的生活型態對其他生物與生態系的衝擊。 【海洋教育】 海 E14 了解海水中含有鹽等成份，體認海洋資源與生活的關聯性。 海 E16 認識家鄉的水域或海洋的汙染、過漁等環境問題。 【國際教育】 國 E12 觀察生活中的全球議題，並構思生活行動策略。
與其他領域／科目 目的連結	綜合活動領域/英語文/藝術領域/國際教育	
教材來源	自編	
教學設備／資源	電腦/ 投影機/ 白板/ iPad/ Flashcard /PPT	
學習目標		

Lesson 1-1: Types of pollution (2 periods)

- SWBAT define pollution.
- SWBAT identify different types of pollution.
- SWBAT identify the causes of pollution.

Lesson 1-2: Effect of pollution on humans (2 periods)

- SWBAT understand and mention the effect of pollution on humans.

Lesson 2-1: Effect of pollution on the environment (2 periods)

- SWBAT understand the impact of pollution has caused.
- SWBAT express their opinions about how pollution has affected the environment.
- SWBAT create their graphic organizers regarding the causes and effects of pollution.

Lesson 2-2: The global warming (2 periods)

- SWBAT understand the meaning of global warming
- SWBAT understand what impacts of global warming
- SWBAT use their own words to explain the general ideas about global warming.

Lesson 3-1: The importance of our ocean (2 periods)

- SWBAT understand the importance of the ocean.
- SWBAT change their mentality by thinking that saving the ocean is saving ourselves.
- SWBAT explain how the ocean helps us with different functions.

Lesson 3-2: The main causes of ocean pollution (2 periods)

- SWBAT understand the main causes of ocean pollution.
- SWBAT collaboratively work with their teammates to discuss their ideas.

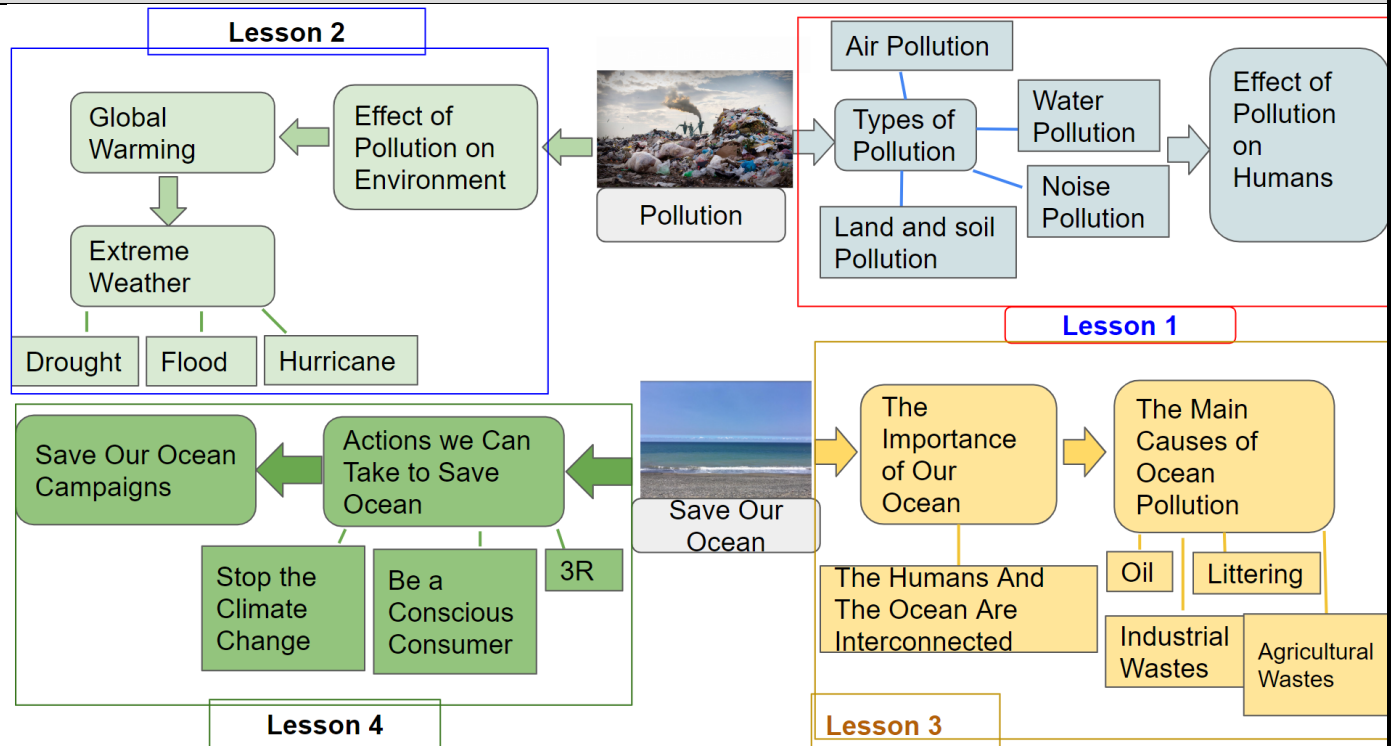
Lesson 4-1: Actions we can take to save our ocean (2 periods)

- SWBAT learn action speaks louder than words.
- SWBAT understand that plastics have caused big trouble on our planet.
- SWBAT learn the importance of implementing 3Rs waste management in our daily life.

Lesson 4-2: Save our ocean campaigns (2 periods)

- SWBAT understand that you are never too small to make a difference.
- SWBAT present their works.

學習
架構



Vocabulary

Sentence Pattern:

<p>Lesson 1-1 pollution/ soil/ harmful/ industrial / waste/pesticide/fertilizer /chemical/ deforestation/ poisonous/carbon dioxide/ detergent/ absorb/ landfill/ contaminate</p> <p>Lesson 1-2 effect/asthma/ abnormality/ illness /rashes/ respiratory/ pollutants/disorder/atmosphere</p>	<p>Lesson 1-1 What type of pollution is it?become (is) harmful What pollution does it cause? _____ cause(s) water/air/noise/land and soil pollution.</p> <p>Lesson 1-2 _____ (pollution) can cause _____ (the problem)</p>
<p>Lesson 2-1 environment/ diversity/ species/endangered/ extinct/deforestation/ consume/mining/fossil fuels/graphic organizer</p> <p>Lesson 2-2 carbon-based/ global warming/ greenhouse/ temperature/particle/ power plant/ agriculture/ evaporate/flood/ drought/ habitat/ glacier</p>	<p>Lesson 2-1 What do these make you think? It (this picture) makes me think of _____.</p> <p>Lesson 2-2 _____ is trapped in _____. _____ cause(s) _____.</p>
<p>Lesson 3-1 oxygen/acidic/ regulate/ equator/ mangrove/ marsh/emission/ carbon sink/carpool/ appliance</p> <p>Lesson 3-2 ecosystem/ affect/ regulation/ relaxation/ reduce/ anxiety/ renewable/ seepage/ hydrocarbon/acid/sediment/ indigestible/marine/ entangled/predator/discharge/mercury/lead /runoff/ eutrophication/algae/</p>	<p>Lesson 3-1 _____ provide(s) _____ with _____.</p> <p>Lesson 3-2 The ocean helps us with _____.</p>
<p>Lesson 4-1 moral/leaking/ dripping/recycle/ reduce/reuse/ implement/vehicle/ sustainable/efficient/Celsius/conscious / consumer/ environmentalist/ sculpture/ installation</p> <p>Lesson 4-2 campaign/ non-profit organization/ gallery</p>	<p>Lesson 4-1 It's a big job for one but if we all lend a hand, we will make a difference.</p> <p>Lesson 4-2 My poster is about ...</p>

Lesson 1-1 Types of pollution (2 periods)

Warm-up



Tr. : Look at these pictures closely and tell me how they make you feel. Do they make you feel happy? Do you think they are beautiful or lovely? Or do they actually make you feel sad?! If they do, please share the reason with everyone.

(Allow time for students to respond and share their answers.)



Tr.: Okay now let's take a look at the second slide. How do you feel about these pictures, and what makes you feel that way?

((Allow time for students to respond and share their answers.))

Introduction: Explain types of pollution, and their causes

Tr.: Those pictures on the second slide, show the situation called "**pollution**" !!
 Can anyone tell me what "**pollution**" is?!
 (Elicit answers from students. While they explain the meaning of pollution, they can either express their thoughts in L1 or L2.)

After students (Ss) give their answers, the teacher praises them for their responses and then reinforces the definition of pollution in English.

Tr.: **Pollution** is something that makes our land, air, and water dirty, and unsafe for use. It is a harmful situation to humans, animals, and our environment. Today we are going to talk about four types of pollution and their causes.

The teacher hands out iPads and asks students to log into Quizizz. Students will see pictures of four types of pollution; which are

Skills:
 Oral speaking of expressing self-opinion

Knowledge:
 Students understand the contents we are teaching.

Water pollution
Air pollution
Land and soil pollution
Noise pollution



The teacher will start to explain and give examples of each type of pollution;

- **Water pollution:**

Water pollution means the water becomes harmful for our use. When we think of water pollution, we will probably think of dirty water coming out of a factory pipe into a river. We call that industrial waste. Industrial waste causes water pollution, but it is not the only problem. Most water pollution comes from things people do every day in their homes and on farms. At home, people wash dishes, do the laundry using chemical detergents, and these chemicals are washed into sewage, then into rivers and the ocean, causing pollution. Farmers apply pesticides to kill insects and use fertilizers to help crops grow better. These chemicals get into the ground and pollute groundwater. Sometimes, the pesticides also end up in the air, and when it rains, the rain becomes acidic because of the chemicals. When acid rain falls on the land, it damages buildings, and when it falls into the water, it pollutes the water.

- **Air pollution:**

Air pollution is something that causes the air to become harmful when we breathe it in. For example, smoke from factories, cigarettes, and cars. Another significant problem causing air pollution is deforestation. The forest of trees absorbs bad gases and uses up carbon dioxide, then releases oxygen. With deforestation, people cut down the forest of trees to build more houses or for farming. When fewer trees are left in our environment, we face worse air conditions.

- **Land/soil pollution:**

Land and soil pollution means the land becomes harmful for humans and animals to live on. This happens when people produce too much trash and apply too many chemicals to the soil. When we produce too much trash, those landfills will contaminate our land, making it dirty, and the rain and floods can transport that contamination to other areas. As for the pesticides and fertilizers farmers apply to make crops grow better, they stay in the soil and make the land and soil poisonous. When it rains, those chemicals in the soil will be washed away into rivers, lakes, and seas, polluting the water.

- **Noise pollution:**

Noise pollution means the sound is harmful to humans and animals. Those loud, unpleasant noises, such as horns from cars, road construction, loud music, engine sounds from cars and airplanes... The sound that makes you stressed, we call it noise pollution.

Practice: Identify types of pollution

After the teacher finishes explaining the four types of pollution and their causes, students will move on to answer those questions on Quizizz;

https://quizizz.com/admin/presentation/62f60b15c8c068001e633aa3?source=quiz_page

The following pictures are the questions on Quizizz; “What pollution does it cause?”



Warm-up: Review the previous class

The teacher shows pictures on the screen and asks Ss to explain what type of pollution is.

Skills:

Memorizing

Introduction: Explain the causes of different types of pollution

The teacher will show pictures of the causes of different types of pollution on the screen.

Skills:

Retrieving

Memorizing



Air Pollution



Industrial smoke



deforestation



car exhaust



Cigarette smoke

Land and Soil Pollution



landfill



pesticide



fertilizer

Noise Pollution



engine sound



loud music



horn



construction

Tasks: Find causes of the pollution

1. The teacher will show pictures of the causes of different types of pollution on the screen. (see the following pictures.)
2. Divide students into 4 groups. Each group will be assigned one type of pollution. And students need to find out the right pictures matching the pollution.
3. Randomly Dispatch cards to each group. There will be 4-5 cards in each group.
4. Students will mingle around by asking some other groups:
Do you have _____. (The name of the picture)
Yes, we do. There you go. / No, we don't, sorry.

Skills:
Identify causes of
different types of
pollution

to find out the right pictures matching their pollution.

5. Once students think they are done with their matching job, they can go back to their seats and be ready to share their answers in groups with the class by saying:
 _____ cause (s) the water/air/noise/the land soil pollution.



Wrap up:

The teacher discusses answers with students, especially on those pictures of pesticides /fertilizer/landfill. Then give some content feedback.

學習活動內容及實施方式

學習評量

Lesson 1-2: Effect of pollution on humans (2 Periods)

Warm-up: Review on the previous class

The teacher will ask the following questions to refresh students memories regarding the previous class;

1. What type of pollution did we mention last time?
2. Which cause of pollution do you remember the best? Why?

Oral speaking of expressing self-opinion

Introduction: Effect of pollution on humans

Before starting to explain the effect of pollution on humans, the teacher divides students into 4 groups, assigning each group a worksheet with one type of pollution. Students will need to think about and discuss the effects based on the worksheet they receive (see the following picture). The teacher will give them 5 minutes to discuss. After 5 minutes, students will share their answers with everyone in their groups.

There are prompted sentences on the whiteboard;

_____ (pollution) can cause _____ (problems, diseases...)

Example: Water pollution can cause Malaria. (Dengue) 瘧疾 (登革熱)

The teacher starts to explain the effect of different types of pollution on humans.

1. Effect of air pollution:


The bad news is that 92% of the world's population is breathing polluted air. Breathing polluted air results in 7 million deaths worldwide every year, making air pollution a very serious problem. According to research, polluted air can increase the risk of heart attacks, coughing, and breathing issues, such as asthma and lung problems. It also causes more serious health issues, including birth abnormalities, reproductive failure, and various illnesses.




2. Effect of water pollution:

- Contaminated water can cause various health issues, such as rashes,

Knowledge:
Students understand types of pollution and their causes.

Skill:
*Students can communicate and express their thoughts well in their groups.
*Students can express their ideas well through writing no matter if it is in L1 or L2.

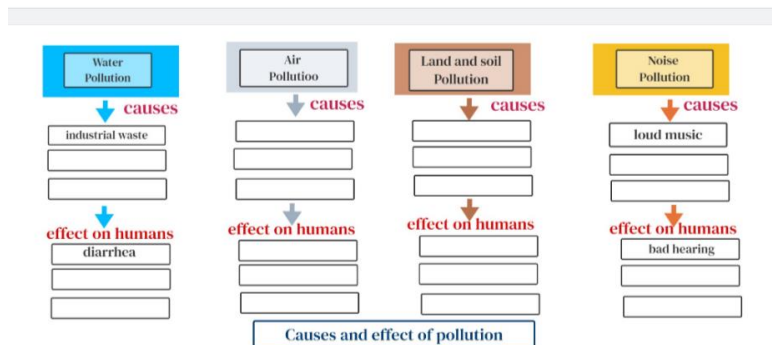
<p>hair loss, itchy skin, pink eye, and respiratory infections.</p> <ul style="list-style-type: none"> ● Drinking water contaminated with chemicals from runoff can put a person at risk of cancer, hormone disruption, and damage to the immune and reproductive systems. ● When humans eat fish that has been poisoned by the chemical runoff, humans will get sick from eating it. <p>3. Effect of land and soil pollution: Much of the land and soil is polluted by harmful chemicals such as pesticides and fertilizers. Contaminated land and soil can cause skin disorders and respiratory issues, and even several types of cancer.</p> <p>4. Effect of noise pollution: Noise pollution can cause stress, anxiety, headaches, irritation, hearing loss, and sleep loss.</p>	
<p>Video Watching: After the teacher finishes explaining how pollution has affected our health, the teacher starts to play the video to reinforce the knowledge; Pollution Mini Documentary: Types Causes Effects</p> <p>After finishing watching the video, the teacher will hand out iPads and ask students to use Kahoot to answer True and False questions. The following are questions on Kahoot:</p> <ol style="list-style-type: none"> 1. Those harmful materials in pollution, we call them pollutants. (True) 2. Pollutants can only damage the quality of air. (False) 3. Pollution exists only in urban (city) areas; it won't spread to the remote (far away) countryside. (False) 4. Soil pollution causes climate change because it releases large amounts of oxygen into the atmosphere. (False) 5. When the greenhouse effect traps more heat in the atmosphere, it will cause extreme weather and increase disease transmission. (True) 6. Soil pollution will not cause any respiratory issues (breathing problems). (False) 7. The toxic waste in the water will affect fish and humans as well. (True) 8. We have talked about 4 types of pollution; which one is not discussed in this video? (Noise Pollution) <p>The teacher will explain every question after students give their answers.</p>	<p>Skill:</p> <p>*Students can understand the gist of the content in the video.</p> <p>*Students can read questions in English.</p>
<p><u>Warm-up: Review the previous class</u></p>	<p>Skill: Remember</p>
<p><u>Introduction: The Effects of different pollutions on humans</u></p> <div style="display: flex; justify-content: space-between; align-items: center;"> <div data-bbox="127 1758 478 1971" style="border: 1px solid black; padding: 5px;">  </div> <div data-bbox="638 1769 829 1971" style="border: 1px solid black; padding: 5px;"> <p>https://edpuzzle.com/media/6405a19a8baa05433cac6e5f</p> </div> </div>	<p>Skill: Listening, remembering, memorizing and understanding</p>

	https://edpuz.zle.com/media/6405a3103495934335780d94	
	https://edpuz.zle.com/media/6405a6607321bb42fb7b2fbb	
	<p>Explain noise pollution by showing pictures via PPT</p>	

Task: Making a graphic organizer by filling in the blank

Students log into their Seesaw account, and work in pairs to discuss first, then finish their tasks individually within 6 minutes.

Seesaw Post



Instructions for the task:

1. Everyone, please log into your Seesaw account and go to the assigned activity.
2. There are four types of pollution we have already discussed: water pollution, air pollution, land/soil pollution, and noise pollution.
3. There are 6 boxes under each type of pollution: 3 boxes at the top represent the causes of the pollution, and 3 boxes at the bottom depict the effects of pollution on humans.
4. Two students will work as a pair. Discuss the answers with your partner and then fill in the boxes on your own.
5. You will have 6 minutes. Remember, when you finish, click on the "check" button to submit your work.

Wrap-up: The teacher shows his/her answers on the screen and displays one or two students' outputs as well. The teacher will remind students that the purpose of doing the graphic organizer is to understand how pollution is caused and how it affects our lives, which is more important than getting the right answers.

Skill:

Students can write down 3 causes and effects of pollution.

Lesson 2-1: Effect of pollution on the environment (2 periods)

Warm-up:

Tr.: Last time, we learned about the causes of pollution and how pollution has affected humans' health. Today, before we start to talk about the effects of pollution on the environment, I want you to watch a video and tell me what you think after watching it.

[Environmental Pollution Animation 2 YouTube](#)

Tr.: So, what do you think about this video?

Students can express their opinions in both their native language (L1) and the target language (L2). The teacher will provide prompting questions (see below) to encourage students to engage in further discussion.

- What is the main message that this video is trying to convey?
- In the video, what issues did the man cause?
- How do you feel about the ending of this video?

Skills:

Oral speaking of expressing self-opinion

Introduction: Humans' impact on the environment

Play another video.

[One Earth - Environmental Short Film](#)

After finishing playing the video, the teacher will show the following pictures on the screen and ask students,

What do these make you think?

Students need to answer the question by starting their sentences with

It makes me think of.....

The teacher will do the demonstration for the first picture.



Tr.: It makes me think of the diversity of species. We used to have lots of different kinds of animals living on Earth, but because of the pollution caused by humans, many animals are now endangered, and some have even gone extinct. Pollution has made our environment difficult for some animals to live in.


After the demonstration, the teacher will ask students to do the same. If students have difficulty coming up with ideas, the teacher will prompt them with some words to help generate more thoughts.



Skill:

Analyzing information from their prior knowledge.


What do these make you think? It makes me think of...



pesticides fertilizers soil pollution water pollution

deforestation → To grow more plants → For short term profit


What do these make you think? It makes me think of...



noise pollution water pollution air pollution

contaminated water Bad quality of air breathing problem

What do these make you think? It makes me think of...




skyscrapers

tall buildings crowdy block more sun light generate more heat

cut down more trees emit more CO2 More animals lost their habitats

What do these make you think? It makes me think of...




Industrial smoke

asthma lung problem soot smog air pollution


bad quality of living condition to humans/animals Greenhouse effect water pollution

What do these make you think? It makes me think of...



people are everywhere over consuming produce more wastes

What do these make you think? It makes me think of...



trash everywhere stinky air diseases What have we humans done?

land and soil pollution air pollution endanger lives We must do something

In the end, the teacher concludes this pictorial activity by telling students that;

Tr.: We humans like to use the Earth's resources for short-term profit. We grew more crops and built more houses through deforestation. We develop more technology products and consume more power to make life luxurious through mining, and burning fossil fuels. Because of our selfishness and ignorance, the environment on Earth is taking its toll. Now, it's time for us to pay more attention to pollution. Before we take action, let's do some more practice at raising our awareness.

Warm-up: Review the previous class

Skill: Memorizing

Introduction: Humans' impact on the environment

Watch videos → Teacher goes through any problematic words, sentences
 → Discuss contents with students

Skill:
 Understanding and analyzing information

Nature Is Speaking – Julia Roberts is Mother Nature

<https://www.youtube.com/watch?v=WmVLcj-XKnM>

The main message of the video is that nature doesn't need humans, but humans need nature. Mother Nature emphasizes that the Earth has existed for billions of years and has gone through various changes and challenges, including the rise and fall of civilizations. It highlights that nature has the ability to self-regulate and restore balance over time.

The video serves as a wake-up call, reminding us that the Earth's ecosystems are fragile, and our actions as humans have significant consequences on the environment. It encourages us to recognize the interconnectedness of all living beings and the planet and to take responsibility for protecting and conserving nature for future generations.

WHAT IF | Climate Change short film | António Guterres speech

<https://www.youtube.com/watch?v=9vdPQX9XQTE>

The messages of the video are;

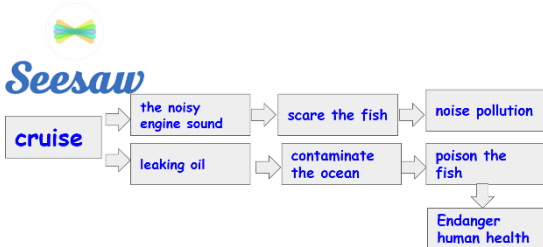
1. The responsibility to address climate change lies with all of humanity. It's not just the concern of a few, but the duty of everyone to take action and make a positive impact.
2. Climate change will have severe consequences for future generations if we do not act now. It's essential to consider the long-term implications of our actions or inactions on the planet.

Task: Draw your graphic organizer

The teacher will hand out iPads to students, and ask them to log into their Seesaw accounts. The teacher will then explain how to work on their task on the seesaw;

Tr: First, I want you to think of two things you learned so far, it can be two words, two incidents, or two phenomena, related to the causes or effects of pollution. For example; “cruise” is the first word that comes to my mind. Then I will draw a box and write words like “the noisy engine sound”, “scare the fish” and then “noise pollution”. Another example could be “leaking oil”, “contaminating the ocean”, “poisoning the fish” and then “endangering human health”. You will proceed similarly for the second word or thing.

(The teacher will show the following graphic organizer on the screen.)



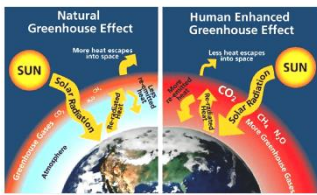
Tr: You will have 6 minutes to work on it. Once you finish, click on the check button to submit your work. After that, we will share and discuss some of your work together.

Knowledge:
Understand different consequences caused by different actions.
Skill:
Be able to write their graphic organizer.

<p>Wrap-up: The teacher shows students' outputs and then gives some content feedback.</p>	
<p>學習活動內容及實施方式</p>	<p>學習評量</p>
<p>Lesson 2-2: The global warming (2 periods)</p>	
<p><u>Warm-up:</u> The teacher will ask students the question; Tr: What do you think is the most serious issue caused by pollution> And Why do you think so?</p> <p>After eliciting answers from students, the teacher will review the four types of pollution, and address that: Most of the pollution produced by humans is carbon-based. These days, humans are emitting more carbon dioxide, and it gets trapped in the atmosphere. The trapped carbon dioxide acts like layers of blankets covering Earth, which causes the planet to become hotter and hotter. This phenomenon is known as global warming.</p>	<p>Oral speaking of expressing self-opinion</p>

Introduction: Global warming

Tr.: Now. Let's look at these two pictures. Can you tell me what the difference is between them.

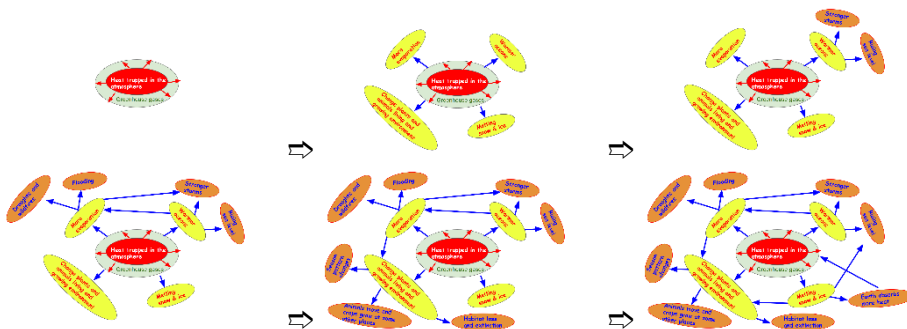


The answer the teacher is looking for is:

The color is different in the Earth's atmosphere is different.

Tr.: Much heat is being trapped inside the greenhouse, causing the Earth's temperature to rise faster than at any previous time in history. The main two reasons for the greenhouse gas effect are first, carbon dioxide, which exists in the upper atmosphere, and second, black carbon, which exists in the lower atmosphere. Black carbon refers to tiny particles present in soot or smoke. For example, during a moon festival barbecue, if you use a tissue to wipe your face afterwards, you will see the tissue gets very dirty. This happens because when you burn coals, it releases oxides and those that do not burn completely turn into black carbon, which is then released into the air.

After students express their opinions, the teacher will show the following graphic organizer to explain why we need to pay attention to the problem of global warming.



Tr.: The scientists say there is a 95% chance that human activities cause pollution on Earth. We have been burning more and more fossil fuels like oil and coal, which release carbon dioxide. Power plants, factories, transportation, the increased global population, and agriculture all contribute to pollution problems and produce more carbon dioxide, leading to the trapping of heat in our atmosphere, resulting in higher temperatures on Earth. The rising temperature will make our oceans warmer, melt more snow and ice, change animal habitats, affect crop growing environments, and lead to increased water evaporation from the earth.

Warmer oceans will cause sea levels to rise and result in stronger storms due to increased water evaporation. This, in turn, can lead to floods in some places and droughts in others. Additionally, the combination of dry and hot conditions can increase the risk of wildfires. More water evaporation will not only cause flooding, stronger storms, droughts, and wildfires, but it will also alter animal habitats and crop growing environments. Due to changing conditions, some animals may lose their homes, leading to potential extinction. For example, with no snow or glacier, where will polar bears and penguins live?! As you can see, all these problems are interconnected.

Now, let's watch a video to give you a clearer idea of what global warming

Skill:

The ability to analyze things that happened in our environment.

Analyzing

is.

[What is Climate Change? | Start Here](#)

After watching the video, the teacher will ask students concept-checking questions as the following;

CCQs:

1. When all gases are released into the air, and sunlight enters the Earth's atmosphere, some of the heat gets trapped, causing the weather to get warmer. What do we call this phenomenon? (The Greenhouse effect)
2. What is the major concern about the Earth getting warmer? (The speed at which it is happening.)
3. Global warming causes climate change, which, in turn, leads to extreme weather. What are the impacts of climate change shown in this video? (Due to rising sea levels, melting ice, and more powerful storms such as typhoons and hurricanes, many people are losing their homes. Additionally, dry and hot weather, such as droughts, causes water and food shortages.)
4. What do you think about why there are some skeptics against the theory of global warming? (Some skeptics oppose the theory of global warming for political and profitable reasons.)

Warm-up: Review the previous class

Introduction: Global warming

The teacher will ask students to watch the following video about the impacts of extreme weather.

<https://drive.google.com/file/d/15WeZaUFd4p7Zp8dyJ4G3aPSFz4bGpJqN/view?usp=sharing>

Watch videos →Teacher goes through any problematic words, or sentences
→ Discuss contents with students

Activity: What can we do to prevent climate change

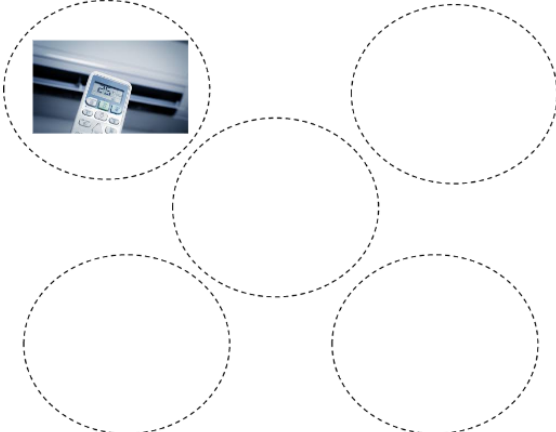

After finishing discussing the video, the teacher will divide students into 6 groups, with 4-5 students in each group. Then the teacher will ask students to discuss what 5 actions they can take to prevent climate change.

Class: _____ Number: _____ Name: _____

5 ACTIONS TO FIGHT CLIMATE CHANGE

You can either write or draw your 5 actions into the circle.

Set the A/C temperature around 25 degree celsius.



After 6 minutes, the teacher will ask students to come to the front to present their works group by group.

Wrap-up: Giving Feedback

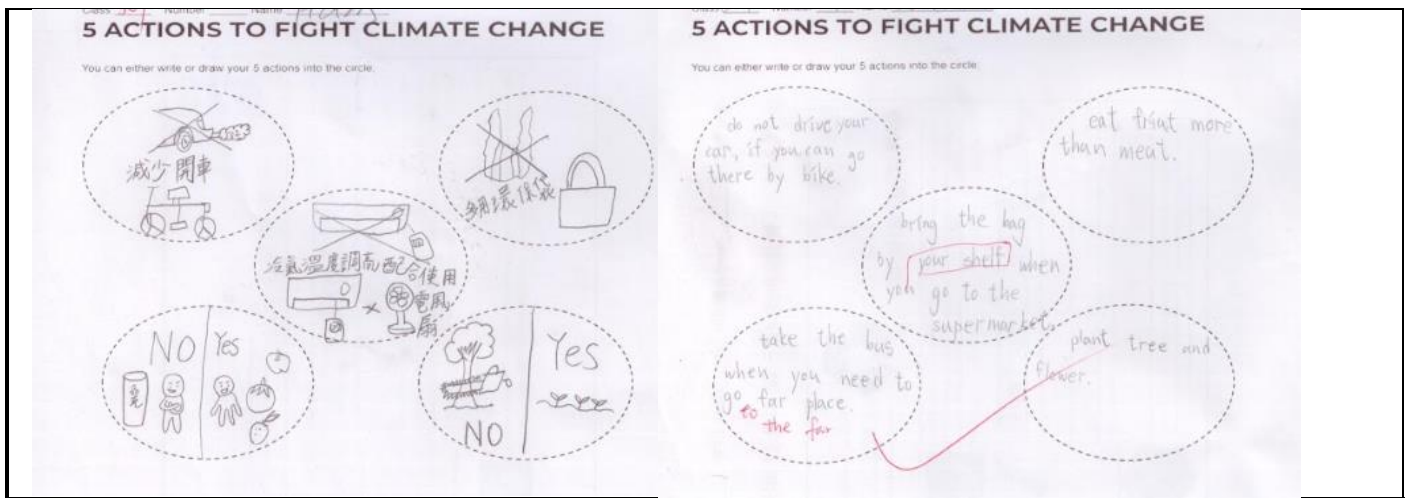
Students will start to give their peers feedback first, then the teacher will give some content feedback at the end.

Extension activity: Exit ticket

The teacher will show the following sentences on the screen, each student needs to pick one sentence and read it aloud before they exit the classroom, one by one.

1. Take public transportation, bike, walk, or carpool (share the ride with others).
2. Turn off lights and unplug other electrical devices when they are not being used.
3. Make sure the lightbulbs and appliances you use are energy-efficient.
4. Recycle your trash and purchase products that have less packaging.
5. Set the temperature of your air conditioner higher in the summer.
6. Buy products made closer to your home.
7. Eat less meat. Consider meatless one day a week.
8. Speak out about climate change to spread the word.

Skill:
Summarizing, Correlating,
problem-solving, and
presenting ability.



學習活動內容及實施方式

學習評量

Lesson 3-1: The importance of our ocean (2 periods)

Warm-up: Fun time of exploring the ocean
 Before students enter the classroom, the iPads will have already been placed on their desks. After students have settled, the teacher will announce the Kahoot game;
 Tr.: Happy hour before we start our class. Now please scan the QR code displayed on the screen and log into the Kahoot game. Remember to type your class, seat number, and your English name. Any naughty behavior, such as using a funny name, will result in your iPad being taken away as usual.
<https://create.kahoot.it/details/a3e8f9ae-ace6-49f1-a55a-5e37d22e8159>

Knowledge:
 Have some general ideas about the ocean.

Introduction:
 The teacher will go to [edpuzzle](https://edpuzzle.com/assignments/62ffaaf9ce977c40e30c9f0b/watch) to play the video of;
 The Ocean's Ingenious Climate Solutions | Susan Ruffo | TED Countdown
<https://edpuzzle.com/assignments/62ffaaf9ce977c40e30c9f0b/watch>
 The video has been edited into 5 segments. In each segment, there's a note that explains the content of the segment.
01:16-01:52:
 Why is the ocean important?
 1. It covers 70 % of the Earth.
 2. It produces 50 % of the oxygen that we breathe.
 3. It regulates the temperature of the planet because of the current. (洋流) So without the ocean, the poles would be unbearably cold, and the equator (赤道) would be unbearably hot.
 The problem we caused in our ocean;
 1. plastic products
 2. oil spills
 3. overfishing
 We try to solve the above problems for saving the ocean, but is it real that we are saving the ocean? Or is the ocean saving us? But what is it saving us from?

Skills:
 Listening ability

01.52-02.30:

What does the ocean do to keep our planet habitable?

1. the ocean absorbs 25% to 30% of the carbon dioxide that we release into the atmosphere. The ocean is the world's largest carbon sink.
2. the ocean absorbs 90% of the extra heat trapped by greenhouse gases.

02.30-03.06

What thinking is it needed to be changed?

We think that saving the ocean is something else we have to do, it is not the main part of solving climate change strategy.

Instead of thinking of saving the ocean as just something else we have to do, we need to think this way;

Saving the ocean is actually for saving us.

03.06-05.31

With all the carbon dioxide and heat the ocean is absorbing, it is coming at a cost now. The evidence for it is;

1. the temperature of the ocean becomes higher.
2. the sea level is rising.
3. the sea water is acidic.
4. the temperature regulation has been changed.

05.31

Mangroves(紅樹林), seagrasses(海草), and salt marshes are some of the most effective carbon sinks on the planet. They can absorb 10 times more carbon than a forest on land. And that carbon can be kept in very deep soils. If we don't disturb it, it can be under the soil for thousands of years. But the bad news is we are destroying these places. We have lost 20% to 50 % of them already, and we lose more every year. So if we can protect these places, we can stop emissions.

Those wetlands can also slow down the power of the wave, and buffer the coast against intensive storms.

New York City, use oysters to protect its coastline. When the strong wave passes through the coastline full of oysters, by the time when it gets to the shore, the wave becomes less powerful and less damaged.

Climate change is the problem we have created, now we will have to learn how to live with water and with the ocean in new ways.

We have to think about the ocean as a source of solutions that we can be using in this fight. We should think about how we can help the ocean save us.

After watching and explaining the video, the teacher will conclude the importance of the ocean with the following speech;

Tr: The ocean provides us food to eat, and oxygen to breathe, and it also stops our planet from getting too hot. Without the ocean, our Earth will be completely different. The Earth will become dry, hot, and lifeless.

Warm-up: Review the previous class

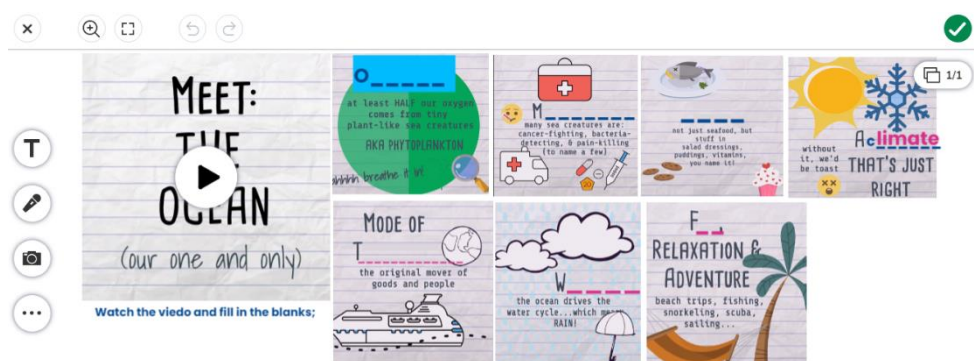
Introduction:

Think about how the ocean helps us

The teacher will ask students to log into their seesaw accounts.

Instructions:

1. Watch the video on Seesaw first.
2. The teacher goes through any problematic sentences and vocabulary.
3. Discuss the content of the video with students.
4. Ask students to fill in the vocabulary in the blank according to the video.
5. After finishing filling in all blanks, click on the green check to submit answers.



How oceans help us

Wrap-up:

The teacher will show the correct answers on the screen, which are; **oxygen, medicine, food, climate** (which has been used as an example), **transportation, water, and fun**

In the end the teacher will emphasize the importance of the following;

1. We need our oceans as much as our oceans need us.
2. Spread the word to raise awareness about loving our oceans and helping our oceans.

Skills:
Listening, memorizing,
and identifying ability

學習活動內容及實施方式

學習評量

Lesson 3-2: The main causes of ocean pollution (2 periods)

Warm-up:

The teacher will review the previous content by asking students what the ocean can help us with. The teacher will elicit answers from students, and then go over the following details with students about the importance of the ocean.

Tr: The ocean helps us with;

1. Food: More than 3.5 billion people depend on the ocean as a source of food. Unfortunately, humans' increasing need for seafood worldwide is putting more and more pressure on an already fragile ecosystem.
2. Fresh Water: The oceans of the world play a major role in the freshwater cycle. They form the clouds that bring us rain, providing us with fresh water.
3. Climate Regulation: Oceans strongly affect climate and weather

Knowledge:
Understand the importance
of the ocean to humans.

Skills:
Expressing self-opinion.

patterns, transferring heat and reducing carbon dioxide levels in the atmosphere.

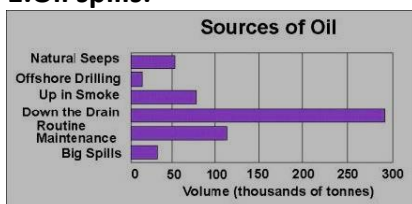
4. The air we breathe: Not only do ocean plants produce half of the world's oxygen, but the ocean also acts as an "air-filtering device" by absorbing nearly one-third of human-caused carbon dioxide emissions.
5. Transportation and commerce: More than 90 percent of global trade is held by ships.
6. Medicine: Many marine ingredients can be used to create cancer-fighting, bacteria-detecting, pain-killing medicines, and some health products.
7. Fun, relaxation, and adventure: Ocean activities such as fishing, swimming, snorkeling, cruising, and beach trips help to calm and reduce anxiety, making humans feel relaxed.
8. Renewable energy: Devices are being developed to generate electricity from waves and tides, as well as offshore wind farms.

See, the ocean has been so helpful to us. And we take it for granted. Now, do you know we are in trouble? (pause for effect.) What kind of trouble are we facing now?

Yes, pollution. Because we do not treat our oceans with the respect they deserve. Now, we are paying the cost. Today, we are going to talk about the causes of ocean pollution, and once we are aware of those causes, we must take action before it's too late.

Introduction: Causes of ocean pollution

1. Oil spills:



The teacher will start to show the above digraph on the screen to students and explain the contents by showing pictures on the screen.



Tr: Oil pollution can come from different sources. Some oil pollution is natural, with less than 10% resulting from natural seepage of oil from the ocean floor.

"Offshore drilling" refers to discharges and accidental spills from oil field operations.

"Up in smoke" refers to air pollution, mainly from vehicles and industries, which emit hundreds of tonnes of hydrocarbons. When hydrocarbons mix with water in the atmosphere and fall to the earth, it becomes acid rain. Acid rain can cause great damage to the environment, including water and plants, and it can even damage buildings and statues.

Skills:

Retrieving, memorizing, and categorizing abilities.

“Down the drain” includes a number of domestic, municipal, and industrial sources of oil pollution. Any oil spilled in industrial or domestic operations can be washed down drains and end up in the ocean.

“Routine maintenance” mostly refers to ship maintenance. Although for a single ship, this is a very small amount of oil leaking during operation, if there are one thousand ships, it can still become a significant issue.

“Big spills” typically account for 5% to 12% of the total oil pollution that enters the ocean, but oil spills are especially serious because of the heavy concentration of oil in one region. Since oil spills are localized, they can severely contaminate beaches and sediment, causing serious harm to ocean animals. Oil spills can suffocate fish, get caught in the feathers of birds and mammals, and block light from photosynthetic plants in the water.

2. Littering:

Tr: Although littering is only one of the pressures on the health of the ocean environment, it is a growing concern, especially due to the long endurance of plastics in nature, which further complicates the issue. Plastics can take hundreds of years to break down into small pieces, and even those small pieces are harmful. At least 8 million tons of plastic end up in our oceans every year.

When marine animals accidentally eat the plastics, their stomachs become filled with indigestible plastic, preventing them from feeding and leading them to starve to death. The chemicals in plastics can also act as poisons, weakening and killing animals.

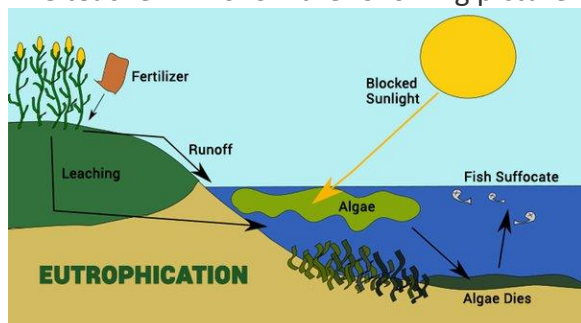
Larger pieces of plastic also pose a threat to marine life. Many species, including seals, dolphins, and sea turtles, can get entangled in plastic debris, fishing nets, and lines lost at sea. Most of the entangled animals do not survive, as they cannot reach the water's surface to breathe, escape from predators, or feed themselves.

3. Industrial wastes:

Tr: More than 2.8 billion gallons of industrial wastewater per day are discharged directly into ocean waters. Heavy metals released from industries, such as mercury and lead, are often found in fish, which are commonly consumed by humans. If we eat contaminated fish, we can also get sick.

4. Agricultural wastes:

The teacher will show the following picture on the screen and explain it.



Tr: The main cause of marine pollution from agricultural wastes is the runoff of fertilizers. When the chemical runoff gets into the ocean, it

causes eutrophication (優養化). These chemicals stimulate the growth of a thick layer of algae on the water's surface, blocking sunlight. As a result, the algae and plants in the lower layers die due to lack of sunlight. This not only affects the amount of oxygen in the water but also disturbs the ecosystem.

Worksheet:

What is happening to our Oceans?

How to solve these problems?

Problems

Solutions

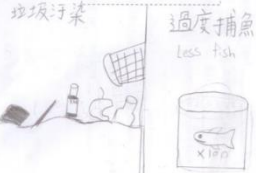
Student's work

Write two causes of the ocean's problems, and two solutions to solve the problems.
寫出海洋問題的高個原因，以及解決問題的高個方法。

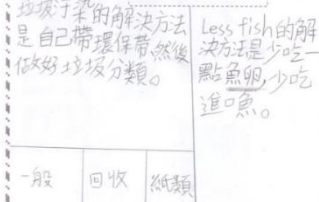
What is happening to our Oceans?

How to solve these problems?

Problems



Solutions



What is happening to our Oceans?

How to solve these problems?

Problems



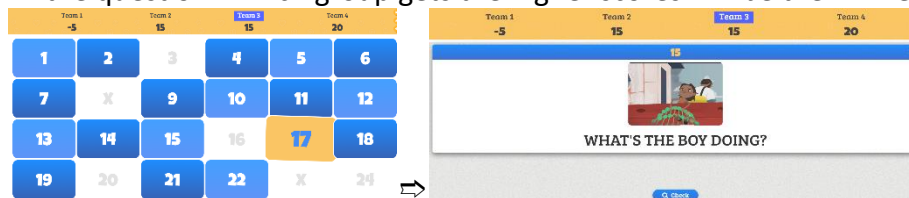
Solutions



Warm-up: Look at the video and answer question

[A Whale's Tale | Hope Works](#)

1. Divide students into 4 groups.
2. Play the video.
3. Take turns asking a group of students to choose a number and answer the question. Which group gets the higher scores will be the winner.



Introduction:

Reasons to protect oceans so they can become our savior:

1. Oxygen
You may think of trees when it comes to the air we breathe, but most of our oxygen comes from the oceans. 70-80 percent of the Earth's oxygen is produced by marine algae. That's why algae are called the world's most important plant.

Skills;
Recall facts and basic concepts.
Explain ideals and concepts.

2. Carbon sink

The oceans don't just produce oxygen; they also absorb 25 to 30 percent of the carbon dioxide and other harmful greenhouse gases causing our planet to heat up. The oceans absorb about one-third of these emissions, which then sink down to the deepest parts of the oceans. However, too much carbon dioxide can make the ocean water become acidic. Simply put, acidic water can harm marine plants and affect their growth. This, in turn, reduces the ocean's capacity to absorb CO2 from the atmosphere.

3. Weather

The sun warms the Earth, and the ocean helps distribute heat around the planet. Near the equator, where the sun's rays are the strongest, the ocean absorbs a lot of heat. In contrast, closer to the poles, the ocean releases heat into the atmosphere. So, the ocean helps circulate heat around the Earth, influencing the distribution of warmth and moisture in the atmosphere. This, in turn, affects weather patterns, causing the different seasons and varying weather in different regions.

4. Freshwater

Ocean water is a significant source of the water cycle. When it evaporates, the ocean water is absorbed by clouds, which convert it into fresh water. This water then falls as raindrops onto land, providing life to plants and animals, as well as supplying us with water to drink.

5. Variety of marine life

Even with billions of creatures on land, most of life on Earth is underwater. There are more than 240,000 known marine species, including the most intelligent and fascinating ones. Scientists say that we've only seen a fraction of what lies in the world's oceans. Only 5 percent of our oceans have actually been explored. We don't know how these unknown creatures interact with each other or how their survival impacts our own lives either. So it's important to take care of our oceans, just as we have been taken care of by them.

Wrap-up:

Tr.: Around 70 % of our planet is covered by oceans and 80 % of litter



is from land. Most litters are plastics. It means if we want to solve the marine pollution problem, we should start to use fewer plastics. And it's better to start from ourselves Now, because...do or die!

學習活動內容及實施方式

學習評量

Lesson 4-1: Actions we can take to save our ocean (2 periods)

Warm-up: Review the importance of our oceans

Introduction: It's a big job for one but if we all lend a hand, we will soon make a difference in things we want to change."

Tr.: We have learned that the most serious problem we are facing is climate change. To solve this issue, we must save our oceans from pollution. Saving our oceans is equivalent to saving ourselves. Additionally, we have identified the causes of marine pollution. Now, what is the next step we need to take? (Pause for effect)... Do you believe that one person can truly make a difference in stopping our Earth from destroying? Before you answer, let's watch a video book.

[Harry Saves the Ocean! \[Children's story | Read Aloud\]](#)

After watching the video, the teacher will ask students what the moral of the story is. The answer will be, "**It's a big job for one but if we all lend a hand, we will soon make a difference in things we want to change."**

Tr.: Yes, small actions do matter. If everyone lends a hand to help our world become a better place, our world will be changed, our problems will be solved. So, now it's time for us all to take action.

Skills:

Use the information to answer questions and solve problems.

Actions we can take to save the ocean

Tr.: Things we can do to save our ocean...what are they? Can anyone think of any?

(Elicit answers from students)

Tr.: Yes, there are lots of things we can do at home, around town or the city, and on the water.

The teacher shows the following picture on the screen and explains it.



Tr.: Look at the picture, what can we do at home? At home, what we can do is 'conserve water', 'reduce pollutants', and 'reduce waste'. 'Conserve water' means to use less water, for example, when we are brushing our teeth or washing dishes, we should turn off the tap when not in use. Instead of using a water hose to wash the car, it's better to use a bucket. And if there are leaking pipes and dripping taps at home, we should fix them right away.

'Reduce pollutants', because all water we use at home will go into the river and then the ocean. When we use too many chemical products at home, those runoffs will pollute our water and our ocean.

'Reduce waste'. See the sign here? Does anyone know what it means when you see it? Yes, it is the universal recycling symbol which means that the item was made from recycled materials. Now, have you heard of the 3Rs waste management? The 3Rs are short for **Recycle**, **Reduce**, and **Reuse**. They are all about cutting down our waste. Now, let's watch a video. From the video, you will get better ideas about what the 3Rs are.

[Reduce, Reuse and Recycle, to enjoy a better life | Educational Video for Kids.](#)

How do we implement the 3Rs principle? What we need to do is to make a small change in our daily lifestyle to reduce waste so that a lesser amount of it goes to landfill.

Now, let's see what we can do when we go out around our city. 'Shop wisely,' 'reduce vehicle pollution,' and 'use less energy.'

'Shop wisely': Choose sustainable seafood, meaning the fish has been caught in a way that ensures there's plenty more fish in the sea now and in the future, or the fish has been farmed without harming the ecosystem.

'Use less energy': We can also do it at home by using efficient bulbs and setting our air conditioner around 26 degrees Celsius. We should always be conscious consumers and pay attention to what we eat and use.

The last part is 'on the water.' When we do water activities, while we are enjoying ourselves, we should not forget to respect the ocean. We don't overfish and we will respect habitats, which means we don't step on seagrass, or corals, and don't pet fish and turtles.

Now, we have full ideas about 'how' we can take action to save the ocean.

Skills:

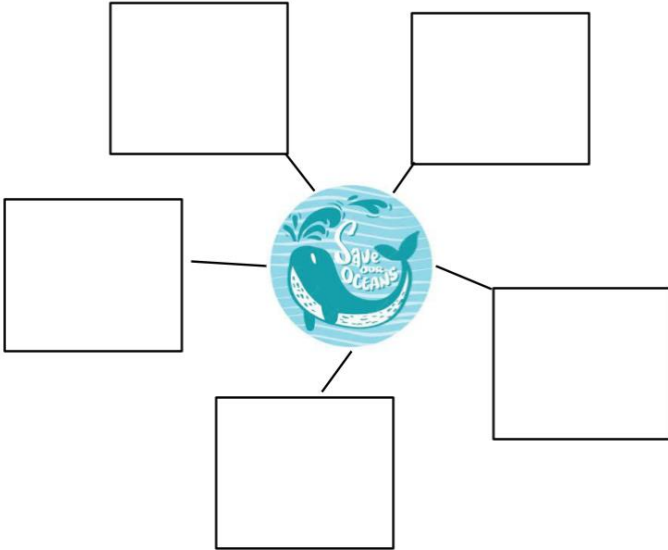
Use their prior knowledge to express their opinions and solve problems.

We can implement the 3Rs and be conscious consumers, and the reason for us to take action is to stop climate change. That's the final goal.

Worksheet:



What are some ways you believe we can protect our oceans?
Please write down your opinions in the boxes below.



Warm-up: Review the content of the previous class

Introduction: Introduce eco-friendly artists

Underwater Sculptures:

Tr.: Action speaks louder than words. Knowing is not enough; we must apply. So here, we have World Ocean Day on the eighth of June. The purpose is to raise awareness about the important role the ocean plays in our lives and the significant ways people can help protect it. There are some organizations, companies, and people who volunteer to do beach clean-ups. Many environmentalists are using recycled materials to create their artwork. All of them are actions people take to show they care for our ocean and our planet. Now, we are going to watch a video. In this video, we can see another example of an environmentalist who is not only creating his artwork but also building a new habitat for marine plants and animals. Remarkably, he used the ocean floor as his gallery to create an underwater museum.

[Underwater Sculptures | Exhibitions | Showcase](#)

This British sculptor has installed his sculptures in many countries, and his installations raise awareness about the environmental crisis. As we can see in the video, this underwater gallery provides not only the artwork but also food and habitat for schools of fish.

Washed Ashore Project

Tr.: Another video is about a non-profit organization called Washed Ashore. The founder, Angela Haseltine Pozzi, collected ocean waste to make giant sculptures, reminding people to stop polluting our ocean.

[Washed Ashore Project](#)

Angela, the founder, tries to use her artwork to convey the message that the plastic pollution problem in the ocean is huge and massive, affecting every beach in the entire world. So, if we want to solve this problem, we need to educate our kids to use fewer plastics and implement the 3Rs of waste management.

Discussion time:

After watching those videos, the teacher divides students into 6 groups. And ask them to discuss the following questions in 10 mins:

- Why do those artists want to create their masterpieces using recycled materials
- Any inspiration from those artists?
- Do you have any families who are doing the same thing as they do?
- How can individuals, beyond artists, incorporate the concept of using recycled materials into their daily lives to reduce waste?
- Apart from creating sculptures, what other creative ways can artists use recycled materials to advocate for environmental causes?
- How can schools play a role in promoting the use of recycled materials and environmental awareness among students and the community?

Sharing time:

Each team will need to share their opinions in front of the whole class.

Wrap-up

Skills:
Listening ability

Skills:
Describe, discuss things and express their thoughts verbally or visually.

<p>The teacher gives some positive feedback related to students' sharing opinions.</p>	
學習活動內容及實施方式	學習評量
Lesson 4-2: Save our ocean campaigns (2 periods)	
<p><u>Warmup; Recap all contents we have taught in previous classes</u></p> <p><u>Introduction: Who is Greta Thunberg</u> Introduce Greta Thunberg, the environmental activist, to students by watching the following video;</p> <p>The Life of Greta Thunberg</p> <p>After watching the video, the teacher explains the contents shown and then asks the students what they think about Greta Thunberg's actions.</p>	<p>Skills: Communicating, discussing and applying.</p>
<p>After students share their opinions, the teacher will tell students that the main message from Greta Thunberg is "You are never too small to make a difference."</p> <p>Task: Make a poster The teacher distributes the painting paper to everyone and asks them to consider what pictures/words they would include on their posters if they had the opportunity to act like Greta Thunberg. What images/words would they like other people to see in order to inspire environmental conservation?</p> <p>For the second class, students will participate in a gallery walk to view their classmates' posters. The teacher will divide them into 6 groups, and each group will select the best poster to display on their team's behalf. Each team will then have 2 minutes to explain their chosen posters to other groups.</p>	<p>Skills: Applying and creating skills. Presentation ability</p>
Students' work	

